

GOVT. OF HIMACHAL PRADESH

FOREST DEPARTMENT



**WORKING PLAN FOR THE FORESTS
OF**

KINNAUR FOREST DIVISION

(01-04-2019 TO 31-03-2029)

VOLUME-I

BY

DR. CHAMAN LAL RAO (HPFS)

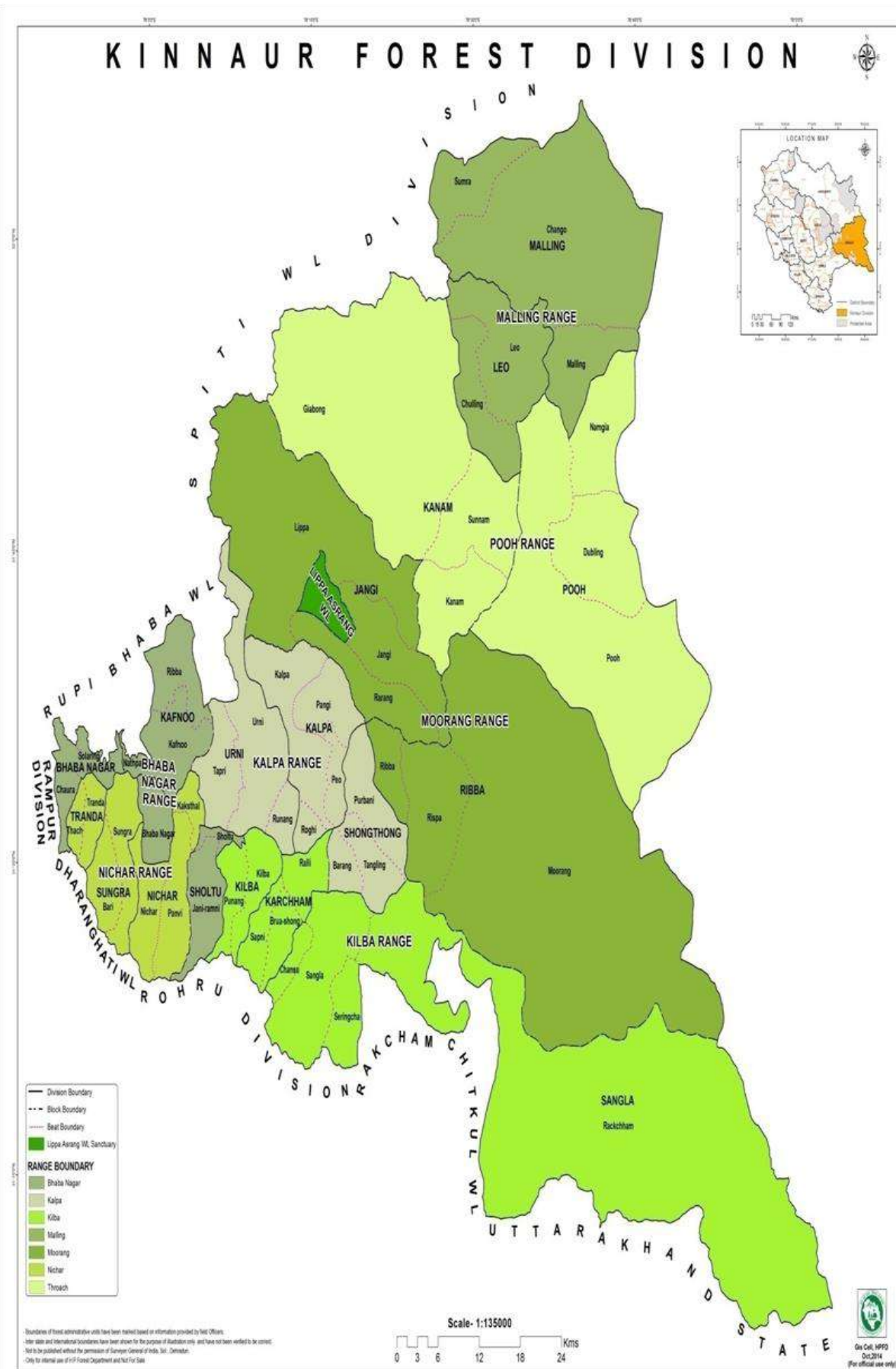
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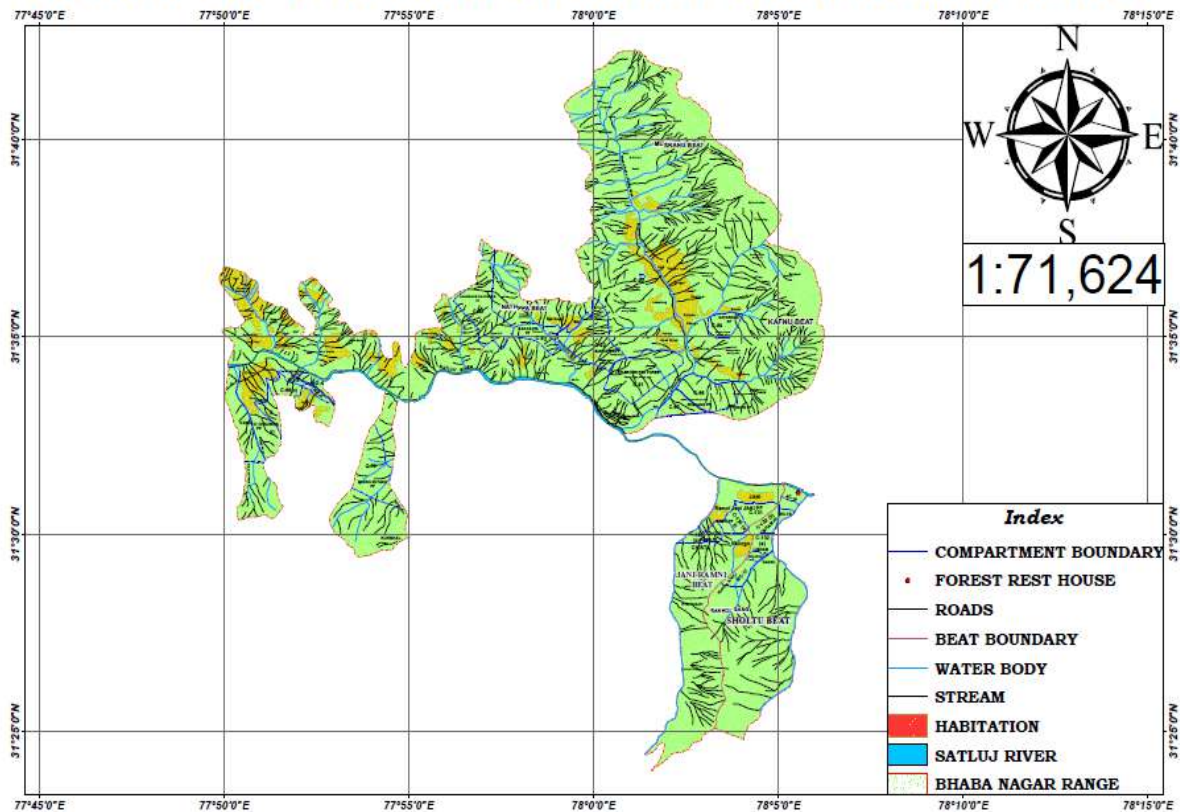
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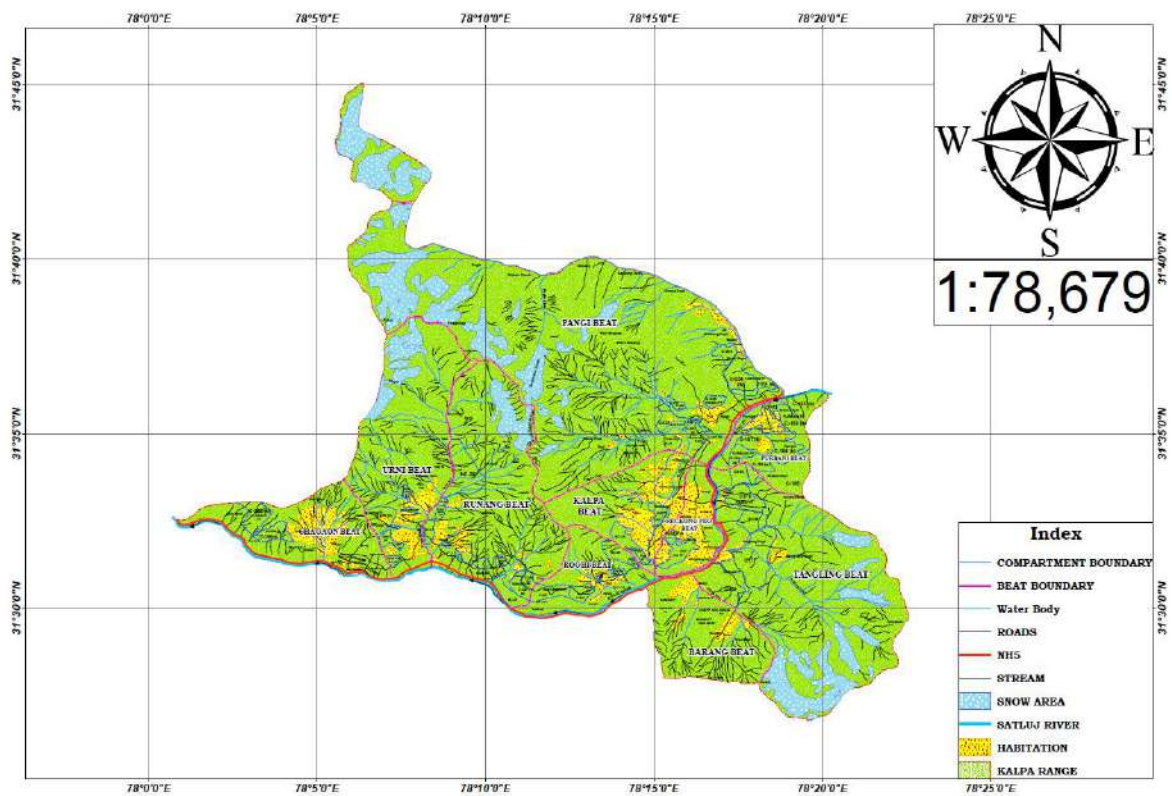




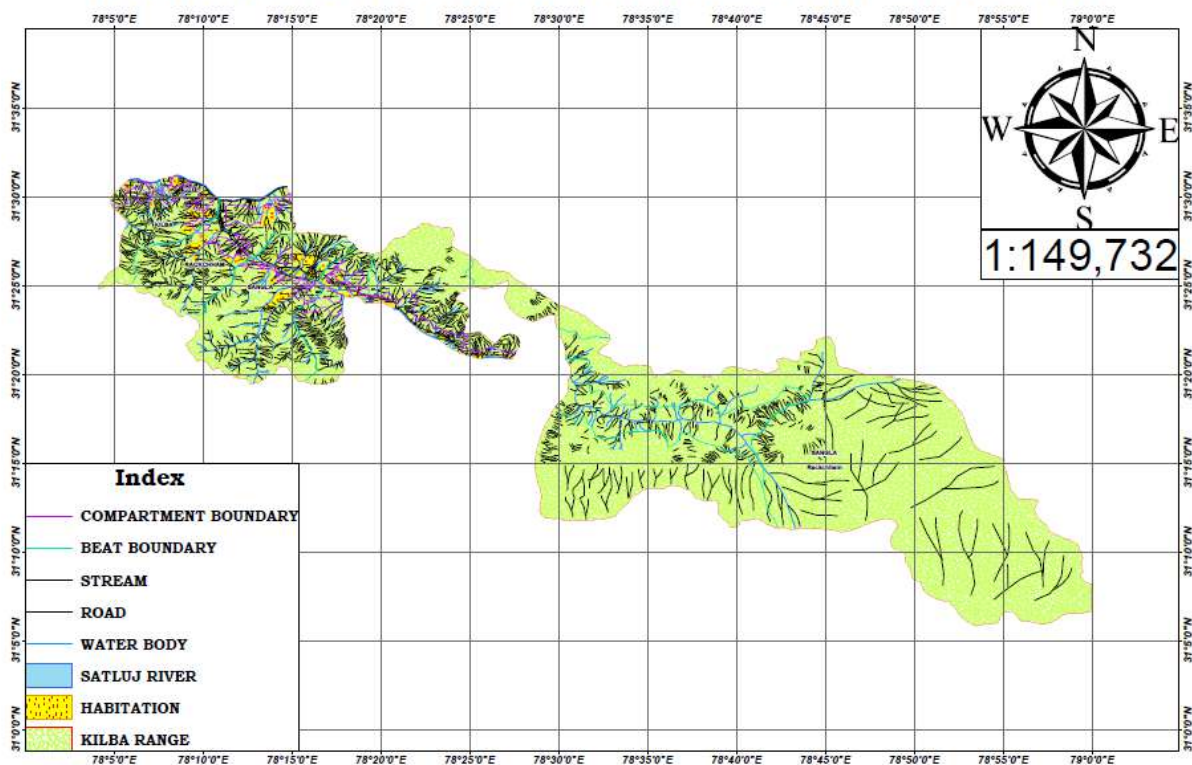
DIGITAL LOCATION MAP OF BHABA NAGAR FOREST RANGE



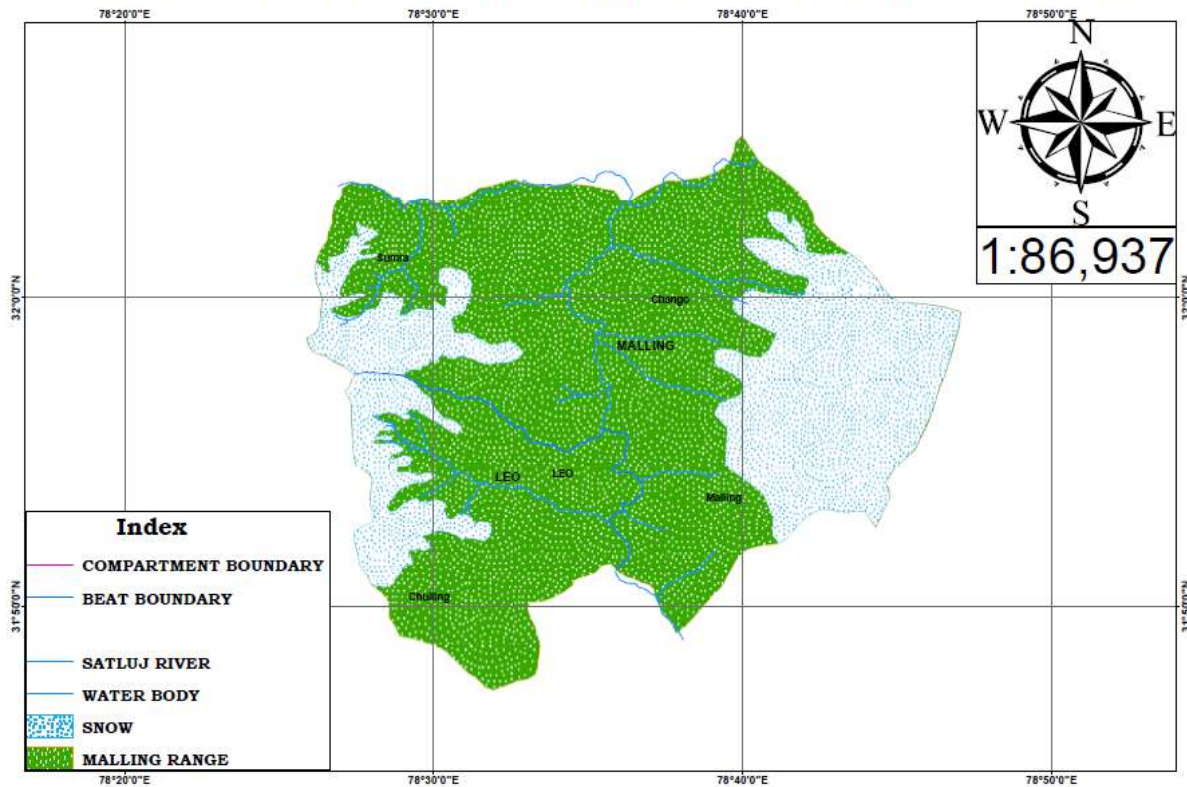
DIGITAL LOCATION MAP KALPA FOREST RANGE



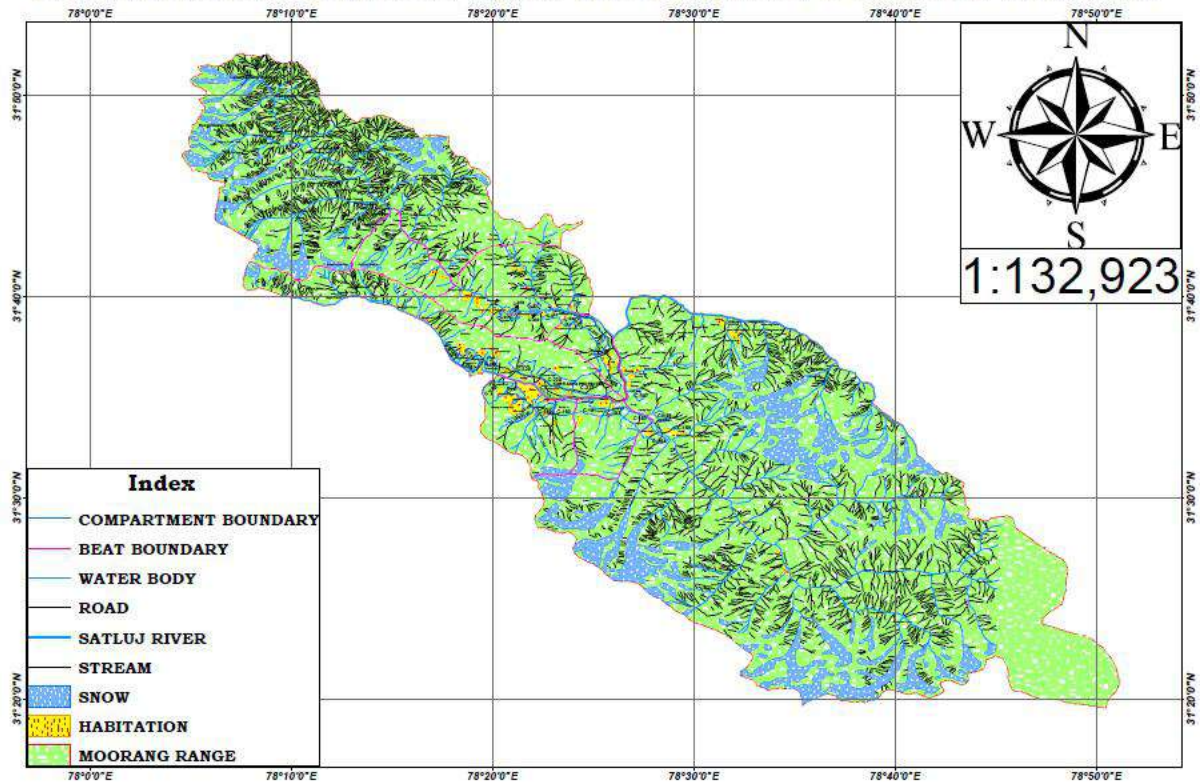
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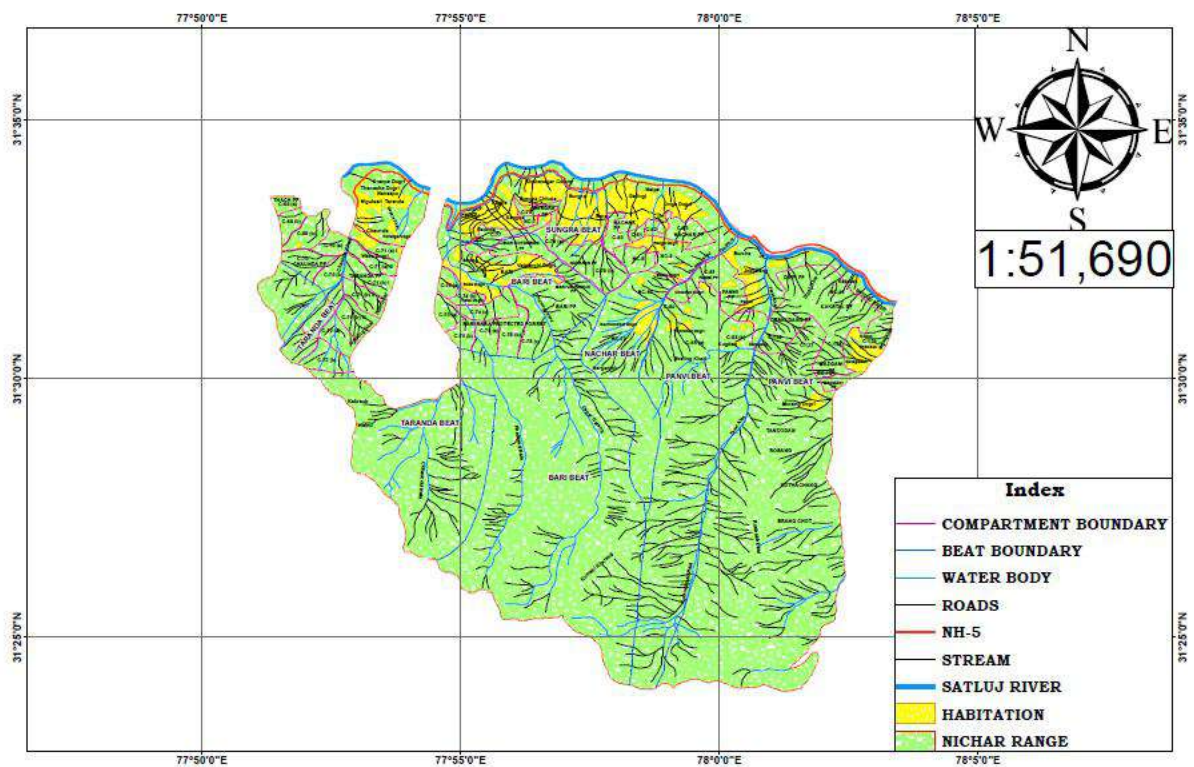
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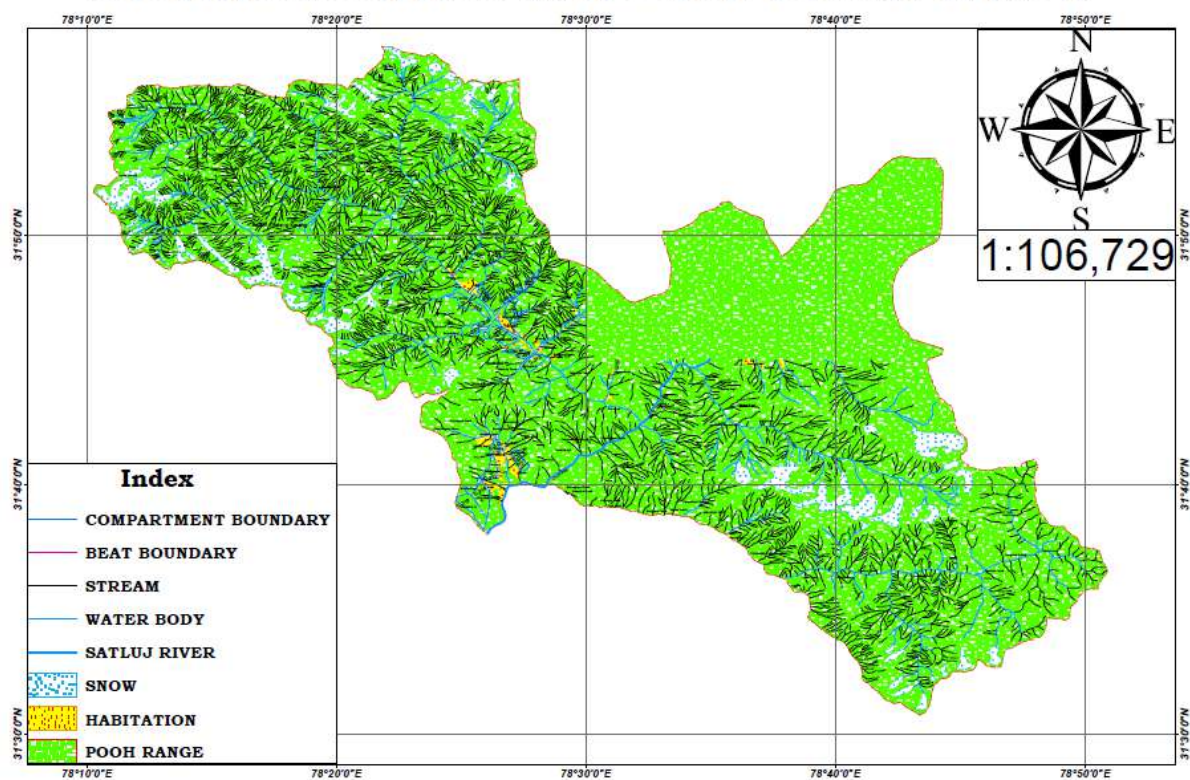
DIGITAL LOCATION MAP MOORANG FOREST RANGE



DIGITAL LOCATION MAP NICHAR FOREST RANGE



DIGITAL LOCATION MAP POOH FOREST RANGE



INTRODUCTION

This working plan is revision of Sh. Rajiv Kumar's Plan (1999-2000 to 2014-15) and includes the forest area transferred from Wild Life Division Sarahan and the areas which were not included in the plan under revision. Dr. Chaman Lal Rao, HPFS was posted as DFO (T) Kinnaur Forest Division at Reckong Peo in the month of March, 2019 and had been assigned with additional work of working plan of Kinnaur Forest Division. Field works started in October, 2017. The field work and preparation of working plan was completed in the month of October, 2019.

The preliminary working plan report was written by Sh. Anil Thakur, IFS, the Chief Conservator of Forests, Rampur and was approved by the Addl. Pr. CCF (HOFF-cum-Chairman, PAC/SCC H. P. Talland Shimla on dated 20-04-2017).

I have gone through the present working plan prepared/written by Dr. Chaman Lal Rao. The working plan contains few new chapters in terms of the National Working Plan Code, Govt. of India, MOEF, and year 2014. Mr. Rao has emphasized in the present plan on sustainable conservation of forests and many changes have been made in this plan based on silvicultural requirement and betterment of forest & wild life, in terms of the Hon'ble Supreme Court's order dated 12-12-1996 and 8-1-2001. The present working plan has been revised thoroughly, notwithstanding, the present moratorium on green felling, the revised working plan includes all regular working circles, prescribing yield and felling cycle/felling series depending on the condition of forests in each working circles. This green felling in any forest or in public forest will be allowed/carried out strictly, in accordance with the approved prescription of working plan subject to the decision of the Hon'ble Supreme Court against the H.P. Govt. affidavit filed in the Apex Court on 21-2-1997 and an affidavit filed in pursuant to the order dated 14-2-2000, which is pending for adjudication before the Hon'ble court. The Hon'ble High court held that there shall be no felling of any tree in any forest area in the State of Himachal Pradesh, whether private or State Forest, except in accordance with the orders passed by the Apex Court. However, in respect of felling of trees in private forests in State of H.P, the Apex Court order dated 8-5-2009 held that felling of trees from the forest area approved for non-forestry use under Section 2 of the Forest (Conservation) Act, 1980 may continue to be permissible. Felling of trees in non-forest area should be strictly regulated as per the provisions of the H.P. Land Preservation Act, 1978. Accordingly, felling of trees in private forest areas is being allowed strictly in compliance of the Apex Court's order dated 8-5-2009 and vide H.P. Govt. Notification dated 19-2-2011.

No felling has been prescribed under Neozaworking circle. Emphasis is given to focus on the need of special attention to the management and conservation aspects of the species. A separate mandatory working circles i.e. Plantation, NTFP, Forest Protection (Fire, illicit felling, encroachment, illegal mining and poaching etc.), and Participatory Forest Management & Wild Life Management (overlapping) Working Circles have also been constituted for the first time and discussed in length with prescriptions of legal control mechanism, which would be very useful as reference. The chapter on NTFP gives an exhaustive list of the useful medicinal plants along with their uses, which would be very useful as reference. Similarly, the new chapter on Five Year Plans & Activities of H. P. State Forest Development Corporation Ltd. in harvesting and marketing of forest produce, result of socio-economic survey, too, are in detailed form. Special mention is to be made of the noteworthy work done to legal control mechanism in the present working plan, which is the first study of its kind in Himachal Pradesh.

The survey sheet number, forest type, density, etc. of every forest/compartments has been mentioned in the Appendix on Area statement to facilitate their location and provide easy access to information. Great efforts has gone into collection of data on human & cattle population, T.D.

distribution, NTFP as well as land use classification i.e. recognized sub-division of forest area data.

For the first time, the enumeration was conducted by using Grid System based technology in the tract of Kinnaur Forest Division. The WPO and entire field staff was new to this technology. The enumeration data was further analyzed. Hence, there was delay in submission of final draft of working plan.

The working plan officer and his staff deserve all appreciation for completing the revision of the plan in shortest time, despite many constraints. The revised working plan has been prepared for a period of 10 years commencing from 1-4-2019 to 31-3-2029. The working plan under revision expired on 31-3-2015. As there were practically no silvicultural fellings done during the last plan period and other prescriptions too, were not particularly followed, there is no problem in making the plan operative prospectively.

Dr. C. L. Rao & his staff worked very hard on the preparation of this working plan in shortest time without support of additional working plan staff and other resources and deserve all appreciation for the same.

It is expected that the information provided and the prescriptions suggested in the plan would be very useful in deciding the management of forest practices in future.

Dated:-12th January, 2021

Addl. Pr. CCF Working Plan &
Settlement, Mandi, H.P.

PREFACE

This Working Plan is revision of Sh. Rajiv Kumar's Plan (1999-2000 to 2014-15) as per the Revised National Working Plan Code, GOI, year 2014 and includes the forest area transferred from Wild Life Division, Sarahan and the areas which were not included in the plan under revision. I was assigned additional work of working plan of Kinnaur Forest Division, when I was posted DFO (T) Kinnaur Forest Division in March, 2019. However, field work was started during 2016-2017 and completed in April, 2019 under the guidance of Sh Angel Chauhan HPFS, the then DFO Cum WPO Kinnaur. However, the data processing and preparation of working plan / writing work was started after April 2019.

The preliminary working plan report was written by Sh. Anil Thakur, IFS, the Chief Conservator of Forests, Rampur and was approved by the Addl. Pr. CCF (HOFF-cum-Chairman, PAC/SCC H. P. Talland Shimla on dated 20-04-2017)

The preparation of the revised working plan for Kinnaur Forest Division has been a great learning experience for the undersigned. It has been a great team effort, laborious and difficult nature, which were impossible to be completed without sincere efforts made by the staff in the field as well as in the office as mandate given by the Pr. CCF H.P., Shimla. I, owe my indebtedness to the my field staff, who extended a whole hearted co-operation and help during field works, valuable suggestions for the preparation & final completion of this working plan.

Special thanks are due to the Pr. CCF, H.P., Sh. Ajay Kumar, IFS (Now Retd), Dr. Savita, IFS Pr. CCF (HoFF), H.P and Addl. Pr. CCF, Working Plan & Settlement, H.P. Sh.H.V. Kathuria, IFS, for their constant guidance, encouragement and help during the preparation of this working plan.

The revised working plan has been prepared for a period of 10 years, commencing from 01-04-2019 to 31-03-2029. The working plan under revision expired on 31-03-2015. As, there was practically, no silviculture fellings during the last plan period in terms of the Hon'ble Supreme Court order dated 12-12-1996, there is no problem in making the plan operative prospectively.

The working plan had the benefit of being supervised by many superior officers of the rank of CCF and Addl. Pr. CCF, owing to the frequent changes at these levels in the working plan set up. I am highly indebted to Sh. Anil Thakur, IFS, CCF, (T) (the then CCF Rampur), Sh. B. L. Negi IFS, Conservator of Rampur Circle, and Sh. C.M. Sharma (Retd. DFO), who were instrumental in providing the necessary guidance to the undersigned, The plan owes its present form, due to the generous technical support provided by Sh. Anil Thakur, IFS, and Sh. B. L. Negi, IFS, also who enriched us with their valuable advise and help, especially, during field work etc.

I would like to acknowledge the valuable contribution rendered by all the staff of the Kinnaur Forest Division, ably led first by Sh. Anil Soni, ACF Kinnaur, Sh. Vinod Ranta F.R.O., Sh. Rajender Negi, F.R.O., Sh. Lal Singh Bilyan, F.R.O. Sh Hira Singh Thakur F.R.O., Sh. Raj Bahadur Negi F.R.O., Sh Paras Ram F.R.O., Sh. Udham Thakur, Deputy Ranger, Sh Kabir Chand Negi Deputy Ranger. Thanks are due to all the field staff and ministerial staff of Kinnaur Forest Division, at Reckong Peo for their sincere and unqualified support in the preparation of the working plan.

Finally, I am thankful to Sh. Raj Kumar, Forest Guard, who have co-operated in typing this working plan in a nice manner in the shortest possible time. Once again, I acknowledge my debt to Sh. H. V. Kathuria, IFS, CCF Working Plan and Settlement, Mandi for bestowing on me the sheer honour of working under his able guidance.

Place: - Reckong Peo

Dated:- 12th January, 2021.

Dr. Chaman Lal Rao HPFS

Divisional Forest Officer,

Kinnaur Forest Division,

At Reckong Peo.

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GLOSSARY OF THE VERNACULAR TERMS	
Local Term	English equivalent
Abadi	A Village habitation
Adna malik	Inferior owner
Ala malik	Superior owner
Ala malkiat	Superior ownership
Badhan Gani	A tax levied by erstwhile Bushahr state on its subjects
Bahan	Float of timber
Balli	Round un-sawn timber used in houses as rafter or post.
Begar	Free labour
Bartan	Right of user
Bartandar	An individual who enjoys Rights of user in the forests
Baoli	A small water spring
Banjar	Waste land
Banjar kadim	A field which is lying fallow for less than 4 years.
Banjar jaded	A field which is lying fallow for more than 4 years.
Behand banjar	Occasionally cultivated.
Bakhal	Unirrigated land.
Barani .	Land not irrigated and dependent on rainfall
Banjar kabala kasht	Cultivable waste land.
Baraniyak fashi	Land not irrigated and dependent on rainfall.
Barani yak fasti	Rain fed, cultivable once a year.
Chak	Included cultivation within forest boundary. In Bushahr revenue settlement, the term ‘CHAK’ is for Mohal or a revenue estate also.
Chaukidar	Watchmen.
Chhanda	The river is land beyond the boom, where timber gets stranded.
Charand	Grazing land
Chhang	Lopping
Chhatai or chhatan	Thinning.
Chohade	A pillar, where boundaries of four villages/ Chaks meet.
Coolie	Labourer

Dandasa	The trade name of the bark of walnut roots, used for cleaning teeth by ladies.
Dehat	Village.
Deota	The local God.
Dhar	A spur or a ridge /Also an alpine pasture.
Danda	A high level ridge.
Dandidar	A mazdoor employed on ration godowns for wieghment of rations.
Darat	Sickle used for lopping purposes.
Dehat	Village.
Dagis	Scheduled caste.
Doghri	A small farm house on the land, usually away from the main village.
Dhulan	Land carriage.
Dhulanee	Labour used for dhulan.
Dimdima	Any odd size of wood roughly axes dressed and ranging in cross Sections from 25 cms. × 25 cms. to 30 cms. and lentgth less than 1.82 meters.
Draiman	A mazdoor, which with the help of an inflated buffalo skin, can swim in the river and help in floating of timber.
Gad	A small stream with perennial water.
Gaddies	The professional shephards belonging to district Chamba or Kangra.
Gattu	A small odd size of scantling usually less than 4 feet in length.
Garhwali	Inhabitants of Garhwal (UP)
Gharat	A water flour mill.
Ghair mumkin	Land under, road, habitation and Nallah etc.
Ghall	Timber floating in the stream or river.
Ghallu	Labour engaged on floating of timber.
Ghasni	The village grass land.
Ghati	The pass in main ridge.
Ghee	Clarified butter. / Purified butter
Girdawar	Kanungo.
Gujjar	The nomadic buffaloe grazier, generally mohammadan.
Gurkha	A native of Nepal.
Godam	Ration godown
Hakries	Small triangular split up pieces of wood, usually less than 5 feet in length.
Hath	Hand, equivalent to one and a half feet.
Had-bast-number	A specific number assigned to a particular villageat the time of Revenue Settlement.
Illaqa	Area / Locality
Jagir	Estate or grant
Jagirdar	Owner of estate or grant
Jogthi	Torchwood.
Jungle mufuza	Reserved forest
Jungle mahaduda	Demarcated protected forest
Kacha Mal	Any small size of sawn timber.
Karries	Scantlings./ Axe squared scant.
Kanda	Alpine Pasture. / Alpine meadows or Summer pastures.
Kanaits	Rajputs.
Kanungo	A revenue official immediatly above Patwari.
Khad	A small stream with perennial water.

Kharif	Rainy season crop.
Kiars	Irrigated fields, wherein, usually paddy is cultivated.
Kanawaras or Kinnauras	Residents of illaqa Kinnaur, Bushahr. / Inhabitants of kanawar or Kinnaur District.
Koli	Scheduled Caste.
Kokat	Miscellaneous species of inferior trees.
Kuhal/Kuhl	A water channel.
Kuhli	Irrigated.
Kuthars	Barnhouse made of timber.
Kilta	A conical basket for carrying farmyard manure and grass and fruits, etc.
Lambardar	The village headman.
Lamdori	A log line acting as a temporary boom in a river.
Ladus	Male goat and sheep used for carriage purposes.
Mali	Gardener or Man employed for maintenance of nurseries.
Mandee	Market.
Mallah	Labour conversant with steering timber rafts.
Mauza	A village.
Mela	A local fair.
Mistri	Head sawyer or a foreman of gang of sawyers
Moawza	Compensation
Moharrir	An accountant.
Mohri	The scant of the ghall, which arrive foremost at the catching point.
Mohal	A revenue estate.
Mazdoor	A labourer.
Muharir	Man employed to check work.
Nala/Nallah	A ravine or depression with or without water.
Nautor	Land granted for fresh cultivation.
Nazrana	A fee leviable on the fresh breaking up of land.
Negi	A sect of Rajputs.
Neoza or Chilgoza	<i>Pinus gerardiana</i> , its fruit/ seeds.
Paimuda	Measured.
Pattoo	Blanket.
Patti	Locally manufactured woollen cloth used for preparing coat and a pair of trousers.
Parao	Halting stage.
Panchayat	Village council.
Panwi	A grass land, burnt annually during winter.
Pargana	A unit comprising of several villages.
Patwari	Revenue official incharge of the smallest revenue unit.
Pichhari	Tail of the ghal.
Pulas	A locally made pair of shoes.
Pulang / Walang	
Rabi	Winter crop.
Rai	Spruce (<i>Picea morinda</i> or <i>smitheana</i>)
Rakha	A watchman for protection of forest.
Rawana	Permit for exporting forest produce.
Ropa	Irrigated rice fields.
Sahukar	Moneylender.

Sarnai	An inflated goat / buffalo skin used for crossing river.
Samudha	A category of timber for sale purposes which includes all grades of timber.
Shamlat	Waste land owned by the villagers.
Suhr	Fallen pine leaves.
Tal	Lake.
Tandel	Mate of labour gang
Tehsildar	A revenue officer, incharge of a tehsil.
Thach	Small grassy blanks in alpine forests used as halting places by graziers
Tibba	Peak.
Tirni	Grazing tax
Wajib-ul-arz	Regulation regarding land, rights etc.
Watt	A ridge raised along field boundaries for retaining water.
Watt bandi	Operation of making watts round the field.
Waziri	Assessment circle
Zamindar	Owner of land assessed to land revenue.
Zamidari	Land assessed to land revenue, of which owner is the sole proprietor.

Glossary of common Trees, Shrubs, Herbs and Grasses found in Kinnaur Forest Division

A:- Trees		
Sr. No.	Botanical name	Local name
1	2	3
1.	<i>Abies pindrow</i>	Tosh
2.	<i>Acer oblongum</i>	Parang
3.	<i>Acer pictum</i>	Rikhandlu
4.	<i>Acer caudatum / Acer villosum</i>	Rikhandlu
5.	<i>Acer caesium</i>	Chirandru, Manderang
6.	<i>Aesculus indica</i>	Khanoor, Poo
7.	<i>Albizzia lebbek</i>	Siris
8.	<i>Alnus nitida</i>	Kosh, Kunish, Nyum
9.	<i>Betula utilis</i>	Bhojpatra, Pad
10.	<i>Betula alnoides</i>	Sheori, Kathbhoj, Shagra.
11.	<i>Buxus wallichiana (Syn. Buxus empervirens)</i>	Shamshad
12.	<i>Carpinus viminea</i>	Khirkii, Lolti
13.	<i>Castanea sativa</i>	Mitha Khanor, Poo
14.	<i>Cedrela serrata</i>	Darb, Krishing
15.	<i>Cedrus deodara</i>	Deodar, Kelo, Diar, Kialmang
16.	<i>Celtis australis</i>	Khirak, Koo
17.	<i>Corylus colurna</i>	Sharol, Banshari, Ge bija
18.	<i>Cornus capitata</i>	Kareeva, Khagsha, Sak taquas
19.	<i>Cornus oblonga</i>	Kareeva
20.	<i>Cupressus sempervirens</i>	Saru
21.	<i>Cupressus torulosa</i>	Devidiar
22.	<i>Euonymus tingens</i>	Barmelui, Kalachindwara
23.	<i>Engelhardtia colebrookiana</i>	Samma
24.	<i>Fraxinus xanthozyloides</i>	Thum
25.	<i>Fraxinus micrantha</i>	Angu
26.	<i>Ficus palmata</i>	Phedu
27.	<i>Ilex dipyrena</i>	Kandru
28.	<i>Kydia calycina</i>	Pula
29.	<i>Juglans regia</i>	Akhrot, Khor, ka
30.	<i>Juniperus macropoda</i>	Guggal, Dhup, Shur
31.	<i>Litsaea umbrosa</i>	Paror, Chirindi
32.	<i>Litsea consimilis</i>	Paror, Chirindi
33.	<i>Machilus duthiei</i>	Chan, Chirindi
34.	<i>Melia azedarach</i>	Bakain, Drek
35.	<i>Olea cuspidata</i>	Kahu, Vee
36.	<i>Picea smithiana</i>	Spruce, Rai, Rayang
37.	<i>Pinus wallichiana</i>	Kail, Lim
38.	<i>Pinus roxburghii</i>	Chil
39.	<i>Pinus gerardiana</i>	Neoza, Chilgoza, Ri
40.	<i>Pieris ovalifolia</i>	Ayar, Yarta
41.	<i>Pistacia integerrima</i>	Kakkar, Kakrian
42.	<i>Populus alba</i>	Safeda, Mal
43.	<i>Populus ciliata</i>	Poplar, Pahari Pipal, Chalun, Karamal, Mangal
44.	<i>Prunus armeniaca</i>	Chulli, chul

45.	<i>Prunus cerasoides</i>	Paja
46.	<i>Prunus persica</i>	Aaroo, Behmi, Reg
47.	<i>Pyrus foliolosa</i>	Ranreg
48.	<i>Pyrus lanata</i>	Ban Palti, Marpol
49.	<i>Pyrus pashia</i>	Shagal, Batangi, Kainth, Lee
50.	<i>Quercus ilex</i>	Breh
51.	<i>Quercus leucotricophora</i>	Ban, Bani
52.	<i>Quercus semicarpifolia</i>	Kharshu, Kor
53.	<i>Rhododendron arborium</i>	Baras, Parag
54.	<i>Rhus wallichii</i>	Hurku, Shush
55.	<i>Robinia pseudoacacia</i>	Pahari kikar
56.	<i>Salix babylonica</i>	Majnun, Shon
57.	<i>Salix daphnoides</i> / <i>Salix alba</i>	Beuns
58.	<i>Salix elegans</i>	Bhashal, Beuns, Shon
59.	<i>Salix tetrasperma</i>	Beau, Shon
60.	<i>Symplocos crataegoides</i>	Lodar, Logh
61.	<i>Taxus baccata</i>	Rakhal, Barmi, Neyamdol
62.	<i>Ulmus wallichiana</i>	Marn, Maldung
63.	<i>Ulmus laevigata</i>	Maral, Maldung
B-SHRUBS AND HERBS		
	Botanical Name	Local Name
1.	<i>Abelia triflora</i>	Indian Abelia
2.	<i>Andrachne cordifolia</i>	Durlu, Bharti, Karkan
3.	<i>Artemisia maritima</i>	Seski, Buer
4.	<i>Artemisia vestita</i>	-Do-
5.	<i>Artemisia vulgaris</i>	Charmer (Khadar)
6.	<i>Astragalus candolleanus</i>	Rudravanti
7.	<i>Astragalus rhizanthus</i>	Root-Flower Milk-Vetch
8.	<i>Berberis chitria</i>	Kashmal, Chutrum
9.	<i>Berberis aristata</i>	Kashmal, Khepacho
10.	<i>Berberis lycium</i>	Kashmal, chutrum
11.	<i>Berberis kunawurensis</i>	Kashmal, chutrum
12.	<i>Bosia amherstiana</i>	Khasbar
13.	<i>Buddleia paniculata</i>	Safed chindwa
14.	<i>Caragana gerardiana</i>	-
15.	<i>Caragana brevispina</i>	Shameh
16.	<i>Colebrookai oppositifolia</i>	Bhamber
17.	<i>Coriaria neplensis</i>	Masuri, lit zaklo
18.	<i>Colutea nepalensis</i>	Chum raonsh, banang
19.	<i>Cotoneaster acuminata</i>	Chum, Raonsh, banang
20.	<i>Cotoneaster bacillaris</i>	Reuns, Raonsh, banang
21.	<i>Cotoneaster microphylla</i>	Raonsh
22.	<i>Crataegus oxyacantha</i>	Bat sangli
23.	<i>Daphne oleoides</i>	Jiko
24.	<i>Daphne papyracea</i>	Kaula, gandiri
25.	<i>Daphne retusa</i>	Agru
26.	<i>Desmodium sambuense</i>	Safed kathi
27.	<i>Desmodium tiliaefolium</i>	Mortoi, mus
28.	<i>Deutzia staminea</i>	Ghugtai

29.	<i>Deutzia corymbosa</i>	Philru, chururu, kakhu
30.	<i>Elaeagnus umbellata</i>	Geai, gehain, surch
31.	<i>Elsholtzia polystachya</i>	Pothi jaunkra
32.	<i>Eurotia ceratoides</i>	-
33.	<i>Ficus foveolata (Climbing Shrub)</i>	-
34.	<i>Flemingia fruticulosa</i>	Chopru
35.	<i>Flemingia prostrata</i>	-
36.	<i>Gaultheria nummularioides</i>	-
37.	<i>Hypericum lysimachioides</i>	-
38.	<i>Indigofera dosua</i>	Kathi, Kanthi
39.	<i>Indigofera hebeptala</i>	Kathi, Kanthi, Kastiarang
40.	<i>Indigofera gerardiana</i>	Kathi, Kanthi
41.	<i>Indigofera heterantha</i>	-Do-
42.	<i>Indigofera pulchella</i>	-Do-
43.	<i>Inula cappa</i>	-
44.	<i>Inula grandiflora</i>	-
45.	<i>Juniperus recurva</i>	Thaily, Guggal, Thailu
46.	<i>Jasminum humile</i>	Chameli, Kurang
47.	<i>Lepidagathis cuspidata</i>	-
48.	<i>Lepidagathis lanceolata</i>	Choti Frodari
49.	<i>Loranthus elatus</i>	Banda, Pand
50.	<i>Loranthus vestitus</i>	-Do-
51.	<i>Lonicera angustifolia</i>	Kantias, Pirlu
52.	<i>Lonicera quinquelocularis</i>	Kantias, Pirlu
53.	<i>Myrsine Africana</i>	Banwa, Chhota Mehndru, Chitring
54.	<i>Piptanthus nepalensis</i>	Chamboa
55.	<i>Plectranthus rugosus</i>	Chhichhri, Piyag
56.	<i>Plactranthus coetsa</i>	Bangra
57.	<i>Porana racemosa</i>	-
58.	<i>Prinsepia utilis</i>	Bhekal Bekhlang
59.	<i>Perowskia atrpolicifolia</i>	-
60.	<i>Rhus cotinus</i>	Rikhal, Tung, Tugang
61.	<i>Rhus semialata</i>	Titar, Titry
62.	<i>Reinwardtia trigyna</i>	Basant
63.	<i>Ribes grossularia</i>	-
64.	<i>Ribes orientale</i>	-
65.	<i>Rhododendron campanulatum</i>	Kashimiri patha, Sirmang
66.	<i>Rhododendron lepidotum</i>	Sumral
67.	<i>Rhamnus virgatus</i>	-
68.	<i>Roylea calycina</i>	Karnol titpati
69.	<i>Rubus biflorous</i>	Anchu
70.	<i>Rubus ellipticus</i>	Hinsar, Kala, Chosho
71.	<i>Rubus lasiocarpus</i>	Kalaksha, Swating
72.	<i>Rubus purpureos</i>	-
73.	<i>Salix hastata</i>	Buins
74.	<i>Salix denticulata</i>	-
75.	<i>Salix daphnoides</i>	Buinus, Bhainsala
76.	<i>Sarcococca saligana</i>	Taliary, Charabara
77.	<i>Skimmia laureola</i>	Shashra, Kedar patti, Shuru

78.	<i>Spiraea canescens</i>	Takol, Chaku, Taku
79.	<i>Spiraea bella</i>	-
80.	<i>Spiraea lindleyana</i> Syn. <i>S. Sorbifolia spiraea vestita</i>	Kaltiri, Kueht
81.	<i>Solanum dulcamar</i>	-
82.	<i>Staphylea emodi</i>	Nag Daun
83.	<i>Smilax vaginata</i>	Peepal Satta
84.	<i>Syringa emodi</i>	-
85.	<i>Saussurea lappa</i>	Kuth
86.	<i>Viburnum coriaceum</i>	-
87.	<i>Viburnum cotinifolium</i>	Taliana, Bhutool, Tustus
88.	<i>Viburnum Stellulatum</i>	Richhoi
89.	<i>Viburnum nervosum</i>	Tilenal, Talkha, Thalin
90.	<i>Viscum album</i>	Bhangra
91.	<i>Wikstroemia canescens</i>	Chambat, Tilak
92.	<i>Woodfordia floribunda</i> (Syn <i>W. fruticosa</i>)	Dhan, Dawe
93.	<i>Zanthoxylum alatum</i>	Timber, Tirmira, Timri
HERBS		
94.	<i>Aconitum heterophyllum</i>	Patish, Mohra
95.	<i>Agrimonia eupatorium</i>	Kanaula
96.	<i>Ainsliaea aptera</i>	Durwa, kalighati
97.	<i>Anaphalis arvensis</i>	-
98.	<i>Anaphalis nubigena</i>	Bhujnu
99.	<i>Androsace lanuginosa</i>	-
100.	<i>Androsace rotundifolia</i>	-
101.	<i>Androsace sarmentosa</i>	-
102.	<i>Anemone obusilosa</i>	Ageli
103.	<i>Anemone rivularis</i>	Ageli, Carbini, maruiri
104.	<i>Aquilegia pubiflora</i>	-
105.	<i>Asparagus filicinus</i>	Sahasimuli
106.	<i>Atropa belladonna</i>	Saagngur
107.	<i>Bidens wallichii</i>	-
108.	<i>Boenninghausenia albiflora</i>	Pesmmar
109.	<i>Caltha palustris</i>	-
110.	<i>Campanula argyrotirica</i>	-
111.	<i>Campanula cashmiriana</i>	-
112.	<i>Campamula latifolia</i>	-
113.	<i>Campanula colorata</i>	-
114.	<i>Cannabis sativa</i>	Bhag, kus
115.	<i>Capsella bursa-pastoris</i>	-
116.	<i>Carum carvi</i>	Zira
117.	<i>Chenopodium album</i>	Tulsi, Dankhar
118.	<i>Cimicifuga foetida</i>	-
119.	<i>Crepis japonica</i>	-
120.	<i>Cynoglossum micranthum</i>	-
121.	<i>Cynoglossum wallichii</i>	-
122.	<i>Datura stramonium</i>	Datura
123.	<i>Delphinium denudatum</i>	Nirvisi
124.	<i>Delphinium vestitum</i>	Kalulu

125.	<i>Digitalis purpurea</i>	-
126.	<i>Dipsacus inermis</i>	Tori
127.	<i>Echinops cornigerus</i>	-
128.	<i>Echinops niveus</i>	-
129.	<i>Ephedra gerardiana</i>	Somlata, Khanta
130.	<i>Erigeron multiradiatus</i>	-
131.	<i>Erythimum hieracifolium</i>	-
132.	<i>Fagopyrum cymosum</i>	-
133.	<i>Fragaria vesca</i>	Balbalsho
134.	<i>Foenieuhum vulzare</i>	Saunf
135.	<i>Gallium spp.</i>	-
136.	<i>Gentian argented</i>	Nili sarnal
137.	<i>Gentian kurroo</i>	Karu, Kore
138.	<i>Geranium nepalense</i>	Tirrahani
139.	<i>Geranium ocellatum</i>	-
140.	<i>Geranium robertianum</i>	-
141.	<i>Geranium wallichianum</i>	Chowhri
142.	<i>Gerbera lanuginose</i>	Kopra
143.	<i>Geum urbanum</i>	Chandana
144.	<i>Geraradiana heterophylla</i>	Bechu buti
145.	<i>Gnaphalium luteo-album</i>	-
146.	<i>Gynura angulosa</i>	Kasiunga
147.	<i>Halenia elliptica</i>	Pitpapra
148.	<i>Hypericum cernuum</i>	Banj wakra
149.	<i>Hyoscyamus niger</i>	-
150.	<i>Impatiens amphorata</i>	-
151.	<i>Impatiens roylei</i>	-
152.	<i>Impatiens thomsoni</i>	-
153.	<i>Impatiens scabrida</i>	-
154.	<i>Jurinea macrocephalla</i>	Dhup
155.	<i>Mentha sylvestris</i>	Podina
156.	<i>Morina persica</i>	-
157.	<i>Myosotis caespitosa</i>	-
158.	<i>Myosotis sylvatica</i>	-
159.	<i>Nepeta ciliaris</i>	Brun
160.	<i>Nepeta elliptica</i>	-
161.	<i>Pedicularis pectinata</i>	-
162.	<i>Phlomis bracteosa</i>	-
163.	<i>Picrorhiza kurrooa</i>	Karu, kardi, karwi
164.	<i>Podophyllum hexandrum</i>	Bankakri, Papri
165.	<i>Polygonatum cirrifolium</i>	-
166.	<i>Polygonatum verticillatum</i>	Salam mishri
167.	<i>Polygonum alatum</i>	Malora
168.	<i>Potentilla argyrophylla</i>	-
169.	<i>Potentilla atrosanguinea</i>	-
170.	<i>Potentilla nepalensis</i>	Dora
171.	<i>Potentilla sibbaldi</i>	-
172.	<i>Plantago tibetica</i>	-
173.	<i>Primula denticulate</i>	Hantingoo

174.	<i>Primula petiolaris</i>	Kouri, Phantingoo
175.	<i>Ranunculus arvensis</i>	-
176.	<i>Rumex hastatus</i>	Malora, Bhilmora
177.	<i>Rumex nepalensis</i>	Malora, Bhilmora
178.	<i>Salvia glutinosa</i>	Gwadra
179.	<i>Salvia lanata</i>	-do-
180.	<i>Salvia lappa</i>	Kuth, Koot
181.	<i>Saxifrage diversifolia</i>	-
182.	<i>Scrophularia himalensis</i>	-
183.	<i>Senecio chrysanthemoides</i>	-
184.	<i>Sisymbrium alliarea</i>	-
185.	<i>Stroilanthes atropurpureus</i>	Mashna, Mashain
186.	<i>Strobilanthes daldousianus</i>	Machine Mashian
187.	<i>Strobilanthes alatus</i>	Mashna, Machin, Nashain
188.	<i>Sambucus ebulus</i>	Gandala
189.	<i>Sweritia chirata</i>	Charaita
190.	<i>Swertia cordata</i>	-do-
191.	<i>Swertia paniculata</i>	-do-
192.	<i>Tanacetum nubigenum</i>	-
193.	<i>Tanacetum longifolium</i>	Bhut ker
194.	<i>Taraxacum officinale</i>	-
195.	<i>Thalictrum pedunculatum</i>	Gabini Mamiri
196.	<i>Thalictrum javanucum</i>	-do-
197.	<i>Thalictrum neurocarpum</i>	Barmod
198.	<i>Trifolium repens</i>	Kuth
199.	<i>Thymus serpyllum</i>	-
200.	<i>Smilax vaginata</i>	Ban jewain
201.	<i>Valeriana hardwickii</i>	-
202.	<i>Valeriana pyrolaefolia</i>	Nlhani, Nakh
203.	<i>Veleriana wallichii</i>	-
204.	<i>Verbascum Thapsus</i>	Mushkbala
205.	<i>Veronica serpyllifolia</i>	-
206.	<i>Viola serpens</i>	Banafsha
207.	<i>Viola patrinii</i>	-do-
208.	<i>Wulfenia amherstiana</i>	-
C- CLIMBERS		
1.	<i>Cuscula reflexa (parasite)</i>	Akashabel
2.	<i>Clematis connate</i>	Garol, Wantah
3.	<i>Clematis grata</i>	Garol, Wantah
4.	<i>Clematis barbellata</i>	Belkangu, Chabru, Wantah
5.	<i>Clematis Montana</i>	Garol, Wantah
6.	<i>Dioscorea deltoidea</i>	Kunj Calendi, Singlimingli, Baniatakari
7.	<i>Hedera helix</i>	Grumru
8.	<i>Jasminum officinale</i>	Malti, Bammalti
9.	<i>Jasminum dispernum</i>	Malti
10.	<i>Rosa macrophylla</i>	Pahari gulab, Kuja, Benyal
11.	<i>Rosa moschala</i>	Kuja, Yal
12.	<i>Schizandra grandiflora</i>	Angeli

13.	<i>Smilax vaginata</i>	-
14.	<i>Smilax parvifolia</i>	-
15.	<i>Vitis semi-cordata</i>	Miaza
16.	<i>Vitis trifolia</i>	Pola
17.	<i>Vitis parvifolia</i>	Panibel
D-GRASSES AND BAMBOOS		
1.	<i>Andropogon ischaemum</i>	-
2.	<i>Agropyron longearistatum</i>	-
3.	<i>Agropyron semicostatum</i>	-
4.	<i>Agrostis alba</i>	-
5.	<i>Agrostis royleana</i>	-
6.	<i>Arthraxon lanceolatus</i>	-
7.	<i>Arundinaria falcate</i>	Ringal, Nirgal, Poo
8.	<i>Arundinaria spathiflora</i>	-do-
9.	<i>Arundinella brasiliensis</i>	-
10.	<i>Arundinella setosa</i>	-
11.	<i>Arundo donax</i>	Nal, Naldura, Rajal
12.	<i>Avena aspera</i>	-
13.	<i>Avena fatua</i>	-
14.	<i>Bromus asper</i>	-
15.	<i>Bromus patulus</i>	-
16.	<i>Cynodon dactylon</i>	Dub, Drub
17.	<i>Calamagrostis littorea</i>	-
18.	<i>Dactylis glomerata</i>	-
19.	<i>Danthonia cachemyriana</i>	-
20.	<i>Deyeuxia scabrescens</i>	-
21.	<i>Eragrostis nigra</i>	-
22.	<i>Erianthus fulvus</i>	Kahio
23.	<i>Erianthus ravennae</i>	-
24.	<i>Festuca gigantea</i>	-
25.	<i>Festuca kashmiriana</i>	-
26.	<i>Festuca modesta</i>	-
27.	<i>Ischaemum nototum</i>	-
28.	<i>Muehlenbergia himalayensis</i>	-
29.	<i>Neyraudia madagascariensis</i>	-
30.	<i>Oplismenus compositus</i>	-
31.	<i>Oryzopsis aequigumis</i>	-
32.	<i>Panicum plicatum</i>	-
33.	<i>Paspalum ambiguum</i>	-
34.	<i>Pennesetum flaccidum</i>	-
35.	<i>Poa pratensis</i>	-
36.	<i>Pogonatherum saccharoideum</i>	-
37.	<i>Pollinia mollis</i>	-
38.	<i>Pollinia quadrinervis</i>	-
39.	<i>Setaria gluaca</i>	Siun
40.	<i>Setaria viridis</i>	-
41.	<i>Sporobolus piliferus</i>	-
42.	<i>Stipa sibirica</i>	-
43.	<i>Tripogon filiformis</i>	-

ANIMALS, BIRDS, REPTILES AND FISH ETC. FOUND IN KINNAUR FOREST DIVISION

English Name	Scientific Name	Local Name
(A) Animals		
<u>(i) Cats</u>		
Panther or leopard	<i>Panthera pardus</i> , Linnaeus	Bagh, baghera
Leopard cat, jungle cat	<i>Felis bengalensis</i> , <i>Felis chaus</i> Guldensdoedt Syn.	Ban bilao, Jangli billi
Snow leopard	<i>Uncia uncia</i> , Schreber	Safed bagh
<u>(ii) Bears</u>		
Himalayan black bear	<i>Selenarctos thibetanus</i> , Syn. <i>Ursus torouatus</i> , G.Cuvier.	Bhalu
Brown bear	<i>Ursus arctos</i> , Linnaeus	Lal bhalu
<u>(iii) Dog family</u>		
Himalayan fox, Tibetan wolf Himalayan jackal, Tibetan wolf	<i>Vulpes bengalensis</i> , Shaw <i>Canis Nodgson</i> .	Lomri Siar
<u>(iv) Mongoose</u>		
Common mongoose	<i>Herpestes edwardsi</i> , Geoffroy	Neola
<u>(v) Weasels</u>		
Himalayan yellow throated marten	<i>Martes flavigula</i> , boddaert	Chitralla
Himalayan weasel	<i>Musteres sibirica</i>	
<u>(vi) Goat & sheep group</u>		
Himalayan Thar	<i>Hemitragus jemlahicus</i>	Thar
Blue Sheep	<i>Pseudois nayaur</i>	Bharal
<u>(vii) Goat antelope group</u>		
Goral	<i>Nemorhaedus goral</i>	Goral, ghurar
Serrow	<i>Capricornis sumatrensis</i>	Serao
<u>(viii) Deer group</u>		
Barking deer	<i>Muntiacus muntjak</i>	Kakar
Musk deer	<i>Moschus moschiferus</i>	Kastura
Sambhar	<i>Cervus unicolor</i> , nigar	Jarao
<u>(ix) Rodents</u>		
Common Indian Hare	<i>Lepus nigricollis</i>	Khargosh
Large red flying Squirrel	<i>Petaurista petaurista</i>	Koryal
Indian crested porcupine	<i>Hystrix indica</i>	Sehi
Common house rat	<i>Rattus rattus</i> , Linn.	Chuha
House mouse	<i>Mus musculus</i> Linnaeus	Musco
Indian gorbille or Indian Antelope rat	<i>Tatera indica</i> , Hardwicke	„
Short tailed mole rat	<i>Nesokia indica</i> , Gray and Hardwicke	„
Himalayan marmot	<i>Marmot bobak</i> , Mueller	„
<u>(x) Monkey and Langoors</u>		
Himalayan langur	<i>Presbytis entellus</i>	Guni
<u>(xi) Insectivores</u>		
Gray musk shrew	<i>Suncus murinus</i>	Chuchundar
<u>(xii) Bats</u>		
The allied horse shoe bat	<i>Rhinolophus affinis</i>	Chamgadar

(B) BIRDS		
(a) GAME BIRDS		
(i) Pheasants and fowls group		
Cheer pheasant	<i>Catreus wallichii</i> , Hardwicke	Cheer
Jungle fowl	<i>Gallus gallus</i> <i>Murghi</i> Robinson & Khoss	Jungli murghi
The white crested pheasant	<i>Lophura leucomelans</i> Latham	Kaleej/ kala murga
Koklas, Medium tailed Himalayan pheasant	<i>Pucrassia macrolopha</i> , Lesson	Kokla
Impeyyan or Monal Pheasant	<i>Lophophorus impeyanus</i>	Monal
Western Tragopan	<i>Tragopan melanocephalus</i>	Jejurana
(ii) Partridge and quail group		
Button quail	<i>Turinix taki</i> , Blyth	„
Jungle bush quail	<i>Perdica asiatica</i>	„
Chakor pertridge	<i>Alectoris graeca</i> , meisner	Chakor
Black Breasted or rain quail	<i>Coturnix coromandelica</i> Gemelin	Chinak bater
Snow partridge	<i>Lerwa lerwa</i> . Hodgson	Gunguria
Black partridge	<i>Francolinus francolinus</i> . Linnaeus	Kala Titar
Himalayan or wood partridge	<i>Arborophila torqueola</i> Valenciennes	Peora
Snow cock	<i>Tetraogallus tibetanus</i> G.R.Gray	Ram chakor
(iii) Doves and pigeon group		
Spotted dove	<i>Streptopelia chinensis</i>	Chitter fakhta
Rufous turtle dove	<i>Streptopelia orientalis</i> Latham	Ghugti
Ring Tailed dove	<i>Streptopelia decaocto</i>	„
Common green pigeon	<i>Treron phoenicopterus</i>	Harial
Wedge tailed green pigeon	<i>Treron apicauda</i>	
Blue rock pigeon	<i>Columba livia</i> . Gamelin	Kabutar
Pintailed green	<i>Treron apicauda</i> . Blyth	Malya
Snow pigeon	<i>Columba leuconota</i> . Vigor	Safed Malya
(b) NON- GAME BIRDS		
(i) <u>Crows, king crows, tree pies</u> Magpies, Jays and nut crackers		
Himalayan nut cracker	<i>Nucifraga carvocatactes</i>	Pathphor
Jungle crow	<i>Corvus</i> <i>macrorhynchos</i> , Walger	Kawa
Himalayan red crowned	<i>Carrulus glandarius</i> , Linnaeus	Lal kanth
Red billied blue magpie	<i>Kitta erythrophyncha</i> , Boddaert	Lampuchhia
Himalayan tree pie	<i>Dendroecitta</i> <i>fromosea</i> , Swinhoe	„

Blue throated jay	<i>Garrulus lanceolatus</i> , Vigors	Neel kanth
<u>(ii) Vultures, Eagles, Kites and Falcons</u>		
Black Hobby falconKastonal Falcon	<i>Ictinaetus malayensis</i> , Tamminck	Cheel
Panish Kite	<i>Milvus migrans</i> , Boddaert	„
Brahminy kite	<i>Haliaster Indus</i> , Boddaert	„
Golden eagle	<i>Aquila chryaetos</i> , Hodgsoni	„
Hawk eagle		„
Tawny eagle		„
Himalayan griffon vulture	<i>Gyps himalayensis</i> , Hume	Gidh
Lammergeier or beards vulture	<i>Gypaetus barbatus</i> Linnaeus	Gidh
King vulture	<i>Torgos alyus</i>	„
White backed vulture	<i>Gopaetus bengalensis</i>	„
Scavenger vulture	<i>Neophron perenopherus</i>	„
<u>(iii) Owls and night jars</u>		
Himalayan wood owl	<i>Strixaluco nivicola</i> , Idnnaus	Uloo
Scully's wood owlHorned owl	<i>Strixaluco biddhphi</i>	„
Himalayan batred owl	<i>Glaucidium cuculoides</i>	„
Lolng tailed night jar	<i>Caprimulgus macrourus</i>	—
Franklings night jar	<i>Caprimulgus monticolus</i>	—
<u>(iv) Thrushes and babblers</u>		
Whistling thrush	<i>Myophoneus caeruleus</i>	Chilar
While throated thrush	<i>Garrulax albogularis</i> .Gould	„
Variegated thrush	<i>Garrulax varisgatum</i> , Vigors	„
Red backed thrush	<i>Garrulax erythrocephalus</i> Vigors	„
streaked thrush	<i>Garrulax striatus</i> , Vigors	„
Jungle babbler	<i>Turodoides striatus</i>	„
<u>(v) Fly catchers</u>		
Sooty fly catcher	<i>Hemochslidon silbrica</i>	
White browed blue fly catcher	<i>Muscicapula surperciliaris</i>	
White billied blue fly catcher	<i>Muscicapula pallipos</i>	
Blue throated fly catcher	<i>Muscicapula Rebecoloides</i> , Vigors	
Rufous bellied niltava	<i>Niltava sundara</i>	
<u>(vi) Finches, sparros and buntings</u>		
Rose finch	<i>Carpodacus erythrinus</i> , Pallas	Tuti
Himalayan gold finch	<i>Carduelis carduellis</i> linnaeus	Surja
Himalayan tree finch	<i>Cardelis spinoides</i> , Vigors	Surja
Common house sparrow	<i>Passer domesticus</i> Linnaeus	Gauriyya, Chirya
Cinnamon tree sparrow	<i>Passer rutilans</i> Temminck	Gauriyya, Chirya
Created bunting	<i>Melophus lathanfi</i> , Gray	Rather Chirta
White capped bunting	<i>Eperza stewarti</i> , Blyth	
<u>(vii) Wood Peckers, Tree Creepers and Barbets</u>		

Scaly bellied wood pecker	<i>Picus squamatus</i> , Vigors	Kathphorwa
Himalayan pied wood pecker	<i>Cryobates himalayasis</i>	„
Brown fronted pied wood Pecker	<i>Dryobates auriceps</i>	„
Himalayan tree creeper	<i>Certhia himalayana</i>	„
Himalayan barbet	<i>Mogalaima virens</i> , Boddaert	
Green barbet	<i>Mogalaima viridis</i>	
(viii) <u>Birds along water courses</u>		
White capped red start	<i>Chaimarrornis laucocephalus</i>	
Plumbeous red start	<i>Rhyacornis fuliginosus</i>	
Spotted fork tail	<i>Enicurus maculates</i>	
Himalayan pied king fisher	<i>Ceryle lugubris</i>	
(ix) <u>Others</u>		
Red vented bulbul	<i>Molpastes cafer</i>	Bulbul
White cheeked bulbul	<i>Milpastes leucoganys</i>	„
Yellow cheeked bulbul	<i>Macholophus xantogenus</i>	
Gray tit	<i>Paras major</i>	
Black tit	<i>Lophopharrens rufornuchalis</i>	
Pied bush chat	<i>Saxicola caprata</i>	
Common house swallow	<i>Hirundo rustica</i>	
Parakeet	<i>Psittacula himalayana</i>	Tota
Gray hornbill	<i>Dichoceras bicornis</i>	
Swift	<i>Chaetura caudatus</i>	
Blue bearded bee eater	<i>Alcemerops Althertoni</i>	
Black headed shrike	<i>Lanius nigriceps</i>	
C) REPTILES		
(i) <u>Snakes</u>		
Rat snake	<i>Ptyas mucosus</i> , Cope	Dhaman
Krait	<i>Bungarus caeruleus</i> , Daud	Krait
Indian cobra	<i>Naja naja</i> , Schleg	Kobra, Nag
Himalayan pit viper	<i>Ancistrodon himalayanus</i> Gunther	Sapp
(ii) <u>Lizards</u>		
Common house gecko	<i>Himidactylus brooki</i> , Gray	Chhipkali
Common lizard	<i>Agama tuberculata</i> , gray	„
Common Indian monitor Lizard	<i>Varanus monitor</i> , Linnaeus	„
(D) FISHES		
-	<i>Barbus tor</i> , Hamilton	Mahaseer
-	<i>Labeao calbasu</i>	Kala Bans
Rishala	<i>Orcinus sinautus</i>	Rishala

ABBREVIATION

ACF	Assistant Conservator of Forests
APO	Annual Plan of Operations
AIR	All India Reporter
AWPO	Assistant Working Plan Officer
Addl. Pr. CCF	Additional Principle Chief Conservator of Forests
BPs	Boundary Pillars
CAI	Current Annual Increment
CCF	Chief Conservator of Forests
CF	Conservator of Forests
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CAT Plan	Catchment Area Treatment Plan
CWP	Civil Writ Petition
CAI	Current Annual Increment
DBH	Diameter at Breast Height
DCF	Deputy Conservator of Forests
DFO	Divisional Forest Officer
DPF	Demarcated Protected Forest
DKWC	Deodar Kail Working Circle
DM	Divisional Manager
EPA	Environment Protection Act
FCA	Forest (Conservation) Act
FDA	Forest Development Agency
Fgd	Forest Guard
FS	Felling Series
FSWC	Fir Spruce Working Circle
FRA	Forest Rights Act, 2006 {Scheduled Tribes & other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006}
FRI	Forest Research Institute
GPS	Global Positioning System
GoHP	Government of Himachal Pradesh
GoI	Government of India
GDP	Gross Domestic Product

GIS	Geographic Information Systems
GSDP	Gross State Domestic Product
HPSFDC Ltd	Himachal Pradesh State Forest Development Corporation Limited
ICFRE	Indian Council of Forestry Research & Education
IFA	Indian Forest Act
IWDP	Integrated Watershed Development Project
JFPM	Joint Forest Participatory Management
JFM	Joint Forest Management
LUS	Land Use System
LULUCF	Land Use, Land Use Change and Forestry
MAI	Mean Annual Increment
MASL	Meter Above Sea Level.
MFP	Minor Forest Produce
MIS	Management Information System
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
NTFP	Non-timber Forest Produce
NGO	Non-Governmental Organization
NGS	Normal Growing Stock
NREGA	National Rural Employment Guarantee Act
NPCC	National Plan in Climate Change.
NWFP's	Non- Wood Forest Products
OWC	Oak Working Circle
Pr. CCF	Principle Chief Conservator of Forests
PB	Periodic Block
PES	Payment for Environment Services
PFM	Participatory Forest Management
REH. WC	Protection Working Circle
PL.WC	Plantation Working Circle
RFO	Range Forest Officer
RSD	Road Side Depot
SFR	State of Forest Report
SLUB	State Land Use & Waste Land Development Board
SPCB	State Pollution Control Board
SCC	Supreme Court Cases

SLP	Special Leave Petition
TD	Timber Distribution
UNFCCC	United Nations Framework Convention on Climate Change
UPF's	Un-demarcated Protected Forests
VFDCS	VillageForest Development Committees
WC	Working Circle
WLPA	Wild Life (Protection) Act
WP	Working Plan
WPO	Working Plan Officers

KINNAUR FOREST DIVISION
Statistics at a Glance

1.	Total Geographical area of the tract	= 491619.66 Hac.
2.	Forest area (DPF & Listed UPF)	=35476.08 hac.
3.	Percentage of forest area to total Geographical area	=7.22 %
4.	Legal status of Forest area —	

i) Indian Forest Act, 1927

a)	Reserved forests	= Nil
b)	Protected Forests (i.e. Demarcated Protected Forests)	=24771.08 hac.
c)	Village Forests	= Nil

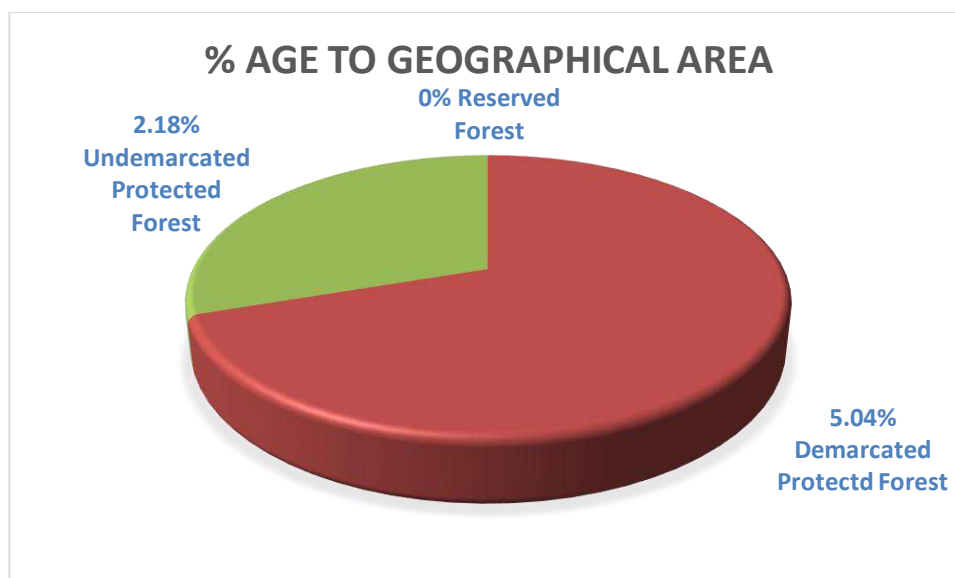
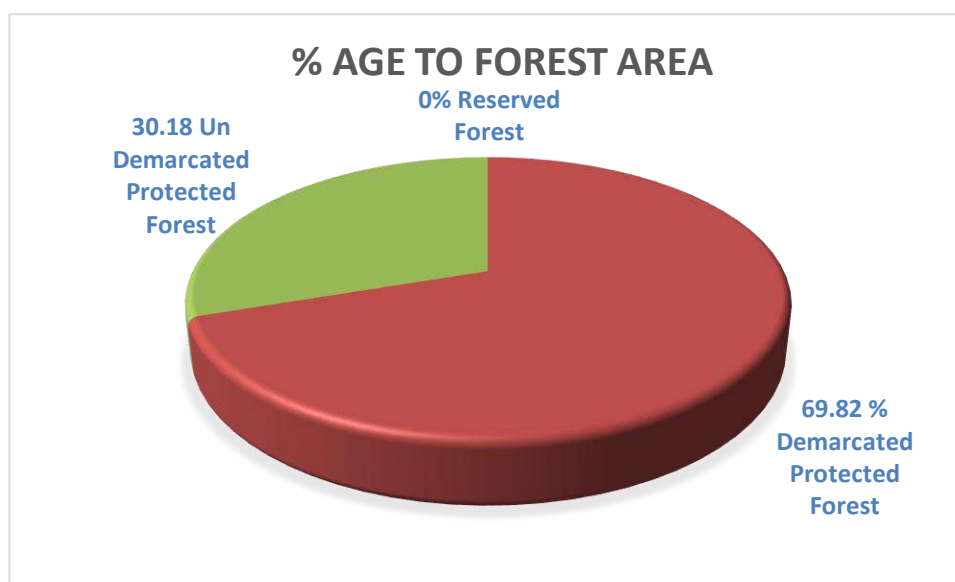
ii) Forest Conservation Act, 1980

a)	Reserved forests	= Nil
b)	Protected Forests (i.e. Demarcated Protected Forests)	= 24771.08 hac.
c)	Village Forests	= Nil
d)	Un-demarcated Protected Forests	=10705 hac.
e)	Other Land as defined by the Supreme Court	= 456143.58hac.
f)	Private Forests	= Nil

5.	Percentage of forest area under Reserved, Demarcated Protected Forests and Un-demarcated protected forests.	

Category of forests	% age to forest area	% age to Geographical area
a) Reserved forests	0	0
b) Demarcated Protected Forests	69.82	5.04
c) Un-Demarcated Protected Forests	30.18	2.18

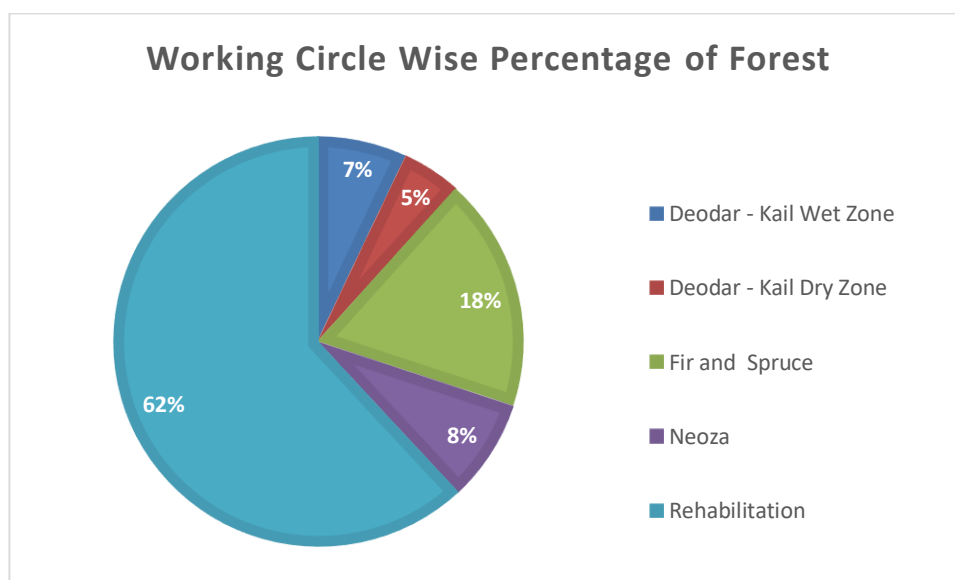
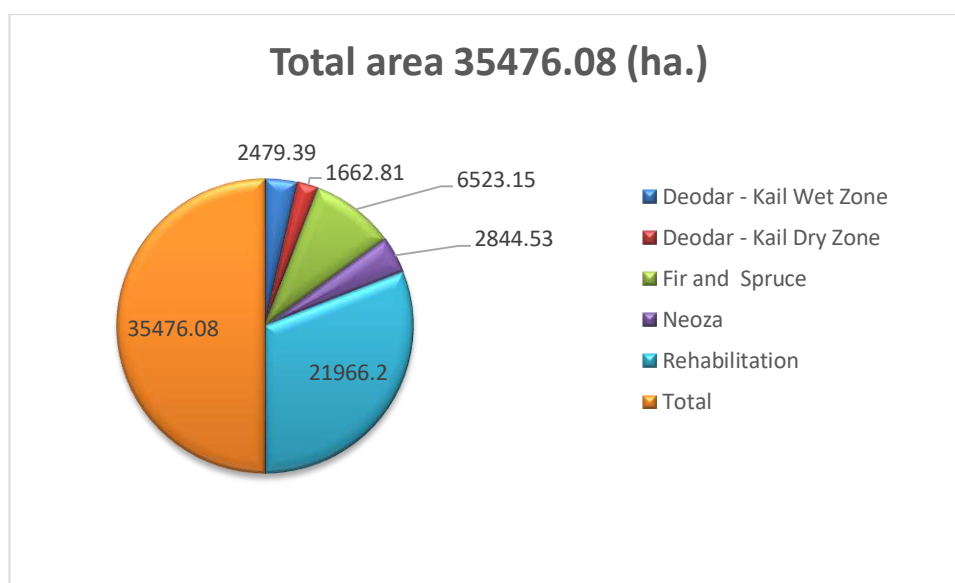
Graphical Representation of category of forests



6. Area by Working Circle

Sr. No.	Working Circle	Total area (ha.)	% age to total Divisional forest area
1	Deodar - Kail Wet Zone	2479.39	6.99
2	Deodar - Kail Dry Zone	1662.81	4.69
3	Fir and Spruce	6523.15	18.39
4	Neoza	2844.53	8.02
5	Rehabilitation	21966.2	61.92
	Total	35476.08	100.00

Working circle wise % of area



7. Species wise and Working circle wise Growing Stock (volume in M³)

Sr. No.	Species Code No	Botanical Name	Common / Local Names	Deodar / Kail Wet Zone Working Circle	Deodar / Kail Dry Zone Working Circle	Fir Spruce Working Circle	Neoza Working Circle	Rehabilitation Working Circle	Total
1	0241	<i>Cedrus deodara</i>	Deodar	763766.69	388258.22	755173.53	401813.57	2800493.37	5109505.4
2	0926	<i>Pinus wallichiana</i>	Kail	118491.41	12803.64	251922.31	142.23	451546.22	834905.81
3	0002	<i>Abies pindrow</i>	Fir	36052.67	3808.63	990032.41	0	761663.90	1791557.6
4	0921	<i>Picea smithiana</i>	Spruce	155659.14	42916.33	679400.82	0	172434.67	1050411
5	0929	<i>Pinus roxburghii</i>	Chil	0	0	0	0	336879.84	336879.84
6	0927	<i>Pinus gerardiana</i>	Chilgoza	0	0	0	98776.3	222973.83	321750.13
7	1162	<i>Taxus baccata</i>	Taxus	0	0	19483.31	0	647.72	20131.031
8	0153	<i>Betula alnoides</i>	Betula	0	0	0	0	2281.11	2281.1054
8	1010	<i>Quercus incana</i>	Ban oak	0	348.4	0	0	119293.36	119641.76
9	1006	<i>Quercus dilatata / floribunda</i>	Mohru Oak	0	0	7969.46	0	13855.60	21825.063
10	1017	<i>Quercus semecarpifolia</i>	Kharshu Oak	0	0	0	0	4956.48	4956.4759
11	0652	<i>Juniperus macropoda</i>	Juniper	0	0	0	0	844.85	844.85385
12	0651	<i>Juglans regia</i>	Walnut	2889.07	0	20676.26	0	28330.77	51896.096
13	0038	<i>Aesculus indica</i>	HC Nut	360.49	0	0	0	1943.16	2303.6538
14	0061	<i>Alnus nitida</i>	Alnus (Kunish)	0	0	20210.84	0	6702.51	26913.347
15	0630	<i>Illex dipyrena</i>	Bray	4012.48	0	0	0	153622.59	157635.07
16	1038	<i>Rhododendron aeboreum</i>	Rhododendron	72.1	0	0	0	197.13	269.23256
17	0019	<i>Acer acuminatum</i>	Maple	10.98	0	7869.92	0	15038.40	22919.298
18	0965	<i>Prunus cornata</i>	Bird cherry	307.29	0	22976.59	0	2112.13	25396.015
19	0500	<i>Fraxinus Species</i>	Fraxinus	0	0	0	0	2562.72	2562.7233
20	0992	<i>Pyrus pashia</i>	Kainth	0	0	2623.24	0	0	2623.24
21	2000	Identified and Uncoded Tree	Other B/L	82.16	182.12	42269.87	0	9800.30	52334.455
22	0047	<i>Ailanthus species</i>	Ailanthus	10.3	0	0	0	0	10.3
23	0969	<i>Prunus species</i>	Prunus	19.96	0	0	0	0	19.96
			G Total	1081734.8	448317.33	2820608.6	500732.1	5108180.67	9959573.40

8. Working Circle wise total number of trees

Sr. No.	Species Code No	Botanical Name	Common / Local Names	Deodar / Kail Wet Zone Working Circle	Deodar / Kail Dry Zone Working Circle	Fir Spruce Working Circle	Neoza Working Circle	Rehabilitation Working Circle	Total
1	241	<i>Cedrus deodara</i>	Deodar	496199	376330	411556	210969	1520737	3015791
2	926	<i>Pinus wallichiana</i>	Kail	83154	16960	171565	4741	363284	639704
3	2	<i>Abies pindrow</i>	Fir	81027	913	329757	0	202765	614462
4	921	<i>Picea smithiana</i>	Spruce	62015	15979	105473	0	64772	248239
5	929	<i>Pinus roxburghii</i>	Chil	0	0	0	0	160522	160522
6	927	<i>Pinus gerardiana</i>	Chilgoza	0	0	0	187265	433692	620957
7	1162	<i>Taxus baccata</i>	Taxus	0	0	139233	0	22529	161762

8	153	<i>Betula alnoides</i>	Betula	0	0	0	0	14081	14081
9	1010	<i>Quercus incana</i>	Ban oak	0	1121	0	0	98566	99687
10	1006	<i>Quercus dilatata / floribunda</i>	Mohru Oak	0	0	1968	0	14081	16049
11	1017	<i>Quercus semecarpifolia</i>	Kharshu Oak	0	0	0	0	11265	11265
12	652	<i>Juniperus macropoda</i>	Juniper	0	0	0	0	5632	5632
13	651	<i>Juglans regia</i>	Walnut	6995	0	76200	0	39427	122622
14	38	<i>Aesculus indica</i>	HC Nut	2060	0	0	0	11265	13325
15	61	<i>Alnus nitida</i>	Alnus (Kunish)	0	0	53657	0	11265	64922
16	630	<i>Illex dipyrena</i>	Bray	7039	0	0	0	188684	195723
17	1038	<i>Rhododendron aeboreum</i>	Rhododendron	1030	0	0	0	2816	3846
18	19	<i>Acer acuminatum</i>	Maple	1098	0	72801	0	129544	203443
19	965	<i>Prunus cornata</i>	Bird cherry	2036	0	36378	0	11265	49679
20	500	<i>Fraxinus Species</i>	Fraxinus	0	0	0	0	22529	22529
21	0992	<i>Pyrus pashia</i>	Kainth	0	0	5962	0	0	5962
22	2000	<i>Identified and Uncoded Tree</i>	Other B/L	2036	1121	35771	0	42243	81171
23	0047	<i>Ailanthus species</i>	Ailanthus	1030	0	0	0	0	1030
24	0969	<i>Prunus species</i>	Prunus	1996	0	0	0	0	1996
			G Total	747716	412424	1440320	402975	3370964	6374399

9. Working circle wise Growing stock per ha. (in M3)

Sr. No	Species Code No	Botanical Name	Common / Local Names	Deodar / Kail Wet Zone Working Circle	Deodar / Kail Dry Zone Working Circle	Fir / Spruce Working Circle	Neoza Working Circle	Rehabilitation Working Circle	Total
1	241	<i>Cedrus deodara</i>	Deodar	308.05	233.5	115.77	141.26	127.49	926.07
2	926	<i>Pinus wallichiana</i>	Kail	47.79	7.7	38.62	0.05	20.56	114.72
3	2	<i>Abies pindrow</i>	Fir	14.54	2.29	151.77	0	34.67	203.27
4	921	<i>Picea smithiana</i>	Spruce	62.78	25.81	104.15	0	7.85	200.59
5	929	<i>Pinus roxburghii</i>	Chil	0	0	0	0	15.34	15.34
6	927	<i>Pinus gerardiana</i>	Chilgoza	0	0	0	34.73	10.15	44.88
7	1162	<i>Taxus baccata</i>	Taxus	0	0	2.99	0	0.03	3.02
8	153	<i>Betula alnoides</i>	Betula	0	0	0	0	0.10	0.10
8	1010	<i>Quercus incana</i>	Ban oak	0	0.21	0	0	5.43	5.64
9	1006	<i>Quercus dilatata / floribunda</i>	Mohru Oak	0	0	1.22	0	0.63	1.85
10	1017	<i>Quercus semecarpifolia</i>	Kharshu Oak	0	0	0	0	0.23	0.23
11	652	<i>Juniperus macropoda</i>	Juniper	0	0	0	0	0.04	0.04
12	651	<i>Juglans regia</i>	Walnut	1.17	0	3.17	0	0.04	4.38
13	38	<i>Aesculus indica</i>	HC Nut	0.15	0	0	0	0.09	0.24
14	61	<i>Alnus nitida</i>	Alnus (Kunish)	0	0	3.1	0	0.31	3.41
15	630	<i>Illex dipyrena</i>	Bray	1.62	0	0	0	6.99	8.61
16	1038	<i>Rhododendron aeboreum</i>	Rhododendron	0.03	0	0	0	0.01	0.04

17	19	<i>Acer acuminatum</i>	Maple	0	0	1.21	0	0.68	1.89
18	965	<i>Prunus cornata</i>	Bird cherry	0.12	0	3.52	0	0.10	3.74
19	500	<i>Fraxinus Species</i>	Fraxinus	0	0	0	0	0.12	0.12
20	0992	<i>Pyrus pashia</i>	Kainth	0	0	0.4	0	0.00	0.40
21	2000	<i>Identified and Uncoded Tree</i>	Other B/L	0.03	0.11	6.48	0	0.45	7.07
22	0047	<i>Ailanthus species</i>	Ailanthus	0	0	0	0	0.00	0.00
23	0969	<i>Prunus species</i>	Prunus	0.01	0	0	0	0.00	0.01
			G Total	436.29	269.61	432.4	176.03	231.30	1545.63

10. Working Circle wise total number of trees per hac. (in numbers)

Sr. No.	Species Code No	Botanical Name	Common / Local Names	Deodar/Kail Wet Zone Working Circle	Deodar/Kail Dry Zone Working Circle	Fir/Spruce Working Circle	Neoza Working Circle	Rehabilitation Working Circle	Total
1	0241	<i>Cedrus deodara</i>	Deodar	200	226	63	74	69	633
2	0926	<i>Pinus wallichiana</i>	Kail	34	10	26	2	17	18
3	0002	<i>Abies pindrow</i>	Fir	33	1	51	0	9	18
4	0921	<i>Picea smithiana</i>	Spruce	25	10	16	0	3	7
5	0929	<i>Pinus roxburghii</i>	Chil	0	0	0	0	7	4
6	0927	<i>Pinus gerardiana</i>	Chilgoza	0	0	0	66	20	45
7	1162	<i>Taxus baccata</i>	Taxus	0	0	21	0	1	0
8	0153	<i>Betula alnoides</i>	Betula	0	0	0	0	1	0
8	1010	<i>Quercus incana</i>	Ban oak	0	1	0	0	4	6
9	1006	<i>Quercus dilatata / floribunda</i>	Mohru Oak	0	0	0	0	1	2
10	1017	<i>Quercus semecarpifolia</i>	Kharshu Oak	0	0	0	0	1	0
11	0652	<i>Juniperus macropoda</i>	Juniper	0	0	0	0	0	0
12	0651	<i>Juglans regia</i>	Walnut	3	0	12	0	2	6
13	0038	<i>Aesculus indica</i>	HC Nut	1	0	0	0	1	0
14	0061	<i>Alnus nitida</i>	Alnus (Kunish)	0	0	8	0	1	3
15	0630	<i>Illex dipyrena</i>	Bray	3	0	0	0	9	9
16	1038	<i>Rhododendron aeboreum</i>	Rhododendron	0	0	0	0	0	0
17	0019	<i>Acer acuminatum</i>	Maple	0	0	11	0	6	2
18	0965	<i>Prunus cornata</i>	Bird cherry	1	0	6	0	1	1
19	0500	<i>Fraxinus Species</i>	Fraxinus	0	0	0	0	1	0
20	0992	<i>Pyrus pashia</i>	Kainth	0	0	1	0	0	0
21	2000	<i>Identified and Uncoded Tree</i>	Other B/L	1	1	5	0	2	7
22	0047	<i>Ailanthus species</i>	Ailanthus	0	0	0	0	0	0
23	0969	<i>Prunus species</i>	Prunus	1	0	0	0	0	0
			G Total	302	248	221	142	153	1066

11. Working Circle wise prescribed annual yield (in M3)

Working Circle												
Species	Deodar/Kail WZ			Deodar/Kail DZ			Fir/Spruce			Neoza	Rehabilitation	G. Total of yield (In m3)
	PB-I	PB-IV	Total	PB-I	PB-III	Total	PB-I	PB-U	Total			
Deodar	1350	1900	3250	950	650	1600	850	800	1650	Yield not prescribed	Yield not prescribed	6500
Kail	750	500	1250	660	100	760	100	10	110			2120
Fir	1200	870	2070	0	45	45	4650	1400	6050			8165
Spruce	1050	850	1900	0	245	245	2250	1300	3550			5695
Total	4350	4120	8470	1610	1040	2650	7850	3510	11360			22480

12:- Comparative Chart for comparison of present prescriptions with that given for working circle in previous working plan and its analysis

Sr. No.	Heading	Prescriptions		Analysis / Remarks
		Rajiv's Plan	Present Plan (Plan under revision)	
1	Division	Nichar and Pooh Forest Division	Kinnaur Forest Division	• Erstwhile Kinnaur Division (with headquarter at Nichar) bifurcated in to two Divisions namely (Nichar and Pooh Forest Division) during 1984. • In addition, a Wild Life Division was also created at Sarahan and the sanctuary areas of erstwhile Kinnaur Forest Division were transferred to Sarahan WL Division. • During 1999 H.P. Government ordered the merger of Nichar and Pooh Forest Division named as Kinnaur Forest Division with headquarter at Reckong Peo.

2	Ranges	a. Nichar Forest Division (Nichar, Bhaba Nager, Kilba and Kalpa) b. Pooh Forest Division (Moorang, Pooh and Malling)	Bhaba Nager, Kalpa, Katgaon, Kilba, Malling, Moorang, Nichar and Pooh	• Three WL ranges viz Rupri, Katgaon and Sangla under the control of Wild Life Division Saharan. • During July 2014, the Hon'able Court ordered to re-organization of Wildlife Sanctuaries and ordered to transfer the excluded area of wildlife sanctuaries to Kinnaur Forest Division. Consequently new Range at Katgaon was created.
3	Distribution of Area	• ---- • Total geographical area = 4764.23km² (both for Nichar and Pooh forest Division)	• Nine nos. UPFs have converted/notified into new DPFs, • Total geographical area = 4916.20km²	• Detail given in Appendix No-II • 1788 .77 km² geographical area covered by the Wildlife Division, Saharan. • After issuance of final Notification of Wildlife Sanctuaries, 125.58 km²

				of area has been transferred to Kinnaur Forest Division. • Beside this, some Forest areas were not included in the Rajiv's Plan that too has also been incorporated in the current plan.
4	Numbering of Compartments	• The old compartment numbers of Kharwasra's Plan (previous to Rajiv's Plan) was followed in both for Nichar and Pooh Forest Division	• Re-numbering of compartments for Kinnaur Forest Division.	• Due to creation of unified Kinnaur Forest Division (Nichar, Pooh and areas transferred from Wild Life Division Sarahan) it was necessitated to re-numbering of compartments. • The re-numbering of compartments for Kinnaur Forest Division is in ascending order starting from Bhaba Nagar Range and ending in Kalpa Forest Range in clock wise orientation. • The detail of compartments and sub-

				compartments numbers both old and new are given in Appendix No-V and Appendix No-VI. • General abstract showing the allotment of forests to various working circle is given in Appendix No- VII.
5	Grant of Nautor Land	• Banned	• Relaxed for two years with conditions for the scheduled areas of Himachal Pradesh.	• After the enactment of the Forest (Conservation) Act, 1980, no land was to be given under Nautor. • The Govt. of H.P. vide Notification during 2014 (copy of notification annexed as Appendix - XXVII) has relaxed the condition of Forest Conservation Act, 1980 for a period of two years to the scheduled areas of Himachal Pradesh. • The detail conditions given in the said Notification.

				Further, the Government of Himachal Pradesh vide its Notification dated 27-May-2017 (copy of notification annexed as Appendix no-XXIX) has amended the condition number 3 of the previous Notification.
6	Encroachment	Only 10 number cases detected from 1994-95 to 1998-99 in Nichar Forest Division and 3 cases in Pooh Forest Division.	Total numbers of encroachment cases above 10 bigha 134 cases area 208-28-02 hac. and below 10 bigha 130 Cases area 25-64-55hac.	The detail given in Table No. 1.12 for encroachments above 10 bigha and Table No. 1.13 for encroachments below 10 bigha.
7	Recent Development	-----	- New activities like MGNREGA - Green India Mission - Scheduled Tribes & other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	Detail described under Para No. 1.22 of chapter I
8	New Chapters	-----	- ACTIVITIES OF H. P. STATE FOREST DEVELOPMENT CORPORATIONS LTD. IN HARVESTING AND MARKETING OF FOREST PRODUCE - FIVE YEAR PLANS	New chapters described in detail in Part –I of the Current Working Plan as per new Working Plan Code – 2014.

9	Constitution of Working Circles	• The wet Zone Deodar Kail Working Circle. • The Dry Zone Working Circle. • The Fir Spruce Working Circle. • The Neoza Working Circle • The Protection Cum Rehabilitation Working Circle. • The Soil and Water Conservation (overlapping) Working Circle. • The Alpine Grazing Working Circle.	• The Wet Zone Deodar- Kail Working Circle. • The Dry Zone Deodar- Kail Working Circle. • The Fir/Spruce Working Circle. • The Neoza Working Circle • The Rehabilitation Working Circle. • The Plantation (overlapping) Working Circle • The NTFP (overlapping) Working Circle • The Forest Protection (Overlapping) Working Circle,(Fire, Illicit felling, Encroachment, Illegal mining and Poaching etc.). • The Joint Forest Management/ ParticipatoryForest Management (overlapping) Working Circle. • The Wild Life Management (overlapping) Working Circle.	• The detail given under Chapter – I of Part – II.																																																		
10	Working Circle Wise Area	<table><tr><th rowspan="3">Name of Division</th><th rowspan="3">Name of WC</th><th colspan="2">Protected Forest</th><th rowspan="3">Total</th></tr><tr><th colspan="2">(Area in Hac.)</th></tr><tr><th>DPF</th><th>UPF's</th></tr><tr><td>Nichar</td><td>Wet ZoneDeodar / Kail</td><td>2397.09</td><td>0</td><td>2397.09</td></tr></table>	Name of Division	Name of WC	Protected Forest		Total	(Area in Hac.)		DPF	UPF's	Nichar	Wet ZoneDeodar / Kail	2397.09	0	2397.09	<table><tr><th rowspan="3">Sr. No.</th><th rowspan="3">Name of WC</th><th colspan="3">Protected Forest</th><th rowspan="3">Total</th></tr><tr><th colspan="3">(Area in Hac.)</th></tr><tr><th>DPF</th><th>NDPF</th><th>Listed UPF's</th></tr><tr><td>1</td><td>Deodar/Kail Wet Zone</td><td>2406.39</td><td>0</td><td>73</td><td>2479.39</td></tr><tr><td>2</td><td>Deodar/Kail Dry Zone</td><td>1662.81</td><td>0</td><td>0</td><td>1662.81</td></tr><tr><td>3</td><td>Fir/Spruce</td><td>3846.15</td><td>0</td><td>2677</td><td>6523.15</td></tr><tr><td>4</td><td>Neoza</td><td>2844.53</td><td>0</td><td>0</td><td>2844.53</td></tr></table>	Sr. No.	Name of WC	Protected Forest			Total	(Area in Hac.)			DPF	NDPF	Listed UPF's	1	Deodar/Kail Wet Zone	2406.39	0	73	2479.39	2	Deodar/Kail Dry Zone	1662.81	0	0	1662.81	3	Fir/Spruce	3846.15	0	2677	6523.15	4	Neoza	2844.53	0	0	2844.53	• The variation in area is on account of transfer of areas from Wild Life Sanctuaries to this Division after issuanance of final notification. • Some Forest areas which were not
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			Dry ZoneDeodar / Kail	1122.57	0	1122.57		5 Rehabilitation 13039.75 971.45 7955 21966.2						included in the previous plan that too has also been incorporated in the current plan.
			Total 23799.63 971.45 10705.00 35476.08											
			Fir/Spruce	3459.27	1642	5101.27								
			Neoza	777.8	0	777.8								
		Pooh	Protection	7460.36	2786	10246.4								
			Wet ZoneDeodar /Kail	0	0	0								
			Dry ZoneDeodar /Kail	0	0	0								
			Fir/Spruce	0	0	0								
			Neoza	2066.73	0	2066.73								
		Protection	3272.27	0	3272.27									
	G Total	20556.09	4428	24984.09										

11	Blocks and Compartments		Total No. of				Name of Range	Protected Forests			G. Total	• The variation in the Number of Compartments are due to transfer of areas from Wild Life Sanctuaries to this Division after
		Name of Division	DPFs	NCs	UPFs			Total	Old DPF's	New DPFs			UPFs
		Nichar	135	34	12			181				

		<table><tr><td>Pooh</td><td>54</td><td>0</td><td>0</td><td>54</td></tr><tr><td>Total</td><td>189</td><td>34</td><td>12</td><td>235</td></tr></table>	Pooh	54	0	0	54	Total	189	34	12	235		<table><tr><td>Bhaba Nagar</td><td>28</td><td>0</td><td>12</td><td>40</td></tr><tr><td>Kalpa</td><td>72</td><td>0</td><td>3</td><td>75</td></tr><tr><td>Katgaon</td><td>6</td><td>0</td><td>7</td><td>13</td></tr><tr><td>Kilba</td><td>52</td><td>9</td><td>10</td><td>71</td></tr><tr><td>Malling</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Moorang</td><td>36</td><td>0</td><td>0</td><td>36</td></tr><tr><td>Nichar</td><td>45</td><td>0</td><td>9</td><td>54</td></tr><tr><td>Pooh</td><td>18</td><td>0</td><td>0</td><td>18</td></tr><tr><td>Total</td><td>257</td><td>9</td><td>41</td><td>307</td></tr></table>	Bhaba Nagar	28	0	12	40	Kalpa	72	0	3	75	Katgaon	6	0	7	13	Kilba	52	9	10	71	Malling	0	0	0	0	Moorang	36	0	0	36	Nichar	45	0	9	54	Pooh	18	0	0	18	Total	257	9	41	307	issuance of final notification. • Some Forest areas which were not included in the previous plan that too has also been incorporated in the current plan. • Creation / Notification of New DPFs. • The detail of Forest alongwith area and allotment is given in Appendix No. –III and IV					
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12	Period of Working Plan	15 years			10 Year				• As per Working Plan Code – 2014																																																								
	The Deodar Kail Wet Zone Working Circle																																																																
	Prescribed annual Yield	<table><tr><td>Species</td><td>PBI</td><td>PBII</td><td>PBIII</td><td>PBIV</td><td>Total</td></tr><tr><td>Deodar</td><td>775</td><td>65</td><td>450</td><td>1300</td><td>2590</td></tr><tr><td>Kail</td><td>445</td><td>0</td><td>40</td><td>200</td><td>685</td></tr><tr><td>Fir</td><td>710</td><td>0</td><td>70</td><td>700</td><td>1480</td></tr><tr><td>Spruce</td><td>570</td><td>0</td><td>25</td><td>550</td><td>1145</td></tr><tr><td>Total</td><td>2500</td><td>65</td><td>585</td><td>2750</td><td>5900</td></tr></table>	Species	PBI	PBII	PBIII	PBIV	Total	Deodar	775	65	450	1300	2590	Kail	445	0	40	200	685	Fir	710	0	70	700	1480	Spruce	570	0	25	550	1145	Total	2500	65	585	2750	5900		<table><tr><td>Species</td><td>PBI</td><td>PBIV</td><td>Total</td></tr><tr><td>Deodar</td><td>1350</td><td>1900</td><td>3250</td></tr><tr><td>Kail</td><td>750</td><td>500</td><td>1250</td></tr><tr><td>Fir</td><td>1200</td><td>870</td><td>2070</td></tr><tr><td>Spruce</td><td>1050</td><td>850</td><td>1900</td></tr><tr><td>Total</td><td>4350</td><td>4120</td><td>8470</td></tr></table>	Species	PBI	PBIV	Total	Deodar	1350	1900	3250	Kail	750	500	1250	Fir	1200	870	2070	Spruce	1050	850	1900	Total	4350	4120	8470	• The variation is on account of complete moratorium on Green Felling.
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	Right holder’s Demand	Requirement of right holders as per settlement provisions.					The demand of right holders will be met as per the provision of Forest Settlement Report, 1921. as per revised timber distribution policy as notified by H.P. Govt. during 2016					- Due to ban in Green felling, no green trees were granted to the right holders. - The GoHP framed Timber Distribution policy to the Right Holder during 2013 and further amended during 2015. - Now the right holders demand are met as per new TD policy 2016.				
	The Deodar-Kail Dry Zone Working Circle															
	Prescribed annual Yield	Species	PBI	PBII	PBIII	Total			Species	PBI	PBIII	Total		The variation is on account of complete moratorium on Green Felling.		
		Deodar	285	170	200	655			Deodar	950	650	1600				
		Kail	85	20	60	165			Kail	660	100	760				
		Fir & Spruce	130	10	60	200			Fir	0	45	45				
									Spruce	0	245	245				
		Total	500	200	320	1020			Total	1610	1040	2650				
	Control of Yield	Control of yield for a year a period of five years & plan period to be +- 10%					The control of yield and the deviation for a year, a period of five year and a plan period shall not exceed +- 25%,+10% and +-05% respectively.					The detail described in Chapter – III in Para No. 3.17				
	THE FIR/SPRUCE WORKING CIRCLE															
	Prescribed annual Yield	Species	PBI	PBII	PBU	Total (M³)			Species	PBI	PBU	Total (M³)		The variation is on account of complete moratorium on Green Felling.		
		Deodar	200	0	200	400			Deodar	850	800	1650				
		Kail	200	0	50	250			Kail	100	10	110				
		Fir & Spruce	4100	200	1950	6250			Fir	4650	1400	6050				

		<table><tr><td>Total</td><td>4500</td><td>200</td><td>2200</td><td>6900</td></tr></table>	Total	4500	200	2200	6900	<table><tr><td>Spruce</td><td>2250</td><td>1300</td><td>3550</td></tr><tr><td>Total</td><td>7850</td><td>3510</td><td>11360</td></tr></table>	Spruce	2250	1300	3550	Total	7850	3510	11360																																																																								
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	Consolidated working circle wise total prescribed yield	<table><tr><th colspan="5">Working Circle</th></tr><tr><th>Species</th><th>Deodar/Kail WZ</th><th>Deodar/Kail DZ</th><th>Fir/Spruce</th><th>G. Total of yield (In m3)</th></tr><tr><td></td><td>Total</td><td>Total</td><td>Total</td><td></td></tr><tr><td>Deodar</td><td>2590</td><td>655</td><td>400</td><td>3645</td></tr><tr><td>Kail</td><td>685</td><td>165</td><td>250</td><td>1100</td></tr><tr><td>Fir</td><td>1480</td><td>200</td><td>6250</td><td rowspan="2">9075</td></tr><tr><td>Spruce</td><td>1145</td><td></td><td></td></tr><tr><td>Total</td><td>5900</td><td>1020</td><td>6900</td><td>13820</td></tr></table>	Working Circle					Species	Deodar/Kail WZ	Deodar/Kail DZ	Fir/Spruce	G. Total of yield (In m3)		Total	Total	Total		Deodar	2590	655	400	3645	Kail	685	165	250	1100	Fir	1480	200	6250	9075	Spruce	1145			Total	5900	1020	6900	13820	<table><tr><th colspan="5">Working Circle wise total prescribed annual yield (in M3)</th></tr><tr><th colspan="5">Working Circle</th></tr><tr><th>Species</th><th>Deodar /Kail WZ</th><th>Deodar/Kail DZ</th><th>Fir/Spruce</th><th>G. Total of yield (In m3)</th></tr><tr><td></td><td>Total</td><td>Total</td><td>Total</td><td></td></tr><tr><td>Deodar</td><td>3250</td><td>1600</td><td>1650</td><td>6500</td></tr><tr><td>Kail</td><td>1250</td><td>760</td><td>110</td><td>2120</td></tr><tr><td>Fir</td><td>2070</td><td>45</td><td>6050</td><td>8165</td></tr><tr><td>Spruce</td><td>1900</td><td>245</td><td>3550</td><td>5695</td></tr><tr><td>Total</td><td>8470</td><td>2650</td><td>11360</td><td>22480</td></tr></table>	Working Circle wise total prescribed annual yield (in M3)					Working Circle					Species	Deodar /Kail WZ	Deodar/Kail DZ	Fir/Spruce	G. Total of yield (In m3)		Total	Total	Total		Deodar	3250	1600	1650	6500	Kail	1250	760	110	2120	Fir	2070	45	6050	8165	Spruce	1900	245	3550	5695	Total	8470	2650	11360	22480	- The variation is on account of complete moratorium on Green Felling.
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	Assessment of Annual Production of Neoza Seed	-----	Annual collection of Neoza Seeds discussed	The assessment annual production of Neoza seed discussed in																																																																																				

				Chapter – V Para No 5.14.6.
	THE REHABILITATION WORKING CIRCLE			
	Constitution of Working Circle	Protection Working Circle	Rehabilitation Working Circle	Discussed in Chapter No – VI Para No. 6.1
	THE SOIL CONSERVATION (OVERLAPPING) WORKING CIRCLE			
	Constitution of Working Circle	- The main objective of the working circle are to conserve soil and water through biological and engineering measures. - To stabilized and rehabilitate the existing land slide and erosion prone nallas and streams.	-----	- No separate chapter proposed in the current plan. - The detail of soil conservation measures discussed and laid down in CHAPTER – XI+2 (MISCELLANEOUS REGULATIONS) in Para No XI+2.37 under head Watershed Management
	THE ALPINE GRAZING WORKING CIRCLE			
	Constitution of Working Circle	this working circle includes grassy blanks of all high lying undemarcated and un listed forest known as kandas and are fit for pasture development	----	No separate chapter in the current plan, however, detail is discussed in the plan
	THE PLANTATION (OVERLAPPING) WORKING CIRCLE			

	Constitution of Working Circle	-----	New chapter on Plantation (Overlapping) Working Circle	• Detail discussed under Chapter No. VII. • Working Circle wise detail planting programme given in Table No. 7.2 for ten years.
	THE NON TIMBERFOREST PRODUCE (OVERLAPING) WORKING CIRCLE			
	Constitution of Working Circle	----	New Chapter on Non Timber forest Produce (Overlapping) Working Circle	• Detail discussed under Chapter No. VIII. • Measures are suggested for the conservation, protection and propagation of medicinal plants. • The technique of propagation and harvesting of some important plants species prescribed.
	THE FOREST PROTECTION (OVERLAPPING) WORKING CIRCLE			
	Constitution of Working Circle	----	New Chapter on Forest Protection (Overlapping) Working Circle	• Detail discussed under Chapter No. IX.

				This Working Circle is constituted to address the forest protection problems like Fire, Illicit felling, Encroachment, Boundary pillars, Illegal mining and Poaching.
	THE PFM (OVERLAPPING) WORKING CIRCLE			
	Constitution of Working Circle	----	New Chapter on PFM (Overlapping) Working Circle	Detail discussed under Chapter No. X.
	THE WILDLIFE MANAGEMENT (OVERLAPPING) WORKING CIRCLE			
	Constitution of Working Circle	----	New Chapter on Wildlife Management (Overlapping) Working Circle	Detail discussed under Chapter No. XI.
	Carbon Stock Carbon Sequestration and Mitigation	-----	Detail discussed	Carbon Stock Carbon Sequestration and Mitigation given in Chapter No XI+2 in Para No XI+2.42

EXECUTIVE SUMMARY

The tract of the Kinnaur Forest Division was re-organized during 1984. Before re-organization in 1984, the Division was known as “Kinnaur Forest Division” with the Divisional headquarters at Nichar. Subsequently, this Division was bifurcated into two Divisions vide HP Govt. Notification No. Ft.SC.A(I)1/83 dated 24-02-1984, thereby, creating a new Forest Division at Pooh and the old Kinnaur Forest Division was renamed as Nichar Forest Division. In addition, a Wildlife Division was also created at Sarahan and the sanctuary areas of, erstwhile Kinnaur Forest Division were transferred to Sarahan WL Division, comprising of three Wildlife Ranges viz Rupi, Katgaon and Sangla. Again, during 1999, H.P. Government ordered merger of Nichar and Pooh Forest Division with headquarter at Reckong Peo vide Notification No FFE-A(A) I-3/98-Pt dated 21-12-1999. Pursuant to the Hon’ble Supreme Court ordered 01-02-2013 vide the H.P. Government vide its Notification No.FFE-B-A(1)-1/2013 dated 31 July 2014, ordered to re-organization of the excluded areas of the Wildlife Sanctuaries to Territorial Division. Subsequently, the forest areas of Wild Life Division Sarahan were transferred to Kinnaur Forest Division during 2014, (copy of notification is annexed as **Appendix-XXXV**). As such, Katgaon Range was transferred to this Division during 2014. Now, there are eight territorial Ranges viz Bhaba Nagar, Nichar, Katgaon, Kilba, Kalpa, Moorang, Pooh and Malling in this Division. The territorial jurisdiction of the Kinnaur Forest Division falls in whole of Kinnaur District, H.P.

The total geographical area of this division is **4916.20Km²**. The forests of Kinnaur Forest Division were being managed under Rajiv’s Working Plan for Nichar and Pooh Forest Division before the plan under revision. The salient features of the revised plan are that **9** Nos of listed UPFs have been notified as New DPF and brought into the plan for Management of forest, which was out of the scope of the previous working plan. There are **257** Nos old DPFs, **9** new DPF and **41** No.s of listed UPFs. All the total forests (**307**) has been listed up on the basis of the composition of the crop and allotted Range wise into respective working circle Govt. waste land i.e. other land as defined by the Supreme Court, which includes Charagah Drakhatan, Charagah Bila Drakhatan, pasture land except Gair Mumkin land, etc. are included in the plan in compliance of the Hon’ble Supreme Court order dated 12-12-1996 for application of Forest (Conservation) Act, 1980, as these Govt. waste lands were declared in general as ‘Protected Forests’ by the Govt. notification dated 25th February 1952, which were out of the scope of the previous working plan. The Range wise statement of the forest area is given as under:

Range wise Distribution of the Forest Area (in hac.)

Sr. No.	Name of Range	Reserve Forest (RF)	Protected Forests			Other Forest Land as defined by the Supreme Court	G. Total
			Old DPF's	New DPFs	Listed UPFs		
1	Bhaba Nagar	0	2407.88	0	2375	14517.17	19300.05
2	Kalpa	0	5281.13	0	445	48050	53776.13
3	Katgaon	0	1232.92	0	1740	7277.08	10250
4	Kilba	0	3943.91	971.45	2408	130700.76	138024.12
5	Malling	0	0	0	0	73681	73681
6	Moorang	0	3966.42	0	0	99387.45	103353.87
7	Nichar	0	5579.51	0	3737	22050	31366.51
8	Pooh	0	1387.86	0	0	60480.12	61867.98
	Total		23799.63	971.45	10705	456143.6	491619.66

There are no reliable records available which could throw the light on the early history of these forests. Since, the plan includes forest areas which were managed by different

administration of various states, each state had, therefore, its own past history and system of management. However, little is known about the history of the forests covered by the Working Plan before the advent of the British Rules. Consequently, the general history and past management of each constituting unit/area are described in different erstwhile States as Bushahr State Forests, Sangri State forests, Delath State Forest. The forests of this division are covered mostly under Bushahr State. Little is known, of the history of Bushahr Forest prior to 1850. In 1850, an Indian trader purchase Deodar trees from Raja at Two Anna (12 paise each), but the forest were not heavily felled, until 1859, when other traders obtained permits to fell indefinite number of trees merely by giving the Raja a bag full of Rupees. The Satluj valley Forests, were inspected by Cleghorn in 1962 and remarked about the sheer wasteful working of forest by the traders. After Cleghorn's suggestion, the Raja applied to the Superintendent, Hill states, to appoint an officer for exercising control over the working of forest and realization of revenue, which was proposed at Rupees 3.50 per tree of Deodar, which alone had any market. Mr. Barnes, the Superintendent, Hill states, drew up rules for the management of these forests and a native Forest Ranger was appointed, but, these measures did not have the desired effect.

In 1864, the management of the Bushahr State Forest was taken over by the British Government and a lease was concluded with the Raja of Bushahr State in consideration of certain payments. In the same year, Brandis made inspection of forests in the Sutlej Valley. After inspection, he drew up a felling scheme based on enumeration on rough linear surveys. Thus, felling was confined mainly to the easier forests on the left bank of the Sutlej. The system of management proposed was selection with girth limit of six feet and felling were limited to 3000 trees annual.

In 1872, Brandis again visited Bushahr State and found that the rate of felling had averaged only 1400 trees annual. He recommended an early preparation of a proper working plan, which was soon taken up in hand by Ribbentrop with Batchelor and Stenhouse. This plan for the period 1875-1890 was of particular interest, because, then it was first realized the necessity for differentiating between the treatment of compact blocks of regular high forest and that of irregular forest on steep ground. The former type received two successive regeneration felling and in the latter, felling were to be made by selection of individual trees. The forests were worked by the departmental agency.

Bushahr forests were leased to the Punjab Government, and the first regular lease was drawn up during 1877, which was renewed from, time to time, during 1928 and 1942. The control of Bushahr forests was transferred to Himachal Pradesh Government w.e.f. April 1, 1949.

The first detailed working plan was prepared by Mr. Lace in 1892 for a period of twelve year 1892 to 1904. Later on, the forests of this Division were covered in the following working plans as under:-

- i) Lace's working plan 1892-1904.
- ii) Hart's working plan 1905-1930.
- iii) Hamilton's working plan 1930-1950.
- iv) Tandon's working plan from 1960-61 to 1975-76.
- v) Kharwasra's working plan from 1976-77 to 1990-91.
- vi) Rajiv's working plan from 1999-2000 to 2014-15.

The detail of each working plans are described in Chapter VII-Past System of Management, Part-I of the working plan.

The present working plan is the revision of Rajiv's Working Plan from 1999-2000 to 2014-15. This working plan has been prepared, strictly, on the basis of National

Working Plan Code, 2014. In order to, achieve the objects of management outlined in Chapter-I, Part-II, the Deodar-Kail Dry and Wet Zone Working Circle, the Fir-Spruce Working Circle, the Neoza Working Circle, and the Protection Working Circle have been constituted as per composition of the crop. A separate mandatory working circle i.e. Plantation, NTFP, Forest Protection (Fire, illicit felling, encroachment, illegal mining, poaching etc.) and Joint Forest Management & Wild Life Management overlapping working circles have also been constituted for the first time and discussed in length with prescriptions of legal control mechanism, which would be very useful as reference. The chapter on NTFP gives an exhaustive list of the useful medicinal plants along with their uses, which would be very useful as reference. Similarly, the new chapter on Five Year Plans & Activities of H. P. State Forest Development Corporation Ltd. in harvesting and marketing of forest produce, result of socio-economic survey too, are in detailed form and described in Part-I Chapter-V and Chapter-IV respectively. The circle wise statement of forest area is given as under:

Circle Wise Statement of the Forest Area (in Hac.)

Sr. No.	Name of Working Circle	Protected Forests			Total
		DPF	NDPF	Listed UPF's	
1	Deodar/Kail Wet Zone	2406.39	0	73	2479.39
2	Deodar/Kail Dry Zone	1662.81	0	0	1662.81
3	Fir/Spruce	3846.15	0	2677	6523.15
4	Neoza	2844.53	0	0	2844.53
5	Rehabilitation	13039.75	971.45	7955	21966.2
Total		23799.6	971.45	10705	35476.08

As per working plan code 2014, the enumeration was carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The enumerations were carried out, accordingly, in all the PBs down to 10 cms dbh in all the working circles. All the coniferous and important broad leaved species have been included in the enumeration list. The results have been analyzed and growing stock has been assessed accordingly. The present working plan has been revised thoroughly, notwithstanding, the present moratorium on green felling. The revised working plan includes all regular working circles, prescribing yield and felling cycle/felling series depending on the condition of forests in each working circles. Thus, green felling in any forest or in public forest will be allowed/carried out strictly in accordance with the approved prescriptions of working plan subject to the decision of the Hon'ble Supreme Court.

The forests allotted to different working circles viz Deodar/Kail Wet Zone, Dry Zone, Fir/Spruce are prescribed to be managed under the Punjab Shelter Wood System and Indian Irregular Shelter Wood System respectively. The rotation period is fixed at 120 years for Deodar/Kail Wet Zone, Dry Zone and 150 years Fir/Spruce. Beside this, the felling cycle of 15 years corresponding to the period of plan has been adopted. The regeneration period of 30 years has been adopted and area of the all working circles has been divided into four periodic blocks i.e. PB-I to PB-IV.

The yield has been calculated by volume and separately for PB-I and IV on the basis of enumeration result in the, Deodar/Kail Wet Zone, Dry Zone and Fir/Spruce working circles. The total Annual prescribed yield from the forests of the different working circles has been worked out by Hufnagels formula and is given in the Table below:-

Annual yield (in M³) prescribed in different Working Circle

Working Circle												
Species	Deodar/Kail WZ			Deodar/Kail DZ			Fir/Spruce			Neoza	Rehabilitation	G. Total of yield (In m3)
	PB - I	PB - IV	Total	PB - I	PB - III	Total	PB -I	PB -U	Total	Yield not prescribed	Yield not prescribed	
Deodar	2200	1900	4100	1100	800	1900	900	800	1700			7700
Kail	1000	500	1500	660	125	785	100	10	110			2395
Fir	1200	900	2100	0	130	130	8300	1400	9700			11930
Spruce	1300	1100	2400	0	245	245	2300	1300	3600			6245
Total	5700	4400	10100	1760	1300	3060	11600	3510	15110			28270

The methods of executing fellings/thinning have also been described alongwith the detailed felling and planting programme. An exhaustiveartificial regeneration and miscellaneous regulations are also prescribed under respective working circles. However, all the working circles are described in detail from Chapter II to Chapter XI of Part-II of the working plan. Similarly, miscellaneous regulations in Chapter-XI+2 are also described in detail, which would be useful as reference.

The working circle wise detailed plantation programme has been laid down in Plantation (Overlapping) Working Circle, Chapter-VII, Part-II. It is also pertinent to mention that out of total hac. of other forest land as defined by the Supreme Court, only **117** hac. of culturable land i.e. Charagah Drakhtan, Charagah Bila Drakhtan excluding refractory area is proposed for planting during the plan period provided that the plantation shall be carried out only after issuance of closure notification under Section 30 (b) of IFA, 1927. Similarly, the land bank area comprising **110 hac.** has been identified and is tabulated in Table No. 7.7 of the Chapter-VII, Plantation (Overlapping) Working Circle. The identified land bank area for compensatory afforestation in lieu of the forest land diverted for non-forestry purpose shall be transferred to the ownership of the forest department and declared as ‘Protected Forests’ under Section 29 of the Indian Forest Act, 1927 and will be added to the total recorded forest area of the State. It has been observed that large chunk of forest land consisting of listed UPFs or other forest land i.e. Charagah Drakhtan, Charagah Bila Drakhtan were covered in the working plan for raising plantation, but, these areas does not come under the preview of IFA, 1927 in absence of notification under Section 29 to 32 of IFA, 1927.

All the relevant Govt. notifications, rules and important judgments are also annexed as Appendices for the ready reference to all.

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PART-I

**SUMMARY OF FACTS
ON WHICH THE
PROPOSALS ARE BASED**

CHAPTER-I

THE TRACT DEALT WITH

1.1 Name and Situation:- This Working Plan deals with all the protected forests i.e. Demarcated and Listed Un-demarcated Protected Forests including other land of Kinnaur Forest Division. The forests, which have been covered in the plan under revision are located in Bhaba Nagar, Nichar, Katgaon, Kilba, Kalpa, Moorang, Pooh and Mallang Ranges of Kinnaur Forest Division. The total Geographical area of the tract is 4916.20 km². The boundaries of Kinnaur Forest Division are co-terminus with that of Kinnaur District. The whole tract drains into river Satluj. The tract lies between latitude 31° 05' 50" to 32° 05' 15" North latitude and between 77° 45' and 79° 00' 35" East longitudes. The Head quarter of Kinnaur Forest Division is located at Reckong Peo which is about 230 KM from Shimla.

1.1.1 The tract of the Kinnaur Forest Division was re-organized during 1984. Before re-organization in 1984, the Division was known as "Kinnaur Forest Division" with the Divisional headquarters at Nichar. Subsequently, this Division was bifurcated into two Divisions vide HP Govt. Notification No. Ft.SC.A(I)/83 dated 24-02-1984, thereby creating a new Forest Division at Pooh and the old Kinnaur Forest Division was renamed as Nichar Forest Division. In addition, a Wild Life Division was also created at Sarahan and the sanctuary areas of erstwhile Kinnaur Forest Division were transferred to Sarahan WL Division comprising of three WL ranges viz Rupin, Katgaon and Sangla. Again, during 1999, H.P. Government ordered the merger of Nichar and Pooh Forest Division with headquarter at Reckong Peo vide Notification No FFE-A(A) I-3/98-Pt dated 21-12-1999. Pursuant to the Hon'ble Supreme Court order dated 01-02-2013 vide the H.P. Government vide its Notification No.FFE-B-A(1)-1/2013 dated 31 July 2014, ordered to re-organization of the excluded areas of the Wildlife Sanctuaries to Territorial Division. Subsequently, the forest areas of Wildlife Division, Sarahan has been transferred to Kinnaur Forest Division during 2014, (copy of notification is annexed as **Appendix - XXXIV**). As such, Katgaon Range was transferred to this Division during 2014. Now, there are eight territorial forests Ranges viz Bhaba Nagar, Nichar, Katgaon, Kilba, Kalpa, Moorang, Pooh and Mallang in this Division. The territorial jurisdiction of the Kinnaur Forest Division falls in Kinnaur District, H.P.

1.2 Boundaries:- The District adjoins part of Western Tibet, with which it shares its Eastern boundary by following a well defined ridge generally along the Zaskar Mountains. Its Southern boundary adjoins the Uttar- Kashi district of Uttarakhand and Rohru Tehsil of Shimla district. Its Western boundary adjoins Rampur tehsil of Shimla district. The Northern boundary of Kinnaur adjoins Spiti sub Division of Lahaul Spiti District by following mostly the ridge of Spiti and Satluj river basins until the international boundary, it follows the Spiti river and its main tributary, the Parechhu.

North :- Spiti Sub-division of Lahaul Spiti District

East: - Ridge along the Zaskar Mountains.

South: - Uttar- Kashi district of Uttarakhand and Rohru Tehsil of Shimla district.

West: - Rampur Tehsil of Shimla district.

1.3 Configuration of the Ground:-

1.3.1 The tract is hilly and the slopes vary from moderate to steep and very steep to precipitous. Rugged and sharp edged cliffs are very common in the upper catchment of the area. The tract is chiefly mountainous and river Satluj flows almost in the middle and drain the whole tract. Satluj enters the district from the North East and leave the District at its Western end. In its passage through Kinnaur, the Satluj River successfully crosses three more or less parallel mountain ranges, the Zaskar, the Great Himalaya and the Dhauladhar. The crest of the Zaskar Ranges forms the Eastern international boundary of Kinnaur with Tibet, the Great Himalayas extends from the North West to the South- Eastern part of the District, roughly, bisecting it, while, the crest of the Dhauladhar constitutes the Southern boundary of

Kinnaur, at the South- East corner of which the last two ranges merge. Between these three mountain ranges, lie the subsidiary valleys of varying dimensions from the narrow glens and ravines of the Tirung and Taiti streams to the sizeable valleys of the Spiti and Baspa rivers. The significant tributaries that flow into the main Satluj river from the south or along its left bank are successively the Gyanthing Khad, Tirung Khad, Baspa River, Duling Khad, Panvi Khad, Sholding khad, Chaunda khad and Kundlu Khad, and likewise, those that flow into the Satluj river from the North or along its right bank are the Spiti river, Ropakhad, Taiti khad, Kashang khad, Baura khad, Wanger khad, Shalaring khad, and Shorang khad. In between are innumerable mountain, tills rapidly disgorging from hanging valleys into the main Satluj River and its tributaries. Few villages of Kinnaur lie along the bank of the Satluj River in the main valley, while, the remaining habitations nestle in- side the aforementioned major subsidiary valleys. Geological Survey of India, H.P. Circle Chandigarh has carried out detailed survey of this area.

1.3.2 The crests of the three mountain ranges that encompass Kinnaur, the Zanskar Range, the Great Himalayan and the Dhauladhar lie generally in perpetual snow with many peaks raising between 5180 m and 6770 m. The highest two peaks in Kinnaur, Leo Pargial 6770m. and the other peak? 6608 m are in the Zanskar Range. The third and the fourth highest peaks, 6593 Raldang, 6473 m.? rise in the Great Himalaya. The Peaks of the third mountain range, the Dhauladar are, somewhat, lower ranging generally from 4877m. to 5791m.

1.4 Geology and Rock:- The tract lies in Western Himalayas. The main rock types are Mica, Schist and Quartzite Schist with Gneiss, Granite, Phyleites, Slates, Shale and Quartzite. The geology and rock effect the vegetation of a place by influencing the moisture regime, texture and drainage of the soil. The known geological formation in the area is as follows:-

- (i) Pre-cambrianschists, gneisses, granites, quartzites (Vaikrita system)
- (ii) Late pre-cambrian Himanta system- phylities, quartzites, contomerates, shales and slates.
- (iii) Silurian, Karol limestone quartzite.
- (iv) Carboniferous-quartzite's state dolomite limestone.

1.5 Soils:-

Soil types found in the area are:-

I. Forest Soil:- This is mainly of two types (a) Acidic Soil with low base status and (b) Neutral Soil with high base status.

Forest soils are by and large rich in humus.

II. Alluvium Soil:- At very few places in this tract, this type of soil is found, mostly along the river. In areas, having adequate forest cover, especially of Deodar, Kail, Fir and Spruce, the soils are generally deep to very deep. In Deodar and Kail forest, the soil has adequate organic matter, whereas, in Fir and Spruce forests humus layer is thick. However, soil, in Chil forest is poor in organic matter due to repeated fire and thus, vulnerable to erosion. Oak forests are generally accompanied by mature soils of good depth and possess high water holding capacity and acidic in reaction.

1.5.1 The profile is well developed in higher locations under dense forest. Lower down, it suffers from erosion and has no scope to develop. Soil over most of the area is formed in situ, and is more or less loam to clay-loam. Generally speaking, on ridges, spurs, precipitous slops and southern slopes the soil is shallow. On the other hand, it is moderately deep on the cooler aspects and on gentle slopes.

1.6 Climate:- By virtue of elevation, the tract may be set to have a temperate zone climate with winter from November to April, and summer from May to October, which includes the rainy season from July to September the Wet Zone only. The transition period from April to May and from September to October, correspondent, to the spring to autumn season of the temperate zone. Broadly speaking, three season viz. winter, summer and rainy are discernible in the tract.

1.6.1 Winter Season:- Through, the duration of winter season depends on the altitude, it generally last from November to April, in most parts of the tracts. It is characterized by heavy frost in the lower areas and fairly heavy snowfall at higher elevation. Rain and snow during winter season come from northwestern air currents, and snowfall starts at higher elevation toward the end of the November or early in December. The snow comes down to 1300 m. elevation, but it seldom lies long below 2000 m. In normal year, snow disappears before the middle of May; all the areas are clear of snow, except the shady localities on northern faces and the nalas. Snow lies almost permanently above 4500 m.

1.6.2 Summer Season:- This is the driest period and is characterized by frequent showers in the moist or wet zone, while in the dry zone, snowfall as late as May and June has taken place at Kalpa in 1957 and in 2013. This period is of intense phonological activity at the higher elevations can be termed as spring. At this time of the year, the lower valleys are hot. Hot winds blowing up the Sutlej and hot sun in arid and semi arid parts allow only in short spring.

1.6.3 Rainy Season:- It starts with the advent of monsoon, either towards the end of the June. Or early in July or lasts till middle or sometime in the end of September. The bulk of rainfall is received during this period in the wet zones. In the inner valley beyond Wangtoo, the rainfall shows a progressive decline followed by an enhanced snowfall. So much, so that at Pooh, there is higher snowfall and absolutely no rains. The distribution of rainfall is, however, not regular. Sometime, it rains exceptionally heavy for few days and rest of the rainy season may go erosion landslides and floods. The scars of landslides caused by such unusual cloudbursts take several years to heal.

1.6.4 After the rainy season, the sky becomes clear and there is very little rain, if any, during October to November. In these months, the diurnal range of temperature is quite marked. The soil losses moisture very rapidly. There is another dry period during the months of October and November. All the areas above about 1200-M. elevation experience severe frost especially in the depression.

1.7 Rain Fall:- The climate of the Sutluj valley shows a gradual alternation from the heavy monsoon of the outer Himalayas to the arid Tibetan type with the winter snowfall and practically, no summer rain. The Monsoon clouds advancing from the plains of India are combed out by the outer ranges of the hill, where most of the rain falls, so that the inner valleys get a good deal of clouds, but no steady perception. The snow falls is also heavier in the Himalayas than it is on the Tibetan plateau, but, the zone of heavy snowfall includes the whole of Kinnaur and it is only beyond the Tibetan border and up in Spiti valley, that the snow falls shows any marked decline. The monthly and average RH in percentage data of rain fall as procured from India Meteorological Department, Meteorological Centre Bibra House, Cliff-end Estate, Shimla- 171001 for the last 10 years is tabulated on Table No. 1.1. and 1.2 respectively. However, the average snow fall data is tabulated in Table no. 1.3

Table-1.1**Monthly Rainfall Data of Kinnaur (Kalpa) Rainfall (in mm)**

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2009	-	-	-	84.0	73.4	29.9	48.9	21.8	201.9	17.1	34.5	24.1
2010	50.2	101.1	62.7	132.3	127.2	61.2	130.1	84.7	208.3	28.8	5.2	85.8
2011	63.1	151.1	84.9	70.3	49.3	44.6	75.9	128.0	24.8	4.2	0.0	8.8
2012	105.7	152.4	89.4	62.9	10.1	11.4	24.8	64.7	38.0	0.6	1.5	18.1
2013	150.7	244.7	89.4	57.2	31.4	335.4	25.4	25.5	76.8	5.5	8.4	9.4
2014	80.9	132.9	111.7	99.6	56.0	7.8	70.5	24.7	26.9	5.5	0.6	52.0
2015	89.9	236.0	245.2	15.7	59.3	54.7	50.4	29.0	45.5	4.0	5.8	15.0
2016	23.2	38.2	105.7	116.4	21.6	12.6	42.3	58.5	30.8	2.4	0.0	5.0
2017	159.0	49.2	89.6	132.2	24.8	42.4	42.4	26.8	87.6	0.2	37.0	27.0
2018	3.0	49.8	64.8	52.0	53.5	42.0	85.2	34.6	116.0	0.0	45.4	34.0
2019	131.0	180.2	124.4	-	-	-	-	-	-	-	-	-

(Source: Deptt. of Meteorology, Shimla)**Table-1.2****Monthly avg RH of 0830 HRS (in Percent) of Kalpa w.e.f April 2009 to March, 2019**

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2009	-	-	-	36	42	33	50	59	57	38	58	44
2010	49	46	50	34	37	48	71	67	62	53	44	55
2011	68	72	54	55	55	74	86	89	79	54	41	48
2012	79	80	68	75	58	69	83	87	82	45	50	50
2013	NA	NA	56	54	59	76	84	84	80	80	47	55
2014	57	70	71	61	72	76	83	82	81	78	53	47
2015	54	62	60	41	54	67	80	80	70	58	53	58
2016	64	61	58	54	57	64	87	89	74	47	36	39
2017	75	63	53	49	54	70	90	87	79	59	60	60
2018	68	68	41	49	50	67	87	87	74	48	54	63
2019	78	89	59	-	-	-	-	-	-	-	-	-

(Source: Deptt. of Meteorology, Shimla)

Table-1.3

Year	Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Apr-09	4			0.5				13.2																								
Dec-09	12															4.5																
Jan-10	1			10.0	25.4										14.8																	
Feb-10	2								32.1	52.6																						
Dec-10	12																														22.3	63.5
Jan-11	1	16.8								2.0	0.6					21.0	10.6		6.2			Tr									4.5	1.4
Feb-11	2						0.2	16.1	35.3					13.9	15.4	13.6	4.9	7.1	Tr		3.7	2.0			16.1	8.0	11.1	3.7				
Mar-11	3	9.1	18.1	18.0	19.2	0.1				0.1	1.0											Tr									2.5	
Apr-11	4			4.8	8.4	0.2	Tr	3.1	Tr																							
Dec-11	12									5.2	3.6																					
Jan-12	1					3.0		14.2	8.8	8.8						0.2	41.8	1.2			4.4	1.0	0.5	5.7			2.6	1.0				
Feb-12	2				6.3	18.7	8.9		26.7	16.6			2.5	10.0	7.5		1.8	11.4		0.1	4.4	15.4	1.4				Tr			3.4		
Mar-12	3						11.0	3.4		5.3	2.2	4.4		4.4	0.8																	
Nov-12	11																													Tr	1.5	
Dec-12	12												3.2	0.6	8.0	1.2	5.0													Tr		
Jan-13	1													6.4					95.2	49.1												
Feb-13	2				22.0	54.7	38.6	41.0									12.2	33.2					1.0	15.0	10.0			2.0	15.0			
Mar-13	3										2.0	10.0				24.0	1.0	2.0								10.4	24.0			4.0		
Dec-13	12																				0.4		2.0	4.0								3.0
Jan-14	1					1.0	7.6			15.0		4.4		0.7	5.0	12.4			1.0					30.4	0.6							
Feb-14	2				5.8	2.3									18.0	37.0	13.8						5.0	7.0				5.0	11.6			
Mar-14	3	9.4	2.3			1.8	2.8					7.4	19.1						15.0	2.8												
Apr-14	4			2.0				6.0			0.6				10.0					10.0	2.0											
Nov-14	11																												Tr			
Dec-14	12														28.2	15.8	8.0															
Jan-15	1			9.2	11.6										13.0	8.0							19.1	8.6			1.2	13.0	1.2		5.0	
Feb-15	2		2.0	52.0	12.0					0.4							0.8	12.6	0.4	4.8	36	34				11.0	39.0	25.0	6.0			
Mar-15	3	8.0	65.0	45.0	2.2		9.0		10.0	27.0	26.5						3.2	8.0														

1.7.1 It is clear from the description of the climate and figure of the rainfall, that the tract covered by the plan can be divided into three climate zones of fairly marked climate characteristics. These may be called Wet, Dry and Arid Zones. On the above basis, the entire Bhaba Nagar, Katgaon and Nichar ranges falls in the wet zone, the Kilba ranges fall in wet and dry zone, in almost equal proportion, while, the Kalpa ranges fall entirely in dry zone. The whole of Pooh, Moorang and Malling Ranges falls in Dry & Arid zone. These climate zones evince considerable interest among the foresters for reasons of their peculiar problems of silviculture management.

1.8 Temperature:- Due to great variation in altitude, the temperature also varies considerably. Minimum temperature goes down up to 1°C during winter and maximum temperature exceeds 25-30°C in the lower areas during the summer. The temperature in the different parts of the tracts varies according to the elevation. Temperature, begins to rise rapidly from the end of February, till June which is the warmest month. The temperature, remains high during July and August in the Arid zone, because it lies beyond the reach of monsoon. The weather is cool and pleasant in the summer season, except in the deep valleys. With the onset of the Southwest monsoon by the end of the June, the temperature begins to decrease gradually. However, the temperature drop is rapid only after October. January is the coldest month. In association with the passage of Western disturbance in the cold season, the tract experience spells of cold weather, when the temperature often goes down several degrees below the freezing point. Frost occurs from October to May. The monthly average maximum and minimum data of Kalpa Station is available which has been procured from India Meteorological Department, Meteorological Centre Bhabra House, Cliff-end Estate, Shimla - 171001 and is tabulated in Table No. 1.4 and 1.5.

Table-1.4

Monthly Avg. Max Temperature (in Deg C) of Kalpa w.e.f April 2009 to March, 2019

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2009				17.4	19.8	23.3	23.4	23.8	20.9	18.1	12.9	7.8
2010	7.2	8.4	16.1	18.8	20.4	21.1	20.9	21.5	19.4	18.2	15.9	10.2
2011	2.9	4.9	12.4	15.2	21.9	22.0	21.8	21.8	22.0	19.6	16.7	11.5
2012	3.4	4.5	12.1	16.5	21.1	23.8	22.9	21.5	22.1	18.0	14.2	9.3
2013	3.6	1.9	9.7	16.6	21.7	22.3	23.6	22.5	21.3	19.2	14.0	10.2
2014	4.5	4.2	8.8	15.3	19.8	24.1	22.7	23.1	22.2	19.3	16.1	9.4
2015	5.3	5.6	10.4	18.1	21.4	22.0	23.5	23.2	22.6	19.2	15.0	10.6
2016	9.5	10.7	13.8	17.7	22.2	24.7	22.7	21.9	23.4	20.5	16.7	14.1
2017	3.9	8.4	12.0	17.7	21.5	21.7	22.6	23.1	21.4	20.2	13.4	9.9
2018	10.8	10.7	14.4	18.1	25.8	23.7	22.1	23.0	21.1	17.9	12.7	9.2
2019	3.2	4.2	10.0									

(Source: Deptt. of Meteorology, Shimla)

Table No:- 1.5

Monthly Avg. Min Temperature (in Deg C) of Kalpa w.e.f April 2009 to March, 2019

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2009				1.9	4.0	6.9	10.2	10.4	6.7	1.7	1.1	3.3
2010	-4.3	-4.2	3.3	5.4	7.3	8.9	13.1	13.9	10.1	4.6	2.1	1.4
2011	-5.0	-2.1	1.1	3.5	7.7	10.8	13.7	13.5	10.4	5.3	2.6	1.5
2012	-4.9	-3.1	0.6	3.7	6.4	10.1	13.8	13.4	10.9	3.4	0.6	1.0
2013	-5.1	-4.8	0.7	3.5	8.3	12.0	14.6	13.9	9.5	6.4	0.9	1.7
2014	-3.1	-3.4	-0.2	2.8	6.4	10.7	13.7	12.9	9.8	5.0	2.1	0.8
2015	-4.5	-6.6	-3.9	3.3	7.0	9.1	13.4	13.4	9.0	5.3	2.4	0.7
2016	-1.9	-0.8	1.7	4.9	7.9	11.9	13.9	12.7	9.5	4.6	2.2	1.2
2017	-3.8	-0.9	0.4	5.0	7.0	10.1	14.3	13.5	9.5	5.3	1.0	0.2
2018	-2.2	-0.8	1.5	4.7	6.9	11.1	14.1	14.1	9.5	3.1	0.9	2.3
2019	-4.9	-4.4	-0.6									

(Source: Deptt. of Meteorology, Shimla)

1.9 Effects of Climate on Forest Growth:-

- Heavy rains in monsoon or pre- monsoon, sometimes, cause havoc to trees growth which result in soil erosion, landslides and floods.
- From April to June, when temperature is high, the probability of forest fires is very high in lower areas. Young plants in the nurseries and plantations suffer from persistent drought and large scale mortality is noticed in areas with sandy and dry soils. The natural springs run dry, thus, causing a problem of water for raising nurseries.
- Autumn (September –October) are relatively dry months.
- All the areas above 1000 m, experience severe frost, especially in the depressions during winter.
- High hill areas experience snow, during November to February; many plants are uprooted or broken. In young regeneration areas, roots lifting due to frost is also noticed. However, snow is very helpful for augmenting ground water and is also utilized by the plants.

1.10 Water Supply:-The whole tract is covered with swelling Khads. The main perennial Khads are Kandlu Chaunda Khad, Sholding Khad, Panvi Khad, Duling Khad, Baspa River etc. on the left bank of River Satluj and Shorang Khad, Wanger Khad, Pangi Khad, Kashang Khad, Kirang Khad and Ropa Khad, etc on the right bank of River Satluj, in the tract, which are tributaries to Sutlej River. From interpretation the above paras in the climate and rainfall, it will be seen that, the water supply will vary considerably from locality to locality.

1.10.1:- In Nichar Range, on the left bank of the Sutlej, at an elevations between 1850-3600 m, the slopes are densely covered, gradient is not steep and the aspects is cool. These factors combined with a moderate rainfall produce an equitable flow of water down the streams and sufficient moisture in the forests, springs begun frequent. On the opposite bank, the slopes are steep and rocky, the aspect is hot and snow melts rapidly on the steep ground, above the forest on slopes, overlooking, the Sutlej are the drier nature. In the sides nalas water supply is again sufficient.

1.10.2:- East of Wangtoo, on the sides of the Sutlej, the shortage of water is more marked, the supply being mainly dependent on the melting of snow. In Kilba Range, the shortage is less marked, because the aspect is northerly and the snow melts slowly. But in Kalpa Range, where the snow melts fast, soil soon becomes dry and dusty and springs are rare. Thus, it is only in the main sides nalas, where a continuous flow of water is maintained, because of origin of streams from glaciers and snow fields.

1.10.3:- The moisture condition in dry arid zones is very poor, with the result that regeneration comes up only in shady and sheltered pockets. In the past, few irrigated plantation of Deodar as in C-152 (b) and C-76 (b) had been raised successfully.

1.10.4:- There is an adequate quantity of water in the side nalas to allow telescopic floating of timber over short distances. The floatability gets restricted, owing to numerous rapids and falls.

1.11 Distribution of Area:- Nine nos.UPFs have converted/notified into new DPFs during the period of Working Plan under revision and are included in the plan. **(See Appendix No-II).** Out of 9 newly notified DPFs, and Govt. waste land i.e. other land as defined by the Supreme Court, which includes Charagah Drakhtan, Charagah Bila Drakhtan, Ghasnies, Pasture land except Gair Mumkin Land, etc. are included in the plan in compliance of the ***Hon'ble Supreme Court's order dated 12-12-1996***, for application of Forest (Conservation) Act, 1980 only, as these Govt. waste land were declared, in general, as 'Protected Forests' by the Govt. notification dated 25th February, 1952, which were out of the scope of the previous Working Plan. Some of the unlisted UPFs, culturable waste land which includes Charagah Drakhtan and Charagah Bila Drakhtan land (except Gair mumkin land including refractory area) are included in the Plantation (overlapping) Working Circle for afforestation including Compensatory Afforestation in lieu of the forest land diverted for non forestry purpose. At present these forest land i.e. Govt. waste land, throughout the tract, have not been defined boundaries on the ground. Similarly, record of rights admitted in these forests is to be prepared and notified under Section 29 (3) of the Act and also to be notified in the official gazette.

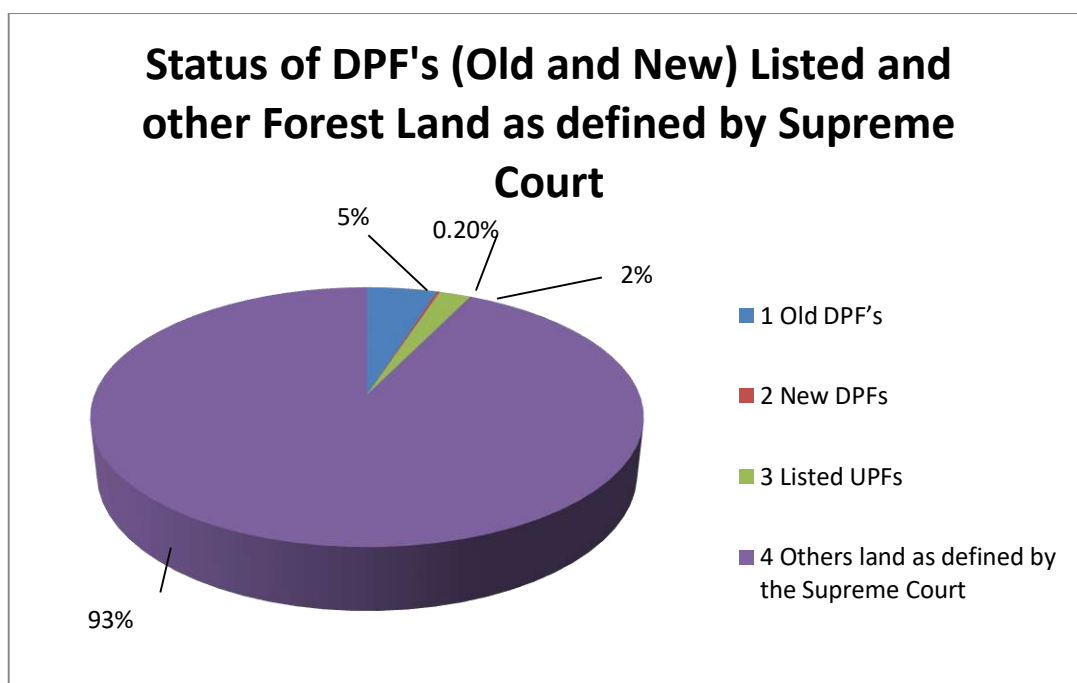
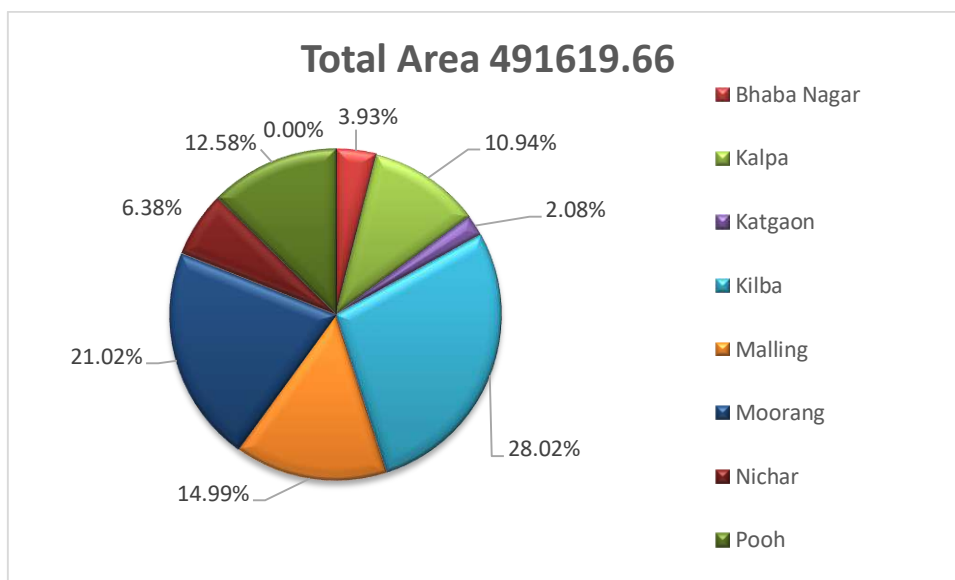
The total geographical area of the tract covered by Rajiv's plan was **4764.23km²** and **1788.77 km²** was covered by the Wildlife Division, Saharan, which is an independent unit. But due to issuance of final Notification of Wildlife Sanctuaries, **12558.33ha**, of area has been transferred to Kinnaur Forest Division. Beside this, some Forest areas were not included in the previous plan that too has also been incorporated in the current plan. Therefore, the total geographical area of the tract covered by this plan is **4916.20 Km²**

The major portion of the tract is uninhabited. The Demarcated Protected Forests and listed Un-demarcated Protected Forest covers **24771.08ha** and **10705 ha**, respectively, which contributes to only **7.22** percent of the total geographical area. Forests from long belts between 2130 to 3600 m, elevation on both sides of Sutlej, the continuity of which, however, is often more apparent than real. In Kalpa Range and Pooh Range, however, there are isolated patches of forests.

The Range wise statement of the forest area is tabulated in Table No:-1.6.

Table No. 1.6

Sr. No.	Name of Range	Reserve Forest (RF)	Protected Forests			Other Forest land as defined by the Supreme Court	G. Total
			Old DPF's	New DPFs	Listed UPFs		
1	Bhaba Nagar	0	2407.88	0	2375	14517.17	19300.05
2	Kalpa	0	5281.13	0	445	48050	53776.13
3	Katgaon	0	1232.92	0	1740	7277.08	10250
4	Kilba	0	3943.91	971.45	2408	130700.76	138024.12
5	Malling	0	0	0	0	73681	73681
6	Moorang	0	3966.42	0	0	99387.45	103353.87
7	Nichar	0	5579.51	0	3737	22050	31366.51
8	Pooh	0	1387.86	0	0	60480.12	61867.98
	Total		23799.63	971.45	10705	456143.6	491619.66



The name of the forests remains the same as given in the notification of Protected Forests and Bushahr State Forest Settlement Report of H.M. Glover. The Demarcated Protected Forests have been divided into **266** compartments/ sub-compartments. Similarly, there are **41** numbers of Listed Un-demarcated protected forests and **Nil nos** of Unlisted Un-demarcated Protected Forests. The Range wise statement of forests is given in **Appendix No-III**. The details of Range wise allotment of forest areas to periodic blocks and in various Working circle along with compartments and sub-compartments are given in **Appendix No-IV**. The boundaries and areas of these forests have been taken from old maps/record and also from the H.P. Govt. Notification, etc.

1.12 Newly Created DPF's:-The **Nine numbers** New DPF's have been created from earlier unlisted and listed UPF's. These generally bear degraded forest crops. Their maps have been drawn from the revenue maps and reduced to 1:50,000 and stock maps inserted in compartment

History Files. They have also been numbered serially like the old DPFs in an anti clock manner and run from NDPF-1 to NDPF-9. The “N” has been retained in the Working Plan to differentiate between new DPFs and old DPF’s and to make field staff aware of the position and status of new DPFs. In case of newly created DPFs, necessary entry in the revenue record is required to be done and should be completed within **three years** of the plan period. However, these forests have been brought under scientific management in the current plan.

1.13 Numbering of Compartments:- Rajiv’s Working Plan was plan for Nichar and Pooh Forest Division. Now Working Plans has been prepared for Kinnaur Forest Division and also areas of Wildlife Division, Sarahan included in Kinnaur Forest Division, therefore, it was necessitated to re-numbering of compartments. The re-numbering of compartments for Kinnaur Forest Division in ascending order, has started from Bhaba Nagar Range and end in Kalpa Forest Range in clock wise orientation. The detail of compartments and sub-compartment numbers both old and new are given in **Appendix No-V and Appendix No.-VI**. General abstract showing the allotment of forests to various working circle is given in **Appendix No- VII**.

1.14 State of Boundaries:- The first attempt to demarcate forest was done in deodar forests of erstwhile Bushahr State in 1868. However, permanent demarcation of forests commenced during the year 1884. Thereafter, measurement and demarcation of forests have taken place and recorded in the Forest Settlement of Sutlej Valley Forest of Bushahr State, 1921. All the boundaries of demarcated protected forests were fixed and maintained during Glover’s Forest Settlement in 1921, but no notification of DPFs are available on record except name of forest and area given in Forest Settlement Report, 1921. The Un-demarcated Protected Forests have not, so far, been demarcated and surveyed. As a result, many of UPFs have either completely vanished on the ground or has been reduced or is in the process of reduction in size and shape by way of encroachment / unauthorized occupation by the right holder’s.

The listed UPFs are roughly demarcated and mapped. The position is, still worse, in respect of Unlisted Un-demarcated Protected Forests, where boundaries are simply indicated by the cultivation of particular village.

It is pertinent to mention here that erstwhile State of Bushahr Forests was demarcated during 1884-1887. This demarcation was revised by H.M. Glover, during 1916-20, at the time of revision of Forest Settlement of Sutlej Valley forests of Bushahr State. During Glover’s Forests Settlement in 1921, when the positions of all the boundary pillars were checked, the boundary was straightened and cultivation was excluded, wherever, possible. The blocks (forests) in most cases are bounded by natural features, such as ridges and nalas, but the sub compartment boundaries have been shown only on the map and no clear lines exists to show their position on the ground. The demarcated protected forests are bounded by pillars of roughly dressed massonry with inset stone slab or slate bearing their numbers. In some places, the boundary pillars have been put up at long distances and in the absence of cleared lines between that, it becomes difficult to connect the two pillars on the ground. The boundary pillars have not been regularly repaired. Majority of pillars, is in a dilapidated condition. Sometimes, they occur in wrong positions or are missing altogether. There are no boundaries registers giving magnetic bearings and distance between adjacent pillars and boundaries have not been checked after the original delimitation. The Range wise and Forest wise list of boundry pillars is given in **Appendix No – XXXIX**.

1.14.1 Included cultivation (chak) is also demarcated by small numbered pillars. The extent of included cultivation is quite larger. The records of chaks have been carefully checked with the maps and on the ground during the field work of the plan.

1.14.2 Many un-demarcated forests bearing tree crops were surveyed and demarcated in the Forest Settlement during early eighties and have resulted in their being notified as DPF’s as discussed in para 1.12. Some of the Un-demarcated Protected Forests still remains, to be notified as DPFs as discussed in Para 1.11, for which DFO Kinnaur is advised to get them demarcated and notified so that these forests can be brought under scientific management.

Secondly, no magnetic bearing (Forward & Backward) are recorded for avoiding encroachments, etc. The boundary pillars in most of the cases are found damaged or missing; it should be reconstructed after getting proper demarcation. Annual programme for checking and repair of B.Ps was proposed in the Working Plan under revision. All the B.Ps could not be checked/ maintained as per annual programme prescribed in the expired Working Plan due to paucity of funds.

1.15 Maps Survey sheets on 1:50000 scales are available in this division. However, the entire area of Kinnaur Forest Division is covered in the survey sheets given below in the Table No:- 1.7.

Table No:- 1.7

Sr. No.	Survey Sheet No.
1	53 E / 13
2	53 E/ 14
3	53 E /15
4	53 I/1
5	53 I /2, 53 I /3,
6	52 L/8, 52 L/12
7	53 I/5,53 I/6,53 I/7, 53I/8 53 I/9,
8	53 I/10, 53 I/11, 53 I /12, 53 I/13
9	53 I /14, 53 I/15, 53 I /16
10	53 M/4

Out of these Survey Sheets, Survey Sheet number 52 L/12, 53 I/9, 53 I/11, 53I/13 Sheets are not available in the Division Office. The DFO Kinnaur is advised to take necessary steps to procure them.

1.16 Legal Position:-Prior to the integration of princely States in Himachal Pradesh on 15th April, 1948, rulers of erstwhile Bushahr State,were the owners of all types of land including demarcated as well as un-demarcated protected forests. After formation of Himachal Pradesh, the ownership of all demarcated as well as un-demarcated areas including pastures and ghasnies not assessed to land revenue vested in the Himachal Pradesh Government subject to the rights of users.

1.16.1:- Bushahr forests were leased to the Punjab Government, as early as, in 1864. This lease was revised from time to time during 1877, 1928 and 1942. The last lease, which was for a period of 50 years with effect from April 1, 1941 automatically lapsed after the transfer of Bushahr forest to the Govt. of Himachal Pradesh, when the lesser and lessee became the same. The control of Bushahr forests was transferred to Himachal Pradesh Government with effect from April 1, 1949.Raja of Bushahar was the outright owner of all State Forest. All the forests were leased to the British Government in 1864 and were being managed by the Punjab Forest Department, till 1949. The terms and conditions of the lease were revised from time to time. Forest Settlement as done by Mr. Minniken in 1884. First measurement of cultivated land for the state land Revenue Settlement was done on 1889. This resulted in many discrepancies in the two records, which were never rectified till 1916, when Glover took up the revision of Minniken Forest Settlement and completed it, in 1921.

1.16.2:- After the re-organization of Forest Department in the newly formed State of Himachal Pradesh, Indian Forest Act of 1927 was made applicable; vide Govt. of India, Ministry of States, Notification No. 146-J dated December 6, 1950 and 25th February, 1952. Thereafter, the provisions of Chapter-IV of Indian Forest Act, 1927 have been made applicable, to all forest lands and wastelands in Himachal Pradesh, which are the property of Government or over which

the Government have proprietary rights or to the whole or any part of the produce of the which the government is entitled as recorded in the forest settlements or land revenue settlements or land revenue records of the intergrated States.

1.16.3:- The two distinct types of protected forests came to be recognized in the erstwhile Bushahr State. The Demarcated Protected Forest, called the first class and second class protected forests by H.M. Glover, Forest Settlement Report, 1921 carried no meaning and are not governed by any law and thus, it is not sustainable in the eyes of law for application of the Chapter-IV of the Indian Forest Act, 1927. Subsequently, the Government through rules under Section 32 of Indian Forest Act, 1927, the forests of erstwhile Bushahr State were notified as ‘Demarcated Protected Forest’ vide Govt. Notification No. 43-241-A/49-2 dated February 25, 1952 as first class protected forests and second class protected forests. The **second class protected forests means** the un-demarcated forests or areas other than the demarcated forests and include all tracts of land bearing tree growth or from which the trees have been felled, which pay no land revenue, as cultivated land.

All the forests and waste land were declared as protected forests by the Himachal Pradesh Government vide Notification No. Ft. 29-241/49 dated Shimla-4, the 25th February, 1952 (**See Appendix No-XXV**). Subsequently, the Government through notification No. Ft. 774-1/63 (M) dated 24-2-1964 ordered that these forests be demarcated, and surveyed, and rights be determined. At present, un-demarcated protected forests, throughout the tract, have not defined boundaries on the grounds.

Thus, the Himachal Pradesh Government declared, in general, all such lands as ‘Protected Forests’ vide notification dated 25th February, 1952. All trees are declared to be reserved in these forests under Section 30 (a) of IFA, 1927 w.e.f. 1st January, 1964, vide Himachal Pradesh Govt. notification No. Ft. 29-24-BB/49 dated 13-11-1963 copy endorsed to all Deputy Commissioners/CFs and all DFOs in H.P. This general notification of the protected forests is of great legal significance for the authorities engaged in the task of forest management. The individual forests under this category have, however, got to be defined and notified under the provision of chapter-IV of Indian Forest Act, 1927. The rules for these forests are also to be prepared and notified under the said chapter for the Act. Record of rights admitted in these forests is to be prepared and notified under the Act and also, to be notified in the official gazette. The State of affairs being as it is at present, any system of scientific management applied to these forests, is deemed to be confronted with legal complications of a serious nature.

Vide Pr. CCF, HP Memo No. Ft. 48-66/83 (FCA) dated 20.4.2010 and the Supreme Court’s order dated 12-12-1996, Forest (Conservation) Act, 1980 is applicable on all such lands in State of Himachal Pradesh, except on vested land under the H.P. Village Common Lands (Vesting and Utilization) Act, 1974 and H.P. Ceiling on Land Holding Act, 1972, as per H.P. Govt. Notification dated 21-4-2006. In **T.N. Godavarman V/s Union of India, WP(C) No. 202/95 dated 12-12-1996**, the Hon’ble Supreme Court held that the Forest (Conservation) Act, 1980, must apply to all forests, irrespective, of the nature of ownership and classification of land thereof and it was, further, held that the word “Forest” must be understood according to its dictionary meaning. This description covers all statutory recognized forests, whether designated as reserved, protected forests or otherwise for the purpose of Section 2 (i) of the Forest (Conservation) Act, 1980. The terms of “Forest” shall not be applicable to the plantation raised on private lands, except notified private forest. However, felling of trees in these private plantations shall be governed by the HP Land Preservation Act, 1978. Cases of illicit felling, illegal mining and encroachment, etc. have to be dealt under the provision of the Indian Forest Act, 1927. Similarly, in **T.N. Godavarman Thirumulpad V. Union of India (1997) 2 SCC 267**, the Supreme Court held that no eviction may be made from any land or building containing machinery and equipment or any other facilities for housing, school or dispensary etc. in the, meantime, on the basis of the Apex Court order dated 12-12-1996. Till date, as far, concerned of ‘Protected Forests’ declared by the Govt. Notification dated 25th February, 1952, no efforts has

made for ascertaining and determining the nature and extent of the rights and setting them in a through manner, as in the case of constitution of a Reserved Forests, Chapter-II of the Act. Therefore, it needs to be done under Sub Section (3) of Section 29 read with Section 30 to 32 of the Act, otherwise, it carries no meaning in the eyes of law. By mere declaration of such land will not be treated as forest land, until and unless, waste land which declared by the State Govt. by notification dated 25th February, 1952 as “Protected Forests” is recorded as forest land in land revenue record under the H.P. Land Revenue Act, 1954 read with Sub-Section (3) of Section 29 of the Indian Forest Act, 1927. If, no such record is maintained, it is reasonable to presume that land in dispute, is not recorded as, ‘Protected Forests or Forest Land’ in the revenue record. Thus, it is clear that provision of the Indian Forest Act is not applicable on un-demarcated protected forests, as the same, is not a notified forest under Act.

Similarly, it is also mention here that the forest department has raised plantation over these land (i.e. waste land and Shamlat Deh lands) over the period of time, but these areas do not come under the purview of Indian Forest Act, 1927. Similarly, 32 nos of existing listed un-demarcated protected forests (UPFs) area are required to be notified as ‘Protected Forest’ under the Act, so that anomalies could be legally rectified for the same as the Indian Forest Act, 1927 use the word ‘Protected Forest’ only, instead, of Demarcated Protected Forests and Un-demarcated Protected Forests.

After the Forest (Conservation) Act, 1980, coming into force, no forest land can be diverted for non-forestry purpose without the prior approval of the Central Government. Due to this enactment, the distinction amongst the demarcated or un-demarcated forest or un-classed forests and common lands regarding breaking up of land or use land has disappeared for application of Forest (Conservation) Act, 1980 only.

Thus, no forest/forest land or part thereof, shall be leased or transferred to any other Govt. Department or organization or institution or agency or grant nautor or land to landless person, etc. without prior approval of Govt. of India and forest land will not be diverted/used for non-forestry purpose without obtaining prior approval of Govt. of India, under Forest (Conservation) Act, 1980. Furher, in the recent times the Hon’ble Court has relaxed the conditions for grant of nautor in Tribal areas, as discussed under Para No:- 1.17.

1.17 Rights and Concessions:- Rights and concessions of local people in various forests have been recorded, in the Forest Settlement Report, Sutlej Valley, Bushahr State, 1921. The nature of rights and concessions enjoyed by the villagers in protected forests or un-classed forests are more or less the same, all over the division, though, they differ in extent from village to village. The right and concessions are appended to the cultivated land and are not personal. For detail rules and regulations of rights in different forests had been regulated and notified by the HP Govt. vide Notification No. 43-241-A/49-2 dated Simla-4, the 25th February, 1952 under Section 32 of the Indian Forest Act, 1927, subject to the provision of Forest Settlement Report, 1921. All forests are heavily burdened with rights. The state has permitted certain kind of usages (Bartan) in the forest, to meet the bonafide domestic and agricultural requirements of the people, in the matter of grazing and forest produce and such usages will be maintained, so far, as they are compatible with the system of forest conservancy, suited to the requirement of state and the people. The bartans are appended to cultivated land assessed to land revenue or the land revenue of which has been assigned. All rights are subject to the limitation that the rights will not be exercised to an extent which will endanger the existence of forests. Liberal rights and concessions granted to people of Sutlej Valley more than a century ago, are becoming a serious drain on forestry resources and threatening, the very existence of forests.

1.17.1 Timber Distribution to Right Holders:- Rights and concessions were recorded in Forest Settlement Report, during the year 1916-21 by H.M. Glover and have remained unchanged except Timber Distribution Rights. However, the State Govt. has recently notified H.P. Forest (Timber Distribution to Right Holders) Rules, 2010, for the rationalization of grant of timber and further, amended new (Timber Distribution to Right Holders) Amendment rules, 2015. The detail

rules with regard to quantity, periodicity, rates, priority for grant of timber distribution and various other provisions have been given in the Notification No. FFE-B-A (3)4/2015 dated 26 February 2016 (**See Appendix No-XXX**).

These rules, cover the Timber Distribution (T.D.) Rights for construction and maintenance of residential house, cowshed that too for bonafide domestic use, without affecting the other rights contained in the Forest Settlement Report in operation. Forest centered based on the principle, that if, the forests will remain intact only people will be able to exercise rights namely of Timber distribution (TD). Further, these rights are people centered, more so, rural poor centered.

- (i) The rights recorded in settlement other than Timber Distribution (TD) like free grant for last rites of the dead, collection of medicinal herbs, grazing, etc. have not been touched upon and would remain to be exercised, as they were in the past.
- (ii) To have transparency involvement of people in Timber Distribution through their Gram Sabha has been ensured. For rationalization process, the Hon'ble High Court before deliberating and deciding the issue under consideration of PIL with them, directed the State Govt. to rationalize the timber distribution process, which took into account the following aspects.
 - a) As the TD is concerned with land holding in rural areas, that too, for construction of house/cowshed for domestic purpose, the TD in Urban areas has been done away with.
 - b) If the Right Holders have land holding at more than one place, then TD will be granted at only one place of the choice of land holder.
 - c) TD will only be enjoyed by original Right Holder and not by those, who have purchased land after taking permission under Section 118 of the HP Tenancy and Land Reforms Act, 1972 from now onwards.

The following are some of the important provisions admitted in the Settlement Report:-

1.17.2 Grant of Timber:- Timber Distribution (T.D.) is a unique policy, in the colonial history of forest management. It is a policy, that provides every landowner with the right to harvest timber for the construction and repair of their houses. This policy, while, providing for a basic need of the local population, is also the single largest reason for timber harvest in the Western Himalayan region. Rates, were accordingly fixed, for the grant of trees of all the conifer species to landowners. Though, no limit on the number of trees to be sanctioned was fixed, but, it was provided in the Settlement Report that trees should be sanctioned only to meet the legitimate domestic and agricultural requirements. It results in the harvest of 60,256.14 cubic meters of prime timber, till recently, before Hon'ble High Court, while disposing a PIL directed the State Govt. to rationalize the process of timber distribution rights. The trees used for building timber in this division are namely Deodar, Kailash Fir/Spruce, etc. The trees at concessional rates were given from the Demarcated Protected Forests and Un-demarcated Protected Forests to the right holders only. As per current Timber Distribution Rules, the requirement of the right holders is to be met from the salvage trees, as per H.P. the Notification No. FFE-B-A (3)4/2015 dated 26 February 2016 and by this notification, now, right holders are not entitled to get timber distribution (T.D) for construction & repair of house etc. from the forest directly. The annual quantity of timber given to right holders on right holder rates and free grant during the period 1999-2000 to 2018-19 is tabulated in Table No: 1.8

Table No. 1.8

Year	Deodar		Kail		Rai/Fir		Neoza		B.L.		Total	
	No.	Vol.(in cum)	No.	Vol. (in cum)	No.	Vol. (in cum)	No.	Vol.(in cum)	No.	Vol.(in cum)	No.	Vol.(in cum)
1999-00	1138	4305.58	275	557.41	1	4.25	2	1.4	1	0.82	1417	4869.46
2000-01	1129	4179.24	214	800.38	22	76.52	0	0	0	0	1365	5056.14
2001-02	619	2422.01	145	364.91	3	13.87	0	0	0	0	767	2800.79
2002-03	549	1621.53	134	487.46	8	26.62	0	0	0	0	691	2135.61
2003-04	824	2685.64	131	458.28	7	28.87	0	0	0	0	962	3172.79
2004-05	292	1114.29	73	219.44	0	0	0	0	0	0	365	1333.73
2005-06	707	2623.44	174	493.84	7	23.26	0	0	0	0	888	3140.54
2006-07	469	2273.79	56	167.99	7	19.26	1	2.18	0	0	533	2463.22
2007-08	6	41.4	0	0	0	0	0	0	0	0	6	41.4
2008-09	0	0	0	0	0	0	0	0	0	0	0	0
2009-10	0	0	0	0	0	0	0	0	0	0	0	0
2010-11	0	0	0	0	0	0	0	0	0	0	0	0
2011-12	2	6	0	0	0	0	0	0	0	0	2	6
2012-13	0	0	0	0	0	0	0	0	0	0	0	0
2013-14	0	0	0	0	0	0	0	0	0	0	0	0
2014-15	661	2301.98	126	315.25	0	0	0	0	0	0	787	2617.23
2015-16	2078	6610.28	165	453.95	12	38.52	0	0	0	0	2255	7102.75
2016-17	448	1509.54	243	680.23	9	23.7	0	0	0	0	700	2213.47
2017-18	401	1340.19	269	831.78	14	49.58	0	0	0	0	684	2221.55
2018-19	515	1658.86	193	628.49	11	40.23	0	0	0	0	719	2327.58
G Total	9838	34693.77	2198	6459.41	101	344.68	3	3.58	1	0.82	12141	41502.26

(Source:- Records of Kinnaur Forest Division.)

Though as per instructions contained vide H.P. Govt. Notification dated 2nd January, 2010, quantity of timber was to be given to right holders from depots, but no timber has been given to the Right Holders of Kinnaur Forest Division.

1.17.3:- Temples have not been allotted rights, in particular forests, but exercise general rights, sufficient timber free of charge for repair and for new buildings is given, whenever, needed. Where temples have been included in the forests, no green tree within hundred feet may be cut, dry tree may, however, be cut with the Forest officer's permission for the use of the temple. The right to cut the tree for agriculture implements had been admitted without restriction, but mostly oak and other broad-leaved species are in demand for the purpose. For burning for dead, two trees except deodar of not more than 0.90 m (3 feet) girth each are allowed to be cut. These trees may be cut without permission, but the forest guard must be informed within 15 days.

1.17.4 Irrigation channels:- Or Khuls, may be constructed through demarcated protected forests provided the alignment receives the previous section of the Divisional Forest Officer.

1.17.5 Lopping:- Lopping of Broad leaved species except Ash, Walnut, Shisham and Boxwood is allowed. For Kail, Spruce and Silver Fir lopping is allowed provided that no tree under "two haths" in girth (90cm) at 4 feet 6 inches from the ground will be lopped and lopping is restricted

to the lower half of the trees. Meaning, thereby, one third of the tree will be allowed to lop from the lower half of the tree. Lopping of Deodar is prohibited. Glover allowed lopping of broad leaved species and yew trees for fodder and for bedding for cattle and lopping of broad leaved trees other than ash, walnut and box for firewood. Lopping of Kail, Spruce, Silver Fir and Neoza trees are allowed for charcoal and firewood, for the manufacture and repair of agricultural implements provided that no tree less than 2 haths (1 meter) in girth at breast height, would be lopped and that the lopping would be restricted to the lower half of the tree. This privilege is liable to be withdrawn at any time by the DFO with the permission of the Government.

1.17.6 Grazing:-The right holders are permitted to graze their cattle, buffaloes, sheep and goat for the whole year without any restriction in the forests, not closed to grazing by any specific order. The forest settlement provides that the rights of the villagers are limited to reasonable agricultural and domestic requirements of the people. Migratory graziers too have been permitted to graze their sheep, goats and buffaloes, during summer months, as a matter of concessions.

The Forests Settlements provide for free grazing to all for the rights holders in their own chaks, and no ceiling has been fixed on the number of cattle that might be grazed. But, they pay **Tirni** for winter grazing facilities availed by them in other divisions. Similarly, the grazers, who avail summer grazing facilities in alpine pastures outside their chaks, unless allowed, as special concession, pay tirni to the following rates as tabulated in Table No. 1.9

Table No. 1.9

Kinds of Animal	Fee charged in Rs.
Ponies	2.00
Sheep	0.20
Goat	0.40
Buffalo	8.00
Cow	2.00

1.17.7 Panwi or Preserved Grass Land:- Bushahr State had earmarked definite grassland, which are not to be broken for cultivation or allowed to revert the forests. These Panwis play an important role in providing winter grazing facilities to the large number of sheep and goats of the local grazers. These Panwis are burnt in the winter months under the mistaken beliefs that burning brings in earlier and better growth of grass. This burning has resulted in damage to the grasslands and even to the adjoining forests.

1.18 Minor Forest Produce:- The local people have rights to collect medicinal plants, herbs, roots, shrubs and other forest produce for bonafide domestic use and for sale to the traders as enshrined in the Bushahr Sutlej Valley Forest Settlement Report, 1921 by H.M. Glover. The system of issuance of export permit was made easier by delegating power on the Pradhan Gram Panchayat vide Govt. Notification No. FEE-B-C (9)/94-II dated Shimla-2, the 28th February, 2003, but now, the same has been withdrawn by the state government of Himachal Pradesh. The right of cutting grass has been admitted even in the demarcated protected forests. Collection and sale of fruits and honey and other seeds, flowers, roots, leaves and small branches for dyes, medicines and incenses have been admitted without hindrance.

1.19 Nautor Land:- After the enactment of the Forest (Conservation) Act, 1980, no land was to be given under nautor. But, Govt. of H.P. vide its Notification No. FFE-B-F(5)2/2002-Pt.IV-loose dated 17/7/2014 (copy of notification annexed as **Appendix - XXVII**) has relaxed the condition of Forest Conservation Act, 1980 for a period of two years to the scheduled areas of Himachal Pradesh with the following conditions, given in the said Notification.

- I. The area does not fall in National Park / Sanctuary / Conservation Reserve / Community Reserve / Reserve Forest / Demarcated Protected Forest.
- II. There is no tree standing on the land proposed to be allotted as nautor.
- III. The area is situated at a minimum distance of five kilo meter (Ground Distance) from National Park / Sanctuary / Conservation Reserve / Community Reserve.

- IV. The area is situated at a minimum distance one kilo meter (Ground Distance) from perennial / natural water source.
- V. The nautor, so granted is utilized only for bonafide domestic purpose and is not utilized for any commercial activity.
- VI. The nautor is not granted to any such person who is involed in any kind of Forest Offence, including encroachment on Forest Land.

Further, vide Govt. of H.P. vide its Notification No. FFE-B-F(5)2/2002-Pt.IV-loose dated 23/7/2014 (**copy of notification annexed as Appendix no-XXVIII**)has ordered that the suspension of Forest Conservation Act, 1980 in the scheduled areas of Himachal Pradesh shall be for the limited purpose of implementation of Himachal Pradesh Nautor Rules, 1968, subject to the condition imposed vide Notification No. FFE-B-F(5)2/2002-Pt.IV-loose dated 17/7/2014. Subsequently, the Govt. of H.P. vides its Notification No. FFE-B-F(4)1/2015 dated 27 May 2017(**copy of notification annexed as Appendix no - XXIX**)has directedthat the Forest Conservation Act, 1980 shall not apply for the limited purpose of implementation of Himachal Pradesh Nautor Rules, 1968 and carring essential development activities for a period of two years, subject to the fulfillment of following conditions given in the notification.

1. The area does not fall in national Park/ Sanctuary/ Conservation Reserve/ Community reserve Forest/ Demarcated Protected Forest.
2. The number of trees standing over the land proposed to be allowed as Nautor, should not exceed two.
3. It shall only be applicable to the nautor lands already sanctioned by competent authority till the date of issue of this Notification in which pattas could not be granted.
4. The Nautor, so granted, is utilized only for bona- fide domestic purpose and is not utilized for any commercial activity.
5. The Nautor is not granted to any such person, who is involved in any kind of forest offence, including encroachment on forest land.
6. No forest land will be granted for any purpose, in which natural water resources are utilized by the local inhabitants.
7. No forest land will be granted for any purposes, where paths and roads exist, which are used by the local inhabitants.
8. The essential developmental activities to be provide by the Govt. shall include (1) Schools (2) Dispensaries/ Hospitals (3) Electric and telecommunication lines (4) Drinking water projects (5) Water/ Rain Water Harvesting Structures (6) Minor Irrigation Canals (7) Renewable Sources of Energy (8) Skill Up gradation/ Vocational Training centers (9) Power sup- stations (10) Communication posts (11) Construction/ Widening of roads, including approach roads to road side establishments (12) Up gradation/ Strengthening/ Widening of existing bridges by the border Roads Organization (BRO) (13) Police Establishments like Police Stations/ Outposts/ Border Outposts/ watch towers in sensitive's area identified by the Ministry of Home Affairs permission for these activities shall be granted by the Forest Department, Government of H. P. on, case to case, basis for which regulation shall be framed by the Government of H. P. specifying procedure and authorities for granting the permission.

The Government of Himachal Pradesh vide its Notification FFE-B-F(4)1/2015 dated 27-May-2017 (**copy of notification annexed as Appendix no-XXIX**)has amended the condition number 3 of the Notification No. FFE-B-F(4)1/2015 dated 02-12-2016 as under:-

Condition No. 3:-Wherever Nautor land has already been sanctioned by competent authority till the date of issue of said Notification, dated 02-12-2016 but pattas could not be granted, pattas may now be granted at the same location for which sanction was issued. For new sanctions of Nautor in Un-demarcated Protected Forest (UPFs) land parcels be selected, in such a manner that the general forests and ecology of the area is not disturbed. Land chunks be, therefore, identified

jointly by Revenue and Forest Officers, in order to avoid scattered allotment of Nautor in the Forests. Divisional Forest officer concerned shall be authorized to issue No. objection Certificate for allotment of Nautor in UPF areas all such time as Forest Conservation – Act, 1980, does not apply in the Scheduled areas.

The latest Notification issued by Government of Himachal Pradesh vide its Notification FFE-B-F(4)3/2018 dated 13-February-2019 (**copy of notification annexed as Appendix no - XXXI**) has directed that the Forest Conservation Act, 1980 shall not apply to the scheduled areas of the State of the Himachal Pradesh for the limited purpose of implementation of Himachal Pradesh Nautor Rules, 1968 and carrying essential development activities, for a period of one year subject to the fulfillment of following conditions:-

The area does not fall in National Park/ Sanctuary/ Conservation Reserve/ Community Reserve/ Reserve Forest/ Demarcated Protected Forest:-

1. The number of trees standing over the land proposed to be allowed as Nautor, should not exceed two.
2. The no of trees standing over the land proposed to be allowed as Nautor, should not exceed two.
3. Wherever Nautor land has already been sanctioned by competent authority till the date of issue of this Notification, but pattas could not be granted, pattas may now be granted at the same location for which sanction was issued. For new sanctions of Nautor in Un-demarcated Protected Forest (UPFs), land parcels be selected, in such a manner that the general forest and ecology of the area is not disturbed. Land chunks be, therefore, identified jointly by Revenue and Forest officers, in order to avoid scattered allotment of Nautor in the Forests. Divisional Forest Officer concerned shall be authorized to issue No. objection Certificate for allotment of Nautor in Un-demarcated Protected Forest areas, till such time as Forest (Conservation) Act, 1980 does not apply in the Scheduled Areas.
4. The Nautor so granted is utilized only for bonafide domestic purpose and is not utilized for any commercial activity.
5. The Nautor is not granted to any such person, who is involved in any kind of forest offence, including encroachment on forest land.
6. No forest land shall be granted for any purpose, in which natural water resources are utilized by the local inhabitants.
7. No forest land will be granted for any purpose where paths and roads exist, which is used by the local inhabitants.
8. The essential development activities to be provided by the Government shall include (1) School (2) Dispensaries/Hospitals (3) Electric and telecommunication lines (4) Drinking water projects (5) Water/Rain Water Harvesting Structures (6) Minor Irrigation Canals (7) Renewable Sources of Energy (8) Skill Up-Gradation/Vocational training centres (9) Power sub- stations (10) Communication posts (11) Construction/ Widening of roads including approach roads to road side establishments (12) Up-gradation/ Strengthening/ Widening of existing bridges by the Border Roads Organization (BRO) (13) Police Establishments like Police Stations/ Outposts/ Border Outposts/ watch towers in sensitive areas identified by the Ministry of Home Affairs. Permission for these activities shall be granted by the Forest Department, Government of Himachal Pradesh, on, case to case basis, as per the regulation already framed by the Government of Himachal Pradesh vide Government of Himachal Pradesh letter No. FFE-B-F (4)-1/2015, dated 31st December, 2016, specifying procedure and authorities for granting the permission.

As in the plan under revision the number of nautor lands given on forest lands to the eligible persons after, relaxing the condition of Forest Conservation Act, 1980, given in the above notifications. is tabulated in the Table No.1.10.

Table No.1.10

Information regarding Nautor cases w.e.f. 1999 to 2019						
S. No.	Year	No. of cases received	No of cases NOC issue	No of cases Rejected	No of cases lying pending with	
					Forest Deptt.	Revenue Deptt.
1	2016-17	2575	Nil	Nil	Nil	Nil
2	2017-18	2575	511	Nil	Nil	2064

1.20 Encroachment / Un-authorized occupation of Forest Land by the Right Holder's:-

Encroachments, have now become a major problem in the tract. The encroachments are especially on Un-demarcated Protected Forests including Govt. waste land as declared 'Protected Forest' by the H.P. Govt. Notification dated 25th February, 1952, as well as, on the Demarcated Protected Forests. The Government of H.P vide Notification No. 1-21/71-LSG dated 8/6/1994 empowered the D.F.O's with the power of Collector under the H.P Public Premises (Eviction & Rent Recovery) Act, 1971 to deal with the cases of encroachments on forest lands. A copy of the said instructions contained in the Notification is annexed as (**Appendix no- XLIII**) During the last plan period, total 56 nos (UPF 2 Nos, area 0-10-86 hac and DPF 54 Nos, area 15-37-02 hac) of cases has been registcred / challaned in the Court of DFO-Cum-Collector and the detail of which is tabulated in the Table No:- 1.11.

Table No. 1.11

Year wise detail of encroachment cases																								
Year	Previous balance						Cases registered during the year						Eviction order passed						Balance cases under Trial					
	UPF		DPF		Total		UPF		DPF		Total		UPF		DPF		Total		UPF		DPF		Total	
	No	Area	No	Area	No	Area	No	Area	No	Area	No	Area	No	Area	No	Area	No.	Area	No	Area	No.	Area	No	Area
1999-2000	1	0-09-78	Nil	Nil	1	0-09-78	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	1	0-09-78	Nil	Nil	1	0-09-78
2000 - 2004	1	0-09-79	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	1	0-09-79	Nil	Nil	1	0-09-79
2004-2005	1	0-09-80	Nil	Nil	1	0-09-80	22	3-89-57	Nil	Nil			22	3-89-57	Nil	Nil	22	3-89-57	1	0-09-79	Nil	Nil	1	0-09-79
2005-2006	1	0-09-80	Nil	Nil	1	0-09-81	7	2-87-45	Nil	Nil	8	2-97-23	7	2-87-45	Nil	Nil	7	2-87-45	1	0-09-79	Nil	Nil	1	0-09-80
2006 - 2012	1	0-09-78	Nil	Nil	1	0-09-78	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	1	0-09-78	Nil	Nil	1	0-09-78
2012-2013	1	0-09-79	Nil	Nil	1	0-09-79	3	0-78-36	Nil	Nil	3	0-78-36	3	0-78-36	Nil	Nil	3	0-78-36	1	0-09-78	Nil	Nil	1	0-09-78
2013-2014	1	0-09-79	Nil	Nil	1	0-09-79	Nil	Nil	18	1.29.19	18	1.29.19	Nil	Nil	18	1.29.19	18	1.29.19	1	0-09-78	Nil	Nil	1	0-09-78
2014-2015	1	0-09-79	Nil	Nil	1	0-09-79	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	1	0-09-78	Nil	Nil	1	0-09-78
2015-2016	1	0-09-79	Nil	Nil	1	0-09-79	Nil	Nil	78	17-33-54	78	17-33-54	Nil	Nil	25	2.16.19	25	2.16.19	Nil	Nil	53	15-17-35	54	15-27-14
2016-2017	1	0-09-79	53	15-17-35	54	15-27-13	Nil	Nil	1	0-19-67	1	0-19-67	Nil	Nil	Nil	Nil	Nil	Nil	1	0-09-78	54	15-37-02	55	15-46-80
2017-2018	1	0-09-79	54	15-37-02	55	15-46-80	1	0-01-08	Nil	Nil	1	0-01-08	Nil	Nil	Nil	Nil	Nil	Nil	2	0-10-86	54	15-37-02	56	15-47-88
2018-2019	2	0-10-86	54	15-37-02	56	15-47-88	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	2	0-10-86	54	15-37-02	56	15-47-88

The detail of encroachment cases where encroachments in the Forest areas is above 10 Bighas and below 10 Bighas is also tabulated and given in Table No. 1.12 and 1.13

Table No:-1.12

List of encroachers who have encroached upon more than 10 bighas of forest land in Kinnaur Forest Division.

Sr. No	Name	District	Tehsil	Village	Division	Range	FIR No. & Date	Forest area encroached		Action taken
								In hectares (up to 3 decimal place)	In Bigha-Biswas	
1.	2.	3.	4.	5.	6.	7.		8.	9.	10.
1	Dharam Kali, Kanta	Kinnaur	Nichar	Burcha	Kinnaur	Nichar	57 dated 27-07-2011	0-97-74 Hac.	13-00	Under Trail in the Court of C.J.M Kinnaur at Reckong Peo
2.	Sang Dass.Mal Sukh	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	58 dated 27-07-2011	0-87-51 Hac.	11-12	--do--
3.	Thakur Lal	Kinnaur	Nichar	Ramni	Kinnaur	Nichar	59 dated 27-07-2011	0-77-40 Hac.	10-06	--do--
4.	Chhaing Gyan	Kinnaur	Nichar	Kashpo	Kinnaur	Nichar	60 dated 27-07-2011	0-98-54 Hac.	13-05	--do--
5.	Balabir	Kinnaur	Nichar	Sungra	Kinnaur	Nichar	61 dated 27-07-2011	1-22-18 Hac.	16-05	--do--
6	Pyare Lal,Janki Dass,Chatur Ram & Ram Singh	Kinnaur	Nichar	Sungra	Kinnaur	Nichar	62 dated 27-07-2011	1-34-83 Hac.	17-17	--do--
7.	Guari Lal	Kinnaur	Nichar	Ramni	Kinnaur	Bhaba Nager	42dated 24-07-2011	0-98-81 Hac.	13-3	--do--
8.	Devi Lal	Kinnaur	Nichar	Ramni	Kinnaur	Bhaba Nager	43dated 24-07-2011	0-98-31 Hac.	13-2	--do--
9	Jaswant	Kinnaur	Nichar	Ramni	Kinnaur	Bhaba Nager	44dated 24-07-2011	0-76-45 Hac.	10--4	--do--
10.	Palden Dorge	Kinnaur	Nichar	Ramni	Kinnaur	Bhaba Nager	45dated 24-07-2011	2-17-47 Hac.	28-18-	--do--
11.	Sujan Singh	Kinnaur	Nichar	Ramni	Kinnaur	Bhaba Nager	46dated 24-07-2011	1-12-73 Hac.	15-00	--do--

12.	Susheel Kumar	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	47dated 24-07-2011	1--91-62 Hac.	25-10	--do--
13.	Shyam Lal	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	48dated 24-07-2011	0-76-27 Hac.	10-5	--do--
14.	Bajan Lal	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	49dated 24-07-2011	0-79-82 Hac.	10-12	--do--
15.	Deav lal	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	50dated 24-07-2011	1-12-85 Hac.	15-00	--do--
16.	Ghambir Singh	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	51dated 24-07-2011	0-81-25 Hac.	10-16	--do--
17.	Anil Kumar	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	52dated 24-07-2011	0-87-37 Hac.	11--10	--do--
18.	Santosh Kumar	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	53dated 24-07-2011	0-93-18 Hac.	12-7	--do--
19.	Bansi Lal	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	54dated 24-07-2011	1-12-31 Hac.	14-19	--do--
20.	Diwan Singh	Kinnaur	Nichar	Ramni	Kinnaur	Bhaba Nager	73dated 30-07-2011	0-80-67 Hac.	10-14	--do--
21.	Ram Chander,Jai Pal Singh	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	74dated 30-07-2011	1-06-64 Hac.	14-4	--do--
22.	Padam Singh	Kinnaur	Nichar	Ramni	Kinnaur	Bhaba Nager	75dated 30-07-2011	0-77-73 Hac.	10-6	--do--
23.	Hari Bhgat	Kinnaur	Nichar	Jani	Kinnaur	Bhaba Nager	76dated 30-07-2011	1-02-31 Hac.	13-12	--do--
24.	Laxmi Bagat	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	22 dated 11-7-2011	0-90-50 Hac.	12-1	--do--
25.	Maheshwari Devi	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	24 dated 24-7-2011	0-81-05 Hac.	10-16	--do--
26.	Uday Singh	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	25 dated 24-7-2011	0-79-57 Hac.	10-12	--do--
27.	Sunder lal	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	26 dated 24-7-2011	0-88-20 Hac.	11-14	--do--
28.	Thakur Ram	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	27 dated 24-7-2011	1-13-56 Hac.	15-2	--do--
29.	Muni Lal	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	28 dated 24-7-2011	1-26-56 Hac.	16-17	--do--
30.	Basant Lal	Kinnaur	Sangla	Kilba	Kinnaur	Kilba	29 dated 24-7-2011	1-21-94 Hac.	16-5	--do--
31	Shankar Bhagat	Kinnaur	Sangla	Kilba	Kinnaur	Kilba	30 dated 24-7-2011	0-96-17 Hac.	12-16	--do--
32	Roop Chand	Kinnaur	Sangla	Bura	Kinnaur	Kilba	31 dated 25-7-2011	1-23-96 Hac.	16-10	--do--

33.	Yashwant singh	Kinnaur	Sangla	Bura	Kinnaur	Kilba	32dated 25-7-2011	0-81-43 Hac.	10-16	--do--
34.	Jawahar Singh	Kinnaur	Sangla	Bura	Kinnaur	Kilba	33 dated 25-7-2011	0-15-69 Hac.	2-2	--do--
35.	Nargu Ram	Kinnaur	Sangla	Bura	Kinnaur	Kilba	34 dated 25-7-2011	0-89-52 Hac.	11-18	--do--
36.	Trilok Singh	Kinnaur	Sangla	Bura	Kinnaur	Kilba	35 dated 25-7-2011	0-77-68 Hac.	10-6	--do--
37.	Sanam Pur	Kinnaur	Sangla	Bura	Kinnaur	Kilba	36dated 25-7-2011	1-14-71 Hac.	15-5	--do--
38.	Dharam lal	Kinnaur	Sangla	Bura	Kinnaur	Kilba	37 dated 25-7-2011	0-81-31 Hac.	10-15	--do--
39	Prem Prakesh	Kinnaur	Sangla	Punang	Kinnaur	Kilba	55dated 25-7-2011	0-78-86 Hac.	10-10	--do--
40.	Sh. Sohan Lal	Kinnaur	Kalpa	Runang	Kinnaur	Kalpa	63 dated 29-7-2011	1-60-11 Hac.	21-5	---do---
41	Shiv Raj	Kinnaur	Kalpa	Runang	Kinnaur	Kalpa	64 dated 29-7-2011	1-56-57 Hac.	20-16	---do---
42.	Mehar Singh	Kinnaur	Kalpa	Runang	Kinnaur	Kalpa	65 dated 29-7-2011	0-96-80 Hac.	12-17	--do--
43.	Vijay laxmi	Kinnaur	Kalpa	Miru	Kinnaur	Kalpa	66 dated 29-7-2011	0-90-00 Hac.	11-19	--do--
44.	Dava Mani	Kinnaur	Kalpa	Chagaon	Kinnaur	Kalpa	67 dated 29-7-2011	0-84-60 . Hac.	11-5	--do--
45	Roshani Devi	Kinnaur	Kalpa	Chagaon	Kinnaur	Kalpa	68 dated 29-7-2011	0-80-51 Hac.	10-17	--do--
46.	Rupi Sukh	Kinnaur	Kalpa	Chagaon	Kinnaur	Kalpa	69 dated 30-7-2011	0-18-10 Hac.	10-11	--do--
47.	Chujur	Kinnaur	Kalpa	Chagaon	Kinnaur	Kalpa	70 dated 30-7-2011	1-06-36 Hac.	14-3	--do--
48.	Sunder Singh	Kinnaur	Kalpa	Chagaon	Kinnaur	Kalpa	71dated 30-7-2011	0-98-67 Hac.	13-3	--do--
49.	Bhagat Sain	Kinnaur	Kalpa	Chagaon	Kinnaur	Kalpa	72 dated 30-7-2011	1-89-99 Hac.	11-18	--do--
50.	Bhagat Chand , Puran Bhagat	Kinnaur	Kalpa	Roghi	Kinnaur	Kalpa	42 dated 28-7-2011	0-78-09 Hac.	10-8	--do--
51.	Bhag Rath	Kinnaur	Kalpa	Chungling	Kinnaur	Kalpa	43 dated 30-7-2011	01-13-60 Hac.	15-2	--do--
52.	Satish Kumar	Kinnaur	Kalpa	Pangi	Kinnaur	Kalpa	44 dated 30-7-2011	01-10-37 Hac.	14-13	--do--
53.	Bargad Dass	Kinnaur	Kalpa	Pangi	Kinnaur	Kalpa	45 dated 30-7-2011	1-00-58 Hac.	13-7	--do--
54.	Jar Chhering	Kinnaur	Kalpa	Telangi	Kinnaur	Kalpa	46dated 30-7-2011	0-79-47 Hac.	10-11	--do--
55.	Sandya Devi	Kinnaur	Kalpa	Kothi	Kinnaur	Kalpa	47dated 30-7-2011	0-87-08 Hac.	11-9	--do--
56.	Parkash Chand	Kinnaur	Kalpa	Kothi	Kinnaur	Kalpa	48dated 30-7-2011	1-00-70 Hac.	13-7	--do--

57.	Dewan Singh	Kinnaur	Kalpa	Kothi	Kinnaur	Kalpa	49 dated 30-7-2011	3-40-33 Hac.	45-5	--do--
58.	Kesi Ram	Kinnaur	Kalpa	Kothi	Kinnaur	Kalpa	50 dated 30-7-2011	2-50-51 Hac.	33-7	--do--
59.	Ganga Jeet	Kinnaur	Kalpa	Kothi	Kinnaur	Kalpa	51 dated 30-7-2011	1-13-61 Hac.	15-3	--do--
60.	Dev Kumar	Kinnaur	Kalpa	Kothi	Kinnaur	Kalpa	52 dated 30-7-2011	0-90-08 Hac.	12-01	--do--
61.	Bhupender Singh	Kinnaur	Kalpa	Duni	Kinnaur	Kalpa	53 dated 30-7-2011	1-91-76 Hac.	25-10	--do--
62.	Devender	Kinnaur	Kalpa	Kothi	Kinnaur	Kalpa	54 dated 30-7-2011	3-23-28 Hac.	29-14	--do--
63.	Vasu dev	Kinnaur	Kalpa	Kothi	Kinnaur	Kalpa	55 dated 30-7-2011	1-42-81 Hac.	19-01	--do--
64.	Bhagi Dass	Kinnaur	Kalpa	Tangling	Kinnaur	Kalpa	56 dated 30-7-2011	11-64-91 Hac.	154-18	--do--
65.	Ram Mohan	Kinnaur	Kalpa	Tangling	Kinnaur	Kalpa	57 dated 30-7-2011	13-23-72 Hac.	176-3	--do--
66.	Chet Ram	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	58 dated 30-7-2011	1-09-41 Hac.	14-11	--do--
67.	Nar Chharing , Rinchain	Kinnaur	Kalpa	Barang	Kinnaur	Kalpa	59 dated 30-7-2011	1-25-44 Hac.	16-13	--do--
68.	Amar Singh	Kinnaur	Kalpa	Barang	Kinnaur	Kalpa	60 dated 30-7-2011	1-00-32 Hac.	13-6	--do--
69.	Dhan Bar	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	61 dated 30-7-2011	0-78-87 Hac.	10-10	--do--
70.	Balwant Singh	Kinnaur	Kalpa	Tangling	Kinnaur	Kalpa	62 dated 30-7-2011	0-99-62 Hac.	13-5	--do--
71.	Prem Sukh	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	63 dated 30-7-2011	1-78-36 Hac.	23-15	--do--
72.	Gopal Singh	Kinnaur	Kalpa	Tangling	Kinnaur	Kalpa	64 dated 30-7-2011	8-78-42 Hac.	116-01	--do--
73.	Gaj Raj Singh Mank Ram	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	65 dated 30-7-2011	0-79-39 Hac.	10-11	--do--
74.	Ajay Kumar & Anil Kumar	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	66dated 30-7-2011	0-52-92 Hac.	7-1	--do--
75.	Saurav & Gaurav Manak Ram	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	67 dated 31-7-2011	0-79-39 Hac.	10-11	--do--
76.	Nirmala Devi	Kinnaur	Kalpa	Barang	Kinnaur	Kalpa	68 dated 31-7-2011	0-80-10 . Hac.	10-16	--do--
77.	Sant Ram	Kinnaur	Kalpa	Barang	Kinnaur	Kalpa	69 dated 31-7-2011	1-15-44 Hac.	15-7	--do--
78.	Jag Dish & Jai Pal	Kinnaur	Kalpa	Barang	Kinnaur	Kalpa	70 dated 31-7-2011	6-35-17 Hac.	17.5	--do--
79.	Surjan Bhagat	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	24 dated 16-7-2011	0-81-99 Hac.	10-18	--do--

80.	Ram Jeet	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	25 dated 16-7-2011	0-01-76 Hac.	13-11	--do--
81.	Subir Singh	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	27dated 16-7-2011	0-21-62 Hac.	3-0	--do--
82.	Bagi Ram	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	37dated 24-7-2011	0-94-53 Hac.	12-11	--do--
83.	Vimal Chand, Sawami Baghat,Bod hnand	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	38 dated 24-7-2011	1-55-32 Hac.	20-13	--do--
84.	Devi Singh	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	59 dated 29-7-2011	0-46-89 Hac.	06-5	--do--
85.	Vinod Kumar	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	60 dated 29-7-2011	0-93-66 Hac.	12-9	--do--
86.	Kehar Singh	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	61 dated 29-7-2011	1-33-39 Hac.	17-15	--do--
87.	Rattan Devi	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	62 dated 29-7-2011	0-89-06 Hac.	11-17	--do--
88.	Amir Chand	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	63 dated 29-7-2011	0-07-95 Hac.	13-11	--do--
89.	Padam Chand	Kinnaur	Moorang	Rispa	Kinnaur	Moorang	64 dated 29-7-2011	1-29-21 Hac.	17-6	--do--
90.	Ram Chander	Kinnaur	Moorang	Thangi	Kinnaur	Moorang	65 dated 29-7-2011	3-86-63 Hac.	51-7	--do--
91.	Sonam Dorje	Kinnaur	Moorang	Shiling	Kinnaur	Moorang	66 dated 1-8-2011	1-14-21 Hac.	15-3	--do--
92.	Sohan Singh	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	67 dated 1-8-2011	1-04-17 Hac.	13-17	--do--
93.	Bhagat Chand	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	68 dated 1-8-2011	0-85-81 Hac.	11-9	--do--
94.	Nand Lal	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	69 dated 1-8-2011	0-80-80 Hac.	10-14	--do--
95.	Kamal Singh	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	70 dated 1-8-2011	1-77-31 Hac.	23-11	--do--
96.	Hari Bhajan	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	71 dated 1-8-2011	1-29-36 Hac.	17-4	--do--
97.	Rajiv Kumar	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	72 dated 1-8-2011	2-00-92 Hac.	26-14	--do--
98.	Dandup Chhewang	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	73 dated 1-8-2011	00-83-36 Hac.	11-2	--do--
99.	Jitender Singh	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	74 dated 1-8-2011	00-88-87 Hac.	11-15	--do--
100.	Surat Ram	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	75 dated 1-8-2011	1-16-10 Hac.	15-8	--do--
101.	Sanma Dev	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	76 dated 1-8-2011	1-04-17 Hac.	13-17	--do--
102.	Madup Chhetan	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	77 dated 1-8-2011	1-12-25 Hac.	14-18	--do--

103.	Yanguir Devi	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	78 dated 1-8-2011	2-85-85 Hac.	13-10	--do--
104.	Devi Saran	Kinnaur	Moorang	Lippa	Kinnaur	Moorang	55 dated 29-7-2011	1-09-67 Hac.	14-12	--do--
105.	Anand Singh	Kinnaur	Moorang	Lippa	Kinnaur	Moorang	56 dated 29-7-2011	1-10-75 Hac.	14-14	--do--
106.	Tangeer Pur	Kinnaur	Moorang	Lippa	Kinnaur	Moorang	57 dated 29-7-2011	1-72-62 Hac.	22-18	--do--
107.	Jawan Singh	Kinnaur	Moorang	Jangi	Kinnaur	Moorang	58 dated 29-7-2011	0-81-50 Hac.	10-17	--do--
108.	Sant Kumar	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	28 dated 23-7-2011	1-14-95 Hac.	15-6	--do--
109.	Man Singh	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	29 dated 23-7-2011	1-03-66 Hac.	13-15	--do--
110.	Viday Sagar	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	30dated 23-7-2011	08-80-85 Hac.	117-03	--do--
111.	Viday Sain	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	31 dated 23-7-2011	0-81-65 Hac.	10-17	--do--
112.	Partap Singh	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	32 dated 23-7-2011	0-85-90 Hac.	11-0	--do--
113.	Arjun Singh	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	33 dated 23-7-2011	1-14-95 Hac.	15-6	--do--
114.	Satish Kumar	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	34 dated 23-7-2011	0-89-52 Hac.	11-18	--do--
115.	Rinchenda	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	35 dated 23-7-2011	0-81-84 Hac.	10-18	--do--
116.	Medup Dandup	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	36 dated 23-7-2011	1-03-57 Hac.	13-15	--do--
117.	Ringzing Chhopel	Kinnaur	Pooh	Taling	Kinnaur	Pooh	48 dated 29-7-2011	1-80-00 Hac.	24-00	--do--
118.	Sita Ram	Kinnaur	Pooh	Giaboung	Kinnaur	Pooh	49 dated 29-7-2011	2-55-11 Hac.	33-18	--do--
119.	Chhoinint Dorje	Kinnaur	Pooh	Rushkulang	Kinnaur	Pooh	50 dated 29-7-2011	0-75-20 Hac.	10-0	--do--
120.	Chhimet Dolma	Kinnaur	Pooh	Giaboung	Kinnaur	Pooh	51 dated 29-7-2011	0-75-20 Hac.	10-0	--do--
121.	Ringchepn Dawa	Kinnaur	Pooh	Rushkulang	Kinnaur	Pooh	52 dated 29-7-2011	0-75-20 Hac.	10-0	--do--
122.	Yanchen Moni	Kinnaur	Pooh	Giabong	Kinnaur	Pooh	53 dated 29-7-2011	0-75-20 Hac.	10-0	--do--
123.	Damdul Singh	Kinnaur	Pooh	Namgia	Kinnaur	Pooh	54 dated 29-7-2011	0-75-34 Hac.	10-1	--do--
124.	Dandup Chharing	Kinnaur	Yangthang	Chango	Kinnaur	Malling	39 dated 28-7-2011	0-97-31 Hac.	12-18	--do--
125.	Padama Chhoter	Kinnaur	Yangthang	Chango	Kinnaur	Malling	40 dated 28-7-2011	0-78-06 Hac.	10-7	--do--

126.	Viday Lal	Kinnaur	Yangthang	Chango	Kinnaur	Malling	41 dated 28-7-2011	0-88-22 Hac.	11-14	--do--
127.	Yonden Namgial	Kinnaur	Yangthang	Chango	Kinnaur	Malling	42 dated 28-7-2011	0-82-31 Hac.	10-19	--do--
128.	Gurmat	Kinnaur	Yangthang	Chango	Kinnaur	Malling	43 dated 28-7-2011	1-10-00 Hac.	14-13	--do--
129.	Dharam Singh	Kinnaur	Yangthang	Chango	Kinnaur	Malling	44 dated 28-7-2011	1-50-00 Hac.	19-19	--do--
130.	Tashi Dolma	Kinnaur	Yangthang	Chango	Kinnaur	Malling	45dated 28-7-2011	1-10-00 Hac.	14-13	--do--
131.	Tanzen	Kinnaur	Yangthang	Chango	Kinnaur	Malling	46 dated 28-7-2011	1-10-00 Hac.	14-13	--do--
132.	Anil Kumar	Kinnaur	Yangthang	Chango	Kinnaur	Malling	47 dated 28-7-2011	9-02-21 Hac.	119-19	--do--
133.	Mast Ram	Kinnaur	Sangla	Brua	Kinnaur	Kilba	5/14 date 4-3-2014	0-55-09 Hac.	7-8	--do--
134.	Sharep	Kinnaur	Yangthang	Chango	Kinaur	Malling	19/2013 dated 2-10-2013	2-97-00 Hac.	39-13	--do--
						Total Cases 134 Cases		208-28-02 Hac.		

Table No:- 1.13
List of encroachers who have encroached upon less than 10 Bighas of forest land in
Kinnaur Forest Division.

Sr. No	Name	District	Tehsil	Village	Division	Range	Area in hac.
1	2.	3.	4.	5.	6.	7.	8.
1.	Duni Chand S/o Sh. Kalu Ram	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-09-78
2.	Sanduv S/o Daulat Ram	Kinnaur	Moorang	jangi	Kinnaur	Moorang	0-20-63
3.	H.P. P.W.D.	Kinnaur	Moorang	jangi	Kinnaur	Moorang	0-32-44
4.	Sanam Nargu S/o Sanam Dandup	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	0-07-91
5.	Ram Bhagat S/o Chopel	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	0-06-75
6	Inder Pur S/o Narpal	Kinnaur	Sangla	Kilba	Kinnaur	Kilba	0-09-90
7.	Gulab Chand S/o Dava Ram	Kinnaur	Sangla	Kilba	Kinnaur	Kilba	0-10-85
8.	Joginder Singh S/o Vidya Sain	Kinnaur	Sangla	Kilba	Kinnaur	Kilba	0-14-74
9.	Nola Chand S/o Uma Sukh	Kinnaur	Sangla	Kilba	Kinnaur	Kilba	0-23-62
10.	Raj Kumar S/o Shyam Lal	Kinnaur	Sangla	Kilba	Kinnaur	Kilba	0-32-97
11.	Ram Pal Singh S/o Nargu Chharing	Kinnaur	Sangla	Kilba	Kinnaur	Kilba	0-88-77
12.	Padam Singh S/o Kripa Ram	Kinnaur	Nichar	Kasho	Kinnaur	Nichar	0-05-82
13.	Dhaum Devi Pradhan Mahilamandal Nichar	Kinnaur	Nichae	Nichar	Kinnaur	Nichar	0-08-86
14.	Gopi Chand S/o Ganga Veer	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-02-23
15.	Eshra Devi W/o Sh. Inder Sain	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-04-99
16.	Ashoke Kumar S/o Bhagat Singh	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-15-87
17.	Vilku Ram S/o Nand Ram	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-06-10
18.	Joginder Singh S/o Sunder Singh	Kinnaur	Nichar	Bari	Kinnaur	Nichar	0-16-10
19.	Prem Bhadur S/o Inder Sukh	Kinnaur	Nichar	Bari	Kinnaur	Nichar	0-14-17
20.	Cheat Ram S/o Sukh Nand	Kinnaur	Nichar	Baro	Kinnaur	Nichar	0-18-00
21.	Roshan Lal S/o Choder Sukh	Kinnaur	Nichar	Baro	Kinnaur	Nichar	0-21-34
22.	Bajan Devi W/o Ram Chander	Kinnaur	Nichar	Baro	Kinnaur	Nichar	0-11-63

23	Delu Ram S/o Murtba	Kinnaur	Nichar	Baro	Kinnaur	Nichar	0-15-88
24.	Bal Krishan S/o Durga Nand	Kinnaur	Moorang	Moorang	Kinnaur	Moorang	0-24-65
25	Vinod Kumar S/o Thakur Sin	Kinnaur	Moorang	Ribba	Kinnaur	Moorang	1-06-55
26.	Rup Singh S/o Bhagat Ram	Kinnaur	Moorang	Skiba	Kinnaur	Moorang	0-09-90
27.	Laxshman S/o Gyan Chand	Kinnaur	Moorang	Skiba	Kinaur	Moorang	0-28-21
28.	Vimala Devi W/o Nargu Tanzin	Kinnaur	Moorang	Skiba	Kinnaur	Moorang	0-12-00
29.	Vijay Vikrant S/o Bsanti lal	Kinnaur	Moorang	Skiba	Kinnaur	Moorang	0-15-54
30.	Laxmi Bhagat	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	0-90-60
31.	Gita Bhagat S/o Nargu Ram	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	0-60-98
32.	Surat Ram S/o Shambu Ram	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	0-08-68
33.	Vijay Laxshmi W/o Chander Bhagat	Kinnaur	Sangla	Sangla	Kinnaur	Kilba	0-08-70
34	Sh. Baghat Chand S/o Sh. Yangwar	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-02-54
35	Sh. Sant Ram S/o Raguwar	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-25-30
36	Sh. Dev Krishan S/o Sh.	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-00-80
37	Sh. Kesar Chand S/o Chheduv	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-03-04
38	Sai Engineering foundation Tangling	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-17-20
39	Sh. Agya Ram S/o Sh. Bilwar	Kinnaur	Kalpa	Roghi	Kinnaur	Kalpa	0-02-89
40	Sh. Prushotam S/o Sh. Lafan Singh	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-10-48
41	Sh. Dil Bhagh S/o Sh. Chand	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-03-45
42	Kelash Chand S/o Sh. Sohan Lal	Kinnaur	Kalpa	Roghi	Kinnaur	Kalpa	0-07-36
43	Sh.Resham Dev S/o Sh. Sanam Guru	Kinnaur	Kalpa	Roghi	Kinnaur	Kalpa	0-01-40
44	Sh.Arun Kumar S/o Sh. Durga Chand	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-08-64
45	Sh.Rajender Singh S/o Sh. Devi Chand	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-06-80
46	Sh.Manoj Kumar S/o Sh. Chander Singh	Kinnaur	Kalpa	Roghi	Kinnaur	Kalpa	0-03-52
47	Sh. Jyoti Ram S/o Sh. Puran Jeet	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-16-64
48	Sh. Thapa Singh S/o Sh. Gopal Dass	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-01-30
49	Sh. Jai Singh S/o Sh.Maam Singh	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-09-58

50	Sh. Sanam Deva S/o Sh. Ratan Singh	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-03-38
51	Sh. Mansua S/o Sh. Sangya Sukh	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-04-87
52	Smt. Maal Mani W/o Ganga Sahay	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-12-00
53	Sh. Ram Singh S/o Mava Chhering	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-23-75
54	Sh. Prem Sukh S/o Jeet Pur	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-44-46
55	Manohar Singh S/o Deve Ram	Kinnaur	Kalpa	Tangling	Kinnaur	Kalpa	0-42-61
56	Sh. Roshan Lal S/o Ambar Sukh	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-13-11
57	Sh. Lal Jue S/o Bna Sukh	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-12-58
58	Sh. Jyoti Prakash S/o Deva Ram	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-47-23
59	Sh. Jyoti Lal S/o Deva Ram Vill. Powari	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-15-00
60	Sh. Subash Chand S/o Chhering Funchok	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-25-39
61	Sh. Roshan Lal S/o Late Sh. Ambar Sukh	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-18-81
62	Sh. Yangwar S/o Jeeti Sukh	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-05-27
63	Sh. Charan Sukh S/o Jeu Dass	Kinnaur	Kalpa	Tangling	Kinnaur	Kalpa	0-16-78
64	Sh. Sita Ram S/o Tukluva	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-04-32
65	Sh. Maan Singh S/o Gauri Dat	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-07-54
66	Sh. Jiya Lal S/o Jeet Pur	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-47-89
67	Sh. Bhagi Dass S/o Bhai Sukh	Kinnaur	Kalpa	Tanglanpi	Kinnaur	Kalpa	0-42-79
68	Sh. Dev Krishan S/o Prabu Lal	Kinnaur	Kalpa	Telangi	Kinnaur	Kalpa	0-10-14
69	Sh. Jagat Singh S/o Gau Karan	Kinnaur	Kalpa	Telangi	Kinnaur	Kalpa	0-54-10
70	Sh. Bhagwan Dass S/o Raguar	Kinnaur	Kalpa	Kalpa	Kinnaur	Kalpa	0-10-87
71	Sh. Bhagi Dass S/o Bhai Sukh	Kinnaur	Kalpa	Tangling	Kinnaur	Kalpa	0-02-73
72	Sh. Ram Lal S/o Pal Sukh	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-26-44
73	Sh. Chet Ram S/o Tukluva	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	1-84-82
74	Sh. Jiya Lal S/o Jeet Pur	Kinnaur	Kalpa	Tanglanpi	Kinnaur	Kalpa	0-15-39
75	Sh. Gopal Singh S/o Mansa Ram	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	3-14-91

76	Sh. Dhanvar S/o Bhai Sukh	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-78-87
77	Sh. Kishori Lal S/o Urgyan Sukh	Kinnaur	Kalpa	Powari	Kinnaur	Kalpa	0-52-73
78	RaguRam S/o Mansa Ram	Kinnaur	Kalpa	Tangling	Kinnaur	Kalpa	0-42-49
79	Sh. Bhagat Singh S/o Uttam Vir	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-12-40
80	Sh. Jyoti Lal S/o Uttam Veer	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-02-50
81	Sh. Sinku Ram s/o Uttam Veer	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-06-58
82	Smt. Deviyung W/o Sher Singh	Kinnaur	Nichar	Kashpo	Kinnaur	Nichar	0-76-10
83	Sh. Rakesh S/o Bal Bhadur	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-09-46
84	Sh. Parma Nand S/o Raji Ram	Kinnaur	Nichar	Kashpo	Kinnaur	Nichar	0-01-30
85	Sh. Vinod Kumar S/o Bhadur Singh	Kinnaur	Nichar	Nichar	Kinnaur	Nichar	0-07-10
86	Sh. Laik Ram S/o Ram lal	Kinnaur	Nichar	Kashpo	Kinnaur	Nichar	0-05-04
87	Sh. Ram lal S/o Sibu Ram	Kinnaur	Nichar	Grade	Kinnaur	Nichar	0-04-00
88	Sh. Kapil Dev S/o Ram Chander	Kinnaur	Nichar	Grade	Kinnaur	Nichar	0-51-78
89	Sh. Pyare Lal S/o Chander Sukh	Kinnaur	Nichar	Grange	Kinnaur	Nichar	0-14-08
90	Sh. Baldev Singh S/o Dev Sain	Kinnaur	Nichar	Grange	Kinnaur	Nichar	0-08-12
91	Sh. Hukam Singh S/o Buding	Kinnaur	Nichar	Grade	Kinnaur	Nichar	0-13-32
92	Sh. Seva Ram S/o Harmn	Kinnaur	Nichar	Grade	Kinnaur	Nichar	0-06-00
93	Smt. Vidya Mani W/o Bhag Sain	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-34-86
94	Sh. Yangdub Chhering S/o Narsukh	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-13-36
95	Sh. Dakhu Ram S/o Simru	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-14-61
96	Sh. Bhagi nar S/o Narpur	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-27-70
97	Sh. Jvahar Singh S/o Balak Ram	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-04-80
98	Sh. Mahesh Kumar S/o Jai Chand	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-01-86
99	Sh. Mohan Lal S/o Shiv Lal	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-10-77
100	Sh. Sunder Lal S/o Nargyal	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-13-30
101	Sh. Rameshvar S/o Vidya Ram	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-01-80
102	Sh. Hukam Singh S/o Laxmi Ram	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-12-21

103	Sh. Inder Pur S/o Jar Sukh	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-02-12
104	Sh. Mast Ram S/o Bhag Sukh	Kinnaur	Nichar	Panvi	Kinnaur	Nichar	0-00-42
105	Sh. Sh. Dev Sain S/o Rangir	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-04-22
106	Sh. Kehar Singh S/o Bhagwan Dass	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-07-35
107	Sh. Sh. Viond Kumar S/o Sunder Singh	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-08-70
108	Sh. Devi Singh S/o Lafan	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-11-57
109	Sh. Thakur Ram S/o Guri nand	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-04-62
110	Sh. Devi Chand S/o Jagar Nath	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-11-77
111	Sh. Thakur Singh S/o Bhagwan Dass	Kinnaur	Nichar	Nigulsari	Kinnaur	Nichar	0-02-92
112	Sh. Dharsghan Dass S/o Kram Sukh	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-09-04
113	Sh. Anil Kumar S/o Mahaveer Singh	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-03-60
114	Sh. Shubam S/o Late Sh. Balak Ram	Kinnaur	Nichar	Nigulsari	Kinnaur	Nichar	0-00-80
115	Sh. Jai Chand S/o Late Sh. Vidya Chand	Kinnaur	Nichar	Tranda	Kinnaur	Nichar	0-02-60
116	Sh. Devki Nand S/o Ishwar Singh	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-05-68
117	Sh. Bilku Ram S/o Nand Ram	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-00-78
118	Sh. Rajender Singh	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-14-72
119	Sh. Ram Sahi S/o Ranjor	Kinnaur	Nichar	Kashpo	Kinnaur	Nichar	0-14-88
120	Sh. Laxmn Singh S/o Tika Ram	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-06-70
121	Sh. Raju S/o Menu	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-03-96
122	Sh. Jawala Singh S/o Inder Sain	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-02-30
123	Sh. Vir Badhar S/o Gopi Chand	Kinnaur	Nichar	Nigani	Kinnaur	Nichar	0-01-84
124	Smt. Hira Devi W/o Late Har Singh	Kinnaur	Nichar	Sungra	Kinnaur	Nichar	0-01-40
125	Sh. Gopal Singh S/o Kol Ram	Kinnaur	Nichar	Bari	Kinnaur	Nichar	0-10-62
126	Sh. Udev Singh S/o Chatur Sain	Kinnaur	Nichar	Bari	Kinnaur	Nichar	0-04-90
127	Sh. Sunder Singh S/o Hira Singh	Kinnaur	Nichar	Bari	Kinnaur	Nichar	0-03-52
128	Sh. Shyam Sukh S/o Nar Sukh	Kinnaur	Nichar	Sungra	Kinnaur	Nichar	0-02-08

129	Smt. Deva Dassi W/o Late Sh. Har Singh	Kinnaur	Nichar	Sungra	Kinnaur	Nichar	0-09-32
130	Sh. Jai Dev S/o Ishwar Dass	Kinnaur	Kalpa	Khwangi	Kinnaur	Kalpa	0-19-67
130 no Cases							25-64-55

The encroachment cases where FIR lodged with Police under Section 33 of IFA, 1927 read with Section 447 of IPC, as on 31-06-2019, is given in Table No:- 1.14

Table No. 1.14

Statement showing the encroachment cases where FIRs lodged with the police under Section 33 of IFA, 1927 read with Section 447 of IPC as on 31-06-2019.												
Name of Range	Total FIR registered		Cases in which demarcation/ investigation carriedout		Cases filed in judicial court						Total	
					Cases put in Court for trial		Case filed for cancellation Report		Case filed for untraced			
1	2	3	4	5	6	7	8	9	10	11	12	13
	No	Area	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area
Nichar	6	5.2046	6	5.2046	6	5.2046	6	5.2046	0	0	6	5.2046
B/ Nagar	17	18.0579	17	18.0579	17	18.0579	17	18.0579	0	0	17	18.0579
Kilba	16	14.6071	16	14.6071	16	14.6071	16	14.6071	0	0	16	14.6071
Kalpa	39	83.0598	39	83.0598	39	83.0598	39	83.0598	0	0	39	83.0598
Moorang	29	33.9973	29	33.9973	29	33.9973	29	33.9973	0	0	29	33.9973
Pooh	16	24.6814	16	24.6814	16	24.6814	16	24.6814	0	0	16	24.6814
Malling	11	20.802	11	20.802	11	20.802	11	20.802	0	0	11	20.802
Total	134	200.4101	134	200.4101	134	200.4101	134	200.4101	0	0	134	200.4101

1.20.1 Forest Offences:-The forest offences, in Kinnaur Forest Division, are also increasing day by day. The offences of petty nature are compounded. While, those of the serious nature are either challaned in the court or registered with the police. On an average, about 144 forest offences take place annually in the Kinnaur Forest Division. The total number of forest offence cases during the plan under revision is tabulated in Table No:-1.15.

Table No:- 1.15

Sr. No.	Year	No. of cases detected	No. of cases compounded	No. of cases registered with police	No. of cases challaned	Pending cases for compounding
1.	1999-2000	151	125	1	0	25
2.	2000-01	206	230	0	0	0
3.	2001-02	140	129	1	0	10
4.	2002-03	144	148	0	0	6
5.	2003-04	137	135	0	0	8
6.	2004-05	152	147	0	0	13
7.	2005-06	181	193	0	1	0
8	2006-07	166	160	3	0	3

9.	2007-08	111	114	0	0	0
10	2008-09	168	168	0	0	0
11	2009-10	245	197	4	0	44
12	2010-11	122	161	0	0	5
13	2011-12	145	128	0	0	22
14	2012-13	123	112	0	0	33
15	2013-14	163	68	0	0	128
16	2014-15	93	164	1	0	57
17	2015-16	178	228	2	0	5
18	2016-17	122	125	0	1	1
19	2017-18	85	85	0	0	1
20	2018-19	42	39	0	0	4

1.21 The Forest (Conservation) Act, 1980:-In the year 1980, Forest (Conservation) Act was promulgated, which has made it mandatory, to seek permission of the Central Government for diverting any forest land for non-forestry purpose. Thus, forest land cannot be diverted to any non-forestry use without prior approval of Govt. of India under Forest (Conservation) Act, 1980. Instructions have been issued from time to time to all field officers to ensure that no non-forestry activity is allowed to be implemented by any user agency on any forest land without prior approval of Govt. of India. It is pertinent to mention here that Hon'ble High Court of Himachal Pradesh has also taken a serious note of violation of FCA, 1980 in the Contempt Petition No. 56/2009 titled as Kuldeep Chauhan V Balbir Singh Thakur dated 28-8-2009, and has directed not to undertake the construction of any road in forest areas without the mandatory permission under the FCA, 1980. Therefore, field functionaries must ensure that no work related to non-forestry activities should be allowed to be taken up without prior approval of Govt. of India under FCA, 1980. During the last plan period total 647.3166 hac. UPFs forests have been diverted under the provisions of the Forest (Conservation) Act, 1980 and the details of the cases is tabulated and given in the Table No. 1.15 and the FCA cases approved and CA stipulation thereof, is also tabulated and given in Table No. 1.16.

Table No. 1.15
Forest land diverted under FCA in Kinnaur Forest Division

Sr. No.	Year	Name of the Proposal	Proposal No.	Date of Final Approval	Area involved
1	2002	Karchham Wangtoo 1000MW	FP/HP/514/2002	17-11-2005	167.4247
2	2009	130 MW Integrated Kashang II& III	FP/HP/HYD/497/2009	14-06-2011	17.6857
3		Shongtong Karchham 402MW		14-11-2012	63.5015
4		Tidong I HEP			
5	2008	400 KV DC Karchham WangtooAbdullapur Transmission Line	FP/HP/TRANS/752/2008	21-07-2009	322.8538
6	2007	Construction of Police Post at Karchham	FP/HP/OTR/696/2007	20-08-2007	0.05
7	2006	Construction of Sholtu to Poonang Road	FP/HP/ROAD/1233/2006	2/2/2007	2.5585
8	2004	Construction of Bye Pass from Wangtoo to Kakshthal	FP/HP/ROAD/251/2004	23-02-2006	1.5895

9	2005	Construction of link road to Panvi	FP/HP/ROAD/804/2005	20-10-2006	4.919
10	2004	Construction of Petrol pump at Reckong Peo	FP/HP/OTR/291/2004	25-02-2005	0.1171
11	2004	Construction of 220 KV Sub station Bokhtu	FP/HP/TRANS/287/2004	27-10-2005	102639
12	2000	Rehabilitation of village Brua& others washed away in floods	FP/HP/REHAB/316/2000	14-06-2005	1.33
13	2001	Construction of Kashang HEP	FP/HP/HYD/396/2001	23-06-2004	18.714
				10/11/2004	3.123
14	1999	Transmission line from Nathpa to Akpa	FP/HP/TRANS/338/1999	12/10/2003	73.02
15		M/S Panchhor HEP Wanger Homte 24.60MW			
16		24 MW Shelti Masrang Ramesh			

Table No. 1.16

Statement showing FCA cases approved and CA stipulation thereof.						
S.No	Name of the proposal	Approved letter No	Date of approval	Area diverted in hac.	CA stipulation in hac.	Amount deposit towards CA scheme
1	1500MW NJPC HEP		28-07-1986	36.6509	72	0
2	Sanjay Vidhyut Pariyojna	8-229/86-Fry9Cons)	28-12-1986	8.98	0	0
3	300 MW Baspa-II HEP	8-224/89-FC	8/11/1993	44.1795	88.35	3944000
4	800KV Titang HEP	9-794/99-ROC/415	21-03-2000	0.22	0.5	38750
5	65 MW Kashang-I HEP	8-8/2001-FC	23-06-2004	18.7142	38.00	3366650
6	Karchham-Wangtoo HEP (1000 MW) main	8-5/2002-FC	17-11-2005	167.4247	273.00	25450041
7	Additional land of KW HEP	8-5/2002-FC	6/7/2006	4.9598	11.00	975100
8	100 MW Shorang HEP	9-HPC532/2006-CHA/5413	1/11/2006	4.3627	9.00	819021
9	3 MW Shyang Mini HEP	9-HPB2199/2004-CHA/1445	15-02-2007	0.4496	0.1	88700
10	3MW Tangling Mini HEP	9-HPB173/2007-CHA/5744	18-06-2007	2.7544	5.55	599679
11	5MW Brua Mini HEP	9-HPB229/2007-CHA/5736-40/7831	18-06-2007	3.7836	8.00	788900
12	4.5 MW Melan Mini HEP	9-HPB225/2007-CHA/5759-63/8186	18-06-2007	4.4119	9.00	859100
13	4 MW Panvi Mini HEP	9-HPB223/2007-CHA/5732-35/7836	18-06-2007	4.2381	9.00	859100

14	100 Tidong-I HEP	9-HPC602/2007-CHA/5230	18-06-2008	39.0546	79.00	26676610
15	5 MW Rukti Mini HEP	9-HPPB232/2009-CHA/4678	26-8-2009	2.2812	5.00	683127
16	3 MW Shoung Mini HEP	9-HPB066/2009-CHA/7011	24-12-2009	2.7004	5.5	694848
17	3 MW Pangi Mini HEP	9-HPB465/2009-CHA/1189	19-04-2010	1.7888	3.6	491852
18	8 MW Roura Mini HEP	9-HPB561/2010-CHA/104	3/1/2011	4.2017	9.00	1133027
19	130 MW Integrated-Kashang Stage-II and III HEP	9-HPC366/09-CHA	14-06-2011	17.6857	36.00	11957406
20	9 MW Rala small HEP	9-HPB470/2011-CHA/8588	20-10-2011	2.8602	6.0	818350
21	20 MW Roura-II SHEP	9-HPB166/2011-CHA/6687	17-08-2012	4.8951	10.0	1363911
22	402 MW Shongthong-Karchham HEP in favour of HPPCL	8-78/2010-FC	14-11-2012	63.5015	128.00	17465952
23	66 KV transmission line from Maniotidhar to Nathpa	-----	15-12-1983	6.696	6.70	23300
24	220 KV transmission line from Sungra to Baroatiwala	-----	25-04-1985	23.625	5.00	35200
25	400 KV D/c transmission line from Karchham to Jhakri	----	7/5/1999	124.956	250.00	10537000
26	Additional forest land for 400 KV Tri line from Karchham- Jhakri	8-21/98-FC	31-03-2003	3.198	7.66	394624
27	Lying of 66 KV Tr. Line from Nathpa to Akpa	8-84/99-FC	12/8/2003	73.02	146.00	5966600
28	400 KV Bye pass Tr. Line from exisiting tower No 66to 69 of Karchham to Jhakri Tr. Line	9-2280/2004-ROC/2999	10/11/2004	3.123	6.24	225957
29	Const.of 220/22 KV sub. Station Boktoo	9-HPPB2391/2004-CHA/5063	27-10-2005	1.2639	2.60	130200
30	Const.of 22 KV Tr. Line on 66 KV tower from Akpa to Pooh	9-HPC695/2005-CHA/P515	28-09-2007	34.2867	69.00	15008200

31	Const. of 220 KV T/line from Nathpa to Kashang (on already approved 66 KV Tr. Line from Nathpa to Akpa)	-----	24-07-2008	57.3881	115.00	6774100
32	400KV DC Transmission line from Karchham Wangtoo-Abdullapur	8-18/2008-FC	21-07-2009	63.2178	127.00	17351435
33	400 KV Dc transmission line from Switch yard of Shorang HEP to Karchham Wangtoo-Abullapur transmission line	9-HPC060/2010-CHA/2997	3/8/2010	8.6521	18.00	2459259
34	C/o Link road to Village Tranda	9-780/99-ROC/310	3/3/2000	1.795	3.609	307336
35	C/o Shongthong to Purbani road	-----	28-07-2000	3.79	7.55	345120
36	C/o karchham to Ralli road	9-1138/2001-ROC/255	19-02-2001	3.4062	7.00	425400
37	C/o Wangtoo- Kaksthal bye -pass road	-----	23-02-2006	1.5895	3.5	275887
38	C/o Link road to Village Panvi	9-HPB256/2005-CHA/5175	20-10-2006	4.919	10.00	838700
39	C/o Sholtu to Punang road	9-HPB305/2006-CHA/1011	2/2/2007	2.5585	5.1170	429132
40	C/o link road to Village Thangi	9-HPB291/2005-CHA/5154	13-06-2008	2.015	4.03	864136
41	C/o Approach road to Concrete Batching and mixing plant at Baltarang for Karchham Wangtoo HEP	8-5/2002-FC	28-07-2008	1.6348	3.3	429200
42	C/o Bridge over Cholling Nallah by 68 RCC (GREF)	9-HPB132/2007-CHA/1030	5/12/2008	0.0601	1.00	63341
43	C/o Chhappan to Shipkila road in favour of ITBP	9-HPB063/2008-CHA/1445	6/3/2009	9.504	19.00	6589218
44	Upgradation of NH-22 to NHDL specification from Km 356.300 to 361.000	9-HPB512/2008-CHA/4106	30-07-2009	4.89	10.00	1366255
45	C/o thangi- Charang road in favour of ITBP	9-HPC032/2009-CHA/2424	9/7/2010	35.64	72.00	25945911

46	Upgradation of NH-22 to NHDL specification from Km 373/300 to 395/000	9HPC361/2009-CHA/4945	3/12/2010	21.7094	44.00	6011521
47	Upgradation of NH-22 to NHDL specification from Km 361/000 to 373/000	9-HPC023/2010CHA/5001	3/12/2010	7.2209	14.5	1981069
48	C/o FIS Chhot Kanda to Nichar	9-317/96-ROC	29-09-1999	1.35	2.70	64710
49	C/o PDS Godawn at R/Peo	-----	24-01-2000	0.257	1.00	6400
50	C/o Sewerage treatment plant at Rekong Peo	332/96-ROC/29b	5/3/2001	1.25	2.5	68875
51	Crusher , quarry & dumping site in favour of NJPC	-----	6/6/2002	25.0397	45.00	0
52	C/o Petrol Pump Rekong Peo.	9-HPB238/2004-CHA/988	25-02-2005	0.1171	1.00	73200
53	Rehabilitaion of Brua village	-----	14-06-2005	1.33	2.67	102040
54	C/o Vocational Institure at Rekong Peo by Mahila Kalyan Parishad	9-HPB786/2005-CHA/584	15-01-2007	0.0473	1.00	58905
55	Diversion of forest land in favour os sh. Daulat Ram R/o Kilba for extraction of river bed minerals i.e. stone, sand and bajri etc.	9-HPB003/2007-CHA/7213	26-07-2007	1.3918	2.79	176755
56	C/o Police Post at Karchham	9-HPD216/2007-CHA/8156	20-08-2007	0.050	1.00	63350
57	Diversion of forest land in favour of ITBP for C/o Border out post at Kota Dogri	9-HPB133/2007-CHA/3171	10/4/2008	0.5781	1.15	266080
58	C/o FIS Rispa in favour of IPH Deptt.	9-HPB126/2006-CHA/858	13-02-2009	0.54	1.20	252320
59	Diversion of forest land in favour of M/s Amit Singla for installation of Crusher, Hot Mixing and wet Mixing Plant near Akpa.	9-HPB-206/2009-CHA/4PIP	1/9/2009	0.475	1.00	304613
	Total				1826.416	

1.22 Recent Development:-

1.22.1 MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act):- The National Rural Employment Guarantee Act, 2005 was passed on September 2005. The Act came into force on February 2, 2006 and was implemented in a phased manner. The objective, of the Act is to provide for the enhancement of livelihood security of the households in rural areas of the country, by providing at least one hundred days of guaranteed wage employment in a financial year to every household, whose adult members volunteer to do unskilled manual work. The law was initially called the NREGA but was renamed as MGNREGA on 2 October, 2009. The Job Card will be issued by the Gram Panchayat to the household that has been registered. The Job Card should be issued, immediately, upon completing verification i.e. within a fortnight of the application for registration. If a worker who has applied for work is not provided employment within fifteen days from the date on which work is requested, an unemployment allowance shall be payable by the State Government at the rate prescribed in the Act. The responsibility for payment of unemployment allowance shall be with the Programme Office. At least 50% of the works in terms of cost in a Gram Panchayat will be allotted to Gram Panchayat for execution. This is the statutory minimum and the Programme Officer or the District Programme Coordinator may allot more, if deemed feasible. The Ministry has set up a comprehensive monitoring system. For effecting, monitoring of the project 100% verification of the works at Block level, 10% at the District. Level and 2% at the State level inspections need to be ensured.

This scheme was introduced in H.P. in 2008 and a meeting was held on 11-06-2008 by Secretary, Rural Development & Necessary decisions were taken:-

- i) The forest Department, through its field functionaries, submitted their shelf of projects to the Gram Sabha through BDO concerned. Schedule 1 under section 4(3) of the Act provides for the following works that can be included under MGNREGA. The focus of the scheme shall be on the following works in their order of priority.
- ii) Water conservation and water harvesting.
- iii) Drought proofing (including afforestation and tree plantation.
- iv) Irrigation canals including micro and minor irrigation works.
- v) Provision of irrigation facility, plantation, horticulture, land development to land owned by households belonging to the scheduled Castes and Scheduled Tribes, or to land of the beneficiaries of land reforms, or that of the beneficiaries under the Indira Awas Yojna/BPL families.
- vi) Renovation of traditional water bodies including de-silting of tanks.
- vii) Land development.
- viii) Flood control and protection works including drainage in water logged areas.
- ix) Rural connectivity to provide all-weather access. The construction of roads may include culverts, where necessary, and within the village area may be taken up along with drainages.
- x) Any other work, which may be notified by the Central Government in consultation with the State Government.
- xi) Live fencing work to protect crops from wildlife depredation as suggested by the Govt. of India, Ministry of Rural Development (MGNREGA Division) dated 5th July, 2012, shall be followed.

As indicated above, all works are subject to prior approval by the Gram Sabha and Panchayat Samiti/Zila Parishad. The Forest Department, in this case, is required to prepare a shelf of projects and submit to the Gram Sabha through Block Development Officer. As soon as, the shelf of projects

is approved by Gram Sabha, the same is forwarded to Panchayat Samiti and Zila Parishad for approval.

The Range officer is appointed as nodal officer for the implementation of MGNREGA Programme at field level in their respective Forest Range. The copies of brochure on MGNREGA are available in the Directorate of Rural Development and Panchayati Raj Department; the same can be collected for reference as and when required.

1.22.2 Green India Mission:- The National Mission for a Green India was announced by Dr. Man Mohan Singh, the then Prime Minister of India, as one of the eight Missions, under the National Plan on Climate Change (NAPCC). It recognizes that climate change phenomenon will seriously affect and alter the distribution, type and quality of natural biological resources of the country. The NAPCC addresses the urgent and critical concerns of sustainable development and identifies the close linkage of the economy with its natural resource base, and cautions that climate-sensitive sectors such as forestry, may face a major threat, because of the projected changes in climate. This will have repercussions for livelihoods of people, in general, and forest dependent communities in particular. The Green India Mission, therefore, puts the “greening” in the context of climate adaptation and mitigation, aiming to enhance ecosystem services like carbon sequestration and storage (in forests and other ecosystems), hydrological services and biodiversity; alongwith provisioning services like fuel, fodder, timber and NTFPs.

The Central Govt. has put in place a National Mission for a Green India as part of the country’s National Action Plan for Climate Change with a budget of Rs. 46,000 crores (approx. USD 10 billion) over a period of 10 years. The overarching objectives of the Mission are to increase forest and tree cover in 5 million hac. and improve quality of forest cover in another 5 million hac. Thus, the Mission will help in improving ecosystem services in 10 million hac. of land, and increase flow of forest based livelihood services to, and income of about 3 million forest dependent households, and enhances annual CO₂ sequestration by 50 to 60 million tones in the year 2020. The Mission is innovative in several respects:

- i) First, it proposes a fundamental shift from our traditional focus of merely increasing the quantity of our forest cover, towards increasing its quality and improving provision of ecosystems goods and service.
- ii) Second, the Mission proposes to take a holistic view of greening, not merely, focus on plantations to meet carbon sequestration targets. There is a clear and more important focus on enhancing biodiversity, restoring ecosystems and habitat diversity.
- iii) Third, there is a deliberate and major focus on autonomy and decentralization. The Mission will be implemented, through, an autonomous organizational structure with a view to reducing delays and rigidity, while ensuring accountability.
 - a) Local communities will be at the heart of implementation, with the Gram Sabha as the overarching institution overseeing Mission implementation at the village-level. The Joint Forest Management Committee would be revamped as Committees of the Gram Sabha. This is in consonance with the fact, forests are a source of livelihood for over 200 million people in the country, and hence, centrality of their participation is critical.
 - b) A key innovation is the idea of engaging a cadre of young ‘Community Foresters’, most of whom will be from scheduled tribes and other forest dwelling communities, to facilitate planning, implementation and monitoring of Mission activities at local level.

1.22.3 Time Frame:- The actual implementation period of the Mission would spread over 10 years, coinciding with 12th and 13th Five Year Plan period, 2011-12 will be taken as the preparatory phase of the Mission. Thus, the Mission will have a preparatory phase, a first phase (five years) and a second phase (five year). Actual field operations will take place from 2012-13.

The preparatory phase of the Mission will be utilized for carrying out the reforms, setting up the Mission organization, leveraging resources for the Mission, identification of sub-landscapes/areas for Mission intervention, identification of partners, creating awareness across multiple stakeholders, setting up/revamping and strengthening of institutions to improve decentralized forest governance, sensitizations of forest department/multiple agencies, and forest dependent communities, capacity building of staff and the communities, commissioning of research/assessment etc. The Mission would consider getting many of these actions in the preparatory phase as conditionally before funding could flow for implementation which is reproduced as under:-

1. Centrality of Gram Sabha for improved Forest Governance:-

- i) The Gram Sabha and the bodies set up by it, to be the key institutions to plan and implement the Mission activities at the village level.
- ii) Revamping of JFMCs as bodies of the Gram Sabha.
- iii) Legal empowerment of the bodies of the Gram Sabha, including the revamped JFMCs to protect, regenerate and sustainably manage forests. Thus, could be done under Indian Forest Act and Forest (Conservation) Act, 1980. Provisions to acknowledge such bodies of the Gram Sabha would need to be made in Panchayat Act by respective States.

2. Revamped FDA's to strengthen decentralized forest governance:-

- i) The FDAs would be revamped as institutions contributing to decentralized forest governance.
- ii) The FDAs, at the district/division level, would be positioned as democratic and inclusive institutions, chaired by an elected representative, instead of a Government official. Representative of federations of local bodies including revamped JFMCs/forest committees of Gram Sabha and SHG federations to be represented in decision making body in the FDA at division level.

3. Strengthening Front Line Formation in Forest Department:-

- i) The existing vacancies of the front line staff (FG to RFOs) need to be filled on a priority basis during the preparatory phase of the project. A 10 year perspective plan of recruitment and capacity building must be put in place to ensure continuous inflow of new recruits.

1.23 State CAMPA:- Whereas, the forest land/Govt. land is diverted for non forestry purpose under FCA, 1980, user agency has to deposit the value of NPV, CA and CAT Plan in the State CAMPA account as per proposal approved by the MoEF, GoI. These funds have to be spent to maintain ecological and environmental losses caused by the user agency, it may be site specific or otherwise. To make this procedure, in uniform manner, in all over the country, MoEF, GoI has instructed to form State CAMPA vide letter No. 1-58/09-MoS (I/c)-E&F dated 15/7/2012. To comply the instruction MoEF, GoI, Govt. of Himachal Pradesh vide notification no. FFE-B-F (2)-72/2004-Pt-II dated 3/8/2009 has constituted "State Compensatory Afforestation Fund Management and Planning Authority" (hereinafter referred to as State-CAMPA) as an instrument to accelerate activities for compensatory afforestation, preservation of natural forest management of wildlife infrastructure development and allied works. Its prime task is to regenerate natural forests and

building up the institution engaged in this work. HP Forest department would be modernizing to protect and regenerate the forests and wildlife habitat.

The state CAMPA is constituted to promote i) Afforestation and soil and water conservation suitable for Himachal Pradesh, ii) Conservation, protection, regeneration and management of existing natural forests iii) CA and CAT Plan activities & environmental activities. The function of state CAMPA also include funding, overseeing and promoting CA, CAT Plan, watershed works and wildlife conservation.

The money available with the State CAMPA will be utilized towards the development, maintenance and protection of forests and wildlife management and 2% of the amount has to spend on monitoring and evaluation of the expenditure occurred.

State CAMPA releases the funds to the field officers as per the Annual Plan of Operation finalized. The State CAMPA is functioning through a Governing Body, a steering committee and Executive committee. Governing body is consisting of Chief Minister as Chairman, Forest Minister as Vice Chairman and Pr.CCF as Member Secretary alongwith other members. Steering Committee consisting of Chief Secretary as Chairperson, Addl. Pr.CCF (CAT) as member secretary alongwith other members. Executive Committee consisting Pr.CCF as chairperson and Nodal officer as Member secretary alongwith other members. Steering committee lay down or approve the rules and procedure for functioning of body and executive committee, monitoring the progress of the utilization of funds, approve the APO prepared by Executive Committee and annual reports audit accounts of the State CAMPA. Executive Committee take all steps to run the State CAMPA as per procedure laid down by the Steering Committee. All the works under CAMPA fund shall be executed by field functionaries at Divisional Level under the over all administrative/financial control of Executive Committee. They shall be responsible to prepare the APO and get the approval of APO from the Steering Committee and also to monitor the progress of the utilization of funds released by the State CAMPA.

1.24 Scheduled Tribes & other Traditional Forest Dwellers (Recognition of Forest Rights)

Act, 2006:- Recently, the Central Govt. came out with legislation namely “The Scheduled Tribes & other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006”. The objective of the Act has been set out in the Preamble to the Act, which read that this is “an Act to recognize and vest the forest rights and occupation in forest land in forest dwelling scheduled tribes and other traditional forest dwellers, who have been residing in such forests for generations, but whose rights could not be recorded, forest rights on ancestral lands and their habitat were not adequately recognized in the consolidation of State Forests during the colonial period as well as in independent India, and to address the long standing in security of tenurial and access of forest rights. The Act is divided into six chapters spread over 14 sections. The Ministry of the Central Government dealing with Tribal Affairs or any officer or authority authorized by the Central Government in this behalf, shall be nodal agency for the implementation of the provisions of the Act. The Act also empowers the Central Government to issue directions and make rules for carrying out the provisions of the Act and rules framed thereunder, scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Rules, 2008.

In pursuance of the Central Act, the Govt. of Himachal Pradesh has already been implemented this Act in three districts of Tribal Areas of the State in the first phase since 2008. Thereafter the Government of Himachal Pradesh has decided to implement this Act in whole of the State with immediate effect vide notification No. TD (A)-3-1/2011 Loose dated 27-3-2012. The copies of the said Act and Rules are available on website www.forestrights.gov.in.

Himachal Pradesh is a unique State among the Indian States and having no forest villages as like other states in India. In M.P, Jharkhand, Chhatisgarh, Orissa, A.P, Tamil Nadu, West Bengal, Maharashtra and North-Eastern States tribal population live in forest villages but possesses no rights and ownership to the land they cultivate generations, as these are the forest land, as per Govt. record. They are primarily resided in forest and who solely dependent on forests or forest land for their bonafide livelihood needs or their survival. Whereas in State of Himachal Pradesh, tribals and other forest dwellers hold private land in revenue villages in their own name under the well settled laws i.e. H.P.Land Revenue Act, 1954 and well recorded forest rights under the provision of Indian Forest Act, 1927. Thus there are no tribals or group of people or forest dwellers or other people in state of H.P as like other states in India who are dwelling in forest areas and occupation on forest land for generation. There is much difference between occupation and encroachment on forest land and also difference between basic needs or necessity of forest produce for cultivating agricultural land and economy who dependent on forest produce directly or indirectly and dependent on forests or forest land for their bonafide livelihoods needs or survival who primarily reside in forest and dependent on forest land or forest and occupation of land since generation.

After the enactment of this act in Kinnaur Forest Division, the number of cases sanction is tabulated in the table No:- 1.17

Table No:- 1.17

Area diverted under FRA 2006 under section 3(2)						
S. No.	Year	Name of Proposal	Sanction No. & Date	Extent of area diverted (ha.)	Kind of Area	
					DPF	UPF
1	2010-11	C/o School building at Nigulsari	31/8/2010	0-67-46	0	0-67-46
2	2010-11	C/o Community center for Cow Shed	13/8/2010	0-18-00	0	0-18-00
3	2011-12	Flow irrigation Mahal Dhar Gramval (Thangi)	28/6/2011	0-88-10	0	0-88-10
4	2011-12	Link Road Khula Nala to Tarkhva DPF C-239,240 Telangi Tehsil Kalpa.	28/6/2011	0-90-40	0-90-40	0
5	2012-13	Dispensary at Up Mahal Tangling Tehsil Kalpa	7/6/2012	0-02-42	0	0-02-42
6	2012-13	Animal Husbandry at Up Mahal Purbani Tehsil Kalpa	7/6/2012	0-03-35	0	0-03-35
7	2012-13	Link Road Kojag to meber (Pangi) DPF C-237 Telangi	4/8/2012	0-60-06	0-60-06	0
8	2012-13	Link Road Rungra to Spilo Panchayat Ghar	14/8/2012	0-86-59	0	0-86-59
9	2013-14	Vocational Training Centre at Spillo	2/4/2013	0-04-00	0	0-04-00
10	2013-14	To Construct School Building and Campus at Up Mahal Shalkhar	22.4.2013	0-72-05	0	0-72-05
11	2013-14	Aurveda Dispensary at Leo	30.4.2013	0-06-10	0	0-06-10
12	2013-14	Link Road Praelmna to tellingkhu Vai. Middle	27.5.2013	0-60-49	0	0-60-49

13	2013-14	To construct School building and campus at up mahal Rangle	6.6.2013	0-17-24	0	0-17-24
14	2013-14	To construct School building Sr. Sec. School Rarang in up Mahal	10.7.2013	0-06-81	0	0-06-81
15	2013-14	To construct the Aurveda Dispensary at mahal Tokto Mahals Asrang	31/7/2013	0-03-22	0	0-03-22
16	2013-14	To construct the Aurveda Dispensary at Mahal Charang Tehsil Moorang	23/8/2013	0-01-10	0	0-01-10
17	2014-15	Animal Husbandry at up Mahal Shalkhar Up Tehsil Hangrang	6/1/2014	0-04-00	0	0-04-00
18	2014-15	Link Road Labrang Bus Stand to Bodh Mandir Vill. Labrang	6/3/2014	0-94-84	0-94-84	0
19	2014-15	Community Center at up Mahal Holding Tehsil Moorang	6/3/2014	0-00-84	0	0-00-84
20	2014-15	Community center at up mahal Tokto Tehsil Moorang	6/3/2014	0-03-23	0	0-03-23
21	2014-15	Community centre at up mahal Charang Tehsil Moorang	6/3/2014	0-00-77	0	0-00-77
22	2014-15	To construct School building at up mahal Sakicharang	15/7/2014	0-08-20	0	0-08-20
23	2014-15	Link Road Brua to Baturi Tehsil Sangla	3/9/2014	0-93-94	0	0-93-94
24	2014-15	Link Road Plingcha to Shong Khad Vill. Plingcha Tehsil Sangla.	28/11/2014	0-90-96	0	0-90-96
25	2014-15	To construct the Sewerage tank in village Rarang	27/12/2014	0-15-00	0	0-15-00
26	2014-15	Link Road Punspo to Uprala Baro Vill. Baro Tehsil Nichar	24/12/2014	0-46-46	0-46-46	0
27	2014-15	To construct the Fair Price shop building at Purbani.	24/12/2014	0-01-50	0	0-15-50
28	2014-15	To construct Link Road From Chukchura	2/4/2014	0-98-10	0	0-98-10
29	2014-15	To construct Link Road Pooh to Pooh Stadium	2/4/2014	0-42-63	0	0-42-63
30	2014-15	Link Road from Chukchru to Chelat	2/4/2014	0-83-50	0	0-83-50
31	2015-16	Construct the Dispensary Building Runang	7/5/2015	0-07-50	0	0-07-50
32	2015-16	Community center Runang	7/5/2015	0-02-00	0	0-02-00
33	2015-16	To construct of Mobile Tower Chango	19/7/2015	0-04-00	0	0-04-00
34	2015-16	C/O Link Road from Panvi village	19/6/2015	0-96-65	0	0-96-65
35	2015-16	C/O Link road from village Ribba to Ribba Kanda.	26/6/2015	0-84-45	0-84-45	0
36	2015-16	C/o link road from village Kalpa Rungchampo to Sharakpi	3/7/2015	0-68-97	0-68-97	0

37	2015-16	Link Road from Kayarbu to kota	10/9/2015	0-97-50	0	0-97-50
38	2015-16	Sub Station Electricity board Pooh	30/9/2015	0-64-40	0	0-64-40
39	2015-16	Construct the Link road bruno to Shamshyangat uperia Pangi	1/8/2015	0-37-84	0-37-84	0
40	2015-16	Link road from Ropa to Thoropa	1/11/2015	0-40-28	0	0-40-28
41	2015-16	Link Road from Chungling to Kuto kanda	4/11/2015	0-90-80	0-90-80	0
42	2015-16	Community center at Khadra	16/11/2015	0-04-50	0	0-04-50
43	2015-16	Link road Ribba building to Kyaden	17/11/2015	0-95-65	0-95-65	0
44	2015-16	Link road Homtey Pul to Masrang	27/11/2015	0-69-81	0	0-69-81
45	2015-16	Link road Nichla Rizing kanda to Uprala Rizing Kanda	30/11/2015	0-27-81	0	0-27-81
46	2015-16	Construct of the Maunkumo Bahudeshia Sehkari Sabha samiti Sholtu.	30/11/2015	0-04-13	0	0-04-13
47	2016-17	Link Road Khawangi to NH-22	2/2/2016	0-47-18	0	0-47-18
48	2016-17	Link Road Khawangi to NH-2	2/2/2016	0-52-12	0	0-52-12
49	2016-17	Community centre Kalpa.	3/2/2016	0-04-50	0-04-50	0
50	2016-17	Link road Kayoden to Chuain	15/3/2016	0-73-98	0-73-98	0
51	2016-17	Community Rain Shelter Duni	26/3/2016	0-00-24	0	0-00-24
52	2016-17	C/O Primary School R/Peo	31/3/2016	0-08-00	0	0-08-00
53	2016-17	Link Road Karva to Makermang	13/4/2016	0-23-79	0	0-23-79
54	2016-17	Link Road Jani to Fochitang Ramni	22/4/2016	0-98-00	0	0-98-00
55	2016-17	Link RoadNH-05 to Canbook Ka Dogri	22/4/2016	0-98-00	0	0-98-00
56	2016-17	Link RoadYanthasng toSasang	22/4/2016	0-96-00	0	0-96-00
57	2016-17	Link Road Chuyan to Shirmoling	23/5/2016	0-35-00	0-35-00	0
58	2016-17	Link Road Gotang to Chuding	13/6/2016	0-94-64	0	0-94-64
59	2016-17	Link Road Jogtyaring to Panvi	14/6/2016	0-75-00	0	0-75-00
60	2016-17	Link Road Charang to Kota Dogri	8/6/2016	0-97-81	0	0-97-81
61	2016-17	Link Road Lippa Asrang to Pyaskunti	8/7/2016	0-99-99	0	0-99-99
62	2016-17	Link Road Link Road to Batseri	14-7-2016	0-55-63	0	0-55-63
63	2016-17	Link Road Chungling to Breyang	16-8-2016	0-59-92	0-59-92	0
64	2016-17	C/o Link road Aktang to Dumdumka	22-8-2016	0-29-80	0-29-80	0
65	2016-17	C/o Link road Lower Aktang to Chojurang	22-8-2016	0-26-72	0-26-72	0
66	2016-17	C/o Link road Nichar to Negani	31-8-2016	0-53-88	0	0-53-88
67	2016-17	To way Electric Ropeway	26-10-2016	0-71-33	0	0-71-33
68	2016-17	Community center at Punang	26-10-2016	0-01-45	0	0-01-45

69	2016-17	Link Road Paringkhor to Wangtoo	26-10-2016	0-67-25	0	0-67-25
70	2016-17	C/o new school Building Choling	29-10-2016	0-29-14	0	0-29-14
71	2016-17	Link Road Ruturang to Boningsaring	29-10-2016	0-22-93	0	0-22-93
72	2016-17	Community center at Nesang	29-10-2016	0-59-85	0	0-59-85
73	2016-17	Community center at Rarang	29-10-2016	0-00-54	0	0-00-54
74	2016-17	Link Road to Yangpa-II	3/11/2016	0-03-50	0	0-03-50
75	2016-17	Link Road to Katgaon Bazar to Shango	3/11/2016	0-50-83	0	0-50-83
76	2016-17	Community center Chansu	12/12/2016	0-03-00	0-03-00	0
77	2016-17	Link Road Khadura to Tisurang	20/12/2016	0-06-18	0	0-06-18
78	2016-17	Community Parking center	20/12/2016	0-04-51	0	0-04-51
79	2016-17	Link Road Moorang rest to Labeyan Kuhal	26/12/2016	0-90-41	0	0-90-41
80	2017-18	Link Road Fuchitang to Ramni	11/1/2017	0-93-09	0	0-93-09
81	2017-18	Link RoadThikru to Lingney	11/1/2017	0-53-98	0	0-53-8
82	2017-18	Link Road Akhrok To Kota Dogri	17/1/2017	0-99-34	0	0-99-34
83	2017-18	Community center Lingney (Kilba)	18/1/2017	0-01-50		0-01-50
84	2017-18	Link Road Holdo to staydion	28/1/2017	0-53-16	0	0-53-16
85	2017-18	Community center Rarang	16/2/2017	0-00-54	0	0-00-54
86	2017-18	Community center Distt employment office R/Peo	17/2/2017	0-03-75	0	0-03-75
87	2017-18	Link Road Laban kuhal to shrubu kanda	21/3/2017	0-90-85	0-33-10	0-57-75
88	2017-18	Link Road kuto kanda to Shati	22/3/2017	0-61-36	0	0-61-36
89	2017-18	Link Road Kothi kanda to japrodden	22/3/2017	0-72-39	0-72-39	0
90	2017-18	Link Road Baudh Mainder to Orva	25-3-2017	0-03-17	0	0-03-17
91	2017-18	Link Road Ruturang to Boningsaring	29-3-2017	0-22-93	0	0-22-93
92	2017-18	Community center R/Peo	19-5-2017	0-07-75	0	0-07-75
93	2017-18	Link Road Rava to Bari	29-5-2017	0-55-67	0	0-55-67
94	2017-18	Link road Kalpa to Chanka	1/6/2017	0-97-68	0-97-68	0
95	2017-18	Road side establishmant (Magzin)	6/6/2017	0-03-00	0	0-03-00
96	2017-18	Link Road Vishram Grhee Roghi to Roghi Kanda	22-6-2017	0-92-05	0-75-80	0-16-25
97	2017-18	Link Road Shati to Gonodor	24-6-2017	0-64-13	0	0-64-13
98	2017-18	Link Road Vishram Grhee Rarang to Sholding Santang	4/7/2017	0-50-22	0-50-22	0
99	2017-18	Link Road NH-05 to Village Grange	11/7/2017	0-36-73	0-36-73	0
100	2017-18	Link Road Rarang to Chhota Kanda	24-6-2017	0-70-93	0	0-70-93

101	2017-18	Link Road Dumdumka to Radule	2/8/2017	0-12-00	0-12-00	0
102	2017-18	Community center R/Peo	2/8/2017	0-06-56	0	0-06-56
103	2017-18	Link Road Khawangi Kanda to Milasti	7/8/2017	0-06-49	0	0-06-49
104	2017-18	Link Road Japroden to Taley	7/8/2017	0-32-68	0	0-32-68
105	2017-18	Community center Sapni	7/8/2017	0-01-30	0	0-01-30
106	2017-18	Skill Development center Sapni	7/8/2017	0-03-75	0	0-03-75
107	2017-18	Community center (peri Sabha) Sapni	7/8/2017	0-00-80	0	0-00-80
108	2017-18	Link Road Lippa Asrang to Pyaskunti	7/8/2017	0-97-08	0-0812	0-88-96
109	2017-18	Skil Development center (Fruti processing Shudarang	18-8-2017	0-01-90	0	0-01-90
110	2017-18	Link road Forest Depot to Dharnmoche	5/9/2017	0-25-05	0	0-25-05
111	2017-18	Community center Kamroo	5/9/2017	0-00-84	0	0-00-84
112	2017-18	Election Trainng center R/Peo	28-9-2017	0-01-20	0	0-01-20
113	2017-18	C/o School building at Panvi	3/10/2017	0-08-92	0	0-08-92
114	2017-18	C/o Link road Ralli to Mebar	3/10/2017	0-23-97	0	0-23-97
115	2017-18	Skill Development center Stadium kilba	9/10/2017	0-85-25	0	0-85-25
116	2017-18	C/o skill Development Anganwadi Bhawan Rang	12/10/2017	0-01-30	0	0-01-30
117	2017-18	C/o Skill Development center building upper Shudarang	12/10/2017	0-01-12	0	0-01-12
118	2017-18	Link Road Van Vishram Ghree to Gotangpra	13-10-2017	0-53-67	0	0-53-67
119	2017-18	C/o community center Namgiya	27-11-2017	0-24-10	0	0-24-10
120	2018-19	C/O Link road Kibla Jullah to Gurvaling	30-01-2018	0-47-60	0	0-47-60
121	2018-19	C/o Community center	30-01-2018	0-03-30	0	0-03-30
122	2018-19	C/o Link road (H.T) to Vill. Runang	9/2/2018	0-99-33	0-99-33	0
123	2018-19	C/o Link road Kangos to uparla Kangos	6/3/2018	0-00-76	0	0-00-76
124	2018-19	C/o Community Center Rarang	8/3/2018	0-18-28	0	0-18-28
125	2018-19	C/o link road Skiba to pana kanda	13-3-2018	0-97-09	0-97-09	0
126	2018-19	C/o link road Thangri to Gyare	14-3-2018	0-96-69	0	0-96-69
127	2018-19	C/o filter tank pooh	19-3-2018	0-01-50	0-01-50	0
128	2018-19	C/o School Building Rarang	9/4/2018	0-49-62	0	0-49-62
129	2018-19	C/o Link road Dubling Pull NH-05 to Dubling Village.	13-4-2018	0-92-99	0	0-92-99
130	2018-19	C/o Link road Tashigang bus stand to Tashigang Temple	8/5/2018	0-99-79	0	0-99-79
131	2018-19	C/o Skill Development center Labrang	22-5-2018	0-92-16	0-92-16	0
132	2018-19	C/o Aurvedik Helth center Roghi	11/6/2018	0-05-00	0-05-00	0

133	2018-19	C/o Annimal Husbandry building Roghi	11/6/2018	0-05-00	0-05-00	0
134	2018-19	C/o Linr road Chiskao to Panungo	14-6-2018	0-74-89	0-74-89	0
135	2018-19	C/o School Building & playground Roghi	20-6-2018	0-11-84	0-11-84	0
136	2018-19	C/o Community center Yulla	23-8-2018	0-02-50	0	0-02-50
137	2018-19	C/o Community center Yulla	23-08-2018	0-02-48	0	0-02-48
138	2018-19	C/o Link road Gothrang to Grama & Shagndor	12/9/2018	0-98-30	0	0-98-30
139	2018-19	C/o Link road Bara Kamba to Shorang	13-9-2018	0-62-62	0	0-62-62
140	2018-19	C/o Link 0/000 ls Rangme Vill.	17-10-2018	0-42-34	0	0-42-34
141	2018-19	C/o Community center Chagaon	1/11/2018	0-56-25	0	0-56-25
142	2018-19	C/o Link road Asrang to Pyaskunti	1/11/2018	0-48-76	0-48-76	0
143	2018-19	C/o School Building Rarang	3/11/2018	0-10-46	0	0-10-46
144	2018-19	C/o Link road Leo Nallah to Sunni Dogri	4/12/2018	0-48-08	0	0-48-08
145	2018-19	C/o Link road Rispa to Korispa	3/1/2019	0-27-00	0-27-00	0
146	2018-19	C/o Link road Shyaso Vill. To Gosang Tample	2/1/2019	0-97-54	0	0-97-54
147	2018-19	C/o Link road Dufak Gufa to Tample	2/1/2019	0-27-70	0	0-27-70
148	2018-19	C/o Community Center Shyaso	4/1/2019	0-02-00	0	0-02-00
149	2018-19	C/o Link Road Thangkoto to Pashsha	5/1/2019	0-68-39	0-68-39	0
150	2018-19	C/o Link road Upper Rizing Kand 0/00 to 2/300 Km.	1/1/2019	0-35-49	0	0-35-49
151	2018-19	C/o Link road Upper Rizing Kand0/0 to 0/720 Km.	8/1/2019	0-75-46	0	0-75-46
152	2018-19	C/o Link road Yunden to Shiling	8/1/2019	0-84-70	0	0-8470
153	2018-19	C/o Link road Nanspo to Dendeoring	9/1/2019	0-85-05	0	0-85-05
154	2018-19	C/o School Building Nesang	10/1/2019	0-82-91	0	0-82-91
155	2018-19	C/o Community center Miru	1/2/2019	0-04-91	0	0-04-91
156	2018-19	C/o Fair Price Shop Miru	1/2/2019	0-01-50	0	0-01-50
157	2018-19	C/o Mahila Mandal Bhawn Choling	1/2/2019	0.01.80	0	0.01.80
158	2018-19	C/o Link road Sungra Mod to Sungra Kanda	0-02-2019	0-99-97	0	0-99-97
159	2018-19	C/o School Building Thengarang	6/2/2019	0-31-04	0-31-04	0
160	2018-19	C/o Link road Dhendoring to Upperla Tranda	7/2/2019	0-66-76	0	0-66-76
161	2018-19	C/o Link road Gramang Kvalo to Mantiden	13/02/2019	0-59-49	0	0-59-49
162	2018-19	C/o Community Center Rarang	14-02-2019	0-99-00	0-99-00	0
163	2018-19	C/o Link road Goroden Kupa to Palika Saryo	18/02/2019	0-67-90	0	0-67-90
164	2018-19	C/o Mhhila Mandal Bhawn Sunam	20-02-2019	0-00-83	0	0-00-83
165	2018-19	C/o Link road Ruwang to Laben	22-02-2019	0-43-41	0	0-43-41

166	2018-19	C/o link road Kanki to Yadon Temple	22-02-2019	0-89-04	0	0-89-04
167	2018-19	C/o Community Center Kalpa	26/02/2019	0-00-15	0	0-00-15
168	2018-19	C/o Sevrage System Kalpa	26/02/2019	0-09-00	0-09-00	0
169	2018-19	School Building Runang	26/02/2019	0-09-93	0	0-09-93
170	2018-19	C/o Sevrage System Pangi	26-02-2019	0-00-16	0-00-16	0
171	2018-19	C/o link road Nh-05 to Forest Reat House Chaura	2/3/2019	0-75-09	0	0-75-09
172	2018-19	C/o Link road Kaloni to Kloni Garden	5/3/2019	0-69-88	0	0-69-88
173	2018-19	C/o Link road Bilige to Tinalang	6/3/2019	0-85-44	0	0-85-44
174	2018-19	C/o Link road Rsargaden to Khuspi	6/3/2019	0-43-79	0-28-43	0-15-36
175	2018-19	C/o Link road Puraning to Gatke	2/3/2019	0-65-36	0	0-65-36
176	2018-19	C/o Samdu to thangkrma	7/3/2019	0-99-62	0	0-99-62
177	2018-19	C/o Community Center Jangi	8/3/2019	0-05-25	0	0-05-25

CHAPTER II A FLORA AND FAUNA

Chapter II A - Forest Flora

2.A.1 Introduction:- The distribution of vegetation follows an altitudinal zonation similar to that in the outer Himalayas but on account of the marked variation in the annual precipitation along the entire length of Sutlej valley the tract can be divided into three main climate zones as under:-

(i) **Wet Zone:-** This zone comprise of the lower or outer valley, extending from Maneotidhar in Nichar to Kilba along the north and upto Wangtu along the southern aspects. It includes all forests of Bhaba Nagar Range, Nichar Range, Katgaon Range, and Part of Kilba Range. This zone receives the bulk of rainfall during rainy season from southwest monsoon and heavy snowfall in winter.

(ii) **Dry Zone:-** This zone lies between Kilba and Purbani on the left bank of the Sutlej and Kalpa on the right bank of Sutlej. It extends over parts of Kilba and Kalpa Ranges. The rainfall shows a progressive decline, as we go eastwards. The snowfall during the winter is heavy.

(iii) **Arid Zone:-** This zone lies beyond Purbani and Kalpa extending to the Indo-Tibetan border. This zone does not get practically any rainfall. The winter is severe and the tract experiences heavy snowfall during winter. Snow melts by the end of the May and thereafter the tract is practically dry for the rest of the year.

2.A.2 General Description of the Growing Stock:- The forest have been classified in the following 'types' according to "*A revised survey of the forest type of India*" by H.G Champion and S.K Seth.

Group 9	<i>Subtropical Pine Forest: C.I.b Upper or Himalayan Chil Pine Forests.</i>
Group 10	<i>Subtropical Dry Evergreen Forests: C.I.a Olea ferruginea Scrub forest.</i>
Group 12	Himalayan moist temperature forests:- C.I.a Ban Oak forest (<i>Q. Leucotrichophora</i>); C.I.c Moist Deodar forest (<i>Cedurs deodara</i>); C.I.d Western Mixed Coniferous forests (Spruce, Blue, pine, silver Fir) C.I.e Moist Temperate Deciduous forest. C.I.f Low level Blue Pine Forest (<i>P. wallichiana</i>) C.2.a Kharsu Oak forest (<i>Q. semicarpifolia</i>) C.2.b West Himalayan Upper Oak/ Fir forest. C.2. c Moist temperate deciduous forest. I.S. 1 Alder Forest. General edaphic and seral types of Himalayan moist temperate forests.
Group 13	Himalayan Dry Temperate C.I Dry broad –leaved and coniferous forests (<i>Quercus ilex- P.geradiana</i>) C.2 a Neoza Pine forest (<i>P. gerardiana</i>) C.2 b Dry Deodar forest (<i>C. deodara</i>) C.4 West Himalayan high level dry Blue Pine forest (<i>P. wallichiana</i>)
Group 14	C.1 West Himalayan Sub-Alpine Birch/Fir forest. C.I a West Himalayan Sub-Alpine forests. Seral and degraded types of Sub-Alpine forests. I.S 1 (<i>Hippophae myricaria/Myricaria brakes</i>) I.S.2 Deciduous Sub-Alpine Scrub.
Group 15	Moist Alpine Scrub

- C.1 Birch/Rhododendron Scrub forests.
- C.2 Deciduous Alpine Scrub.
- C.3 Alpine pasture.
- Group 16 Dry Alpine Scrub.
- C.I Dry Alpine Scrub.

The ecological status of the Forests communities consisting of these groups, Forests and sub types is influenced by climate, geology, rock, soil, aspect, slope and altitude. These types overlap each other to a great extent.

2.A.2.1:- The following are the general description of the growing stock:-

2A.2.2:- 9 C.I.b Upper or Himalayan Chil Pine Forest:- This type occurs between 1000 to 2000 m elevation in C-163, C-164 and C-165 Bhabanagar range. It gradually merges into tropical dry deciduous forest below and gives way to the temperate broad-leaved and coniferous forest above. A little beyond Wangtoo, this type is replaced by Neoza pine (*Pinus gerardiana*). The predominant species among the conifers is Chil (*Pinus roxburghii*). It forms open, poor quality crops on the rocky and shallow soils but on the northern aspects there are a few good pure patches of poles and middle aged crop in un-demarcated forests. The crop is generally irregular and mature trees are few and scattered. Admixture of other species occurs along the upper limits as well as lowers down in streams and damp ravine. The common associates are *Quercus leucotrichophora*, *Rhododendron arboreum*, *Pieris ovalifolia*. The associate may occur in high admixture or occasionally may form an understory in the pine forest. Kail (*P wallichiana*) makes its appearance in the upper reaches and is sometimes found extending into Chil, as may be noticed along Maneotidhar in UFKandlu Chaunda - 41.

2A.2.3:- The flora constituting the undergrowth varies in type and density according to the aspect and the overhead shade; under open stand of Chil, *Woodfordia*, *Rhus cotinus*, *Buddleia paniculata*, *Desmodium sambuense*, *D. continum*, *Rubus ellipticus* are common. Higher up and under a more regular canopy bush growth is less rampant and here *Desmodium* spp; *Berberis* spp; *Indigofera* spp; are found with *Plectranthus* spp; *Lespedeza* spp; and other Compositae as the common herbs. On hot southern aspect, the shrubby under growth is very light owing to regular burning and water grazing.

2A.2.4:- 10C.Ia Olea ferruginea Forests:- This type is of only academic interest, because it is found in a very small scale along the river Sutlej on the alluvial deposit. The trees are lopped during winter for fodder. The regeneration of these species is absent and no young plants have been seen.

2A.2.5:- Himalayan Moist Temperate Forest:- The formation extends in the west zone tract between the chil pine forest below and the sub-alpine formation above. In the inner Sutlej valley with dry climate, it is replaced by the dry temperate forests. The altitudinal forest range of this type is between 1500-3350m. Within this Range its distribution is governed by aspect, microclimate, edaphic and biotic factors. Both in coniferous as well as broad-leaved sub-types pure crops are more frequent than mixed one. Even in mixed stand dominant species are few and generally conifers predominate.

2A.2.6:- 12 C.I.a Ban Oak Forest (Q. leucotricophora):- This type is found over a small area near village in undemarcated forests of Nichar range. The altitudinal range is between 1800-2450m. It thus overlaps into the altitudinal zones of all the lower conifers, and is the common companion of the Blue Pine, Deoda and Spruce as well as Chil. In the upper part of the Chil belt, however it is really the main forest forming species and combines with *Rhododendron arboretum* to form broad-leaved forest in ground too damp or too cold for Chil Pine, while in the middle range the tree combines to form a two storeyed forest of open Chil stand with an Oak-Rhododendron under wood, *Lyonia ovalifolia* (Syn. *Pieris ovalifolia*) being almost as common as *Rhododendron* in some places.

Alnus nitida is found near flowing water, Kail and Deodar occur sporadically on the drier ground towering high above the mass of deciduous species.

2A.2.7:- 12.C.I.c Moist Deodar Forest(*Cedrus deodara*):-The Deodar forest covers the altitudinal range 1800-2450m but may go a little lower down in depressions on cool aspect and nallas and higher upon the warm southern aspects and sunny ridges with better drainage. The forests may be purely Deodar or with an admixture of Kail and occasionally Spruce near the upper limits. The forest seems to have been greatly influenced by biotic influences like the Fire, heavy grazing and shifting cultivation in the past and so are not climax forests. The canopy is fairly complete but very dense (except locally in young crops) and the boles are straight and tall; a height of 33-40m is usual. There are usually scattered Oaks and Rhododendron under the conifers and a scrub growth depending largely on the intensity of grazing. Given proper protection, deodar will colonise much greater proportion of the area that is seen at present. Good example may be seen in C. 1 (a), C. 2 (c) and C-19 (a), C-19 (b).

2A.2.7.1:- In the upper reaches, Spruce and Kail appear, especially in depressions and cooler aspects and moist areas usually unfit for the growth of Deodar. The natural balance here is kept up by drastic opening in the canopy of spruce. Under Kail crop with scattered Deodar seed bearers, conditions are more suitable for Deodar resulting in beautiful sapling crop. Good examples may be noted in almost all blocks of forest above Chaura, Tranda and Nichar. Good Deodar plantations under Kail over wood have been raised in C 1 (a) and C-5 (a).

2A.2.7.2:- The under growth depends upon the intensity of grazing and the opening of the canopy. *Viburnum* spp; and *Indigofera* spp; are common all over. *Lonicera angustifolia*, *Rosa* spp, *Daphne cannabina* and *Jasminum officinale* differentiate the moist type from the drier temperate type namely, *Plectranthus* spp, *Prinsepia utilis*, *Desmodium* spp, etc. The herbaceous vegetation varies. The common species are, *Viola serpens*, *Fragaria vesca*, *Smilax* spp, *Gebera* spp, *Amsliaea aptera*, maidenhair fern (*Adiantum* spp;). Towards the upper level, the bracken fern (*Pteris aquiline*) fills up the open glades and *Iris nepalensis* often forms large patches. Some of the common grasses are *Agropyron longearistatum*, *Agrostis alba*, *Andropogon gryllus*. Regeneration does not present a problem provided the forest is kept free from grazing, weeds and fires.

2A.2.8:-12.C.I.d Western Mixed Coniferous Forest (Spruce, Blue Pine, Silver Fir):-This type is commonly referred to as mixed coniferous forest but it also includes pure Spruce, Spruce and Silver Fir, Spruce Deodar and Deodar Kail formations. This type occurs in the Deodar zone between altitude 2000m and 3500 m in the interior of the side streams such as Kandlu, Chaunda, Sholding, Malgad, Lishnam of Nichar and Bhaba Nagar ranges. Conifers form remarkably pure stands with strips and patches of broad leaved species. The stocking is fair. Both the undergrowth and herbaceous flora is purely rich. Grazing is rich but fires are almost unknown. For convenience of description this type is subdivided into following subtypes on the basis of altitudinal zonation.

2A.2.9:-Spruce-Deodar Forest:- Along the upper limit of Deodar zone, spruce grows mixed with deodar, the former predominating in nallas and shady places and the latter mainly along the spurs. Such admixtures are found in forest of Tranda and Bari. Deodar admixture occurs only along the periphery of these groups. Kail also comes in such areas along the spurs which are too dry for both Deodar and Spruce. Deciduous broad leaved species which viz. Horsechestnut, walnut maple, birdcherry grows in nallas. The age class distribution is irregular with mature classes predominating. In tension belt forest, Spruce is spreading under Deodar. Biotic interference plays an important part in determining the proportion of Deodar and Spruce in these forests. In areas adjoining villages where spruce is planted and Deodar is protected, the proportion of Deodar is increasing. Heavy

grazing in helophytic situation helps Deodar in holding its place. In nallas and cooler sites, where the condition is more mesophytic, the proportion of spruce is increasing in the younger age classes and Deodar is being gradually ousted. The composition of the undergrowth and herbaceous flora is almost the same in the Deodar forests except that it is thicker especially in nallas and the mesophytic species predominate.

2A.2.9.1:-Predominately Spruce Forests:- These forests occur in the narrow belt above Deodar-Spruce mixture and below Spruce-Silver Fir Forests. C-10 can be cited as an example of good spruce formation. The overwood is principally of Spruce with scattered Silver Fir trees. Along the spurs, scattered trees of Deodar and Kail appeared. Nallas are inhabited by deciduous tree species like Horse-chestnut, Walnut, Maple and Birdcherry. Ban Oak along the lower side and Kharsu Oak along the upper portion also occurs in small pockets or narrow strips. The undergrowth and herbaceous flora is fairly thick and consists of species described later under Spruce Silver-Fir Forests. Spruce is not the climax vegetation of this zone and is being gradually replaced by Silver Fir.

2A.2.9.2:-Spruce Silver-Fir Forests:- Forests of this type occur above predominating Spruce forests and below western Oak Fir Forests from an altitude of about 2600m to 3200m. Fir forests of Bari Panwi and Melgad are fine examples of this type. Spruce predominates in the lower one and along spurs while the upper portion and nallas carry Silver-Fir. Intimate mixture of two species is met with only in pockets. Silver Fir is spreading under Spruce and younger age classes predominate. Deciduous species like Walnut, Maple, Birdcherry and Betula grow in nallas. Along the Oaks, Kharsu grows on the top. The understory is generally considered of scattered *Taxus baccata* and Silver Fir and Spruce poles. The undergrowth is fairly thick and consists of mainly of *Viburnum cotinifolium*, *Desmodium* spp, *Indigofera* spp, *Spiraea lindleyana*, *Deutzia corymbosa*, *Quinquelocularis* spp and scattered *Arundinaria falcata* clumps. The herbaceous flora is also very rich and especially so during the rainy season. The main species are *Strobilanthes* spp, *Balsam fern*, *Ainsliaea aptera*, *Iris* spp, *Fragaria vesca*, *Nudicaulis*, *Polygonum* spp, *Rosa* spp, etc. and *Vitis semicordata* is the common climber, and *Hedera helix* occurs only sporadically. The stocking is generally fair except in the nallas where the stocking is comparatively poor because of snow slides. The forests are of selection type with IIA and larger trees predominating. Younger age classes and regeneration are generally deficient. Both a Spruce and Silver Fir tree grows to magnificent heights and attain big dimensions.

2A.2.9.3:-Pure Silver Fir Forest:- These occur in Nichar and part of Kilba ranges. In these Pure Silver Fir stands, Spruce is practically absent and there are no broad-leaved trees either except a few scattered trees of Betula and Maples. The crop is wholly upon with no tree growth in nallas because of snow slides. The understory is generally absent and only scattered *Taxus baccata* and poles of Silver Fir occur. The undergrowth and herbaceous flora is fairly thick and consists of the same species as given in Spruce, Silver Fir mixture. Young regeneration is absent.

2A.10 12.C. I.e. Moist Temperate Deciduous Forest:- This type is commonly found between 1800-2750m in moist hollow and depression often as strips along the hill streams and also on many of the gentler slopes in Nichar and Kilba ranges. The Oaks are only occasional members of this type, which is commonly known as thach (grazing land) owing to the richness of the shrub growth and the quantity of the lootings which the mixed broad-leaved species provide. The common trees are *Acer caesium*, *Azadirachta indica*, *Betula alnoides*, *Carpinus* spp, *Celtis australis*, *Juglans regia*, *Pyrus lanata*, *Ulmus* spp, *Prunus cornuta*. The shrub growth is a mixture of *Cotoneaster* spp, *Deutzia corymbosa*, *Sacrocca saligna*, *Viburnum* spp etc. The herb growth is poorly developed

except in a few rather specialized types of canopy e.g a dense growth of *Chaerophyllum reflexum* under a poor stand of *Pyrus lanata*. *Salvia glutinosa*, *Viola* and *Adiantum* form under a pure stand of *Aesculus indica*.

2A.11:- 12.C.I.fLow Level Blue Pine Forest (*P. Wallichiana*):-The Blue Pine or Kail accompanies Deodar throughout the whole field of its distribution. The Blue Pine has two altitudinal zones which are well defined, although the tree is quite common on intermediate ground between these two habitats too. The low level form, depending on a moderately good monsoon rainfall is found in Bari forests. The high level type is dependent on a long type winter snowfall and is confined to the upper forest limits in the inner hills such as in UFChini - 15Kalpa Range.

2A.2.12:- 12 .C 2.a Kharsu Oak Forest (*Q. semecarpifolia*):- This type generally occurs between 2500-3300m particularly on southern aspects and scarps slopes. This type occurs in parts of Bhaba Nagar and Kalpa Ranges. In this type the dense Oak forests reach the bottom edge of the alpine pastures. On other exposures, this Oak descends down the valleys and the depressions and occurs as scattered trees. *Betula utilis* and *B. alnoides* are its associates in the second storey. Under dense pure stands of Kharsu oak, shade is so thick that no young green plants exist. Even the seedling of Kharsu do not survive under the shade. Kharsu regeneration can usually be observed on steep hillsides or near rocky ledges where the drainage is better and the sunlight finds entry at least from the side.

2A.2.12.1:-Under Kharsu oak, the bush growth is not dense in the lower Spruce forest, but there is a good deal of *Cotoneaster acuminata*, *Viburnum foetens*, *V. stellulatum*, *V. cotinifolium*, *Lonicera* spp, the herbaceous cover is usually coarse and consists of *Anaphalis triplinervis*, *Nepeta goviana*, and *Primula* spp.

2A.2.13:- 12.C.2.bWest Himalayan Upper Oak/Fir Forest:-This type occurs between 2600 and 3400m especially on northern aspect and sheltered sites. It lies above the mixed coniferous forests, too high for Deodar though Spruce may occur. The sites occupied are under snow for several months in the winter. Grassy meadows are typical and more extensive than in the lower zone and often join up in the alpine pasture above tree limits. A deep moist humus layer is usually present.

2A.2.13.1:-The herbaceous cover is usually coarse and consists of *Anaphalis* spp. *Iris* spp, *Saxifraga* spp, *Senecio* spp, etc. The common grasses are *Melica scaberrima* and *Pennisetum flaccidum* and the common climbers, namely *Vitis semicordata* and *Schizandra grandiflora*.

2A.2.14:- I.S.I Alder Forests:- These are found along the banks of the largest streams. The species occurs on newly formed single beds along the streams and on landslips, also a river banks with the often exposed in the flowing water. The altitudinal range is a wide one extending from the lower subtropical belt of about 1200m upwards through the middle and upper Oak is about 2700m. The woods are usually pure *Alnus nitida*. An underwood may not be present. Good example of this type are met with in Sholtu Khad and Melgad.

2A.2.15:- Himalayan Dry Temperate Forest:-This type is confined to Kalpa and part of Kilba ranges. Conifers Predominate, Deodar, Neoza Pine, *Juniperus macropoda* being most characteristic with Kail and occasionally Fir at higher elevation. Among the broad-leaved trees, characteristic xerophytic species such as *Fraxinus xanthoxyloides*, *Q. ilex* and *Olea ferruginea* occur, the trees being of poor height growth and occurring either scattered among the conifers or forming more or less small pure patches. Xerophytic shrubs such as *Daphne oleoides*, *Artemisia* spp, *Caragana* spp, and *Astragalus* spp, occur freely and form a continuous cover but more often have a good deal of the soil exposed. Epiphytes and climber hardly occur except some *Dioscorea deltoidea*.

2A.2.16:- 13. C. 1 Dry Broad Leaved and coniferous Forest (*Quercus ilex P. gerardiana*):- An open forest of pine rarely exceeding 16m in height mixed with evergreen oaks and few other xerophytic trees which together may form a fairly complete cover at least on sheltered sites and cool

aspects, but generally leave much of the soil exposed. There is fair amount of low shrub growth defiantly xerophytic and often aromatic, and thin grass. Locally the pine is absent and Oaks predominate.

2A.2.16.1:- This type is found in Kilba Range. The typical example can be seen below C-45 (a) and 45 (b), C-71 and C-152(a), 152 (B). This type occurs between 2000m and 2400m. exceeding 300m lower, on cool aspects and 300m. Higher southerly exposures. Upper story consists of *Pinus gerardiana*, *Cedrus deodara*, *Quercus ilex*, *Acer pentapomicum* etc. The second storey consists of *Fraxinus xanthoxyloides* and *Olea cuspidate* etc. Common shrubs are *Artemisia maritime*, *Avulgaris*, *Daphne oleoides* & *Lonicera angustifolia*. Grasses are *Argopyron longearistatum* & *Agrostis alba*.

2A.2.17:- 13. C. 2.a Neoza Pine Forest (*P.gerardiana*):-Neoza pine replaces the Chil pine near Wangtoo and continuous along the Sutlej as far as Kanam. Nearly pure crops, locally mixed with some Deodar are seen. The forests being open a great deal of the surface is bare. These are much frequented by the men for the collection of Neoza seed which has got a ready market. Upper storey consists of *Pinus gerardiana* and occasional *Cedrus deodara*. In the second storey *Fraxinus xanthoxyloides* is common. Among the shrubs *Artemisia maritima*, *Daphne oleoides*, *Ephedra gerardiana* & *Lonicera hypoleuca* are common.

“Neoza Pine”



2A.2.18:-13. C.2.b Dry Deodar Forest:-A nearly pure conifers forest, broad leaved tree being confined to the moist ravines. It varies from the complete canopied forests to very open forests of low branching trees depending upon moisture factors. The Deodar tends to be gregarious and forms nearly pure crops. On drier situation it is found mixed with *Pinus gerardiana* but open mixed crops are common especially in the moist and tract where the pine extend much higher up the slopes. Blue pine is frequently present and may occur pure over limited areas, especially at the higher elevations.

2A.2.18.1:- The under growth varies in type and density considerably in pure or mixed forests and also according to the dryness of the locality. Under pure or nearly pure Deodar in transitional zone, the common herbs and shrubs are *Plectranthus* spp, *Indigofera* spp, *Fragaria filicinus* and *Viola serpens* etc. When Kail is dominant, *Desmodium tiliacifolium*, *Asparagus filicinus* and *Salvia glutinosa* are more in evidence. This type is confined to Kalpa and a part of Kilba ranges. The forests is between 2100 and 3250m elevation.

2A.2.19:- 13. C.4 West Himalayan High Level Dry Blue Pine Forests (*P. wallichiana*):- This type is met with the higher altitude of Kilba and Kalpa Ranges. The blue pine replaces both the Kharsu Oak and the Silver Fir as the typical high level tree of the dry zone at high elevation of 3000m to 3600m. It extends as far toward the arid Tibetan uplands as Deodar does. Below this level pine occurs quite frequently as companion of Deodar, but its general tendency is to retreat uphill with increased aridity, depending more and more upon the long lying snow beds of the colder northern aspects for its moisture supply.

2A.2.19.1:- Silviculturally, this high level Blue Pine is quite different from the low level type, it forms very open stands on gentle slopes which hold snow well, while the low level prefers warm well drain ridges. Ecologically also the two types of blue pine were different. Low level Blue Pine is merely a seral phase in the reclothing of slopes from which the forest has been expelled by Fires and leading it back to climax forest type of Deodar. The high level Blue Pine on the other hand is a true climatic climax type for the very specialized conditions in which it grows, and there is no other species except scrub *Juniper* spp, which could take over its role on the arid tracts. Important trees and shrubs met with in this type are *Betula utilis*, *Juniperous communis*, *Potentilla eriocarpus*, *P. fruticosa*, *Pyrus foliolosa*, *Rhododendron anthopagon*, *A chesmanthum*, *Salix hastate*, Among the herbs, the common are *Aconitum heterophilum*, *A chesmanthum*, *Anaphalis* spp, *Anemone* spp, *Aster* spp, *Geranium* spp, *Nepata* spp, *Senecio* spp, etc

Pink Rhododendron.



2A.2.20:- West Himalayan Dry Juniper Forest (*J. macropoda*) :- It is a very open xerophytes formation which is met with in the innermost valley of the Sutlej bordering the Tibetan border. The annual perception is below 300mm with temperate touching 25° C during winter. The vegetation

consists of dwarf trailing shrubs such as *J. macropada*, *J pseudosabina*, *Caragana* spp, *Ephedra* spp, and *Artemisia* spp etc.

2A.2.21:- 14.C.1 b West Himalayan Sub alpine Forest:- This type occurs not as a continuous belt but in large irregular patches above 3050m. *Abies spectabilis* is found pure or mixed with *Betula utilis*. The examples can be seen on slopes of Kailas and above Rogi but it is seldom as common as the high level Blue Pine, which eventually displaces it altogether.

2A.2.22:-14.C.1b West Himalayan Sub-alpine Birch/Fir Forest:- This type occurs in large open and irregular patches above 3000m. elevation or so. The predominant conifers are *Abies spectabilis* and occasionally a few Kail. The crops are usually stunted with varying proportions of deciduous *Betula utilis*. Low *Rhododendron campanulatum* forms dense mat and Kharsu Oak shrubs sometimes extends into this type. Among the shrubby undergrowth *Juniperus macropada*, *Sorbus foliolos*, *Cotoneaster* spp, are common. The herbaceous undergrowth consists of *Primula aconitum* etc. Examples may be seen in the upper reaches of the Chaunda, Panwi, Melgad, Lishnam catchments.

2A.2.23:- Birch/Rhododendron Scrub Forest:- This type forms the upper limit of the alpine forest and occurs as patches of varied size in the sheltered sites and usually on northern and western aspects. This type forms a low evergreen forest almost entirely of species of *Rhododendron* but with some birch and other deciduous trees so dense as to make it difficult to penetrate, particularly in an up hill direction as owing to snow pressure, the stems all curve up from horizontal or downward bent base. The common shrubs are *Salix* spp, *Cotoneaster* spp, and herbs such as *Potentilla* spp, *Polygonum* spp, *Jurinea macrocephala* etc.

2A.2.24:-15.C.3 Alpine Pasture:- Extensive alpine pasture from a characteristic feature of the tract above the tree line. The limit of their altitudinal distribution between 3600-4500m elevations the upper limit extending even to the perpetual snow line. The slopes are usually gentle and bear a thick mat of alpine grasses. Large flocks of sheep and goat graze in these pastures May to September, the grasses remaining snow bound from November to April. The common herbs are *Perimula* spp, *Anemone* spp, *Iris* spp, *Gentiana* spp, and the common grasses are *Agropyron longearistatatum*, *A. semicostatatum*, *Brachypodium sylvaticum*, *Bromus asper*, *B. japonicus*, *Poa* spp., *Dactylis* spp, *Milium effusum* etc.

2A.2.3:- Status of Natural Regeneration:- Due to ban imposed on green felling, no green fellings were carried out during the period of the Working Plan under revision. Therefore, no regeneration survey was conducted as proposed in the Working Plan under revision.

2A.2.4 Injuries to which the Crop is Liable

The forests of this division are exposed to various injuries caused by climatic, fire, man, animal and birds, insects, fungi etc. and are described as under:-

- i) **Climatic injuries** It is caused by the extent of snow, by wind action, hail storms, lightening, frost and drought.
 - (a) **Snow:-** Due to heavy snow fall, breaking and uprooting of trees are quite common. The damage is more in conjoined pole and sapling crops.
 - (b) **Rain:-** Persistent rain causes land slips/slide which destroys large number of trees. Land slips where the land has been broken for cultivation on unsuitable formation. A large number of trees are uprooted due to land slips and erosion during the monsoon.

- (c) **Wind action and Hail Storms:-**Considerable wind damage in the form of uprooting and breaking of trees occur during October, November and March. Hail storms are common during April.
 - (d) **Lightning:-**Occasionally, individual trees are damaged due to lightning but the damage is insignificant. Only few trees are damaged annually by lightning.
 - (e) **Frost:-**Young seedling suffers in case of exceptional winter frost.
 - (f) **Drought:-**There is a drought period of two to three months before and after rains which causes mortality to a large number of seedlings in the afforested areas. It kills the seedling directly. On hot southern aspects, it can enhance chances of Fire damage considerably.
 - (g) **Avalanches:-** The damage from avalanches is very significant in C-138 (a), 138 (b), and 138 (c), C.148 and C.43 (a) and 43 (b) and they break and uproot trees and prevent any subsequent growth.
- ii) **Biotic Injuries** This factor is largely responsible for injuries to trees and forest crops. The various biotic factors are as follows :-
- Fires:-**The greatest damage to forests is due to fires. As per the latest report of forest survey of India, the proportion of forests areas prone to forest fires annually ranges from 33% in some states to over 90% in other. About 90% of the forest fire in India is created by humans. India witnessed the most severe forest fire in the recent time during the summer of 1995 in the hills of U.P. and H.P. The fires were severe and attracted the attention of whole Nation. In case of severe fire it is not possible to restore the original condition and new crop raised in the area is never as good as the one destroyed. Fires are caused accidentally as well as through incendiarism. Accidental fires due to lightening or carelessness and are not very common. Most of the fires are due to local incendiarism with the belief that the burning of forest areas improves the fodder resources by getting fresh grass and tender herbage.
1. Fire is most common of injury to the forest and has been responsible for huge losses of forest wealth in the past. Beside huge financial loss on account of destruction of timber and green trees in the forest, a large sum of money is required for restocking the burnt areas. Further the grazing value and soil fertility are destroyed. In case of several Fires, it is not possible to restore the original condition and new crop raised in the area is never as good as the one destroyed. The trees, which survive severe Fires, are unable to recover their original vitality and do not put on normal increment. Beside, doing incalculable damage to forest growth. Fires result in increased run-off and excessive erosion. In the forest areas burnt in Kaksthal Forest, the fertile soil has been washed away and its rehabilitation is a serious problem.
 2. The fires occur during the dry months of April, May and June and again in October and November in the wet zone. However, in the dry and arid zone of Kinnaur, Fires may occur any time between March and December. An analysis of causes of Fire would reveal that a large majority has originated from smoking, stubble burning, cooking of food and carrying of torches by the villagers. Shepherds included in carelessness which causes fires in the remote forests. Lack of supervision during Panwi burning has been the causes of several fires.
- (a) **Human:-**The injuries to the forest is also caused by human being as given below:-

- (i) **Lopping:-** Local people mostly indulge in lopping of trees for their bonafide use like fuel and fodder which makes the trees sufferer greatly on account of heavy and irregular lopping especially near the habitations and along the Satluj river where large flocks of sheep and goats are grazed during winter. Low level miscellaneous species like Aesculus, Morus, Ficus Celtis and Ban oak suffer greatly on account of heavy and irregular lopping, especially near the habitation and along the Satluj River where large flocks of sheep and goats are grazed during winter. Lopping of Neoza branches to collect cones from the trees which are often situated on difficult ground is another unhealthy practice. The extent of damage can be seen all along the Neoza growing areas during September /October. Large quantities of lops and tops can be seen lying scattered below Neoza trees. Other conifers are generally not lopped.
- (ii) **Cutting of Torchwood & Debarking of Walnut:-** The villagers do considerable damage to Deodar, Kail and Chil trees, by cutting deeply and scooping out the resinous torchwood from the basal portion of the trees. These damages are most severe near the villages. The roots and stems of walnut trees are also debarked by the villagers for cleaning the teeth which is also known as Dandasa in local dialect. Due to these cut injuries; the trees are exposed to insects and fungal attack.
- (iii) **Felling:-** Though incidence of illicit felling is not very high in this division but a few trees are some times cut illicitly by the villagers for their bonafide domestic use. Military and paramilitary camps situated in the interior also indulge in illicit felling of Neoza and broad leaved trees to meet their fuelwood requirement.
- (iv) **Encroachments:-** The encroachment of forest land for cultivation and other purposes continue to be the most pernicious practice endangering the forest resources throughout the country. The decisions of the State Government to regularize the encroachments from time to time have induced the people for further encroachments in the forest land and the problem remained as elusive as ever for want of effective and concerted action against this evil practice.
- (v) **Removal of Pine Needles:-** Local people collect fallen pine needles for their litter purposes. The excessive and continuous removal of the needles especially near the habitations makes the soil bare and thus exposes it to soil erosion and loss of fertility.
- (vi) **Exploitation refuse:-** Felling refuse left in the forests presents a great obstacle on getting natural regeneration. During the past many years when felling refuse was not disposed off, the loss sustained by the forests by way of absence of natural regeneration has been enormous. In Spruce and Fir Forests, where burning of the exploitation refuse is difficult, the accumulated refuse does not let natural regeneration come in at all.
- (vii) **Grass Cutting:-** Though, this practice is beneficial but the damage is only caused by inadvertent cutting of seedling during grass cutting operations.
- (viii) **Quarrying:-** There is little number of regular quarrying sites in this tract. But due to this action landslides are common and causes damage to the tree growth. Considerable damage has been caused by quarrying operations.
- (b) **Wild Animals:-** Birds & Wild animals also damage forest crop, but such damage is not so menacing. Monkeys and Langoors destroy the seed and uproot the young seedling. Flying squirrels destroy lot of conifer seed annually. The Himalayan nutcrackers eat the seed of pine cones. Pheasants also eat up the seeds from the polythene bags in the nursery of Deodar and Chil. Black bear also do considerable damage to the Deodar, Blue pine saplings

and poles by debarking and girdling. Bear also consume large quantities of Oak acorn, seeds of Horse chestnut and walnut etc. Percupines and Monkeys dig out young seedlings in the nurseries as well as in the plantations areas and eat roots. Flying squirrels consume unripe cones of Deodar, Kail and Chil and as such sizeable quantity of seed is destroyed. The birds and Lizards nip the young seedlings and eat fruit. Wood packers bore holes in the stems of standing trees. The damage done by the wild animals in the tract is limited and only occasional. Birds and pheasants eat away the Neoza seeds as the cones open. The rodents to heavy damage by burrowing holes and devouring the seed swon in the nurseries. The young seedlings are nipped off by birds and lizards.

(c) Damage by Insects:- There is no record available to indicate whether any serious damage occurs to forest trees by insects. The only insects known to do serious damage the Deodar cone moth *Cateremma cedrella*, the larvae of which attack Deodar cones and destroy seed. *Agrotis vosilon* kills young Deodar seedlings in nurseries. A noticeable pest of the Silver Fir is *Braxyxystus subsignatus* which causes the new shoots of the year to wither away turn yellow or orange and drop off. Bark boring beetles are occasionally met with and are associated with the death of young Deodar saplings.

(d) Fungi :- The following are the most fungi which attack on the plants in this tract:

- i) ***Heterobasidion annosum*:-** It has appeared in a few young Deodar forests in C-1 (a), 5(a), C-45 (a) and 45 (b), C-78(a) and 78 (b) etc. It is more to be feared in young crops in damp localities. The plants start drying from the top and die in a season or two.
- ii) ***Peridermium cedri*:-** It has been noticed in localized patches of Deodar in C-5(a). To begin with, the leading shoot is attacked and gradually the whole tree is killed. It causes witches brooms in the crown.
- iii) ***Barchayella deformans*:-** This fungus is sporadically found on the current years shoot of Spruce. It causes the characteristic orange tassels frequently seen in the spring. The diseased shoots are stunted and densely covered with covered needles on which the mass of orange and teleutospores appear. This fungus does not do much real harm.
- iv) ***Trametes pinii*:-** This causes significant damage to Kail in this division. The fungus causes decay mainly in the heart wood of Kail trees. The heart wood is stained light pink or brown or reddish, due to which the disease is known as 'red-rot'. *Trametes pinii* in fact, in Kail mainly attacks through trunk wounds caused during lopping which should be prohibited or controlled to minimize infection. In case of severe attack, the loss of timber is enormous. The lopping carried out during monsoon is more damaging because the infection spreads during these months therefore, the lopping that too silviculturally should be done during winter or spring seasons only.
- v) ***Fomes annosus*:-** It attacks deodar poles through the roots in badly drained soil and results in their death. The Deodar root fungus has very occasionally killed individual saplings and poles in pure Deodar crops. The damage due to this fungus is not appreciable and only sporadic casualties have been noticed in this division. As the fungus is soil borne, digging of trench around infected groups of poles, uprooting and burning the infected material will be helpful in controlling this fungus. *Peridermium cedri* a needle fungus causes witches broom and kills trees by attacking leading

shoots. *Fugarium* species causes “dumping off” of the seedling on the wet sites. Other fungi are not of much consequence except for termite pinii.

- vi) ***Peridermium companulatum* & *P. brebis***: These fungi attack the needles of Chil and Kail respectively and kill them. Slight attack of these has been sporadically noticed in some Chil and Kail forests.
- vii) ***Fusarium* species**: It attacks the roots of young deodar seedlings which consequently damp off. Bad drainage & poor aeration are the main causes of this disease. Deodar should, therefore, always be grown in well drained soils. Besides this, damping off in conifer seedlings is also caused by *Pythium*, *Rhizoctonia* & *Phytophthora* spp.
- viii) In the recent years it has been observed that the foliage of *Cedrus deodara* trees in Kalpa Forest Range was covered by black fungal mass. The Divisional Forest Officer Kinnaur had requested the Himalayan Forest Research Institute Shimla to investigate the problem and to suggest the remedial measures. Accordingly team of scientist / researchers of HFRI Shimla visited the affected site of Kalpa Range during August, 2019 and observed that the problem have gained momentum during 2-3 years back, particularly in ten compartments (C-138, C-143, C-144, C-145, C-146, C-147, C-148, C-149 a & b and C-151). The infected compartments contain *Cedrus deodara* as principal species with scattered trees of *Pinus wallichiana*, *Pinus gerardiana*, *Prunus armeniaca* and *Prunus cerasoites*. After intensive survey of affected site, the scientist of HFRI has finally submitted their report during September 2019 which is annexed as **Appendix No.XLIV**. The DFO Kinnaur should take necessary steps to take preventive measure as suggested by the scientists of HFRI Shimla in **Appendix No.XLIV**.

(e) **Climbers**:-There are mainly three climbers namely *Vitis semecodate*, *Rosa moschata* and *Hydra helix* which are most common and are commonly found in Deodar and Kail Forests. These climbers if not removed have been seen to be damaging young plants by suppression.

CHAPTER-II B FLORA AND FAUNA

Chapter II B – Forest Fauna:-

2B.1 Introduction:- India is recognized as one of eighteen mega diverse countries and has four identified bio-hotspots. They are the Himalayas hotspots which have diverse eco-systems ranging from alluvial grass lands, sub-tropical broad leaf forests to alpine meadows. Second hotspot in India is in the North East of India and part of Indo-Burma comprising an aggregate of 2 million Km². The third hotspot is in the rain forests of the Western Ghats and is home to a rich endemic assemblage of plants, reptiles and amphibians. Fourth, the Andaman & Nicobar Island chain forms the biological hotspot in India that is closely allied on the Sundaland hotspot of South East Asia. It is home to 7.6% of all mammalian, 12.6% of all avian, 6.2% of all reptilian, 4.4% of all amphibian, 11.7% of all fish, and 6.0% of all flowering plant species. This diversity becomes even more remarkable given that ***our country, with only 2.4 percent of the total land area of the world, contributes 8 per cent to the known global biological diversity, while also being the second largest populous nation in the world, with over 1.2 billion people.*** It is this unique diversity that the people of India hold in great esteem, are very proud of and have strong cultural and social bonds with.

This deep rooted historical and cultural association with wildlife is central to India and its people. In modern times, burgeoning human population and the consequent exploitation of land and forest resources along with hunting and trapping for trade, food and sport has threatened the survival of many species - from charismatic and well known species to many other lesser known animals and plants whose status is harder to determine.

Post Independence, there has been a growing concern about the decline of wildlife populations and the necessity of conservation and preservation of India's wildlife. This led to the enactment of the Wildlife (Protection) Act, 1972. By an amendment in 2003, the objective of the WLPA, reads as follows, ***“An Act to provide for the protection of wild animals, birds, plants and for matters connected therewith or ancillary and incidental thereto with a view to ensuring the ecological and environmental security of the country.”***

Thus, wildlife conservation is acknowledged as integral part to ecological and environmental security of our country, rather than being limited to conservation of certain species of plants, animals and birds or their habitats.

(a) Mammals:- A variety of fauna is found in the tract due to variation in altitudes, topography, climate and vegetation. The important fauna is Leopard or Panther (*Panthera pardus*), Snow Leopard (*Panthera uncia*), Himalayan Black Bear (*Selenarctos tibetanus*), Brown Bear (*Ursus arctos*), Jungle Cat (*Felis chaus*), Leopard Cat (*Felis bengalensis*), Himalayan Pine Marten (*Martes flavigula*), Jackal (*Canis aureus*), Red Fox (*Vulpes vulpes*), Goral (*Neomorhaedus goral*), Blue Sheep (*Pseudois nayaur*), Ibex (*Capra ibex*), Musk Deer (*Moschus moschiferus*), Barking Deer (*Muntiacus muntjak*), Indian Wild Bear (*Ursus corbula*), Monkey (*Macaca mulatta*), Langurs (*Presbytis entellus*), The Giant Indian Flying Squirrel (*Etaurista petaurista*), Indian Hare (*Lepus nigricollis*) etc.

Blue Sheep (*Pseudois nayaur*)



(b) **Birds and Pheasants:-**Himalayan Griffon Vulture (*Gyps himalayensis*), Golden Eagle (*Aquila chrysaetos*), Monal (*Lophophorus impeyanus*), **Snowcock** (*Tetraogallus himalayensis*) Chakor (*Electors chukor*), Koklas (*Pucrasia macrolopha*), Kaleej Pheasant (*Lophugs leucomelana*), Western Tragopan (*Tragopan melanocephalus*), Wood Cock (*Scolopax rusticola*) etc.

(c) **Reptiles:-**Himalayan Pit Viper (*Ancistrodous Himalayanus*), Common Indian Krait (*Bungarus Caerules*), Rat Snake (*Plyas mucosus*), Common Indian Monitor (*Varanus Monitor*), Rock Lizard (*Agama Tuberculata*), Blood Sucker (*Techydrmous Spp.*) etc.

(d) **Fishes:-**Trout Fish (*Oncorhynchus mykiss*), Mahseer Fish (*Tor chelynoides*).

2B.2 Injuries to which the Fauna is Liable:- The fauna of the tract is decreasing due to reduction of the habitat as a result of ongoing development activities. The biggest enemy of wildlife is man himself. The other hazards to the fauna are epidemics, atmospheric influences, animals and fires. The need of growing population is the cause of animal-human conflict. The normal living conditions of the wildlife are disturbed which is a matter of concern. The following are the hazardous influences threatening the wild life:-

i) **Habitat Destruction:-**The extraction of many species is often associated with the denudation of their natural habitats, owing to ever increasing biotic pressure forestry operations, and development activities like construction of roads and buildings etc. taking place in the natural habitats of wildlife. Roads restrict the movement of fauna. Corridors connecting two vegetation zones gradually vanish due to various developmental activities, which again restrict the movement of Wildlife especially bigger herbivores. The shrinkage of corridors has resulted in the confinement of these herbivores in a particular territory, which was not so in the past. The fragmentation of the Forests has also been causing problems to the avian fauna, mega carnivores and lesser carnivores.

Crop raiding and human casualties due to the attack of Wild Bear, macaques, leopards, etc are the main consequences which villages are experiencing.

ii) Environmental and Ecological Factors:-Environmental factors are food, water and shelter, which are most important components in a habitat. The shortage of the above components is often associated with the habitat destruction. Plant life, upon which animal subsist has an important role in the well being of the animals. Where grazing has been a real problem, the available food has to be shared by the wild fauna and cattle population.

Water is another component which determines the existence of fauna. Water source in the wild are also competed upon by cattle population and wild fauna. Ecological factors like temperature, humidity, etc also affect animal life. Seasonal variations of weather such as severe drought can have marked effect on wildlife. Humidity also has an effect on the loss of moisture from the body of certain animals.

iii) Fires:-Fires play havoc with wildlife. The wild animals get trapped in fire and killed, most susceptible are the young ones. Fires destroy eggs, micro-fauna and nests. There is considerable loss of habitat too.

iv) Epidemics:-Epidemics amongst the wildlife is not a common feature, yet deer and antelopes are susceptible to diseases being transmitted through domestic cattle grazing freely in forest.

v) Atmospheric Influences:-The adult are seldom affected by the climatic disturbance but the young once suffer casualties mostly from frost. The hatching of birds is badly affected by heavy rains. Drought reduces the water sources and threat to wildlife increases.

vi) Hunting/Poaching:-In spite of complete ban on hunting, the stray incidences of hunting wild animals do take place particularly, when the animals migrate to lower elevations due to unfavourable conditions. The damage to orchards and agriculture crops prompts local people to resort to hunting.

vii) Climatic Conditions:-Sometimes the adverse climatic conditions like heavy rains, heavy snow, and prolonged drought affect the wild animals particularly the young ones.

viii) Disease Transmission:-Epidemics constitute one of the main factors for the depletion of our fauna. Very little work has been done on the detection and treatment of wildlife diseases in Himachal Pradesh. The diagnosis of wild animals is very difficult but nevertheless, extremely important. Several communicable diseases of bacterial, viral and protozoan origins occur among wildlife, Wildlife and domestic cattle suffer from almost similar diseases and the chance of transmission is extremely high one such example is Foot & Mouth disease.

2B.3 Protection of Fauna:- Following are the measures for protection of fauna:-

- (i) Wildlife (Protection) Act, 1972 prohibits shooting and hunting of wild animals and trade in Animal articles and trophies. All the statutory provisions and regulatory measures of the Act should be enforced strictly.
- (ii) There are enough perennial streams and springs in the area and water shortage is not a major problem. Grazing by local animals however needs to be controlled/regulated so that the herbivores get enough food especially in lean months.
- (iii) Fires in summers in some localities and majority in winters (due to negligent panwi burning) cause considerable damage to the existing wildlife. Therefore, effective fire protection measures and control of fires will help to a great extent in protection of wildlife.
- (iv) Notice boards having useful information and restrictions should be displayed at prominent place. These should be in Hindi/English.

- (v) Cases of cattle damage by leopard, other carnivores and bear are often reported in the tract. This is due to shortage of natural prey in their habitats. Although compensation is paid for the losses, yet it is insufficient to cover the complete loss. Effort should be made to provide timely compensation.
- (vi) Beers and porcupine cause damage to the agriculture fields. There is no compensation for such damage; people are often tempted to do away with the damaging animals. A suitable crop compensation policy/ crop insurance scheme is likely to be helpful to people. Therefore, the Government should frame a policy for addressing the problem of crop damage by wild life on priority as applicable in the other States in India.
- (vii) Spreading of the message of awareness and conservation can have good results. In this context, celebration of wildlife week, organizing Eco-clubs in schools and colleges and involvement of N.G.O.'s is called for. The ultimate aim should be the involvement of local population in conservation of biological diversity.
- (viii) Renewal of existing arms licenses & grant of new ones to be done judiciously subject to condition that arms will be deposited with the Police Department especially in winter season in every year on set of harvesting of crops to avoid any misuse of gun/arms under the provision of Wildlife (Protection) Act, 1972.
- (ix) Adequate patrolling staff particularly of Fgds in fields is must for the protection of wildlife.

CHAPTER III

UTILIZATION OF THE FOREST PRODUCE

3.1 Agricultural Customs and Wants of the Population:- Forest in mountains constitutes the prime source of fodder and grass for cattle, fuel wood, fertilizer, fiber and a host of other produce. About 90% of the total population of the State is rural and is dependent on forest, for meeting their needs of fuel wood for cooking and heating purposes. In Himachal Pradesh, the domestic needs of timber for construction of houses are also met from the forests through the inherent TD rights. Branches of trees are also lopped for sporting of vegetable crops. Leaves of trees including needles of pine constitute the bedding material for the animals during winter and rainy seasons. Majority of rural population is used to zero cost fire wood from forests and most of them do not have resources to buy fuel. Prior to the imposition of moratorium on green felling State Forest Department was harvesting wood from its forest for packaging of apple and vegetables. This demand had grown to 0.3 million m³ and out of which, more than 40% constituted the official supplies. This mounted tremendous pressure on the State Forest both in terms of physical volume extracted and the financial burden due to subsidized process that was charged.

People of the tract depend upon forests for timber, chilgoza & other forest produce. The population is largely rural villages are widely scattered and are mostly situated in a belt of cultivation, which runs along slopes on the cool left bank of the River Sutlej at about 1800m to 2150m. On the more arid southern exposures in the right bank the cultivation is less regular and is generally confined to elevation of about 2400 to 2750m. The land holdings are small, un-economic and are mostly located outside of their habitations which is popularly known as Kandas. The area is not self sufficient in agricultural commodities, however, horticulture has picked up very well in Kinnaur Forest Division. The main vocation of the inhabitants is agriculture, horticulture and rearing of sheep and goat for the production for the wool for domestic requirements and for trade. The human population of the tract is generally dependent on forest for meeting requirement of timber, agricultural implements, fuel wood, minor forest produce and grasses etc. With the increase of population the requirement of timber has increased whereas the carrying capacity of the forests to meet the requirements has decreased considerably. Therefore, dependence of agriculture/horticulture on the forests should be clearly brought out.

The agriculture is generally primitive. Very steep slopes are being cultivated without proper terracing which not only results in poor agriculture crops, but also increases soil erosion. The main agriculture crops of the tract are *Wheat, Barely, Potato, Kodra, Mash, Phapra, Ogla, and Chulai*. Some progressive farmers go for vegetable cash crops particularly peas, tomatoes and cabbage.

Horticulture has gained tremendous popularity in the past two decades and the main crop being cultivated is apple. Apple is being cultivated in all parts of the tract including the dry and the arid zones. The local, stone fruit bearing trees like *Chuli* and *Behmi* have been removed to make way for raising apple orchards and *Badam* orchards. The poor and landless have taken nautiland to raise orchards

Gorrie, (1930) has mentioned that the practice of breaking up the land in the kandas (alpine zone) after clearing large areas of Spruce and Fir forests at 2900 to 3350m commenced near about the year 1916, but local inquiries revealed that such cultivation has been practiced even since the historical times. The practice is still in vogue. Cash crops like peas and potatoes are being raised as also other millets and grains. It is, however, undisputed that it is a harmful practice as besides reducing that areas under forests and alpine pastures, it renders the land subjected to heavy soil-wash.

People depend on forest for timber and other forest produce. The land holdings are small and uneconomic. The yields are low. The area is not sufficient in agriculture commodities and large quantities of food grains are brought from the plains. However, horticulture has picked up very well in small areas and *Apple*, *Rajmah* and *Peas* are the main crops. The income from agriculture and rearing of goats and sheep requires to be supplemented by income from forest work. Except in areas where development work provides employments, the people mainly depend on forest work to supplement their requirement of agriculture implements, fuel, grazing, grass, fodder leaves, fallen leaves for manure, building stone, torchwood, various medicinal herbs, fruits etc. The rights are recorded in the Forest settlement in respect of demarcated protected forest and un-demarcated protected forests.

The type of houses built in the locality and the requirement of timber, agricultural implements, fuel, fodder, fallen leaves for manure, stones and slates for building construction etc. should be discussed so as to lead to some logical arrangements for meeting all the legitimate requirements of the local population. Timber is granted to right holders for bonafide domestic and agricultural use. The annual quantity of timber given to right holders on right holder rates and free grant during the period 1999-2000 to 2018-19 is given in *Table No. 1.7 Chapter 1 of Part-I*.

Supplementary income of people has significantly improved through a variety of development works undertaken by different Govt. agencies / Projects over the past. As a result of improvement in economy of the tract standard of living of general masses have improved. Majority of the people now live in properly designed pucca houses instead of their old traditional houses, the roof of which used to be covered with the bark of Bhoj Patra (*Betula alnoides*) and mud. Education is spreading. Mechanization of agriculture is also coming in though at a slow pace. The tables below give the statistics of human population on the basis of census for the year **2011** and sub division wise population in District Kinnaur along with the cattle population is tabulated in Table No. 3.1, 3.2 and 3.3 respectively.

Table-3.1

Human Population in Kinnaur Forest Division (Kalpa Pooh Nichar Sub Division)										
Sr. No.	Census year	Total Population		Total	Decadal Population Growth 2001-2011		Total	Percentage		Total
		Male	Female		Male	Female		Male	Female	
1	2011	46,249	37,872	84,121	4 076	1 711	5787	9.66	4.73	7.39

(Source:- District Census Handbook – 2011 Kinnaur)

Table-3.2

Sub Division wise Total Population						
Name of Sub Division / CD Block	Total Rural / Urban	Area in Square Kilometer	Number of House hold	Total Population		Total Persons
				Male	Female	
Pooh	Rural	3383.79	5471	12474	10732	23206
	Urban	0	0	0	0	0
	Total	3383.79	5471	12474	10732	23206
Kalpa	Rural	1673.08	7824	18312	14920	33232
	Urban	0	0	0	0	0
	Total	1673.08	7824	18312	14920	33232
Nichar	Rural	1186.21	6681	15463	12220	27683
	Urban	0	0	0	0	0
	Total	1186.21	6681	15463	12220	27683
	G Total	6243.08	19976	46249	37872	84121

(Source:- District Census Handbook – 2011 Kinnaur)

Table-3.3

Live Stock Population in Kinnaur Forest Division

CATTLE / Name of Animals (In Number)															
Exotic / Crossbred			Indigenous			Total Cattle			Sheep			Goat	Donkey	Mule	Total
									Exotic / Crossbred	Indigenous	Total				
Male	Female	Total	Male	Female	Total	Male	Female	Total							
1349	10622	11971	2384	7202	9586	3733	17824	21557	32461	34146	66607	33229	2918	620	103374

(Source:- Live Stock Census – 2012 Kinnaur District)

3.2 Markets and Marketable Produce:- There is little local market for the forest produce, the demand of the local people being met mostly through exercise of rights. Forest produce is, therefore, carried to the plains for sale.

The primary marketable products of this division are timber, NTFP, fuel wood etc. The commercial exploitation of the forests has been transferred to the Himachal Pradesh State Forest Development Corporation Ltd. since 1982, when the H.P. Forest Produce (Regulation of Trade) Act, 1982 came into force and since then all commercial exploitation is being executed through the HPSFDC Ltd.

Medicinal herbs and fruits from the forests are collected by the right holders for their own domestic use and the local people sell the medicinal herbs collected seasonally as per prescribed four years cycle discussed in detail in Chapter VIII, NTFP (Overlapping) Working circle.

3.3 Demand and Supply of Forest Produce:-

3.3.1 Timber:- The demand of almost all forest produce is ever increasing and it definitely has huge pressure on forests. Although the state has imposed ban on green felling yet meeting requirements of the people is a challenge. All the forest produce like timber, fuel wood, NTFP are

in great demand. The supply of timber requirement for construction/repair of houses has gone over 10 to 15 crores whereas it was 60-70 lac in 1985-86. The yield position of PB-II, PB-III is on plus side in both Deodar-Kail Wet zone and Deodar-Kail Dry zone.

The major marketable Forest produce is coniferous Timber viz Deodar and Kail. The harvesting is being done by the H.P.State Forest Corporation Limited. The Timber of various species removed (standing volume) from the tract is given in the Table No. 4.1. in Chapter IV.

3.3.2 Fuel wood and Charcoal:-With the increase in population, military and paramilitary activities and construction of Hydro Electric Projects like Nathpa-Jakhri, Karchham Wangtoo, Shongthong Karchham, Kashang, and Baspa StageII etc, the demand for firewood and charcoal has increased manifold. People have recorded rights for collection of dry and fallen wood from the neighboring forests. The situation of firewood is satisfactory in Nichar Sub Division (Civil), Kalpa Sub Division (Civil) but in dry and arid zones Pooh Sub Division (Civil) is precarious. There exists acute shortage of fuelwood for both right holders and non-right holders. At present the HPSFDC Ltd supplies fuelwood to fuelwood depot of the Forest Department which is being sold at government fixed rates. The transportation costs are being subsidized. There exist no Ban Oak forests or other scrub forests which could be exploited for preparation of fuelwood/charcoal from the commercial point of view. The quantity of fuelwood supplied, sold and amount realized from the various depots of Kinnaur Forest Division viz Reckong Peo, Spillo, Pooh, Leo, Malling, and Chang for the eleven years (w.e.f. 2007-08 to 2017-18) is tabulated in Table number 3.4.

Table No.3.4.

Quantity of Fuel Wood Supplied, Sold & Amount Realized					
Sr. NO.	Year	Name of Division	Quantity of Fuel Wood Supplied	Quantity of Fuel Wood Sold	Amount Realized
1	2007-08	Kinnaur	13928.75	7352.76	2368629
2	2008-09		14703.83	6520.27	2770454
3	2009-10		17985.41	6934.41	2913245
4	2010-11		16353.15	5026.16	2225888
5	2011-12		19056.09	7247.42	3327015
6	2012-13		22037.56	1184.13	4939238
7	2013-14		19512.24	1959.64	5499114
8	2014-15		14512.36	7515.36	3612437
9	2015-16		19251.99	11129.76	5513073
10	2016-17		50510.3	10677.62	5080705
11	2017-18		18076.59	9184.91	6179569

The estimated requirement of fuel wood in the division is estimated to be 15000 and 18000 quintals respectively for domestic use only. The LPG has, significantly, reduced the requirement of fuel wood but the villagers enjoy privilege of getting free fuel wood from forest and very often resort to heavy lopping of Conifers, Broad leave trees and stripping of bark of Oak trees. Indiscriminate felling of Neoza, Bray in the past has left little scope to fell more trees. This is the main source of fuel wood and charcoal in the tract.

3.3.3 Fuel wood Requirement:- People depend on fuelwood for cooking and heating in this region. The average per head consumption of fuelwood in rural areas has been assessed by the Forest – Survey of India (NZ) Shimla. According to the survey the annual consumption of fuel wood/ head is 11.39 qtls. Out of which 9.26 qtls. is procured from Government forests and 2.13 qtls. from private lands. Besides this agriculture waste and LPG gas are also used. Subsidy on LPG should be increased so that pressure on Government Forest can be reduced. The requirement of Fuel wood to be met with from Govt. forests is tabulated in the Table No.3.5.

Table No.3.5

Year	Population	Average requirement of Fuel wood to be met with from Govt. forests
2011 census	84121	13500 to 13700 Quintals

3.3.4 Forest Grazing and Fodder requirement:- Large number of un economic and poor bred domestic cattle are kept for farm work as well as manuring purposes. Stall feeding is still little known in the tract. The villagers depend for their grazing requirements upon the forest resources only. Hay (locally known as Pulang / Walang) has got to be started in the upper belt for their winter requirements where the area is under snow cover. Un-restricted grazing is practiced in all the forests. The cattle are left loose throughout the day and they wonder all over in the neighboring forests in search of fodder. Pressure of grazing near thickly populated villages is very heavy. The cattle population of the tract is tabulated in the Table No .3.6.

**Table No.3.6
Cattle Population**

Name of Animals/Number															
Yak	Mithun	Sheep			Goat	Horse & Ponies	Mule	Donkey	Camel	Pig					
		Exotic / Crossbred	Indigenous	Total						Exotic / Crossbred	Indigenous	Total	Total Live Stock	Rabbit	Dogs
225	72	32461	34146	66607	33229	582	620	2918	12	0	35	35	125857	29	3210

(Source:- Live Stock Census – 2012 Kinnaur District)

In erstwhile Bushahar State, the areas of the demarcated protected forests are generally open to grazing by right holders cattle, sheep and goats. Divisional Forest Officer, however, has the power of closing and fencing areas as he may consider necessary in the interest of Forest conservancy. The right of grazing admitted is too liberal. The number of cattle to be grazed is not fixed. Un-demarcated forests areas adjoining villages are very heavily grazed.

3.3.5 Fodder Requirement:- In Nichar and Kalpa Sub Division, the local inhabitants generally graze their cattle in Kandas beside stall feeding. In Pooh Sub Division, the people mostly resort to stall feeding and are dependent on purchased grass which they bring from District Shimla and outer Seraj area of District Kullu.

3.4 Medicinal Herbs/NTFP:- Medicinal herbs and fruits from the forests are collected by the local people for their own domestic use and for sale in the market.

The detail of NTFP being exported from Kinnaur Forest Division under approved four year cycle is tabulated in Table No:- 3.7.

Table 3.7

Detail of NTFP Exported from Kinnaur Forest Division							
Year	Name of Panchayat	Name of Species	Scientific Name	Quantity exported (in Qtl.)	Royalty realized (in Rs.)	Export permits fees (in Rs.)	Total Revenue (in Rs.)
1999-00		Guchhi	<i>Morchela esculentum</i>	97 Kg.	9700/-	25/-	9725/-
		Neoza	<i>P. gerardiana</i>	723Qtl.	0	700/-	700/-
		Deodar cones	<i>Cedrus deodara</i>	80 Qtl.	12000/-	25/-	12025/-
		Dhoop	<i>J. macrocephala</i>	21 Qtl.	10500/-	50/-	10550/-
		Karoo	<i>Saussurea costus</i>	4 Qtl.	4000/-	25/-	4025/-
		Revan chini	<i>Rheum spp.</i>	29 Qtl.	12740/-	25/-	12765/-
		Nithouni	<i>Valeriana spp.</i>	2 Qtl.			
		Chora	<i>Angelica glauca</i>	6 Qtl.	900/-	25/-	925/-
		Dori	<i>Potentilla nepalensis</i>	20 Qtl.	7330/-	25/-	7355/-
		Seski	<i>Artemisiabrevifolia</i>	13 Qtl.	6500/-	0	6500/-
2000-01		Dhoop	<i>Jurinea macrocephala</i>	36 Qtl.	18000/-	50/-	18050/-
		Revan chini	<i>Rheum spp.</i>	35 Qtl.	31700/-	25/-	31725/-
		Dori	<i>Potentilla nepalensis</i>	40 Qtl.			
		Somlata	<i>Ephedra gerardiana</i>	449.5 Qtl.	22500/-	75/-	22575/-
		Buch	<i>Iris germanica</i>	30 Qtl.	3900/-	25/-	3925/-
		Kuth	<i>Saussurea lapa</i>	50 Qtl.	0	25/-	25/-
		Neoza	<i>P. gerardiana</i>	330 Qtl.	400/-	25/-	425/-
2001-02		Dhoop	<i>Jurinea macrocephala</i>	53 Qtl.	26540/-	50/-	26590/-
		Neoza	<i>P. gerardiana</i>	293.97 Qtl.	0	525/-	525/-
		Buch	<i>Iris germanica</i>	8 Qtl.	0	25/-	25/-
2002-03		Kuth	<i>Saussurea lapa</i>	26 Qtl.	0	25/-	25/-
		Deodar cones	<i>Cedrus deodara</i>	145 Qtl.	21750/-	75/-	21825/-
		Neoza	<i>P. gerardiana</i>	669 Qtl.	0	825/-	825/-
		Somlata	<i>Ephedra gerardiana</i>	60 Qtl.	3000/-	25/-	3025/-
2003-04		Somlata	<i>Ephedra gerardiana</i>	638.03 Qtl.	31927/-	225/-	32152/-
		Neoza	<i>P. gerardiana</i>	720.95 Qtl.	0	700/-	700/-
2004-05		Kuth	<i>Saussurea costus</i>	60 Qtl.	0	25/-	25/-
		Kashmiri Patta	<i>Rhododendron campanulatum</i>	25 Qtl.	6510/-	0	6510/-

		Mitha Telia	<i>Aconitum violaceum</i>	5 Qtl.	2500/-	0	2500/-
		Somlata	<i>Ephedra gerardiana</i>	115 Qtl.	5750/-	50/-	5800/-
		Neoza	<i>P. gerardiana</i>	970.83 Qtl.	0	875/-	875/-
2005-06		Revan Chini	<i>Rheum spp.</i>	5 Qtl.	550/-	0	550/-
		Kuth		12 Qtl.	0	25/-	25/-
		Neoza	<i>P. gerardiana</i>	96.1 Qtl.	0	100/-	100/-
2006-07		Somlata	<i>Saussurea costus</i>	300 Qtl.	15000/-	25/-	15025/-
		Neoza	<i>P. gerardiana</i>	1102 Qtl.	0	725/-	725/-
		Kuth	<i>Saussurea costus</i>	47 Qtl.	0	75/-	75/-
2007-08		Somlata	<i>Ephedra gerardiana</i>	260 Qtl.	13000/-	75/-	13075/-
		Neoza	<i>P. gerardiana</i>	597 Qtl.	0	425/-	425/-
2008-09		Kuth	<i>Saussurea costus</i>	22 Qtl.	0	125/-	125/-
		Neoza	<i>P. gerardiana</i>	434 Qtl.	0	1275/-	1275/-
		Somlata	<i>Ephedra gerardiana</i>	270 Qtl.	13500/-	50/-	13550/-
2009-10		Neoza	<i>P. gerardiana</i>	480.5 Qtl.	0	400/-	400/-
		Chukhri		40 Qtl.	4400/-	25/-	4425/-
2010-11		Neoza	<i>P. gerardiana</i>	167 Qtl.	0	200/-	200/-
		Somlata	<i>Ephedra gerardiana</i>	240 Qtl.	12000/-	50/-	12050/-
		Guchhi	<i>Morchela esculenta</i>	50 Qtl.	5000/-	25/-	5025/-
2011-12		Guchhi	<i>Morchela esculenta</i>	44 Kg	4400/-	50/-	4450/-
		Neoza	<i>P. gerardiana</i>	226.49 Qtl.	0	250/-	250/-
		Kuth	<i>Saussurea costus</i>	20 Qtl.	0	25/-	25/-
2012-13		Guchhi	<i>Morchela esculenta</i>	20 Kg	2000/-	50/-	2050/-
		Neoza	<i>Pinus gerardiana</i>	331.47 Qtl.	0	275/-	275/-
		Somlata	<i>Ephedra gerardiana</i>	101 Qtl.	5050/-	25/-	5075/-
2013-14		Guchhi	<i>Morchela esculenta</i>	8 Kg.	800/-	25/-	825/-
		Neoza	<i>Pinus gerardiana</i>	205 Qtl.	0	200/-	200/-
		Marigold grass	<i>Bidens spp.</i>	70 Qtl.	0	25/-	25/-
2014-15		Neoza	<i>Pinus gerardiana</i>	71 Qtl.	46000/-	75/-	46075/-
		Kuth	<i>Saussurea costus</i>	60 Qtl.	0	25/-	25/-
		Guchhi	<i>Morchela esculenta</i>	16 Kg.	1600/-	50/-	1650/-
		Karoo	<i>Picrorhiza kurroa</i>	55.48 Qtl.	55480/-	50/-	55530/-

		Dhoop	<i>Jurinea macrocephala</i>	2 Qtl.	1000/-	50/-	1050/-
		Nag chhatri	<i>Trillidium govanianum</i>	2 Qtl.	16000/-	25/-	16025/-
		Marigold grass	<i>Bidens spp.</i>	75 Qtl.	0	25/-	25/-
		Somlata	<i>Ephedra gerardiana</i>	30 Qtl.	6000/-	25/-	6025/-
2015-16		Guchhi	<i>Morchela Spp.</i>	1.05 Qtl.	10500/-	50/-	10550/-
		Karoo	<i>Picrorhiza kurroa</i>	31.9 Qtl.	31900/-	75/-	31975/-
		Somlata	<i>Ephedra gerardiana</i>	280 Qtl.	56000/-	75/-	56075/-
		Kuth	<i>Saussurea costus</i>	12 Qtl.	0	25/-	25/-
		Dhoop	<i>Jurinea macrocephala</i>	214 Qtl.	107000/-	200/-	107200/-
		Nag chhatri	<i>Trillidium govanianum</i>	4.31 Qtl.	34480/-	25/-	34505/-
		Neoza	<i>P. gerardiana</i>	211.51Qtl.	211510/-	425/-	211935/-
2016-17		Kuth	<i>Saussurea costus</i>	31 Qtl.	9300/-	75/-	9375/-
		Guchhi	<i>Morchela esculenta</i>	90Kg	9000/-	25/-	9025/-
		Dhoop	<i>Jurinea macrocephala</i>	89Qtl.	44500/-	75/-	44575/-
		Batter patta	<i>Juniperus recurval</i>	8 Qtl.	1200/-	25/-	1225/-
		Mushak bala	<i>Valeriana Spp.</i>	3 Qtl.	1800/-	25/-	1825/-
		Mehndi	<i>Lichens</i>	10 Qtl.	5000/-	25/-	5025/-
		Somlata	<i>Ephedra gerardiana</i>	15 Qtl.	3000/-	25/-	3025/-
		Neoza	<i>P. gerardiana</i>	6 Qtl.	6000/-	25/-	6025/-
		Karoo	<i>Picrorhiza kurroa</i>	48 Qtl.	48000/-	125/-	48125/-
2017-18		Mehndi	<i>Lichens</i>	14	7025	125/-	32125/-
		Mehndi	<i>Lichens</i>	15	7525	175/-	44175/-
		Karoo	<i>Picrorhiza Kurroa</i>	4	4025	175/-	69675/-
		Dhoop	<i>Jurinea Macrocephala</i>	30	20025	150/-	33150/-
		Nag Chatri	<i>Trillidium govanianum</i>	5	40025	25/-	43225/-
		Guchhi	<i>Norchella esculenta</i>	0.6	6025	150/-	35150/-
		Guchhi	<i>Norchella esculenta</i>	0.7	7025	150/-	37950/-
		Kuth	<i>Saussurea costus</i>	50	1525	25/-	4525/-
		Karoo	<i>Picrorhiza Kurroa</i>	11	11125	25/-	3025/-
		Dhoop	<i>Jurinea Macrocephala</i>	30	15025	100/-	52100/-
		Karoo	<i>Picrorhiza Kurroa</i>	3	5775	175/-	84675/-
		Ban Kakri	<i>Podophllum hezandrum</i>	11	2750	50/-	13550/-
		Mehndi	<i>Lichens</i>	10	5125	25/-	4525/-

		Dhoop	<i>Jurinea macrocephala</i>	45	22525	50/-	2950/-
		Neoza	<i>Pinus gerardiana</i>	5	5125	100/-	22100/-
		Neoza	<i>Pinus gerardiana</i>	10	10025	0	3200/-
		Kuth	<i>Saussurea</i>	15	4525	50/-	22050/-
		Neoza	<i>Ponusgerardiana</i>	5	5025	0	4375/-
		Neoza	<i>Ponusgerardiana</i>	1.05	1525	0	6960/-
		Karoo	<i>Picrorhiza</i>	5	5100		
		Ban Kakri	<i>Podophyllum hexandrum</i>	7	1775		
		Mehndi	<i>Lichens</i>	15	7525		
		Kuth	<i>Saussurea Costus</i>	30.3	9075		
		Neoza	<i>Ponus gerardiana</i>	11	11325		
		Dhoop	<i>Jurinea</i>	10	5075		
		Kroo	<i>Picrorhiza</i>	2	2025		
		Mehndi	<i>Lichens</i>	15	7525		
		Karoo	<i>Pocrorhiza</i>	10	10125		
		Kuth	<i>Saussurea</i>	10	3025		
		Guchhi	<i>Norchellaesculenta</i>	4	4025		
		Mehndi	<i>Lichens</i>	12	6025		
		Guchhi	<i>Norchellaesculenta</i>	6	6025		
		Mehndi	<i>Lichens</i>	12	6025		
		Guchhi	<i>Norchellaesculenta</i>	2	2025		
		Guchhi	<i>Norchella esculenta</i>	1	10125		
			Total	404	278575		
2018-19		Dhoop	<i>Jurinea</i>	15	7525		
		Karoo	<i>Picrorhiza</i>	2	2125		
		Ban Hal	<i>Rhizomes</i>	30	4625		
		Mehndi	<i>Lichens</i>	15	7625		
		Karoo	<i>Picrorhiza</i>	10	10125		
		Kuth	<i>Saussurea</i>	13	3960		
		Guchhi	<i>Norchella esculenta</i>	40	4125		
		Dhoop	<i>Jurinea</i>	3	1625		
		Mehndi	<i>Lichens</i>	6	6125		
		Guchhi	<i>Norchella esculenta</i>	1	10100		
		Nagchatri	<i>Trillidium govanianum</i>	4	3300		
		Guchhi	<i>Norchella esculenta</i>	1	10125		
		Karoo	<i>Picrorhiza</i>	20	20125		
		Neoza	<i>Ponus gerardiana</i>	11	11125		
		Karoo	<i>Picrorhiza</i>	6.5	6625		

		Neoza	<i>Ponus gerardiana</i>	11	11125		
		Mehndi	<i>Lichens</i>	14	7125		
		Karoo	<i>Picrorhiza</i>	8	8100		
		Dhoop	<i>Jurinea</i>	15	7500		
		Mehndi	<i>Lichens</i>	14	7125		
		Karoo	<i>Picrorhiza</i>	3	300		
		Nagchatri	<i>Trillidium govanianum</i>	1	8100		
		Karoo	<i>Picrorhiza</i>	3	3100		
		Karoo	<i>Picrorhiza</i>	10	10100		
		Dhoop	<i>Jurinea</i>	15	7525		
		Karoo	<i>Picrorhiza</i>	5	5125		
			Total	232	184485		
2019-20		Karoo	<i>Picrorhiza</i>	3	3100		
		Karoo	<i>Picrorhiza</i>	18	18100		
		Kuth	<i>Saussurea</i>	10	3100		
		Deodar Cons	<i>Dry Cons</i>	12.4	2520		
		Guchhi	<i>Norchellaesculenta</i>	50	4100		
		Guchhi	<i>Norchellaesculenta</i>		5100		
		Karoo	<i>Picrorhiza</i>	10	10100		
		Karoo	<i>Picrorhiza</i>	11	11100		
		Karoo	<i>Picrorhiza</i>	12	12100		
		Neoza	<i>Pinus gerardiana</i>	3.85	3100		
		Karoo	<i>Picrorhiza</i>	8	8950		
		Neoza	<i>Pinus gerardiana</i>	10	10100		
		Neoza	<i>Pinus gerardiana</i>	3	3100		
		Neoza	<i>Pinus gerardiana</i>	3	3100		
		Neoza	<i>Pinus gerardiana</i>	3	3100		
		Neoza	<i>Pinus gerardiana</i>	10	10100		
		Dhoop	<i>Jurinea</i>	30	24100		
			Total	146	134970		

(Source:- Record of Kinnaur Forest Division)

3.5 Method of Harvesting and their Costs:- Untill 1907, timber was extracted departmently mainly in the form of logs. From 1907-1917 trees were sold standing to the Satluj Forest Company, which extracted timber in the form of scantlings. Their work reached a high standard. It was during this time that Donald invented the gravity ropeway for scantling extraction, a system which is still in use throughout the Himalayas. In 1917, when the Satluj Forest Company declined to work the less profitable forests, their contract was cancelled. Departmental extraction began and continued up to 1984-85. On resumption departmental extraction of logs was again taken up but on account of the following reasons it had to be given up in favour of extraction of scantling:

- (i) Very high cost of log extraction.
- (ii) Little demand of round timber in the market.
- (iii) Most of the large trees in the loggable and accessible forests have been exhausted; the operation had to be shifted to the side valleys from where it did not pay to extract the logs.
- (iv) Old logging roads had fallen into disrepair during the time of the Setluj Forest Company.

With the complete nationalization of timber trade in HP, the HPSFDC Ltd took over the work of timber extraction and sale in the tract from 1985-86. The ropeways and other departmental equipments were also transferred to the HPSFDC Ltd on depreciated value basis.

Since the nationalization of the Forests, extraction and all the logging operations are now being done by the H.P. State Forest Development Corporation Ltd. Similarly Resin Tapping too is done by the H.P. State Forest Development Corporation Ltd.

3.6 Lines of Export:- There has been revolutionary development of network or roads (metalled and un-metalled) which have significantly boosted up export of forest produce from the tract. The timber is now taken by the HPSFDC Ltd in trucks to its sale depots and is disposed off in open auctions. The ghal is not floated now, owing to heavy ghal losses and also opening up of several new roads making road transportation, fast, economic and reliable.

From forest upto road side, the Forest produce is generally transported manually. There after the forest produce is transported by roads.

3.7 Past and Current Prices:- The average royalty rates of timber obtained from the HPSFDC Ltd. during the year 2002- 2003 to 2018-2019 are tabulated in table No:- 3.8

Table-3.8
Royalty rates/average rates per cum (Rs.)

Year	Deodar	Kail	Fir/Spruce	Chil
2002-2003	950	680	240	-
2003-2004	950	680	230	-
2004-2005	870	670	220	-
2005-2006	1098	793	273	-
2006-2007	995	789	259	134
2007-2008	1036	669	210	134
2008-2009	1036	669	210	134
2009-2010	1359	824	259	164
2010-2011	1417	867	245	177
2011-2012	1417	867	319	218
2012-2013	1417	867	319	218
2013-2014	1333	881	358	215
2014-2015	3260	1320	484	310
2015-2016	3317	1392	486	254
2016-2017	2448	1287	418	214
2017-2018	2140	1268	375	187
2018-2019	2194	1296	382	219

The present average market rates of various Forest produce are tabulated in Table No:- 3.9.

Table-3.9
Average Market Rates (1999-2019)

Average Market Rate															
Sr. No.	Name of Forest Produce	Unit	Rates per unit (Rupees.)												
			2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
1	Chil Timber	cum	10600	10600	15372	15372	15372	18630	18630	18630	21117	21117	21117	21117	28237
2	Deodar Timber	cum	29600	33389	38614	44031	47624	47624	47624	47624	55904	55904	55904	55904	65495
3	Kail Timber	cum	27600	32232	38044	38044	38044	38044	38044	38044	38044	40126	40126	40126	46896
4	Rai Timber	cum	13200	13200	17271	17271	17271	22437	22437	22437	22437	22437	22437	22437	26141
5	Mixed Fuelwood	Qtls.	0	278	360	360	410	410	410	430	454	454	454	454	530
6	Charcoal	cum	0	0	0	0	0	0	0	0	0	0	0	0	0

(Source:- Record of Kinnaur Forest Division)

CHAPTER IV

ACTIVITIES OF H. P. STATE FOREST DEVELOPMENT CORPORATIONS LTD. IN HARVESTING AND MARKETING OF FOREST PRODUCE

4.1 General Description:- The H.P.State Forest Development Corporation Ltd. (HPSFDC Ltd.)an undertaking of the H.P.Government which came into existence on the 25 of March 1974. This corporation has been mainly created with the following objectives:-

- i) To carryout extraction of timber and resin on scientific lines by adopting suitable modern techniques.
- ii) To eliminate the contractors agency in respect of works of timber extraction and resin tapping.
- iii) To obviate the chances of illegal felling of trees, illicit tapping of resin and other malpractices.
- iv) To work the forest on commercial lines by recycling of funds for works and also by raising funds from financial institution as per requirements.

The HPSFDC Ltd. took over the complete working of the Government Forest w.e.f. 25/01/1983. The HPSFDC Ltd.has been working salvage lots comprises of dry diseased, uprooted and damaged trees, handed over to them for working which the lots of green trees coming in the road alignments are also handed over for working through H.P.S.F.D.C. Ltd. after obtaining prior approval of the Central Government under Forest Conservation Act 1980. The objectives of HPSFDC Ltd.reveals that sustainable extraction of produce from forest is assured and this guarantees the upliftment of socio economic status of State by providing benefits to local people directly and keeping forests intact by scientific exploitation indirectly. HPSFDC Ltd. is indeed adding in increased income of rural as well as urban population by way of giving employment during exploitation in rural areas and processing in urban areas. A single unit of rosin factory gives employment to large number of people hailing from both rural and urban populations. Forest Corporation is adding income to State Government by way of selling quality products generated from resin, turpentine and salvage lots etc.

After nationalization of forests in 1983, standing trees are being handed over to HPSFDC Ltd.at rates decided by the Himachal Pradesh Government from time to time. Only dry and fallen trees referred to as salvage are handed over to Divisional Manager, HPSFDC Ltd. Rampur who has jurisdiction over this division. The HPSFDC Ltd. carries out extraction through conventional methods and there is no sign of any mechanization to be introduced in the future. Felling is done by axe or saw. The trees are cut in to logs of different sizes with the help of saws. These logs are further squared with help of axe and then sawn into scantlings by using pharnies. All these works are executed through labour supply mates under the direct supervision of the Forest Corporation Staff. The details of extraction of Timber for the last fifteen years are tabulated in Table No:- 4.1.

Table 4.1
Timber yield

Year	Volume marked in M3		Volume Felled in m3		Volume converted in m3		Converted %	
	Coniferous	Broad Leave	Coniferous	Broad Leave	Coniferous	Broad Leave	Coniferous	Broad Leave
1999-2000	6163	0	6163	0	2527	0	41.00%	0.00%
2000-01	247	0	247	0	99	0	40.00%	0.00%
2001-02	3868	23	3868	23	1586	33	41.00%	142.00%
2002-03	8117	32	8117	32	3409	46	42.00%	144.00%

2003-04	3271	5	3261	5	1337	7	41.00%	140.00%
2004-05	3631	0	3557	0	1458	0	41.00%	0.00%
2005-06	10002	0	10002	0	4101	0	41.00%	0.00%
2006-07	7929	0	7929	0	3251	0	41.00%	0.00%
2007-08	172	19	172	19	69	29	40.00%	150.00%
2008-09	14747	20	14747	20	6194	30	42.00%	150.00%
2009-10	0	0	0	0	0	0	0.00%	0.00%
2010-11	0	0	0	0	0	0	0.00%	0.00%
2011-12	196	0	196	0	80	0	41.00%	0.00%
2012-13	0	0	0	0	0	0	0.00%	0.00%
2013-14	1255	34	1255	34	515	48	41.00%	140.00%
2014-15	3256	63	3256	63	1368	95	42.00%	150.00%
2015-16	1034	6	1034	6	434	8	42.00%	140.00%
2016-17	369	6	369	6	159	8	43.00%	140.00%
2017-18	5539	203	5539	203	2382	325	43.00%	160.00%
2018-19	3504	101	3504	101	1507	162	43.00%	160.00%
Total =	73300	512	73216	512	30476	791	42%	154%

(Source:- Forest Working Division - Rampur)

4.2 Forest Development Corporation and Harvesting:-

4.2.1 Timber Extraction Work:-

Timber Lots:- Forest development corporation in Himachal Pradesh commenced in 25th March of 1974 with the mandate to deal with marketing of timber, fuel wood, Pulpwood, Bamboo, Khair, resin turpentine oil, subsidiary products viz phenyl, Varnish, Black Japan viz a viz Fiber board factory at Baijnath is presently engaged in the joinery works, timber chemical treatment and timber seasoning for Government as well as private timber. With complete nationalization of timber extraction works in HP through the aegis of the HPSFDC Ltd, both in Govt. and private forests, it has become absolutely essential to ensure uniformity in working procedures and maintain records in all Forest Working Divisions as per the instruction's contained in Timber Extraction manual of H. P.

(a) Marking: Marking is to be done by the territorial staff in accordance with the instructions issued by the Pr. CCF, HP and concerned Conservator of Forests. The marking lists is being prepared in triplicate.

In case of salvage markings, the event (Fire, wind, snow etc.) requiring salvage markings should be clearly mentioned. The trees standing on very steep and rocky portions, likely to be damaged during fellings or conversion should not ordinarily be marked. The facsimile of the hammer mark has to be affixed on the marked tree on the lower most portion of the tree on downhill so that no difficulty is felt while carrying out fellings.

(b) Time Schedule for Working: The list of forests to be marked each year must be intimated by DFOs to DM by 30 June every year. In case of Khair, Chil, fuelwood coppice Bamboo etc. lots the marking list must be submitted by 15th September for the year in which the work has to be started. No marking list for such type of felling should be received either by the Director or Divisional Manager without the approval of Managing Director after 30th September in case of Chil lots and 15th December in case of high lying conifer lots viz: Fir, Spruce, Deodar, Kail and temperate Broad leaved species.

The working period of a lot related to the standing volume would be as under:-

- i) Lots having standing volume upto and including 2832 M³ = 1 year
 - ii) Lots having standing volume of 2833 M³ to 8496 M³ = 2 year
 - iii) Lots having standing volume of 8497 M³ to 16992 M³ = 3 year
 - iv) Lots having standing volume of 16993 M³ to 28320 M³ = 4 year
 - v) Lots having standing volume of 28321 M³ and above = 5 year
- (c) Due dates of payment of royalty installments from lots are fixed in Table No.:- 4.2

Table-4.2

Sr. No.	Lots	Schedule of payment of royalty
I	Chil Lots	1/3 by 15 th January
		1/3 by 20 th March
		1/3 by 15 th June
II	Khair and Coppice lots	1/3 by 15 th February
		1/3 by 15 th March
		1/3 by 15 th June
III	High lying Coniferous one year lots	½ by 30 th November
		½ by 20 th March.

(d) **Lead Measurement:-**No change in the length of lead will be allowed after it has been measured by a committee comprising of one gazetted officer of concerned forest working division, one gazetted officer of the adjoining forest working division and Assistant Manager of the concerned lot.

(e) Handing over and Taking over of the Marked Forests

The marked forests should be handed over to the Divisional Manager, Sub Divisional Manager or Assistant Manager under proper receipt. The possession should be given after the Forests have been inspected and the description in the markings in respect of illicit fellings or other deficiencies in the marking like fit, unfit etc should be pointed out and reconciled. Any discrepancy noticed after taking over will be to the account of Forest Working Division.

(f) Felling, Logging, Sawing and Transportation:- Trees are lopped, roped where necessary and felled by the labour of L.S.M./contractor. People from Mandi and Kullu are expert in felling and conversion. Felling is generally done by axe and saw. The felled trees are cross cut into log lengths of importance in market. The HPSFDC Ltd. fixes yield of various sawn size and hewn sizes and the scantling by the means of two-men frame saw. The scantlings are then carried manually to the road side depots and to the aerial ropeway depots. The scantlings are then roped down to the roadside depots and from there loaded in trucks and taken to Himcasth sale depots. The HPSFDC Ltd.is now a specialized agency in the timber extraction work.

As per record of HPSFDC Ltd, approximate cost of extraction of sawn wood per cum for the year 2017-2018 excluding royalty are tabulated in Table No:- 4.3

Table-4.3
Timber extraction cost statement

Sr. No.	Name of Work	Timber cost Per cum (Rs.)
1	Lopping and felling	91.00
2	Sawing and Conversion	1966.00
3	Carriage from forest to roadside	3475.00
4	Carriage by trucks	1426.00
5	Contingency charges and establishment OH.	1574.00
Total		8532.00

4.2.2 Losses in Conversion:- the loss of conversion according to the figures supplied by the HPSFDC Ltd. are on average 45% in all species for the previous five years. The loss is conversion is quite high.

4.2.3 Cost of Extraction:- The HPSFDC Ltd. on receipt of lots from the department makes a profit and loss statement of each lot. The lots are put to tender, negotiation and open auction. The labour supply mates are expected to work within or below the sanctioned schedule of rates. The royalty is paid to the department on cubic meter basis in two installments, the royalty is worked out according to density of marking and royalty rate is notified by the pricing committee.

4.3.1 Resin Extraction Work:-

4.3.1.1 Resin Lots:- Resin lots are handed over annually to H.P. State Forest Development Corporation at Resin royalty rates fixed by Himachal Pradesh Government for every year. Earlier the extraction was done by cup and lip method which proved to be disastrous for many forests. Now there is complete shift to rill method of extraction which gives equally good yield as well as obviates the likely damage by fire and wind. The instructions of Resin Tapping are contained in Resin Tapping Manual which shall be followed. No resin lots have been handed over from Kinnaur Forest Division for the extraction of resin.

4.4 Marketing of Forest Produce:- The local people are mostly agrarian. The land holdings are much less than the required livelihood. Due to lack of knowledge and poor marketing infrastructure in the tract, the local people cannot sell their meager agricultural products in the open market. Similarly, the local people also exploit Chilgoza and other NTFPs from Non Protected areas of the tract to supplement their incomes but due to lack of poor marketing infrastructure and value addition, they always used to sell their produce through middle man in the market. It is therefore, quite imperative that the forest department provide ready marketing inputs through co-operative societies to exclude middle man, so that they could get fair price for their goods and avoid over exploitation of NTFPs from forest. Scientific inputs to enhance cultivation, storage and value addition and marketing shall go a long way in enhancing income of local people through maintaining traditional knowledge and help reduce pressure on the national resources of the tract in sustainable manner.

There is little local market for the forest produce; the demand of local people being met mostly through exercise of rights. Timber extracted from this division is marketed through sale depot Baddi. The annual sale turn for the year 2018-2019 in respect of Himkash Sale Depot Baddi (Corporation Timber) Forest Working Division Rampur, is tabulated in the Table No. 4.4.

Table No. 4.4

Sr. No	Species	Average Sale Rate. (in Rupees)
1	Deodar	33986
2	Kail	18925
3	Fir	12518
4	Chil	11311
5	Broad Leave	0

4.5 Result of Socio Economic Survey:-

4.5.1 Ethnic identities, Tradition, Custom and Dependence of Local People on Forests:-

In Kinnaur Forest Division, few villages are by and large poor agrarian. Land holdings are marginal and not sufficient to sustain them. The earliest record on the general condition and livelihood patterns of the local people is available from the observation made by Mr. J.B. Fraser a British Military Officer during the year 1814. Mr. Fraser observed that due to mountains, poor infrastructure development and barren terrain; little grain was produced in the tract. The grain was imported from the plains. The age old system polyandry prevails in most of the district but has been rapidly losing ground to monogamy these days. The age old polyandry system is not encouraging in the society. Polyandry was in former days, directly encouraged by the State through penalties exacted on partitions. When a set of brothers divided movable property one half share of the whole was appropriated by the State and division of immovable property was refused official recognition. That is why dependence of the people on forest resources was dependable on carrying capacity of forests in sustainable manner. Their life and livelihood depend upon the rich biodiversity of the forests. They have been living in harmony with the forests & wild life since time immemorial. The material existence of the local people depends on forests to such an extent that they cannot visualize in the absence of biological resources. Their folklores and culture is full of references to the forests and wild life. There are several rights and rituals where some forest produce is used one way or another. They have co-existed since time immemorial and will continue to co-exist in a mutually re-enforcing relationship in future also.

During the recent years, the tract of the Kinnaur Forest Division is open to outside influence of culture, has been a great deal of commercialization except some part of the area. This is because of infrastructure development, like coming up of Hydro Electric Projects which has brought opening up the tract i.e. road, socio-economic development and education. They have improved extensive development in growing apple and other fruits besides traditional agricultural crops. Since the agricultural crops are insufficient, the local people in remote areas also rear goats and sheep as the secondary occupation and they remained dependent on forest resources.

The condition of people living in some part of the District area are not good, people are poor, clinging to old customs, traditions and beliefs. The land holdings are marginal and un-economic. Still the area is deprived of road and social development and not self sufficient in sustenance to their life. No doubt, horticulture has picked up very well and playing a predominant role and making them prosperous as fruit growers but in some part of the area of the tract, the condition of the people is not good and still meager income. Very few people are employed on seasonal basis. Employment is provided by the forest department and other departments which augment their meager incomes. But by depriving the rights and concessions from the Protected areas as per Forest Settlement Report, 1921, there have been direct conflict among people and field functionaries; hence, it is influencing the management and conservation of forests to a large extent.

Illegal poaching, illegal construction of roads and lack of concern for biological conservation issues among local people is having least impact on the precious forest resources of this division.

Due to network of communications and developmental activities in the fields of Agriculture, Horticulture, Education and Health etc. There is a marked improvement in the living conditions of the inhabitants except few areas of this division. The main problem of the local people is dearth of road, health, education and other public utility services etc. The people are facing problem of damages to their agricultural crops by wild animals for which they are still depriving their rights to get compensation due to lack of H.P. Govt. Policy. Secondly, domestic requirement of fuel wood, fodder, minor forest produce and timber for construction and repair for house/hamlet should be the first priority as Constitutional mandate rather than commercial. Similarly, domestic energy, fuel wood needs to be substituted, as far as, practicable with alternative source like bio-gas, LPG, solar energy and fuel saving devices as a measure of conservation also need to be popularized in rural areas. Alternative measures should be adopted to reduce the social custom based on forests. Stall feeding needs to be popularized in all the villages of the tract to reduce the pressure on the bio-diversity by providing incentive to local people etc. This will help in increasing the forest cover and maintaining the ecological balance of the tract. Realizing this impact on the society the courts in India have also dealt with cases relating to environment and development. A principle has evolved out of these decisions that the socio-economic development shall have to be made in closest possible harmony with the forests and environment.

CHAPTER V FIVE YEAR PLANS

5.1 Introduction:- The economy of India is based on planning through its five-year plans, which are developed, executed and monitored by the Planning commission of India. Planning in India derives its objectives and social premises from the Directive Principles of State Policy enshrined in the Constitution of India, Article 38 and Article 39 (a), (b) and (c) are cited in the resolution of 15th March, 1950 by which the planning commission was setup. These are:-

“The State shall strive to promote the welfare of the people by securing and protecting, as effectively as it may a social order in which justice, social, economic and political, shall inform all the institution of natural life” (Article 58 of Constitution)

The State shall in particular, direct its policy towards securing:-

- a) That the citizens, man and women, equally, have the rights to an adequate means of livelihood,
- b) That the ownership and control of the material resources of the community are so distributed as best to sub-serve the common good.
- c) That the operation of economic system does not result in the concentration, if wealth, and means of production to the common detriment.

The national planning process was started in 1951 in India with the formulation of First Five Year Plan. The first three five year plans laid thrust on the promotion of agriculture and industrialization, Environment-related issues pertaining to the improvement of human environment such as sanitation, public health, nutrition, water supply and housing got due priority in national programmes under the three five year plans. However, environment protection did not receive any significant recognition under the development planning except the forest development and soil conservation.

The brief description of the activities under taken right from 1st Five Year Plans in this Division is given as under:-

5.2 First Five Year Plan (1951-56):- The First Five Year Plan showed maximum concern about rehabilitation of forest areas, which had been over exploited either to meet the Second World War needs. Little efforts were made to help stabilize soil in highly eroded areas through Afforestation. In response to the Forest Policy of 1952, the Central Board of Forestry, Constituted in 1950 to provide guidance to the Central Government in the formulation of policy and programmes in the field of forestry. The wastage in conversion and felling of trees was minimized. Besides, man made forests of economic species were raised.

After the merger of states in 1949, the forests were densely stocked and exploited commercially. By enlarging the scope of 1894 forest policy, the new National Forest Policy which was formulated in 1952 i.e. during First Five Year Plan, the forest of this division were also managed as per the prescription of the Working Plan. In this Division during **Madan's Working Plan (1947-48 to 1958-59)** which almost falls in the First Five Year Plan, the main broad objective of the management were not only to preserve all the existing forest growth, but also suitably to extend it wherever possible primarily with view to prevent further denudation of hills to stabilize the existing land slips etc. and to maintain an even flow of water in the various flames which ultimately flow into river Sutlej.

The year-wise revenue and expenditure of the erstwhile Upper Bushahr Forest Division is tabulated in Table No:- 5.1.

Table 5.1
Revenue and Expenditure of Kinnaur Forest Division during First Five Year Plan

Year	Revenue(Rs.)	Expenditure(Rs.)	Surplus(Rs.)
1951-52	698592	521863	176729
1952-53	1131831	782175	349656
1953-54	1647761	688102	959659
1954-55	1540021	729160	810861
1955-56	1283508	697189	586319

(Source: Working Plan by J. C. Tondon PFS I)

Keeping in view the large scale import of food grains and inflationary pressures on the economy, the First Five Year Plan (1951-56) accorded the highest priority to agricultural including irrigation etc. rather than forestry operation the country adopted a national festival of tree planting ‘Van Mahotsava’, in 1950 which was started with the objectives of creating mass awareness about the value of forests in human well being. At the same time, the drawback of the Forest Policy of 1894 necessitated a fresh look at the forest policy. The earlier forest policy was revised in 1952 and a new National Forest Policy was formulated. The main objectives of the policy were:-

- a) Cover one-third of total geographical area with forests, 60% in hilly regions and 20% in the plains.
- b) Functional classification of forests viz, “Protection Forests, National Forests and Village Forests.
- c) Guarding National interests on top priority basis.
- d) Curbing indiscriminate extension of agriculture.

It is interesting to note that Forest Policy of 1952 retained the concept of reserved forests” which was enunciated under the earlier Forest Policy of 1894 and placed them under the exclusive control of State Government. Although, the policy accepted the category of “Village Forests” to serve the needs of people in surrounding villages, but it did not grant them the right to manage these forests. As during the British rule, the approach of State continued to reflect a lack of faith in the capacity of people to manage or protect their forest resources without State intervention and support, people were in fact seen as a major threat to forests.

5.3 Second Five Year Plan (1956-57 to 1960-61):-The Second Five Year Plan seeks/lays stress to rebuild rural India, to lay the foundations of industrial progress, and to secure to the greatest extent feasible opportunities for weaker and under-privileged sections of our people and the balanced development of all parts of the country. Both the First and the Second Plan put considerable emphasis on preservation processes, improvement of communications and rehabilitation of degraded forests, establishment of new plantations, especially of fast growing species, application of modern systems of intensive forest management, better moderately of inferior varieties by seasoning and preservation processes, improvement of communications and introduction of modern techniques. Large tracts of degraded forests situated in the former Zamindari estates and princely States came under Government control. Schemes for the demarcation of such areas and preparation of maps were taken up.

During this period two working plans viz **Madan’s Working Plan (1947-48 to 1958-59)** and **Tandon’s Working Plan (1960-61 to 1975-76)** was in vogue in this division. This plan like earlier plans, dealt only with the demarcated forests and the general objectives of management were to preserve the demarcated forests and to improve them with a view to prevent erosion, to regulate water supply in streams, to obtain sustained yield of timber and charcoal. In addition to this, it was proposed to regenerate the extensive blanks caused by 1921 fire besides satisfying the legitimate

requirement of the local residents for timber, fire wood, grazing and grass cutting, etc. It was during this period that all types of demarcated forests, irrespective of vegetative association, were included and shelter wood system of regeneration by compartments was introduced for the Deodar and pine forests. Beside this, the deodar forests were exploited for revenue with emphasis on regeneration by mainly natural means.

The year-wise revenue and expenditure of the erstwhile Upper Bushahr Forest Division is tabulated in Table No:- 5.2.

Table 5.2
Revenue and Expenditure of Kinnaur Forest Division during Second Five Year Plan

Year	Revenue(Rs`)	Expenditure(Rs`)	Surplus(Rs`)
1956-57	1001517	866402	135115
1957-58	1589576	936277	653296
1958-59	2310963	1165982	1164981
1959-60	2313410	1234258	1079152
1960-61	3125204	1385788	1739416

(Source: Working Plan by Tendon / Karwasra)

Thus, the plan aimed at an increase of 25% in the natural income, rapid growth of industrialization, large expansion of employment opportunities rather than conservation of forests. Deodar forests were exploited for revenue with emphasis on regeneration by mainly natural means. The natural regeneration was supplemented by the artificial regeneration in the form of patch sowing & planting of deodar.

5.4 Third Five Year Plan (1961-62 to 1965-66):- The Third Five Year Plan seeks to give a more precise content to the social objectives of the Constitution and represents a large advance towards their moderately. It takes account of the successes and the failures in the first two Plans and sets the tasks to be fulfilled in the perspective of development over the next fifteen years and more. Work on the preparation of the Third Plan commenced towards the end of 1958 and was carried out in three main stages. Development of forest resources was an integral part of the programme for optimum land moderately. Forests have important protective as well as productive functions. They not only supply timber, fuel, fodder and a variety of other products but also have a moderating influence against floods and erosion and help to maintain soil fertility.

During this period only one Working Plan of **Tandon's Working Plan (1960-61 to 1975-76)** was in vogue. Tandon constituted five working circle namely (i) The Wet Zone Shelterwood Working Circle, (ii) The Dry Zone Shelterwood Working Circle, (iii) The Wet Zone Selection Working Circle, (iv) The Dry Zone Selection Working Circle (v) The Protection Working circle. The plan was prepared for a period of 15 years. The ambiguous suggestions made in the working plan could not be followed in practice. After the Chinese aggression in 1962, the pressure of grazing increased and desired area could not be closed to grazing. The climate is so hostile in the dry and arid zones that the sowing/ Planting operations done under various schemes did not produce any results. The objective was to maintain and increase the yield of timber by producing trees of dimensions sufficient to produce the standard sizes, restocking of fire blanks and to prevent denudation/desiccation of soil.

The year-wise revenue and expenditure of the erstwhile Upper Bushahr Forest Division is tabulated in Table No:- 5.3.

Table 5.3
Revenue and Expenditure of Kinnaur Forest Division during Third Five Year Plan

Year	Revenue (in Rs.)	Expenditure (in Rs.)	Surplus (in Rs.)
1961-62	1849858	1640082	209776
1962-63	2372111	1676222	695889
1963-64	2619523	1394504	1225019
1964-65	2853318	2238824	614494
1965-66	2188986	3295180	1106194

(Source: Working Plan by A. C. Karwasra, IFS)

During the plan period, industrial and domestic demands put a great deal of pressure on forests leading to serious shortages of wood and sharp increase in fire price rise had to massive illegal felling and inevitable tensions between rural communities and Forest Department.

Also, grazing policies remained unimplemented and increasing cattle population continued to affect forestry's conservation principles. By and large, forests were accorded low priority in the States on account of other needs of more immediate concern. The indiscriminate use of forest land for non forestry purposes increased considerably.

5.5 Fourth Five Year Plan (1969-70 to 1973-74):- The object of the third plan was to raise the productivity of forests, to increase the output through better techniques of timber extraction, to develop forest communications and to bring about increased use of preservation and seasoning processes. The Third Plan also laid stress on the development of village and extension forestry. The main objectives of the Fourth Plan in forestry sector were:-

- (i) To increase the productivity of the forests,
- (ii) To link up forest development with various forest based industries
- (iii) To develop forests as a support rural economy. The increase per hectare production per annum of forests in India is estimated at about 0.53 cubic meters as against the world average of 2 cubic meters. Emphasis was laid on measures to meet the immediate and long-term agricultural and industrial requirements, since the demand for various forest products, timber, domestic fuel and raw materials for industries has rapidly increased.

To increase forest production, the Fourth Plan envisaged further efforts at creating large scale plantations of valuable quick-growing species and species of economic and industrial importance. A concerted effort at regenerating areas, where forest produce was removed for industrial uses was taken. The basic principle of Government policy was the minor forests, pastures and grazing grounds must be managed mainly in the interest of the population of the tract and particularly to serve their requirements of fuel and fodder requirements.

The year 1972 marks a watershed in the history of environment management in India. It was the year in which a conference on Human Environment was held in Stockholm under the aegis of the United Nation. Late Mrs. Indira Gandhi, our then Prime Minister, addressed the conference wherein she attracted the attention of the world community towards our peculiar environmental problems. Pointing out the causes of environmental degradation, she asserted that 'poverty and need' are the biggest polluters. She added that "the environmental problems of developing countries are not the side effects of excessive industrialization, but reflect the inadequacy of development. The rich countries may look upon development as a cause of environmental destruction, but to us it is one of the primary means of improving the environment for living or providing food, water, sanitation and shelter, of making the desert green and the mountain habitable.

In 1972, comprehensive national law, the Wild Life (Protection) Act, 1972 was enacted intended solely to protect wild life. A Centrally sponsored scheme "Project Tiger" was launched in

1973 to ensure maintenance of a viable population of tigers in India for scientific, economic, aesthetic, cultural and ecological values and to preserve for all times, areas of such biological importance as the national heritage for the benefit, education and enjoyment of the people. During this period also only one Working Plan of **Tandon's Working Plan (1960-61 to 1975-76)** was in vogue.

The year-wise revenue and expenditure of the Kinnaur Forest Division is tabulated in Table No: - 5.4.

Table 5.4
Revenue and Expenditure of Kinnaur Forest Division during Fourth Five Year Plan

Year	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
1969-70	43148415	4095933	218882
1970-71	3582991	6104823	2521832
1971-72	3764923	4570571	805594
1972-73	8929001	3344331	5584670
1973-74	5365819	3184769	2181050

(Source: Working Plan by A C. Karwasra IFS)

Keeping in view the facts and figure, the Fourth Five Year Plan accorded the highest priority to exploitation of high lying forest for earning of revenue rather than conservation of forests and improving the condition of the less privileged and weaker section especially through provision of employment and livelihood etc.

5.6 Fifth Five Year Plan (1974-75 to 1978-79):- The fifth plan was formulated against the backdrop of severe inflationary pressures. The major objectives of the plan were to achieve self reliance and adopt measures for raising the consumption standard of people living below the poverty line.

The major objective identified in forestry in the fifth plan was the creation of large scale man made forests through institutional financing. The plan proposed a network of State Forest Corporations for establishment and management of manmade forests. The birth of Forest Corporation and the economic considerations further pushed the ecological consideration to secondary place. The second important objective of the fifth plan was to develop farm forestry and to improve degraded forests so as to increase the fuel and timber supply in rural areas. Wild Life Protection also was attended during this plan. Programmes for development of national parks, strengthening of research on endangered animals including project tiger were taken during this plan.

The Constitution of India came into force on 26th January, 1950. The Constitution originally did not make any specific provision to deal with the environment, forest protection and wild life of the country. The Constitutional 42nd Amendment is also significant from environmental protection point of view as it was through it that the natural commitment of environment protection and improvement was explicitly incorporated into our Constitution. The overriding concern for environmental protection with this amendment has now been inserted Articles 48 A and 51 A (g) in the Constitution of India.

The subjects mentioned in the Concurrent List, inter alia, include forests, protection of wild animals and bird's population control and family planning, minor ports, factories and boilers. Entries No. 17 A and 17 B dealing with birds" respectively, were inserted in the Concurrent List by the Constitution (42nd Amendment) Act, 1976. Earlier these subjects were found in State List. Thus, during the seventies, the environment policy and planning in India had taken place.

In this backdrop, for the control of water pollution, Water (Prevention and Control of Pollution) Act, 1974 was passed. This Act resulted information of Central/State Board for

prevention and Control of Water Pollution with primary duties of setting standards, monitoring and legal enforcement.

During this period the **Tandon's Working Plan (1961-62 to 1975-76)** continued to be existed and also **Karwasra's Working Plan (1976-77 to 1990-91)** was also in vogue in this division. Besides managing the forests as per prevalent Working Plans, the main emphasis had already shifted towards raising the plantations on blank degraded forests & regenerating the forests marked for extraction of timber for packing cases. The HP State Forest Corporation Limited came into existence wef 25-3-1974, registered under **The Companies Act, 1956**. The timber extraction was gradually transferred to corporation since 1976 onward.

The year-wise revenue and expenditure of the Kinnaur Forest Division is tabulated in Table No: - 5.5

Table 5.5
Revenue and Expenditure of Kinnaur Forest Division during Fifth Five Year Plan

Year	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
1974-75	2959216	3313091	-353875
1975-76	3834345	3296380	537965
1976-77	Data not available		
1977-78	Data not available		
1978-79	Data not available		

(Source: Working Plan of Kinnaur Forest Division by A. C. Karwasra, IFS)

5.7 Sixth Five Year Plan (1980-85):- Development without destruction was the theme of the sixth five year plan, which laid emphasis on the ecological and social security, the major thrust of the plan as regards forest management and protection was saving the natural forests from further depletion, formation of new fuel and fodder reserves to meet the growing needs of local population and creation of more National Parks and Wild Life Sanctuaries.

The sixth five year plan framework document as approved by the National Development Council States, "It is imperative that we carefully harvest our renewable resources of soil, water, plant and animal life to sustain our economic development. A full chapter on 'Environment and Development' has been included in the sixth plan. This chapter was devoted to the discussion on problem of environmental degradation such as land use, agriculture, forestry, wildlife, water, air, marine environment, minerals, fisheries, renewable resources, energy and human settlement, with a view to evolve sound environmental and ecological principles.

On the basis of the Tiwari Committee recommendations, the Govt. of India setup a Department of Environment (DOE) with effect from November 1st, 1980, some States namely Karnataka, Uttar Pradesh, Punjab & Madhya Pradesh also established separate department of Environment at the State Level. In 1985, the Department of Environment was replaced by an integrated Department of Environment, Forest and Wild life. In addition to this, two powerful agencies were created to tackle specific environmental problem; namely, the National Waste Land Development Board and the Central Ganga Authority, to further improve the implementation of environmental law and policy decisions.

With a view to meeting the basic and economic needs of community, the programme of social forestry initiated in 1981-82 remained continuing. The social forestry programme which inter-alia includes Farm Forestry, Extension Forestry, and Reforestation on degraded forests and Recreation Forestry; those programmes were assisted by several external agencies, including the World Bank, United State Agency for International Development and Overseas Development

Agency of United Kingdom. The 20 Point Economic Programme of late Prime Minister Mrs. Indira Gandhi also included Afforestation Social Forestry and Farm Forestry programmes.

The year-wise revenue and expenditure of the Kinnaur Forest Division (erstwhile Pooh & Nichar Forest Division) for the years is tabulated in the Table No: - 5.6

Table 5.6
Revenue and Expenditure of Kinnaur Forest Division during Sixth Five Year Plan

Year	Nichar Forest Division			Pooh Forest Division		
	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
1980-81	Data not available			Data not available		
1981-82	Data not available			Data not available		
1982-83	Data not available			Data not available		
1983-84	Data not available			Data not available		
1984-85	Data not available			155862.8	1918840	-1762978

(Source: Nichar and Pooh Forest Division)

During this period, **Karwasra's Working Plan (1976-77 to 1990-91)** continued to be existed in this division. The main objectives of the plan was to create normal forest with normal distribution of age classes in due course of time, and to satisfy the domestic and agricultural requirements of the local, right holders including those of fruit growers for the manufacturing of fruit packing boxes etc. Thus, plan accorded the highest priority to exploitation of high lying forest for earning of revenue rather than conservation of forests.

5.8 Seventh Five Year Plan (1985-90):- The seventh five year plan was envisaged in the development strategy of generation of productive employment. Given the twin emphasis on employment and productivity in the Seventh Plan, the objective was to expand employment opportunities consistent with increases in productivity. The basic approach to the Seventh Plan was also, sustainable development in harmony with the environment. Towards this end, it would have to be ensured that all development programmes, in all sectors, will take environmental considerations fully into account. Environmental management, a term encompassing environmental planning, protection, monitoring, assessment, research, education, conservation and sustainable use of resources, was now accepted as a major guiding factor for national development in India. From the early seventies, India had played a significant role at international forums in delineating and articulating the relevance of environmental concerns in the context of economic development. There had been, over the last decade, a progressive strengthening of official involvement in environmental management in India, with increased scientific, technical, administrative and legislative backup at the Central and State levels. Major activities in the area of environment work was initiated or stepped up during the Sixth Plan which included: water and air pollution monitoring and control; environmental impact assessment; natural living resource conservation; special projects on wildlife; ecological studies by the Botanical and Zoological Surveys of India; eco-development programmes; environmental research promotion; and environmental information, education, training and awareness.

The perceiving the richness of the natural resources and the need for their adequate management so as to harness their potential to meet the material needs for the present and for time to come, the seventh five year plan emphasized on the need to manage the resource base in such a manner as to enable sustainable development. Pointing out the necessity of remedial measures, the

plan emphasized that official and voluntary agencies must work together to create the needed awareness for resource conservation.

As regards, the policy perspective on forest management, the seventh plan envisaged “Forest for survival” as its theme. The plan, giving highest priority to restore the forest cover with 33% of the geographical area of the country being brought under forests from the present level of about 23%: asserted for preserving biological diversity, increase the vegetal cover by massive Afforestation and development Afforestation into a people’s movement (Social Forestry) enhance the productivity of existing forest areas, etc.

The failure of the National Forestry Policy, 1952 particularly inadequate management of forests, negligible efforts made to improve the availability of fuel wood and fodder to forest dwellers which resulted in social conflicts on forest resources use, the short comings of social forestry programme and dwindling forest cover, necessitated a fresh look at the Forest Policy of 1952. The States came under increasing pressure in order to involve people in the protection and management of forests resources and therefore to re-orient its earlier policies. In 1988, a National Forest Policy was formulated with principle aim of ensuring environmental stability and maintenance of ecological balance.

Since forestry is a Concurrent List subject, a State forest policy under the ambit of the National Forest Policy was enunciated by the Government of Himachal Pradesh in 1988. In terms of the Govt. policy decision the complete moratorium on green fellings, the silvicultural marking done upto 1984-85 were discontinued and only salvage marking were carried out. Thus prescription given in the Working Plan was not followed. The Afforestation programme under the social forestry has failed to achieve its objectives of people’s movement for Afforestation due to less public participation in this scheme. During this period **Karwasra’s Working Plan (1976-77 to 1990-91)** remained operative in this division.

The year wise revenue and expenditure of the Kinnaur Forest Division (erstwhile Pooh & Nichar Forest Division) is tabulated in Table No:- 5.7.

Table 5.7
Revenue and Expenditure of Kinnaur during Seventh Five Year Plan

Year	Nichar Forest Division			Pooh Forest Division		
	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
1985-86	Data not available			301837.58	3171816.89	-2869979.31
1986-87	2233238.45	5301932.61	-3068694.16	451147.15	3219458.73	-2768311.58
1987-88	486974.3	6293367.36	-5806393.06	140362	3870350	-3729988
1988-89	770427.85	7006221	-6235793.15	63878	4863300	-4799422
1989-90	593789	7447114	-6853325.00	127668	5227605	-5099937

(Source: Nichar and Pooh Forest Division)

5.9 Eighth Five Year Plan (1992-97):- The Eighth Plan was aimed at to undertake re-examination and reorientation of the role of the Government as well as the process of planning. The plan was to work out the ways and means of involving people in the developmental task and social evolution. The emphasis was to strengthen the people’s participatory institutions.

To ensure the protection of natural environment the plan suggests preventive and regulatory strategies. The strategy of prevention involving raising of public awareness, strict enforcement of laws, statutory assessment of environmental impact of projects, and efforts to regenerate the productivity of ecosystem, can be useful in many cases of environmental degradation. Stringent

laws, rigorously implemented, through stringent punitive measures and by marking an undesirable action expensive for the offender, can prevent environmental destructions. The plan calls for the necessity of statutory environmental impact assessment of all projects and activities before their implementation, as such would prevent environmental degradation by making it obligatory on the part of executing agencies to undertake compensatory measures.

A number of programmes of Afforestation were taken up to secure people's participation. Under this scheme, priority was given to:-

- a) Establishment of decentralized nurseries and school nurseries.
- b) Block plantations especially on community land and lands of SC/ST and people living below the poverty line.
- c) Pasture development through people's institutions and involvement, and
- d) Assistance in the implementation of the Tree Patta Schemes.

The scheme of decentralized people's nurseries was initiated in 1986-87 to encourage seedling production by farmers, especially small and marginal farmers to establish small, dispersed nurseries to cater to local needs of planting material and provide income generating activities to the beneficiaries.

An appraisal of the Afforestation schemes undertaken during the plan period has appeared some deficiencies. They have no specific plan of action for meeting fuelwood and fodder requirements except for the continuance of the scheme for rural fuel wood plantation, which does directly address these issues. Under the social forestry programme, the efforts have already been departmental mode. The rural poor and tribals, who depend mostly on public and forest lands for their livelihood, have at best, been given restricted access to the areas taken up for development. During this period **Karwasra's Working Plan (1976-77 to 1990-91)** continued to be existed in this division.

The year-wise revenue and expenditure and Plantation of the Kinnaur Forest Division (erstwhile Pooh & Nichar Forest Division) is tabulated in Table No: - 5.8. and 5.9

Table 5.8
Revenue and Expenditure of Kinnaur during Eighth Five Year Plan

Year	Nichar Forest Division			Pooh Forest Division		
	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
1992-93	1238185	10483634	-9245449	308891	7397221	-7088330
1993-94	4899892	11490586	-6590694	1090104	6874820	-5784716
1994-95	5176507	11503620	-6327113	98959	7977306	-7878347
1995-96	4366799	14853700	-10486901	1099060	10239396	-9140336
1996-97	784137	15656182	-14872045	137205	11515742	-11378537

(Source: Nichar and Pooh Forest Division)

Table 5.9

Plantations raised during Eighth Five Year Plan		
Year	Total area planted (hac.)	
	Nichar	Pooh
1992-93	Data not Available	77
1993-94	386	107
1994-95	407	147
1995-96	507	89
1996-97	430.35	55

(Source: Nichar and Pooh Forest Division)

During this period the Working Plan (1976-77 to 1990-91) continued to be existed in this Division. Fellings of trees as prescribed in Working Plan had not been done due to ban on green felling. Plantation as prescribed has been done under social forestry scheme but results of planting are not encouraging because of lack of proper supervision and maintenance, non co-operation of local people and in effective closures and protection from biotic pressures. Almost, all plantation done during the period were failure with few exceptions.

5.10 Ninth Five Year Plan (1997-2002):- The Ninth Five Years' Plan was launched in the 50th year of India's Independence, and the aim was to take the country into the new millennium. The emphasis was given to the Integrated Watershed Approach. Since the smallest viable geographical unit is the watershed, it was therefore, imperative that the integrated watershed approach should be followed. The watershed is a geo-hydrological natural unit which has evolved through interaction of rain water with the topography. The measures such as conserving rain water, through treatment of drainage lines in the micro-watersheds and promoting in-situ moisture were proposed. This includes 3-tier appropriate vegetation consisting of grasses, shrubs and trees for fodder, fuel, timber and fruit in a topo sequence which is in consonance with soil depth and moisture. The objectives were:

- i. Eco-restoration and Eco-preservation
- ii. Involvement of the local population
- iii. Gender sensitive planning
- iv. Use of appropriate technology
- v. Redevelopment of traditional agro-eco-systems based on traditional knowledge and technology
- vi. Scientific approach to agriculture, animal husbandry and horticulture in order to raise productivity
- vii. Development of ecologically sustainable industries and tourism.

The hill areas of the country particularly the Himalayan and the Western Ghats regions support the basic life giving natural resources but they have very fragile and sensitive eco-systems. The need to conserve natural resources and the environment particularly to prevent damage to fragile and irreplaceable eco-systems, the Hill Areas Development Programme (HADP) during the 5th Plan was introduced. The programmes implemented during the 5th Plan period were mainly beneficiary oriented. While emphasizes shifted to eco-development in the 6th Plan, the general tenor of HADP remained substantially the same as that of the normal State Plan following the same sectoral approach. In the 7th Plan laid particular emphasis on the development of ecology and environment as summed up in three phrases, namely, **eco-restoration, eco-preservation, and eco-**

development. It aimed at enrolling plans and programmes to take care of socio-economic growth, development of infrastructure and promotion of ecology of the areas covered by the HADP. During the 8th Plan attention was focused on productive sectors of the hill economics especially in modernizing agriculture practices and small scale industries at household, cottage and village levels. For this involvement of people was considered of paramount importance. The aim was to meet actual basic needs of the people through improved management of the land and water resources.

The major environmental problems being faced by Hills were deforestation and soil erosion, which was leading to the drying up of water resources, flash flood, cloud bursts and decline in the yield of food and cash crops, fodder, fuel and other minor forest produce. Besides water retention capacity and productivity of land had been adversely affected. Similarly, poverty in the hills, intensive human & live stock pressures along with encroachment on forest land and indiscriminate felling of trees for commercial purposes in hill areas had already led to loss of soil and rapid depletion and destruction of forest cover. Development activities like construction of buildings, roads, hydro power projects, large and medium industries and mining etc. had aggravated environmental problems. Consequently, perennial sources of water such as springs and small streams have dried up in many hills areas.

The strategy for the 9th five year of Himachal Pradesh States” the degraded forest lands, the village common lands and waste lands will be rehabilitated through various state plans/centrally sponsored and externally aided projects schemes so that a forest cover of 50% by 2000 AD as per policy of the State Govt. is arrived at”. The National Forest Policy, 1988 also has recommended that at least 2/3rd of the total geographical area of Himachal Pradesh should be under forests.

On an average, an area of 172.5% Sq. Km. was planted every year. Recent trends show a continuous decline in the area planted each year, because of paucity of funds and a ban on silviculture and Working Plan operation in the State under an order of the Supreme Court in T.N. Godavarman case dated 12-12-1996, except for the right holders. However dry and fallen trees i.e. salvage marking can be removed through the H.P. State Forest Department Corporation Ltd.

The Govt. of H.P. Constituted the Forest Corporation in 1974, the only agency responsible for the harvesting and exploitation of forests, including resin extraction. Earlier, private contractors carried out all activities related to forests.

The most valued forest product in 2001-02 was timber, followed by medicinal plants and herbs and resin. The total forest produce was worth Rs. 231.30 Crore. Until 1970, timber removal from the forests was more than the annual prescribed yield, which was unsustainable. Since 1985, the annual removal from the forest has always remained below the prescribed yield due to ban imposed by the Govt. on silvicultural operation and also under an order of the Supreme Court dated 12-12-1996.

In the light of the increasing pressure on forests through multiple stake holders and the national policy of conserving the forests for maintaining ecological balance and development, allocation to this sector should have been increasing in successive five year plans. On the contrary, it has been declining continuously w.e.f. 7th Plan (1985-1990). This has affected the pace of Afforestation, protection and management of forests in the State. During this period many Hydro Electric Projects were also installed in this Division and the implementation of Catchment Area Treatment Plans for these projects was also started. The Upper Sutlej Valley Watershed Development Society (USVWD) was also registered for the implementations of these CAT_Plans vide Government of Himachal Pradesh Department of Forest Notification No. FFE-B (F)2-73/97 dated 23-10-2002(**copy of notification is annexed as Appendix-XXXV**)

The year-wise revenue and expenditure along with plantation activities of the Kinnaur Forest Division (erstwhile Pooh & Nichar Forest Division) is tabulated in Table No: - 5.10 and 5.11

Table 5.10

Revenue and Expenditure of Kinnaur Forest Division during Ninth Five Year Plan

Year	Nichar Forest Division			Pooh Forest Division		
	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
1997-98	814857	15181700	-14366843	460691	9388100	-8927409
1998-99	11847070	18226900	-6379830	743213	10516583	-9773370
1999-2000	3689126	21784950	-18095824	150482	9872473	-9721991
2000-01	2349325	36132561	-33783236	After 2000-01, the unified Kinnaur Forest Division was created with Headquarter at Reckong Peo.		
2001-02	1801442	34592446	-32791004			

(Source: Kinnaur (Nichar and Pooh) Forest Division)

Table 5.11

Plantations raised during the year 1997-98 to 1999-2000 in Kinnaur Forest Division (erstwhile Nichar and Pooh Forest Division)		
Year	Total area planted (hac.)	
	Nichar	Pooh
1997-98	348.6	24.7
1998-99	194.6	3.8
1999-00	321.25	27

(Source:- Records of Nichar and Pooh Forest Division)

Table 5.12

Plantations raised during the year 2001 to 2002 in Kinnaur Forest Division

Year	Area planted in Bhaba Nagar Range (hac.)	Area planted in Kalpa Range (hac.)	Area planted in Katgaon Range (hac.)	Area planted in Kilba Range (hac.)	Area planted in Mallang Range	Area planted in Moorang Range	Area planted in Nichar Range	Area planted in Pooh Range	Total area planted (hac.)
2000-01	47.6	108.2	63.9	135.6	31	0	0	0	386.3
2001-02	41	144.9	105.8	188	30	8.5	0	0	518.2

(Source:- Records of Kinnaur Forest Division)

The plantations raised under the various CAT_Plans pertaining to Nichar and Pooh Forest Division is also given and tabulated in the Table No: - 5.13.

Table No:- 5.13

Plantations Raised under CAT Plans during the year 1999-2000 to 2001-02 in Kinnaur Forest Division.						
	Area Planted in Hactare Under					
Year	NJHEP	Baspa HEP - II	Karchham - Wangtoo HEP	Kashang	Tidong	Total
1999-2000	0	50	0	0	0	50
2000-2001	0	0	0	0	0	0
2001-2002	0	40	0	0	0	40

(Source: Records of Kinnaur Forest Division, CAT_Plan)

During this period the **Karwasra's Working Plan (1976-77 to 1990-91)** continued to be existed and also **Rajiv Kumar's Working Plan (1999-2000 to 2014-15)** was also in vogue in this division. Felling of trees as prescribed in Working Plan had not been done due to ban on green felling in compliance of Hon'ble Supreme Court's order dated 12-12-1996. Thus, no silvicultural operation as prescribed in the Working Plan had been carried out due to ban on green felling and blanks/open areas were also not taken up planting/regeneration in planned way. Plantations as prescribed had been carried out under various departmental and CAT Plan Scheme but results of planting are average. However, it needs improvement in plantation technique and management in planned way.

5.11 Tenth Five Year Plan (2002-2007):- The Tenth Five Year Plan (2002-07) has been prepared against a back drop of high expectations arising from some aspects of the recent performance. GDP growth in the post-reforms period has improved from an average of about 5-7% of the 1980 to an average of about 6.1% in the Eighth and Ninth Plan period, making India one of the ten fastest growing countries in the world.

These positive developments are, however, clouded by other features which give cause for concern. The situation in this regard is much worse in the rural areas. Land and forest degradation in hills areas and over exploitation of ground water is seriously threatening sustainability of rural livelihood and food production.

The country's forest resources are under tremendous pressure. Intensified shifting cultivation, indiscriminate removal of timber, fuelwood, fodders and other forest produce, forest fires and encroachment has led to forest degradation and deforestation. Forests meet nearly 40% of the country's energy needs and 30% of the fodder needs. It is estimated that about 270 MT. of fuelwood, 280 MT. of fodder, over 12 million m³ (cubic meter) of timber and countless non-wood forest products (NWFPs) are removed from forests annually. The future management need for meeting the requirements of the community.

Forest plays an important role in environmental and economic sustainability. They provide numerous goods and services, and maintain life support systems essential for life on earth. Some of these life support systems of major economic and environmental importance are:

- (i) Supply of timber, fuel wood, fodder and a wide range of non-wood products.
- (ii) Natural habitat for bio-diversity, and repository of genetic wealth.
- (iii) Provision of recreation and opportunity for ecotourism.
- (iv) Playing an integral part of the watershed to regulate the water regime, conserve soil, and control floods.
- (v) Carbon sequestration and carbon sink.

Despite significant resource flows and national concern, the potential of forests to reduce poverty, realize economic growth, and their contribution to the local and global environment has not been fully realized. A combination of market and institutional failures has led to forests failing to contribute as significantly to rural incomes and poverty alleviation and economic growth as would be possible under good economic and technical management.

The following strategies were proposed in order to address the concerns of forests sector and to achieve the objectives of sustainable forests management:

- i) The role of forests to maintain the hydrological balance is complementary. Successful models of watershed development have helped conserve soil and moisture, improve ground water recharge and the water regime and mitigated the adverse impacts of drought. The watershed approach should be universally adopted for the maintenance and development of forests.

- ii) Due to the increase in human and cattle population, the existing forest resource is under intensive pressure to meet the demands for various forest produce, i.e food, fodder, fuel, fertilizer, timber, bamboo, medicinal plant, etc. About 41% of the forest area is degraded due to over exploitation of forest produce. However, no strategy to conserve the forest eco-system would be successful unless the basic needs of the society are met. The future management strategy must, therefore, take into account this compelling need of the community to meet their requirements.
- iii) The forest areas near population centre's/villages have degraded faster due to over-exploitation and the forest resources has become impoverished. It has adversely affected the livelihood security and employment opportunity of people dependent on forests. Therefore, a special programme needs to be drawn up for development of such villages and to provide alternative sources of income.

5.11.1 Forest Plantations:- The following initiatives were proposed for improving the productivity of forest plantation:-

- i) The plantation strategy should be based on creating new forest resources that help reduce pressure on natural forests and preferably reverse the negative impact of deforestation while meeting the increasing demand. India can benefit from the experience of other countries, which have developed policies and incentives to promote private sector participation in accelerating the pace of Afforestation.
- ii) At present, the performance of forest plantations in terms of survival, growth and yield is poor. The mean annual increment (MAI) of forest plantations varies from about 2m³/ha/year for valuable timber species to about 5-8 m³/ha/year for eucalyptus and other fast growing species. This is far below the MAI of over 10m³ and about 50m³/ha/year for good quality plantations in different countries.
- iii) The productivity and success of plantations can be improved by appropriate site selection, site species matching, planting of elite clones, proper maintenance and protection, timely tending, thinning, irrigation, application of manures and pesticides, etc.
- iv) Reduction in harvesting and post harvesting losses should be achieved by adopting improved technologies.

5.11.2 Green India Programme:- Out of the 328.27 m ha total geographical area of the country; around 300 m ha is the available productive land. The actual forest cover is 63.73 m ha of which only 37.73 m ha has good forests. About 20 m ha is covered under tree plantations (agro-forestry, farm forestry, social forestry and other plantations). Thus, in order to bring one-third area under forest/tree cover, (100-37.73-20 = 42.27) 43 m ha of area should be covered under the greening programme over 10 years. The detail programme should be as follows:

- * 15 m hac. of degraded forest land to be covered under JFM.
- * 10 m hac. of irrigated area to be brought under commercial agro-forestry.
- * 18 m hac. of rain-fed area to be brought under subsistence agro-forestry.

Significant efforts are required for greening India to address the food security and environmental challenges. The country is facing the problem of surplus food production on one hand and unemployment, poverty and food deficiency on the other. The implementation of Greening Programme through “food for work” scheme will ensure meeting the basic needs of people, environmental protection, food accessibility and productive employment generation to 10 crore people (mainly tribals, dalits, backwards, other backward classes, landless and women).

Participatory arrangements have existed in Indian Forestry for several years, in the form of forest labour co-operatives, resin tappers, NWFP Collector's Co-operatives societies and other associations. The JFM programme has led to several positive outcomes in many states in India. The major ones are (i) change in the attitude & relationship of local communities and forest officials towards each other and the forests, (ii) improvement in the condition of forests (iii) reduction in encroachments but in this division results are not encouraging as compared to low lying areas of Himachal Pradesh. Similarly tree plantation has been expressed over the low productivity of plantation due to several factors such as steep slope, FRA, and Nautor claims, inadequacies in the site selections and site species matching, poor plantation stock, lack of proper maintenance and protection, fire hazard, financial and capacity constraints etc.

5.11.3 Working Plan (2002-03 to 2007-08) Rajiv's Working Plan continued to be existed and was in vogue in this division. The year-wise revenue and expenditure along with plantation activities of the Kinnaur Forest Division is tabulated in the Table No: - 5.14 and 5.15

Table 5.14

Revenue and Expenditure of Kinnaur Forest Division during Tenth Five Year Plan

Year	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
2002-03	28045016	37595100	-9550084
2003-04	2309211	31613332	-29304121
2004-05	38202719	29393900	8808819
2005-06	9609896	30582094	-20972198
2006-07	6506321	35946999	-29440678

(Source):-Records of Kinnaur Forest Division, Reckong Peo)

Table 5.15

Plantations Raised during the year 2002-03 to 2006-07 in Kinnaur Forest Division.

Year	Area planted in Bhaba Nagar Range (ha.)	Area planted in Nichar Range (ha.)	Area planted in Kilba Range (ha.)	Area planted in Kalpa Range (ha.)	Area planted in Moorang Range (ha.)	Area planted in Pooh Range (ha.)	Area planted in Malling Range (ha.)	Area planted in Katgaon Range (ha.)
2002-03	78.6	163.6	79.46	75.6	26	9	0	0
2003-04	59.1	109.2	40	94	29	13	0	0
2004-05	67.6	103.06	61	78.3	26	9	2.5	0
2005-06	44	107.24	65	57.02	18	6	2.5	0
2006-07	54.5	63.6	76.3	49.6	24	7	11	0
Total	303.8	546.7	321.76	354.52	123	44	16	0

(Source :-) Records of Kinnaur Forest Division, Reckong Peo)

The plantations raised under the various CAT_Plan pertaining to Nichar and Pooh Forest Division is also given and tabulated in the Table No: - 5.16.

Table No:- 5.16

Plantations Raised under CAT Plans during the year 2002-2003 to 2006-2007 in Kinnaur Forest Division.						
	Area Planted in Hactare Under					
Year	NJHEP	Baspa HEP - II	Karchham - Wangtoo HEP	Kashang	Tidong	Total
2002-2003	40	62	0	0	0	102
2003-2004	9.6	5	0	0	0	14.6
2004-2005	39.4	35	0	0	0	74.4
2005-2006	85	30	0	5	0	120
2006-2007	62	31	10	0	0	103

(Source: Records of Kinnaur Forest Division, CAT_Plan)

During this period the **Rajiv Kumar's Working Plan (1999-2000 to 2014-15)** was in vogue and continued to exist in this division.

5.12 Eleventh Five Year Plan (2007-08 to 2011-12):- India has entered the Eleventh Plan period with an impressive record of economic growth. After a lackluster performance in the Ninth Plan period (1997-98 to 2001-02), when gross domestic product (GDP) grew at only 5.5% per annum, the economy accelerated in the Tenth Plan period (2002-03 to 2006-07) to record an average growth of 7.7%, the highest in any Plan period so far. Besides, there was acceleration even within the Tenth Plan period and the growth rate in the last four years of the Plan has averaged 8.7%, making India one of the fastest growing economies in the world.

National Forest Policy, 1988 acknowledged the importance and primacy of local communities and provided for a sustainable management approach with maintenance of environmental stability as the prime objective. Commitment to conservation of nature was highlighted by the targets of maintaining one-third of land under the forest/tree cover.

Plan investment in forestry and wildlife sector so far, including State and Central plan, was about 1% of the total plan outlay. The National Forestry Commission (2006) had recommended an investment of 2.5% of the plan outlay in the forestry and wildlife sector. Our total plan outlay of the State and central plan in forestry and wildlife sector was 1% only.

The Integrated Forest Protection Scheme was redesigned to provide assistance to the states for building capacity and basic infrastructure for modern forest management. Improving Management Planning and Survey (land records) set-up was the first priority for Central assistance. The following components were provided for modernization of the State forest management:

- i) Modernization of the management planning (Working Plan) units with equipment, infrastructure, and manpower. This may include forest inventories, training and satellite imagery processing, and GIS facilities. This included professional services such as ecologists and sociologists for relevant inputs.
- ii) Forest Land Information System for land records, with modern and empowered survey, and land record maintaining mechanisms for documenting the legally recognized individual rights, concessions, ownerships including those under the Scheduled Tribes and other Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- iii) Forest boundary demarcation by providing assistance for the state-of-the-art infrastructure, training/outsourcing survey work, fixing permanent boundary pillars, updating the forest block indices and compartment histories.
- iv) Installation of forest fire surveillance and warning systems, along with fire management planning in participatory mode.

- v) Assistance for general infrastructure for accommodation in remote areas, communication, improvement of road network, etc. was a part of this programme.

The Upper Sutlej Valley Watershed Development Society (USVWD) was renamed, also registered and restructured as **Sutlej Valley Watershed Development Society (USVWD)** as per certificate of Registration of Societies H. P. Societies registration Act, 2006 on dated 18-12-2008, for the implementation of CAT_Plans in Sutlej Basin up to Kol Dam.

The year-wise revenue and expenditure along with plantation activities of the Kinnaur Forest Division is tabulated in the Table No: - 5.17 and 5.18

Table 5.17

Revenue and Expenditure of Kinnaur Forest Division during Eleventh Five Year Plan

Year	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
2007-08	4309001	32347500	-28038499
2008-09	2956263	47364400	-44408137
2009-10	4229922	49174800	-44944878
2010-11	16788949	13685700	3103249
2011-12	330830884	51093500	279737384

(Source:- Records of Kinnaur Forest Division, Reckong Peo)

Table 5.18

Plantations raised during the year 2007-08 to 2011-12 in Kinnaur Forest Division.

Year	Area planted in Bhaba Nagar Range (ha.)	Area planted in Nichar Range (ha.)	Area planted in Kilba Range (ha.)	Area planted in Kalpa Range (ha.)	Area planted in Moorang Range (ha.)	Area planted in Pooh Range (ha.)	Area planted in Malling Range (ha.)	Area planted in Katgaon Range (ha.)
2007-08	30	59.5	109.17	103	46	30	10	0
2008-09	58.37	69.6	87.8	125	40	27	4	0
2009-10	25	47	79	107.5	37	13	3	0
2010-11	8	31	52	75	0	0	0	0
2011-12	12	19	20	60	13	2	0	0
Total	133.37	226.1	347.97	470.5	136	72	17	0

(Source: Records of Kinnaur Forest Division, Reckong Peo)

The plantations raised under the various CAT_Plans pertaining to Nichar and Pooh Forest Division is also given and tabulated in the Table No: - 5.19.

Table No:- 5.19

Plantations raised under CAT Plans during the year 2007-08 to 2011-12 in Kinnaur Forest Division.

Year	Area Planted in Hactare Under					
	NJHEP	Baspa HEP - II	Karchham - Wangtoo HEP	Kashang	Tidong	Total
2007-2008	79	48	71	0	0	198
2008-2009	100.6	42	106	0	0	248.6
2009-2010	72	32	0	0	0	104
2010-2011	28	20	59	20	0	127
2011-2012	0	0	0	0	0	0

(Source: Records of Kinnaur Forest Division, CAT_Plan)

During this period the **Rajiv Kumar's Working Plan (1999-2000 to 2014-15)** was in vogue in this division.

5.13 Twelfth Five Year Plan (2012-13 to 2016-17):- The objectives of the Eleventh Plan were faster and inclusive growth and the initiatives taken in the Eleventh Plan period had resulted in substantial progress towards both objectives. Inevitably, there are some weaknesses that need to be addressed and new challenges that need to be placed. A comprehensive assessment of outcomes on all these fronts during the Eleventh Plan is not possible at this point, because the data for recent year is still not available. However, available evidence suggests that there have been significant gains on many of these fronts, even though there are shortfalls in some areas on which further work is needed.

Several issues have been flagged during the Planning Commission consultations with different stake holders which deal with hand, mining, forest and wild life management, climate change, waste management, reduction of pollution, conservation of forests and biodiversity etc. These must be viewed in the light of the enormous inter connection that exist within the broader dynamics of environmental management. Important issues that require focused attention during the Twelfth Plan are:-

- i) Securing ecology of watershed and catchment.
- ii) Cumulative Environmental Impact Assessment (CEIAs) for vulnerable regions.
- iii) Carrying capacity studies in selected river basins.
- iv) Maintaining acceptable water quality and quantity through pollution control of water resources.
- v) Restoration of wet lands & lakes etc., and
- vi) Management of waste water discharge from Industrial and Commercial establishment into major water bodies.

5.13.1 Water Resources Management:- Water is a relatively scarce resource in India. We have 16.0% of the world's population and only 4.0% of the usable fresh water. Since the annual availability of fresh water is fixed and demands are bound to expand as production increases, large production can only be sustained if, available water resources are harnessed in a sustainable manner and water use efficiency is increased. At the same time, India receives nearly 1200 milli meters of rainfall throughout the year. Available evidence suggests that with increased use of water, mostly on an unsustainable basis, the country is headed towards a grave water crisis. An irrigation account for 80.0% of our total water usage, 60.0% of irrigation water and 80.0% of rural drinking water comes from ground water.

Satellite data reveals that there has been a decline in the ground water level of 4 centimeters each year between 2002 and 2008 in the alluvial tracks of Northern India where natural rates of recharge are high. This is equivalent to an increase in over 70.0% in the rate of water extraction compared to the previous decades. The decline in the water table evidence shows in the crystalline, volcanic and mountainous regions that account for nearly 70% of our landmass where natural rate of ground recharge is very low.

Lack of any co-ordination between competing uses and the complete absence of regeneration has aggravated the problem inherent in the anarchic drilling for ground water. The fact that neither power nor water is adequately priced has only promoted the misuse of our ground water resources. Water quality issue also arises due to chemical pollution through excessive fertilizer use and reckless dumping of untreated waste into our rivers. Only about 30% of the total sewage generated in the country is actually treated before being dumped into available water bodies.

Water is one of the most vital natural resources of Himachal Pradesh. The State is richly endowed with a hilly terrain having an enormous volume of water from the catchment areas of Satluj, Beas and Chenab rivers. These rivers form part of the Indus system. As such, the state has enormous potential of water resources in the form of glaciers and rivers but ground water resource is limited.

In spite of the fact that there is a large volume of water available in the State, only one third of its cultivated area is irrigated because of physiographic constraints. It is ironical that this water rich state is also not free from drought at times. The normal monsoon rainfall in the state varies from 17 to 120cm. Mandi, Bilaspur, Sirmour, Una, Hamirpur, Kullu and Kangra are high rainfall districts where the annual rainfall exceeds 100 cm. Lahaul & Spiti and Kinnaur district receives a low annual rainfall of about 20 cm.

Most of the surface water resources of Himachal Pradesh flow from perennial rivers which originate from glaciers. The flow in those rivers is further augmented by runoff from the catchment areas. The Sutlej has its origin in Tibet and flows through Himachal Pradesh forming the largest river catchment area in the State.

5.13.2 Ground Water Resources:- The ground water resource occurs mainly in unconsolidated sediments of inter montane valleys and in the submontane tract. Kangra, Una, Hamirpur, Bilaspur, Mandi, Solan and Sirmour districts, particularly their valley areas depend upon ground water. The exploitation is done through open wells, tube wells, infiltration galleries and wells.

5.13.3 Traditional Sources of Water:- As there is an in-balance between the supply and consumption of water, particularly by the poor and weaker section of society, the traditional sources of water play a significant role. These include springs, Kuhals, Baories, Ponds, Khaties and ditches etc. These systems supplement the water requirements of the rural and urban areas. There are about 10512 traditional sources of water in the State for drinking water in rural habitations.

The demand of water in the rural & urban areas based on population projection till 2021 is tabulated in Table No:- 5.20.

Table No. 5.20

District/State	1999		2001		2011		2021	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Bilaspur	2.69	22.84	2.90	23.76	4.18	28.90	6.04	35.06
Chamba	4.70	30.18	5.03	31.5	7.06	38.96	9.92	48.12
Hamirpur	3.63	27.39	3.90	28.23	5.58	32.75	7.99	37.85
Kangra	8.30	90.9	8.63	94.44	10.46	114.43	12.67	138.37
Kinnaur	-	5.75	-	5.96	-	7.13	-	8.53
Kullu	2.99	23.61	3.13	24.71	3.88	31	4.82	38.89
Lahaul & Spiti	-	2.47	-	2.55	-	2.96	-	3.46
Mandi	7.64	59.57	7.89	62.1	9.31	76.45	10.98	94.12
Shimla	21.75	37.7	23.81	38.47	37.45	41.6	58.91	42.52
Sirmour	6.05	28.14	6.48	29.3	9.20	35.81	13.06	43.65
Solan	7.63	27.19	8.22	29.15	11.92	36.12	17.27	44.57
Una	4.83	27.86	5.10	28.84	6.71	34.33	8.83	40.82
Himachal Pradesh	70.21	384.32	75.04	399.01	105.76	480.44	150.49	575.97

(Source:- Himachal Pradesh Human Development Report, 2002).

The demand for water in the urban area has been projected by following the norm of 140 Ipcd whereas the norm of 70 Ipcd has been followed for rural area. By 2021, the urban areas of the

state will require 150.49 mld. of water, out of which over one third will be required by Shimla alone. The demand for the water in the rural areas is much higher than in urban areas as a majority of the population of the state lives in the rural areas. Thus, greater thrust is needed for providing drinking water in the rural areas.

5.13.4 Water Quality:- Under the national drinking water mission programme, the IPH Department has set up water quality testing laboratories at Dharamsala, Una, Peo and Kandaghat.

The State Pollution Control Board has been monitoring the quality of surface water only. Surface water pollution is on the rise. During the period from 1993-94 to 1996-97, an increase in total coli form has been observed at some places. Dissolved oxygen is lower in deep water. This may prove detrimental to the development of aquatic life.

Ground water pollution has been observed in the industrial towns of Parwanoo and Kala Amb as per the report of the Central Pollution Control Board, Government of India (1995).

5.13.5 In Situ Rainwater Harvesting:- Village habitations and towns, which are located at low to high altitude areas of the mountain ranges of Himachal Pradesh, are in dire need of water for domestic as well as irrigation purposes. The only in situ water resource available to them is rain water. The most feasible option is to harvest it along the streams as well as nallahs, or the catchment area of watershed and on rooftops etc., and prevent run-off, evaporation and seepage. Fortunately, Himachal Pradesh has abundant rainfall, except at few places and therefore there is a big scope for tapping this resource for drinking and irrigation.

In the towns, rooftop water harvesting in government office buildings, school and panchayat buildings and houses should be done on a war footing for in situ collection and storage of high quality rainwater to meet urgent requirements, after necessary purification measures.

Thus 12th Five Year Plan showed maximum concern about water shed management & Environment and emphasis on water management needs to be promoted in a sustainable manner to increase the productivity of land in hilly areas.

5.13.6 Maintenance of Surface Water Bodies:- Concerted efforts are need to engage in the process of de-siltation and restitution of water bodies through treatment of their catchment area so that they comply the fruitful purpose of providing capacity to store rain water, water for drinking and other purposes and land themselves to fisheries. Ground water management needs to be promoted in a sustainable manner to increase productivity of land especially in hilly areas where ample untapped ground resources are available.

5.13.7 Ground Water Management:- Ground water will continue to be a major resource for both irrigation and drinking purposes. It is vital to ensure that this resource is used in a sustainable manner. For this we must greatly expand the scope of rain water harvesting and ground water recharge. Preliminary studies suggest that the extent of recharge that is possible with the existing precipitation is extremely high in the alluvial plains where the rates of recharge are high. In the more rocky areas of central India, where recharge rates are lower, rain water harvesting and ground water recharge needs to be supplemented by the creation of rain fed small sized reservoir/water bodies, including farm ponds, dug wells and Van Sarovar to impound rain water. This needs to be done by convergence the MGNREGA with the Integrated Watershed Management Programme.

5.13.7 Improving Forest/Tree Cover:- The second main objective of the twelfth Plan is to improve forest cover which includes both canopy cover as well as extension of afforestation of degraded forest land. To meet the country's demand for timber and non- timber forest produce, a comprehensive approach is required. Upto the Eleventh Plan period the focus was on increasing area under forest and tree cover. However, there is a tremendous scope for increasing the stock and quality of existing forests. "Green India Mission" is being designed to regenerate at least four

million hectare of degraded forests, increase density of cover as two million hectare of moderately dense forests and overall increase the density of forest and tree cover to ten million hectare of forest land, waste land and community lands. Thirdly, forestry extension can be achieved through afforestation of non conventional forest areas adopting farm and agro-forestry approaches. While doing so fruit bearing species may be given importance for wild life and strengthening the nutritional security of the rural population.

5.13.8 Community Rights and Minor Forest Produce:- While it is clear that what the primary tribal collectors of Non timber Forest Produce (NTFPs) get today is a very small fraction of the potential value embedded in NTFPs, we must also ensure that apparent movement forward on Panchayat (Extension to Scheduled Areas) Act (PESA) does not end up making things worse for the primary tribal collectors of NTFPs.

5.13.9 Wildlife:- Both habitations pressure and invasive alien species constitute a threat to native bio diversity in both the terrestrial and adequate eco system. Fragmentation and degradation of wildlife habitats adversely affects the population of wild animal species resulting in increased man animal conflicts. The country has taken a pioneering step in formulation of Biodiversity Act, 2002 and Biodiversity Rules, 2004 assigning adequate importance to community conservation and management of bio-resources for the benefit of all stakeholders. This Act is very much in time with the International Convention and Protocol on Bio-diversity Conservation. Proper implementation of the Act at Gram Sabha level will be the important task for the Twelfth Five year Plan. The twelfth Finance Commission has recommended grant-in-aid for forests in H.P. as under:-

Year	Amount in crore
2010-11	12.58
2011-12	12.58
2012-13	25.16
2013-14	25.16
2014-15	25.16

No grant –in –aid have been received during Twelfth Finance Commission to Kinnaur Forest Division. However, grant –in –aid to Kinnaur Forest Division as recommended by the Thirteenth Finance Commission is given as under:-

Year	Amount in laks
2010-11	16.00
2011-12	33.90
2012-13	47.84
2013-14	28.65
2014-15	35.00

During the Plan period, Rajiv's Working Plan for Nichar and Pooh Forest Division was operative and the recommendations/suggestion given in the twelfth five year plan was achieved during the Working Plan period.

The year-wise revenue and expenditure along with plantation activities of the Kinnaur Forest Division is tabulated in the Table No: - 5.21 & 5.22.

Table 5.21
Revenue and Expenditure of Kinnaur Forest Division during Twelfth Five Year Plan (2012-13 to 2016-17)

Year	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
2012-13	15389017	58735869	-43346852
2013-14	12573940	60112650	-47538710
2014-15	59694795	62696143	-3001348
2015-16	5438190	59793333	-54355143
2016-17	7898109	79554765	-71656656

(Source:- Records of Kinnaur Forest Division)

Table 5.22

Plantations raised during the year 2012-13 to 2016-17 in Kinnaur Forest Division.								
Year	Area planted in Bhaba Nagar Range (ha.)	Area planted in Nichar Range (ha.)	Area planted in Kilba Range (ha.)	Area planted in Kalpa Range (ha.)	Area planted in Moorang Range (ha.)	Area planted in Pooh Range (ha.)	Area planted in Mallang Range (ha.)	Area planted in Katgaon Range (ha.)
2012-13	10.5	13	28.07	97.5	44	11	0	0
2013-14	31.23	7.7	13	86.7	28.5	5	0	0
2014-15	51.11	39.15	64.05	42.55	7	0.9	0.4	0
2015-16	19.5	25.5	30	64	25	0	0	17.5
2016-17	23	36.62	77.74	68	141	0	0	22
Total	112.84	109.85	177.12	361.75	92.5	18.9	0.4	0

(Source: Records of Kinnaur Forest Division)

The plantations raised under the various CAT_Plans pertaining to Nichar and Pooh Forest Division is also given and tabulated in the Table No: - 5.23.

Table No: - 5.23

Plantations raised under CAT Plans during the year 2012-13 in Kinnaur Forest Division.						
Area Planted in Hactare Under						
Year	NJHEP	Baspa HEP - II	Karchham - Wangtoo HEP	Kashang	Tidong	Total
2012-2013	27	0	72	15	9	123

The year-wise revenue and expenditure along with plantation activities of the Kinnaur Forest Division is tabulated in the Table No: - 5.24 & 5.25.

Table 5.24
Revenue and Expenditure of Kinnaur Forest Division during Twelfth Five Year Plan (2017-18 and 2018-19)

Year	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
2017-18	1743700	90532677	-88788977
2018-19	8090548	87599767	-79509219

(Source:- Records of Kinnaur Forest Division)

Table 5.25

Plantations Raised during the year 2017-18 in Kinnaur Forest Division.								
Year	Area planted in Bhaba Nagar Range (ha.)	Area planted in Nichar Range (ha.)	Area planted in Kilba Range (ha.)	Area planted in Kalpa Range (ha.)	Area planted in Moorang Range (ha.)	Area planted in Pooh Range (ha.)	Area planted in Malling Range (ha.)	Area planted in Katgaon Range (ha.)
2017-18	39.08	29	51	63	25	2	0	38

(Source:- Records of Kinnaur Forest Division)

During this period, the **Working Plan (2015-16 to 2018-19)** for the forest of Kinnaur forest division continued to be existed in this division and the revision of Rajiv's Working Plan had also started during 2015. The intervening period April, 2015 to 2018-19 will be considered as plan holiday because no green fellings took place during this period as a result of complete moratorium on green fellings and in compliance of the Supreme Court order dated 12-12-1996. The incidence of forest fire in the State has increased during this plan period and more area is burned each year. Fire is a major factor that causes considerable damage to the forests of this Division and department has failed to protect the forest including plantation area due to paucity of fund, poor infrastructure development, difficult geographical terrain and socio-legal problem etc.

5.13.10 Inadequate Investment in Forestry Sector:- Forestry is the biggest land use in the State. Investment inputs in forestry are grossly-inadequate compared to the economic benefits derived from the forest-leaving aside their role in soil, water and environment conservation. To meet the development needs, forests have been looked upon as a source of revenue for the State. There is quite insufficient budget keeping in view of needs of forest management and the massive Afforestation programme required to bring 50% of the area under forest cover according to State Forest Policy. Even the external financial support (donor assistance) is not considered as additionality but is treated as part of the regular budget of the Department.

5.14:- NITI AAYOG, (The National Institution for Transforming India):- The twelfth five years plan (2012-2017) ended during 2017 and the central government had decided to discontinue with the five-year plans set. Thereafter, the NITI Aayog, **THE NATIONAL INSTITUTION FOR TRANSFORMING INDIA, WAS FORMED VIA A RESOLUTION OF THE UNION CABINET ON JANUARY 1, 2015.** which replaced the Planning Commission when the Narendra Modi as Prime Minister came to power and has been given the task of formulating the 15-year plans. The central body created a platform to monitor, evaluate and review various schemes and also specify target results.

The Centre aims to replace Five years plan with a 15-year blueprint with a shorter seven-year strategy, as part of its National Development Agenda. The National Development Agenda will include a seven-year action plan, with a focus on defence and internal security, besides social and development goals.

The proposal will include mid-term reviews every three years, with the first appraisal in 2019-20. The Prime Minister of India gave the plan go-ahead, and it is set to come into force after the 12th five-year plan concluded in 2016.

CHAPTER VI

STAFF AND LABOUR SUPPLY

6.1 Staff:-The staff position of Kinnaur Forest Division as it stood on 31-3-2019 under various categories is tabulated in Table No. 6.1

Table-6.1
Staff position of Kinnaur Forest Division as on 31-3-2019
Staff position of Kinnaur Forest Division

Sr. No.	Name of Office/Deptt.	Category	Sanctioned Post	Filled up posts	Vacant Post
1.		2.	3.	4.	5.
1.	Kinnaur Forest Division	HPFS	2	2	-
2.		Supdt.G.II	1	1	-
3.		Sr.Assist.	2	3	(+)1
4.		Clerk/Sr.Clerk/Jr. Assist.	6	3	(-)3
5.		Forest Ranger	8	5	(-)3
6.		Dy.Ranger	19	23	(+)4
7.		Fgd.	62	59	(-)3
8.		Naib Tehsildar	1	1	-
9.		Kanungo	1	1	-
10.		Junior Engineer	1	-	(-)1
11.		Driver Truck/Bus/Van	2	1	(-)1
12.		Plumber	1	-	(-)1
13.		Peon/Chowkidar	10	9	(-)1
14.		Chowkidar	13	14	(+)1
15.		Dak Runner	4	-	(-)4
16.		Sweeper	2	-	(-)2
17.		Syce	1	-	(-)1
18.		Malies	11	17	(+)6
19.		Taroo	1	-	(-)1
20.		Dandidar	1	1	-
21.		Depot Watcher	1	-	(-)1
22.		Forest Worker	45	20	(-)25
23.		Multipurpose Worker	-	5	(+)5

There has been no increase in staff strength as warranted by increase of work load and charge of public attitude with time.

6.2 Executive Charges:-This division consists of 8 territorial ranges viz Bhaba Nagar, Kalpa, Katgaon, Kilba, Mallang, Moorang, Nichar, and Pooh list of Divisional Forest Officers who has held the charge of Divisional Forest Office Kinnaur is tabulated in table No:- 6.2

Table-6.2

List of DFOs who held the charge of Kinnaur Forest Division			
Sr. No.	Name of DFOs	Period	
		From	To
1.	Sh. Ajit Thakur HPFS now IFS	14-06-1999	10-05-2002
2.	Sh. Kunal Styarthi IFS	10-05-2002	24-05-2002
3.	Sh. S.S Katiak IFS	24-05-2002	07-08-2004
4.	Sh. R.R Bhalaik HPFS	07-08-2004	11-06-2006
5.	Sh. S.S Patial HPFS	12-06-2006	07-06-2007
6.	Sh. G.R Sahibi IFS	07-06-2007	08-05-2009
7.	Sh. M.M Khushdil HPFS	08-05-2009	30-06-2011
8.	Sh. S.P Singh HPFS	08-07-2011	14-12-2012
9.	Sh. R.L Dhangal HPFS	15-12-2012	23-02-2013
10.	Sh. Angel Chauhan HPFS	23-02-2013	08-03-2019
11.	Sh. Dr. Chaman Lal Rao HPFS	08-03-2019	

The list of Administrative Ranges, Blocks and Beats in Kinnaur Forest Division is given in **Appendix No.- XL**

6.3 Labour Supply:- Generally adequate local labour is available in the tract for various forestry operations like raising of nurseries, plantation, cultural operation, enumerations, marking, repair of boundary pillars, construction and repair of buildings, roads and paths etc. Slight scarcity is felt during monsoon planting season i.e. in July and August which coincides with the apple and vegetable harvest season. Gorkha labour from Nepal is also available for different departmental works. The forest corporation also engages labour locally for resin extraction and timber exploitation. But the H.P.S.F.D.C.Ltd.is mostly relying on imported labour from Mandi, Kangra, Nepal and U.P. areas. The daily wagers are also being regularized as per Govt. policy for time to time. In Kinnaur Forest Division, nearly 30 to 70 numbers of daily wagers are working regularly in the division for whom the work is being provided. Nearly 350 to 600 other persons are also employed annually as casual labour during seasonal forestry works.

The work achieved in one man day i.e. work done by an adult labourer in one working day for eight hours is tabulated in Table No:-6.3

Table-6.3

Sr. No.	Name of Work	Quantity of Work
1.	Soil working picking 15 cms deep, digging trench 30 cms deep breaking clodes and pilling earth from trench over the 15 cms piked line forming a ridge and furrow for very hard soil.	7.08 cum
2.	Soil working patches worked at 30 cms deep clodes broken	4.81 cum
3.	Pit making 30x30x30 cms size	2.40 cum
4.	Digging over completely to 30 cms deep (after this to make the dug up spil into actual beds needs about 150 labourer to do one hac. in one day)	2.97 cum
5.	Broad cast sowing in the nursery	372 sq.M
6.	Weeding in nursery (Ist and rain weeding)	93 sq.M
7.	Weeding in nursery (2 nd and rain weeding)	57.6 sq.M

8.	Making root-shoot cuttings	400 Nos.
9.	Planting cutting includes making and transport over 2.5 Kms.	80 Nos.
10.	Weeding in patches in plantation weeding- Ist weeding	30.6 sq.M
11.	Weeding in patches in plantation weeding- 2 nd weeding	22.37 sq.M
12.	Grass cutting in March (Variable)	278.07 sq.M
13.	Cilling i.e. cutting grass in patches around plants.	278.07 sq.M

(Source: As per Forester's companion)

6.3.1 In the changed scenario (JFM, PFM and PRA techniques, etc), there is the need for imparting specialized skills to the field staff in view of the changing trends may also be discussed.

Forestry works are also coming under the ambit of MNREGA wherein work is being executed by employing the job card holders. But there is scarcity of labours under MNREGA particularly for forestry works.

6.4 Labour Rates:- The wage rates of labour have been increased many folds. The daily wage rate for normal unskilled labour was Rs. 51 per day during 1999 which is now Rs.250 per day (April, 2019). The Conservator of Forests, Rampur Circle fixes the labour rate for Rampur Circle. The schedule of rates has not been revised after 2012-13 and an increase of 92.30% on these rates is being given. The past and present rate of daily waged unskilled labour is tabulated in Table No: - 6.4

Table-6.4
Statement showing comparison of the wage rate of some classes of workman during 1999- 2000 and 2012-2013.

1.	Particular of Labour	Rate in Rs (1999-2000)	Rate in Rs (2012-13)
I	UNSKILLED LABOUR		
1.	Adult male or female	51.00	130.00
II	SKILLED LABOUR		
(A)	Building and Roads labour		
1.	Quarry man (Khangir)	51.00	130.00
2.	Jumper man	51.00	130.00
3.	Driller (for Air Compressor)	51.00	130.00
4.	Spray man	51.00	130.00
5.	Carpenter Ist class	93.00	235.00
6.	Carpenter IInd class	69.50	178.00
7.	Mason Ist class	93.00	235.00
8.	Mason IInd class/ Stone chisler	69.50	178.00
9.	Painter Ist class/Distemperer	69.50	178.00
10.	Painter II nd class/ white washer	56.50	143.00
11.	Blacksmith	65.00	166.00
12.	Plumber Ist class	65.00	166.00
13.	Pulmber IInd class	54.50	140.00
14.	Bar Binder	56.20	143.00
(B)	Machanical labour		
1.	Saw Mill Operator	65.00	166.00
2.	Assistant saw mill operator	51.00	130.00
3.	Cleaner	51.00	130.00

4.	Electrician Ist class (ITI qualified)	82.00	208.00
5.	Electrician IInd class	65.00	166.00
(C) Timber Extraction Labour			
1.	Feller (Girani)	51.00	130.00
2.	Logger	51.00	130.00
3.	Sawyer (Chirani)	56.50	130.00
4.	Dresser (Pachhani)	51.00	130.00
III MISCELLANEOUS LABOUR			
1.	Chowkidar(Office, Depot Nursery, Plantation and Rest Houses), Khalasi/ Syce/Bhisti/Zoo Animal Attenda fire Watcher/Grinder for chips flooring/ Mate/ Calliper man/ Mali/Sweeper/ Enumerator/Enclosure sweeper	51.00	130.00
IV Muleteer		53.20	143.00
1.	Darzi or Tailor Ist class	-	166.00
2.	Darzi or Tailor IInd class	-	140.00
3.	Welder	-	166.00
4.	Well Sinker	-	166.00
5.	Supervisor	-	166.00
6.	Operator	-	166.00
7.	Boat Man	-	130.00

(Source: As per schedule of work and labour rates for Rampur Circle for the year 1999-2000 and 2012-13)

6.4.1 Labour for Resin Extraction Operations:-The extraction of resin from the forest is under the control of HP State Forest Development Corporation Ltd. and they allot the works to the labour supply mates on their schedule of rates for various applications or some times invite tenders.

CHAPTER VII

PAST SYSTEM OF MANAGEMENT

7.1 General History of Forests:- There are no records available which could throw the light on the early history of these forests before 1850. It is, however, admitted that no system of conservancy of forest was in force. Shifting cultivation was practiced on a large scale, and the forests were gradually destroyed for agricultural purposes. With the increase in population, agricultural land, fuel and grass became more acute. This led to a very heavy and constant pressure on the adjoining forests and resulted in depletion of vegetation both in extent and quality. Annual burning of forests for new and tender blades of grass, led to the destruction of fire tender species. In such acute circumstances, necessity towards forest conservancy was realized during later half of the century. But there is ample evidence to show that they were subject to frequent Firing and practice of shifting cultivation.

7.2 Past System of Management and their Results:- Little is known about the history of the Bashahr forests before 1850. At that time large mature trees were plentiful including all proportions to the lower girth classes, were available. The Forests together with, young regeneration, had been destroyed by frequent fires, which appear to have passed repeatedly through all forests, leaving left to the present day the marks of their ravages on the old over mature trees still standing. Shifting cultivation was general and resulted in the destruction of large areas of forest. Deodar forests in the neighborhood of temples were regarded as sacred and trees were only felled for temple repairs or after sacrifice to the local God. The past History of the Forests covered by the Working Plan before the advent of the British Rules, can be divided into three periods i.e. 1850-1891, 1892-1905 to date. Consequently the general history and past management of each constituting unit/area is being described as under:-

7.2.1 Period 1850-1891:- In 1850 an Indian trader purchased Deodar trees from the Raja at two annas (12 paise) each, but the forests were not heavily felled until 1859 when other traders obtained permits to fell an indefinite number of trees merely by giving the Raja a bag full of rupees. The Raja granted "Parwanas" to these traders, a bag of rupees being sufficient to purchase an indefinite number of tree, and even this payment was often avoided. In 1862 the Sutlej Valley forests were inspected by Cleghorn, who remarked about the sheer wasteful working of forests by the traders. It was estimated that in some cases not more than 10% of the logs reached the plains. On Cleghorn's suggestion, the Raja, who was keen to have better supervision of his forests, applied to the Superintendent, Hill States to appoint an officer for exercising control over the working of forests and for control and realization of revenue which was proposed at Rs. 3.50 per tree of Deodar which alone had any market. Every forest cleared by traders was subject to frequent fires, either caused by carelessness or by the villagers who fired the debris in order to clear the ground for cultivation.

The Raja found the greatest difficulty in dealing with traders, who constantly avoided their obligations and was anxious for the forest to be leased by Government and British Officer to be placed in charge. In 1864, a lease was eventually concluded by Government and fixed lease period from 1804 to 1877. Royalty being paid for each tree felled. A larger profit was not anticipated, but the necessity for preserving these forests in the drainage area of the Sutlej was realized to be of paramount importance in view of the important irrigation works on the Lower Sutlej and for the sake of the supply of timber to the Punjab.

Dr. (afterwards Sir Dietrich) Brandis in company with various other forest Officers, made a rough survey of the Bashahr Forests in 1864 and has left on record some very interesting remarks as to their condition. He calculated that between 1859 and 1863, about 30,000 numbers of Deodar

trees had been felled from the more accessible forests, and noted that a large proportion of the forests on the lower slopes of the hills had been completely cleared. Fire entered in the dry season and what was formerly a rich forest with 33 first class trees on the acre, is now a barren slope covered with charred stumps and trees killed by the fire. "He comments on the very large amount of timber left behind in the forests and on the great destruction to timber caused by the tough methods of extraction. At the foot of one slide he counted upwards of one thousand logs and splintered pieces and notes that he observed many similar instances of the destruction of timber."

Promiscuous firing of the forests was stopped, simple rules regulating harmful practices were introduced and the first attempts at conservation were commenced. A rough scheme for felling the more accessible forests was drawn up, prescribing regular regeneration fellings combined with sowing and planting and allowing for the removal of all first class deodar trees from accessible forests during the succeeding sixteen years. Artificial regeneration was, however, to be subsidiary to endeavors to obtain natural regeneration.

7.2.2 As a first step Mr. Barnes, Superintendent of Hill States, drew up rules for the management of these forests and a native Forest Ranger was appointed, but these measures did not have the desired effect. In 1864, the management of the Bushahr State Forest was taken over by the British Government and a lease was concluded with the Raja of Bushahr State in consideration of certain payments. In the same year, Brandis made of inspection of forests in the Sutlej Valley. After inspection he drew up a felling scheme based on enumeration on rough linear surveys. Thus, felling was confined mainly to the easier forests on the left bank of the Sutlej.

The lease was revised in 1877, Government agreeing to pay a fixed annual sum to the Rajah on a fifty years lease, renewable in perpetuity at the will of Government. Rules were introduced and the next few years were occupied in the departmental extraction of timber, in inducing the villagers to conform to the rules, in supplementing natural reproduction in the areas worked departmentally and in repeated but only partially successful attempts to restock artificially the areas devastated by traders fellings and subsequent fires, and to the present day such areas were easily identified by the large number of old stumps still persisting on otherwise barren hill sides.

In 1872, Brandis again visited Bushahr and found that the rate of felling had averaged only 1400 trees annually. He recommended an early preparation of a proper working plan which was soon taken up in hand by Ribbentrop with Batchelor and Stenhouse. This plan for the period 1875-1890 was of particular interest because then was first realized the necessity for differentiating between the treatment of compact blocks of regular high forest and that of irregular forest on steep ground. The former type received two successive regeneration felling and in the latter, felling were to be made by selection of individual trees. The forests were worked by the departmental agency.

Bushahr forests were leased to the Punjab Government, and the first regular lease was drawn up during 1877 which was renewed from time to time during 1928 and 1942. The control of Bushahr forests was transferred to Himachal Pradesh Government w.e.f. April 1, 1949.

The first detailed working plan was prepared by Mr. Lace in 1892 for a period of twelve year 1892 to 1904. The forests of this Division were covered in the following working plans as under:-

- i. Ribbentrop, Batchelor and Stenhouse 1875-1880**
- ii. Lace's working plan 1892-1904.**
- iii. Hart and Gibson's working plan 1904-1930.**
- iv. Hamilton's working plan 1930-50.**
- v. Madan's Working Plan from 1947 to 1958-59.**
- vi. Tandon's Working Plan 1960-61 to 1975-76.**

vii. Karwasra's Working Plan 1976-77 to 1990-91.

viii. Rajiv's Working Plan 1999-2000 to 2013-14.

7.2.3 In 1864 the management of the Bushahr & State Forest was taken over by the British Government and lease was concluded with the Raja of Bushahr in consideration of certain payments. In the same year Brandis made a tour of inspection in the Sutlej Valley. In his report, he estimated that 30,000 Deodar trees had been felled between 1859 and 1863. Most of these had been felled from lower slopes of easily accessible forest which had been practically denuded. Fires had often swept the felled areas. In spite of constant efforts and great expenditure little success has been achieved in restocking these areas and ruins of the old forests can still be seen in such areas at Kaksthal, Dippi, Sapni, Tangling, Kastiarang and Runang.

7.2.4 Brandis drew up a felling scheme based on enumeration or rough liner surveys only those forests which could be logged were included. Thus felling was confined mainly to the easier forests on the left Bank of Sutlej. The system of management proposed was selection with a girth limit of six feet and felling was limited to 3,000 trees annually.

7.2.5 In 1872 Brandis again visited Bushahr and found that the rate of felling had averaged only 1,400 trees annually. He recommended early preparation of a proper working plan.

7.2.6 Ribbentrop, Batchelor and Stenhouse 1875 – 1880 :- In 1874 Ribbentrop with Batchelor and Stenhouse started preparing. First the regular working plan for the forests of Bushahr State. The plan for the period 1875-1880. The plan was of particular interest because it realized the need for differentiating between the treatment of compact blocks of regular high forests and that of irregular forests on steep ground. The former type was to be gone over in two successive regeneration felling, the first felling to leave about 5 seed bearers per acre; shelter belts were to be left where necessary and groups of II class trees were to be retained. In the latter type felling was to be by selection of individual trees. The plan further provided for a detailed examination of the pandrabis forests. The growing stock of Deodar was estimated to be 98,000 classes I trees, exclusive of pandrabis forests and the annual yield was fixed at 2,000 I class trees. Between 1875 and 1880 only 3,309 trees were felled, but during the ten years ending 1891, the average annual felling amounted to 2,302 Deodar trees. With regard to the nature of fellings made between 1875 and 1891, Lacey stated that most of the forest worked was gone over in regeneration fellings of an irregular nature which succeeded one another at too short intervals. He noted that regeneration established neither as speedily nor as completely as it might have been more regular and repeated after longer intervals. The fellings moreover, were generally too light and the regeneration which comes in was soon suppressed as was the case in C.248 (b). Another note of 1885 Miniken observed that natural regeneration of Deodar could be obtained without opening the canopy at all and it was undesirable to make any fellings until regeneration had come in. There is no doubt that this observation was regarding the practice of silvicultural treatment of Deodar prevailing at that time.

7.2.7 There are no authentic records to show whether any artificial regeneration was attempted and with what result. It is, however, mentioned that, a small boundary patch of about 4 ha near Sholtu on the left bank of the Sutlej, which had been destroyed by the early fellings of the traders was planted with Deodar transplants near about 1867 and out of which only a few survived. A good patch of mature Deodar exists at Sholtu even today and is a living monument of all those who introduced early forest conservancy in the remote and inhospitable tract of this valley. Thus during the period, the forests were managed under the reports of Brandis and others published in 1864, 1875 and 1881 Forests were exploited by the departmental agency.

7.2.8 The earliest attempts to demarcate the forests were made in 1868. In the first instance only Deodar forests, under working were demarcated by 1857, Miniken completed that settlement and

the demarcation but owing to certain discrepancies, it was not adopted. In 1916, Glower took up this work again and finally completed it in 1921.

7.2.9 The Survey of India completed a special forest survey of the tract in 1886-1887 which facilitated the overall management of the forests. The general results of management had a wholly beneficial effect upon the growing stock and a check was imposed on indiscriminate destruction of the forests. The regeneration which appeared at several places, however, could not be tanted. Continuous fellings over the same area with a view to complete the regeneration before leaving the site resulted in heavy failures. Instead of any regeneration, heavy weeds colonized the area and the dry girdled trees damaged the regeneration, during the winds falls.

7.3 Lace's Plan (1892-1904): Lace's plan was the First detailed plan prepared for the Sutlej forests. Recognizing that Deodar tends to form compact blocks of even-aged forest, successive regeneration feelings were prescribed for forests workable under this system. The selection system was prescribed for the remaining forests. The interval between successive fellings varied from 10 to 20 years and about half the mature stock was to be removed at the First fellings, extensive opening of the canopy were discouraged. The yield was calculated separately for each forest and was based partly on the proportion of I class and II class Deodar trees and partly on the state of regeneration. The accumulated annual yields of all the Sutlej Valley forests amounted to 1,450 I class trees, which included provision for right holders 'requirements as well.

7.3.1 The regeneration fellings were heavier than in the past and on the whole better results were obtained, but in some compartments, for example C.171 (b), C.172(b) and C.174 (a) they were still too light and the regeneration which came in was suppressed.

7.3.2 Kail was to be treated as a weed. Mature Kail trees mixed with or standing over Deodar were to be felled or girdled: Kail poles were to be heavily thinned or felled in group and Deodar was to be introduced by sowing where no Deodar seed bearers existed. Where Deodar regeneration had already got established the results were excellent, but as a means of inducing Deodar regeneration the operation proved a failure. The only result being that a dense crop of weeds and bushes came up in the gaps made in the Kail canopy. This practice was rightly discarded in 1900 by Elliot in an inspection note and by Hart in his plan.

7.3.3 For the First time a definite scheme of supplementary silvicultural works was laid down in this plan and artificial regeneration met with a fair degree of success.

7.4 Hart's and Gibsons Plan (1905-1930):- Under Hart's plan forests were divided in to five working circle, only three of them viz, the Sutlej working circle, the Kanawar working circle and the Sugnam working circle were represented in Kanawar. Kanawar is old name of Kinnaur.

7.4.1 The Kanawar Working Circle: It comprised mainly of areas in the dry zone where conditions of a locality and the State of the growing stock rendered it impossible to treat the forests by any method other than of improvement fellings. The objects of management were to maintain the forest for improvement felling at 15 years intervals, a sustained yield was not looked for and fellings were prescribed. Fellings in this Circle were carried out in accordance with these prescriptions and subsequently some of the forests showed improvement.

7.4.2 The Sugnam Working Circle:- It comprised of the forests of dry zone suitable only for protection, remote Fir and Kail forests of the wet zone, and all un-demarcated forests from where timber could not be extracted & profit. No feelings were prescribed. Removals by right holders only for their bonafide use were done.

7.4.3 The Sutlej Working Circle:- It comprised of all the valuable Deodar forests from which a sustained yield under the selection system was prescribed. The objects of management were to bring about a more normal distribution of the age classes and to foster the spread of Deodar. The working

circle was divided into 6 felling series co terminus with the forest ranges, five of which lay in Kinnaur, the silvicultural system adopted was selection, but it was also suggested that true selection felling must be modified wherever the condition of the crop necessitated fellings of a more regular and concentrated nature, such as seeding fellings in compact blocks of mature high forest and final fellings where mature trees stood over fully established advance growth. It was held that the seeding fellings would be heavy and should remove about two third of the total number of trees proposed to be felled during the period of the plan. In support of this, it was pointed out that in the past successful regeneration had been obtained only where fellings have been fairly heavy. The interval between successive fellings was fixed as 20 years for dry forests and 15 years for the rest. No rotation was fixed but an exploitable girth of 7 feet 6 inches (nearly 75 c.m diameter) was adopted for Deodar, and Kail was not considered. The estimated growing stock of Deodar was as under.

I class 24" (60cm) diameter and over	II class 18-24" (45-60 cm) diameter	III class 12"-18" (30-45cm) dia.	Total
1,18,132 trees	92,816 trees	1,28,134 trees	3,39,082

7.4.4 The proportion of Ist class trees was considered excessive and it was estimated that about 75 percent of Ist class trees were over 7 feet 6 inches in girth. An annual yield of 2,802 trees of 24 inches (60cm) diameter could be felled for silvicultural reasons. This yield included provision for right-holders. The felling of Kail was not regulated.

7.4.5 The prescription for 26 years (1905-06 to 1930) amounted to 72,852 I class Deodar trees of 24" (60cm) diameter and over. August this, actual fellings, including trees given to right holders have been 68,341 I class Deodar trees, a deficit fellings of 4,511 I class Deodar trees might be felled in the course of regeneration felling, but felling of such trees should count towards the yield, two, II class trees to be equivalent to one Ist class tree for the purpose of control. Between 1921 and 1928 when the order was cancelled, 11,642 II class tree or 5,821 I class equivalents were felled. This later figure added to the actual I class trees removed brings the total fellings as 74,162 I class trees. This gives an excess removal, of 1,310 Ist class trees. The Table No. 7.1 compares the growing stock of Deodar in 1905 with that of 1930.

Table No.7.1
Number of Trees

Growing stock	I Class 24" And over diameter	II class 18-23" Diameter	III class 12-17" dia.	Volume in thousand ofcft
In 1905 fellings	1,18,132	92,816	1,28,134	32,246
In 1905-30	68,341	27,839	23,034	15,056
In 1930	92,520	99,239	1,86,861	30,140

I Class trees were reduced by 19.1 percent, but this was one of the aims of the plan.

7.4.6 The Table No. 7.2 compares the density of stocking per of workable Deodar and Kail bearing forests in 1905 and 1930:-

Table No.7.2

Year	Species	I Class 24" and over diameter	II Class 18-23" diameter	III Class 12-17" diameter	Total	Approx area of workableforests (area)
1905	Deodar	5.6	4.6	6.4	16.9	
	Kail	0.7	0.9	1.3	2.9	
	Total	6.6	5.5	7.7	19.8	20,000
1930	Deodar	4.2	4.5	8.5	17.2	
	Kail	0.7	1.4	3.6	5.7	22,000

7.4.7 The increase of 2,000 acres in 1930 was due partly to the inclusion of some areas classed as unworkable in 1905 and partly to extension of demarcation. The comparison of the figures for Deodar is not strictly accurate as the greater proportion of the newly demarcated area carried Kail, but the inaccuracy is very low, but both species are mixed with Fir and broad leaved trees on considerable areas. The nature of the ground is such that density found under easier topographical conditions could never be expected all over.

7.4.8 Until 1911, the method of treatment, as actually applied was “Selection-cum- Shelterwood”, the Shelterwoodfellings being made on small areas scattered throughout the forest. These have left a considerable mark on the forests and in many cases have the appearance more of group fellings. These fellings were heavier than those made under Lace’s plan and resulted in more healthy regeneration, as in Barang C.171 (b), but they were still light. The major difficulties experienced in adopting this system were:-

- i. There was no prescription for dealing with middle aged trees. The felling of isolated or small groups of mature trees in the middle of crops of large poles of 18 inches diameter and over, left in ragged crop with holes in it in which no regeneration could possibly be expected, may be seen in parts of C.222(b), C.240(a), C.170(b), C.186,
- ii. The coming up of scattered regeneration
- iii. The difficulty of selecting areas for closers.
- iv. In 1908, the Sutlej Forest Company started scantling conversion in all fellings areas, and with fellings of the “Selections-cum- shelterwood” type the disposal of debris was often impossible.

7.4.9 From 1911 to 1913 group fellings were made in mature high forest, but only a few forests were affected and no signs of them remain now. Such fellings had been contemplated by Hart, but they did not succeed in producing natural regeneration.

7.4.10 From 1914, onwards fairly heavy fellings of shelterwood type were made in mature crops. The result of these fellings have, as the whole, been excellent. It became possible to burn felling debris on a large scale, and natural regeneration came in more quickly and was not suppressed. Some good examples of these fellings were C.182 (a), C.244, C.174 (a) and C.175 (b). Though, in the last compartment the spacing of the shelterwood was increased and additional felling made in 1924. All these are now fully regenerated and bear excellent sapling- pole crop.

7.4.11 In 1917 Hart, the then Inspector General of forests, advised the wholesale removal of the over wood from fully established regeneration and this was put into effect in some of the compartments. This suggestion was an outcome of the realization of the necessity for a more uniform treatment of Deodar and was a far reaching modification of the working Plan prescriptions. The object of this deviation, intended solely for the early uncovering of fully established regeneration was misinterpreted and resulted in the felling of immature groups which might well have been left standing, as in C. 72(a), C.78, C.86(a) and C.172(b).

7.4.12 After 1920, the felling programme was not strictly adhered to, and there was a tendency to treat all partially regenerated areas, as if, they were part of a PBI of the Uniform System without any regard to the prescriptions of the plan.

7.4.13 Experience gained during the period of Hart’s Working Plan:- The selection fellings, when properly made in uneven-aged crops with advance growth and on steep ground produced good results e.g., C.181, C.246, C.170 (b), C.167 and C.129. They failed when made in mixed Deodar and Fir crops and in mature high forests of pure Deodar. In the former case, the removal of the Deodar trees, whether singly or small groups, resulted only in the establishment of fir

regeneration and the retrogression of the Deodar bearing areas. In the later case, in the wet zone the holes made did not let in sufficient light to allow Deodar to establish itself and weeds quickly spread the ground, while in the dry zone the holes made did not let in sufficient light to destroy the humus layer and prepare a suitable seed bed.

7.4.14 The shelterwood fellings, which were made from 1914 onwards, produced excellent result, wherever, sufficient light was let in and when the fellings were followed by adequate debris burning and closure.

7.4.15 It was seen that in the wet zone, excessive removals of the overwood resulted in a heavy influx of weeds which was difficult to deal with subsequently and that in order to regenerate the Deodar Fir, mixture in favour of Deodar, marking must bear heavily on Fir C.171 (b) felled in 1918, is a good example of how Fir which has invaded a true Deodar area should be treated.

7.4.16 The vital principle of shelterwood fellings in the dry zone to afford protection against the sun was enunciated and generally accepted, and it was clearly demonstrated that fairly heavy shelterwood fellings correctly, made in suitable crops were not only possible but absolutely essential both in the interest of the silviculture of Deodar and of economic extraction.

7.4.17 Difficulties were experienced in some cases in deciding the extent to which the sacrifice of immature trees should be made. At first the importance of retaining good pole crops when marking seedling felling was fully realized and the fellings were on the light side. It was followed by a tendency to regenerate pole crops and fellings, whether seeding or secondary were too heavy. The result of this was that an unnecessarily large area had been thrown under regeneration and the fertility of the soil was reduced, wherever, the fellings had been too heavy.

7.4.18 The preference of Deodar for regenerating itself in even-aged groups, had been taken full advantage of, and results show that production of even-aged crops was highly desirable.

7.5 Thinning and Improvement Fellings 1905-30:- The programme of thinning and improvement fellings prescribed in the plan was fully carried out. Hart, in the inspection note of 1917, was the opinion that thinning carried out till 1916 had been too light. From that year onwards the intensity of thinning increased. In many young Deodar forests that had been invaded by Kail, thinning through aimed at the production of mixed wood, bore heavily on Kail ruthlessly in thinning in favour of even suppressed Deodar. Thinning of both Deodar and Kail, have been rather heavy in the dry zone forests.

7.6 Hamilton's Plan (1930-50):- Hamilton revised Hart's Working Plan for the Kanawar tract of the upper Bushahr Division, now Kinnaur Forest Division. The area covered by this plan was approximately 10,24,000 acres (4,14,700 ha) out of which 54,210 acres (21,938 ha) were demarcated forests.

7.6.1 Hamilton recognized the great value of Kanawar forests for the welfare of the people in the plains and preservation of forests cover was considered as the basic objects of management. The following working circle was constituted:

1. The Protections Working Circle.
2. The Wet Zone Selection Working Circle.
3. The Dry Zone Selection Working Circle
4. The Punjab Shelterwood Working Circle.
5. The Undermarked Working Circle.
6. The Kanawar Working Circle.

7.6.2 The Punjab Shelterwood Working Circle (6498 acres) (2629.65ha.)

All forests in the wet zone fit for gradual conversion under the Punjab Shelterwood System were allotted to this working circle. A rotation of 180 years was taken as a reasonable period for the conversion of the forest of comparative uniformity and to get trees of 30" (75 cm) d.b.h. Four periodic blocks, I, II, VI and Intermediate were formed.

1. PB I (1451 acres) (587.2 ha) comprised of forest in which regeneration works were in progress or which required regeneration.
2. PB II (766 acres) (310.00 ha). There were few typical PB II forests. Forests allotted to this periodic block were either mixed crops in which no seedling felling had been made, or very irregular crops which had been slightly opened out in the past.
3. Intermediate Blocks (3219 acres) (1302.65 ha) contained extensive young pole crops; some compartments carried scattered overwood.
4. PB VI (1062 acres) (429.80 ha) comprised forests which had been under regeneration for 30 or more years and reached the required degree of uniformity. Part of overwood still stood over established regeneration.

Total enumerations were carried out in 5" (15cm) d.b.h. classes for Deodar and Kail down to 12" (30cm) d.b.h.

7.6.3 Calculation of yield:- The following yields were prescribed:-

- i. Final yield of PBI: Any tree of Deodar and Kail 18" (45cm) d.b.h and over felled counted towards final yield in PB I. Compact groups of poles upto 18" (45cm) d.b.h. were to be retained as part of the regeneration. Felling of Silver Fir and Chill was not controlled. Volume of Deodar and Kail of 18" (45 m) d.b.h and over was as under:-

Deodar	5,66,000 cft	(16027m ³)
Kail	1,57,000 cft	(4446m ³)
Total	7,23,000 cft	(20473m ³)

No allowance was given for increment and annual final yield for 30 years regeneration period was fixed as under:-

Deodar	19,000 cft	(538m ³)
Kail	1,03,100 cft	(147m ³)

- ii Final yield outside PB I: Volume of Deodar and Kail of 18" (45 cm) d.b.h and over was:-

Deodar	2,18,000 cft	(6195 m ³)
Kail	1,03,100 cft	(2920m ³)

The annual final yield outside PB I for working Plan period was fixed as under:-

Deodar	7,300 cft	(207m ³)
Kail	3,400 cft	(96 m ³)

The control of final yield from PBI and outside PB I was by volume. Intermediate yield was to be realized from thinning and improvement fellings rules were laid down. Sowing and planting operation were prescribed. The control was by area.

7.6.4 Method of executing fellings and subsidiary silvicultural operations in all the PBs were prescribed. Thinning and improvement fellings rules were laid down. Sowing and planting operation were confined to PB I. Very little was left to be done to complete the stocking of scattered blanks. An area of 79 acres was to be regenerated during the currency of Working Plan.

7.6.5 Results of Working:- Hamilton's plan was admirably suited for the conditions prevailing at that time. The final yield for the PB I and others was formerly prescribed to be controlled separately,

but, it was soon found impracticable and it was later on jointly controlled for all the PBs. Along with the yield of all the PBs of the Kanawar shelterwood Working Circle.

7.6.6 The allotment of PBs was not normal owing to the highly uneven-aged nature of the crop under the process of conversion. Area of PB I was 40% in excess. It could not be helped as regeneration of mature woods could not be deferred. PB II was 28% in deficit than the normal owing to paucity of mature and maturing trees. The other PBs was nearly normal. Hamilton's prescriptions were definitely on conservative side and the growing stock per ha increased in all the PB's.

7.6.7 The regeneration in PB VI progressed more rapidly than was actually anticipated by the working Plan Officer. This resulted in early removal of the overwood, and early realization of total available yield. The areas suggested for planting/ sowing were gone and gaps were fully regenerated.

7.6.8 The Kanawar Shelterwood Working Circle (5551 acres)(2246.40Ha):- All forests in the dry zone fit for gradual conversion under the modified Shelterwood system approximating in its board outlines to the Irregular Shelterwood System, were allotted to this Working Circle. The silvicultural system applied was elastic leaning towards Selection System, so that, every variation in the crop was to be treated on merits. The system was named as Kanawar Shelterwood System. Four periodic blocks has been made on much the same lines as in Punjab Shelterwood Working Circle.

- I PB I (1111 acres) (449.60 ha) comprised of forest in which regeneration works were in progress or which required regeneration.
- II PB II (851 acres) (344.39 ha.) there were few typical PB II forests. Forests allotted to this periodic block were either mixed crops, wherein no seeding feelings had been made or very irregular crops which had been slightly opened out in the past.
- III PB IV (861 acres) (348.43 ha) comprised of forests which has been under regeneration for 30 or more years and had regeneration for 30 or more years and had reached the required degree of uniformity. Part of overwood was still standing over established regeneration.
- IV Intermediate block (2728 acres) (1103.98 ha) contained extensive young pole crops. Some compartments carried scattered overwood too.
Total enumeration was carried out in 6"15cm d.b.h. classes for Deodar and Kail down to 12" (30cm) d.b.h.

7.6.9 Calculation of Yield:- The following yields were prescribed:-

- i) **Final yield of PB I:-** Any tree of Deodar and Kail 22" (55cm) d.b.h. and over felled counted towards final yield. Compact groups of poles upto 21" (53cm) d.b.h. were to be retained as part of the regeneration. Felling of Fir was not controlled. Volume of Deodar and Kail 22" (55 cm) d.b.h. and over was as under:-

Deodar	7,49,000 cft	(21,209m ³)
Kail	1,08,000 cft	(3,058m ³)

No allowance was given for increment and annual final yield for 40 years regeneration period was fixed as under:-

Deodar	19,000 cft	(538m ³)
Kail	3,000 cft	(85m ³)

- ii) **Final yield outside PB I:-** Volume of IA and IB trees of Deodar and Kail felled counted towards final yield. Volume of IA and IB Deodar and Kail was as under:-

Deodar	1,78,000 cft	(5040m3)
Kail	1,48,000 cft	(4190m3)

The control of final yield from PB I and outside PB I was by volume.

- iii) Intermediate yield was to be realized from the thinning and improvement fellings for which programme as well as thinning rules were prescribed. The control was by area.

7.6.10 Methods of executing fellings and subsidiary silvicultural operations were prescribed. Marking rules for PB II were same as for Punjab Shelterwood Working Circle. Sowing and planting over 145 acres was suggested.

7.6.11 The growing stock position at the end of the working plan period improved by judicious management. The proportion of II class trees which were already in deficit showed no improvement.

7.6.12 As already indicated, the yield jointly controlled for all the PB's along with the yield of all PB's of Punjab Shelterwood Working Circle. At the expiry of the plan, there was a deficit removal of 4,65,222 cft. of Deodar and 1,22,010 cft. of Kail. In PB I and an excess removals of 7,33,131 cft of Deodar and 3,96,837 cft. of Kail from the other PB's. The intermediate yield from thinning and improvement fellings was controlled by area. An analysis of the final yield reveals that the deficit removals in PB I was obviously due to slow progress of regeneration in PB I from where the prescribed yield could not be removed during the first felling cycle 1930 -45. Examples are C.238 and C.248 (b). During the currency of the revised fellings programme of second felling cycle, 1946-60 out of 13 PB I areas only seven were prescribed for working. This caused deficit which along with the accumulated deficit of the First cycle resulted in the net deficit.

7.6.13 There has been excess removal of Deodar and Kail from other PB's. This was described to the following causes:-

- Promising patches of young growth in PB inter needed removal of overhead shade.
- There was also some accumulated excess of the first felling cycle. During the second felling cycle also, the work remained frequently confined to PB inter and young areas in order to concentrate the timber operations.
- During the course of thinning and improvement fellings, some of the mature, top dry Deodar and Kail trees, whose retention was silviculturally not considered sound, were removed.
- Removal of overwood from the PB IV areas such as C.183 (a) and C.170(a) yielded more volume than prescribed.

7.6.14 It was not very judicious to combine PBIV yield with other PB's including PB II. In that way, the progress of fellings which were almost prohibited in PB II was not properly watched and heavy fellings in PB II occurred.

7.6.15 The demand of the right holders was estimated in the working plan as 4000 cft. of Deodar and 6000 cft of Kail. But the actual removals were heavier. The thinning and improvement fellings carried out in accordance with working plan prescriptions greatly benefited the crop. Sowing and planting over 145 acres as prescribed was done but area of C.236 could not be regenerated for want of proper closure.

7.6.16 The Wet Zone Selection Working Circle (10941 acres) (4427.65 ha):- This includes all areas of selection type lying within the influence of the south west monsoons. The silvicultural system applied was Selection. The exploitable diameter for both Deodar and Kail was fixed at 30" (75 cm) d.b.h. The felling rules were prescribed in great details. An estimation of the silvicultural yield from

each forest was made. The collected silvicultural yield of all the forests for the working plan period of 30 years amounted as per details in Table No. 7.3

Table No. 7.3

Species	IB 30" (75cm) and over No. of trees.	IA 24"-29"(50-75cm) No. of trees	Volume in cubic feet in the round
Deodar	5366	1181	14,29,560
Kail	2042	2055	5,30,760
Total	7408	3236	19,60,320

7.6.17 The removal of IB trees in preference to IA was prescribed, the later being in deficit was to be preserved for safeguarding the future yield. No IA trees were to be marked even when standing over established regeneration. However, it could be felled during the course of regeneration fellings in patches of level ground. The felling rules provided for extension of Deodar in Kail areas by retaining healthy seed bearer of Deodar. Shelterwood fellings were prescribed on patches of mature forest on easy ground and around the existing advance growth in mixtures, Deodar was to be preferred by heavy marking of fir or Kail.

7.6.18 Results of Working:- Soon after the adoption of the Working Plan, the yield of all Selection Circle of Kanawar plan and that of Western Pandrabis Selection. Working Circle was jointly controlled. The Table 7.4 compares the yield prescribed and removed during the plan period from the wet zone Selection Working Circle.

Table No. 7.4

Species	Prescribed number of trees and Diameter classes		Number of trees actually removed between 1930-60			
			Excess (+)		Deficit (-)	
	I B 30" & over	I A 24"-29"	IB	IA	IB	IA
Deodar	5366(180 annually)	1181 (40 annually)	370		1616	
Kail	2042 (70 annually)	874 (30 annually)	867		408	

There have been excess removals of IA class Deodar and Kail and deficit removals of IB class trees. The objects of the plan have not been fulfilled.

7.6.19 The growing stock in 1930 was considered as IA trees were in deficit and had to be conserved. For calculation of the yield these were controlled. At the end of the plan the proportion of II and III class together showed improvement, but I class both in Deodar and Kail showed decline.

7.6.20 Artificial regeneration was either already in hand or was to be taken up in certain areas marked as red areas. As a result of heavy grazing and lack of efforts regeneration of many red areas remained neglected.

7.6.21 The Dry Zone Selection Working Circle:- Forests (10,634 acres) grew under adverse climatic and edaphic conditions. The ground supporting the forests usually is steep and occasionally broken up rocky unculturable precipices. The nature of the crop was irregular and open on the whole, the forests were open, the quality low, trees slow grown, ground flora very scarce or Regeneration deficient. Past felling had been heavier. Regeneration, if at all, came very slowly and could not be protected against grazing and browsing. These forests were to be managed for protection and to provide timber for the right holders. No special treatment was prescribed for these forests.

7.6.22 Results of Working:- The climatic and biotic conditions are so adverse that nothing could be done to improve these forests. Even the closure of areas did not bring needed improvement.

7.6.23 The Undemarcated Working Circle: (3826 acres) (1584 ha):- The forest allotted to this Working Circle was those areas of the undemarcated Forests. This required special protection either on account of their value as Protection forests or on account of the value of the crop. These were largely Fir and Kail forests. A list of the undemarcated forests along with rough areas was given, along with short notes on their growing stock and suggestions for their treatment. Commercial felling in these forests was to be especially sanctioned by the Chief Conservator of Forests. The forests situated near the habitations were reserved to meet the demands of the right holders but no breaking of land was to be allowed. Marking in the forests were to be carried out according to the rules laid down for the Wet Zone Selection Working Circle. Yield was not controlled. Programme of thinning and felling was not given. No specific areas for regeneration were prescribed.

7.6.24 Results of Working:- The results of introductions of management in these forests have generally been very poor, serious fires occurred in these forests. No immediate efforts were made to restock the burnt areas, with the result that the top soil has been washed and bushes have occupied the areas. During Second World War, a few of these UF's containing Kail, Fir and Spruce situated on easier slopes were worked on selection principles and the results of felling were encouraging. From 1950 onwards, many more UF's in Kilba and Nichar Ranges were worked along with adjoining demarcated forests with the sanction of the Chief Conservator of forests. Regeneration is completely lacking. No attempts to restock them artificially were made.

7.6.25 Special Works of Improvement Under Taken:-

Thinning and improvement fellings:- A detailed programme of thinning and improvement fellings by ranges was prescribed. But soon after the adoption of the plan, it was found impracticable. In order to co-ordinate this along with the main fellings, it was decided that the control of thinning and improvement fellings (all circles) would be by area. The total area of the plan was to be gone over during the plan period and on this basis annually 2800 acres could be thinned anywhere in the Working Plan area.

7.6.26 Results:- Prescriptions of thinning were followed in all the areas except in areas like the Bhaba Valley forests. Thinning in Deodar was satisfactory but in kail these were very light. The improvement fellings in Kail crops in the dry zone have not been very satisfactory. Here the heavy incidence of *Arceuthobium* spp. had resulted in severe mortality of this species. No thinning and improvement fellings were made in the Spruce and Fir Crops.

7.6.27 Roads:- The main provisions of Hamilton's plan were largely completed. Maintenance, however, lacked and many paths in Nichar and Kilba ranges have fallen into disrepair. Apart from the paths a few new bridges and jhulas were also constructed, viz, bridge on Baspa at Karchham and Batseri.

7.6.28 Buildings:- A large number of new buildings were constructed and the existing buildings were maintained.

7.6.29 Cultural Operations:- Hamilton gave a list of the forests which required artificial regeneration. Results of sowing and planting Deodar and Neoza in the dry zone tract by counter pit sowing had shown little success. Irrigated plantations were attempted with good results. Plantations had been tended regularly. Heavy accumulations of debris all over the forests resulted on account of its non disposal. The position was improved to a certain extent in the last ten years of the plan.

7.6.30 Past Yield:-The total yield of timber from all circles had been as under:-

Species	Volume in Cft.	Average annual Yield in cft.	Against prescribed in cft.
Deodar	60,55,549	2,08,510	98,952
Kail	31,31,719	1,06,057	34,292
Fir	31,26,900	1,04,230	Not prescribed

7.7 Tandon's Plan (1960-61 to 1975-76):- Tandon revised Hamilton's working plan and five working circle namely (i) The Wet Zone Shelterwood Working Circle (2299 ha), (ii) The Dry Zone Selection Working Circle (13916.75 ha) (iv) The Dry Zone Selection Working Circle (v) The Protection Working Circle (5,79,745.88 ha) were constituted. The plan was prepared for a period of 15 years.

7.7.1 The Wet Zone Shelterwood Working Circle:- The circle contained all the better stocked Deodar and Kail forest with limited Spruce and Silver Fir. The forests were prescribed to be managed under Punjab Shelterwood System. The exploitable diameter of 24" (60cm) d.b.h. was fixed. Since the forests allotted to this circle were in the course of conversion period of 120 years was fixed. A felling cycle of 15 years corresponding to the period of the Working Plan was fixed. Four periodic blocks I, II, III and IV were formed.

- PB I (514.76 ha): Included forests which required regeneration or in which the regeneration was in progress but not yet complete. Few forests contains Silver Fir and Spruce were also allotted to this P.B. to work these as an experiment under strip and concentrated fellings for regeneration of Fir and Spruce.
- PBII (583.15 ha): There were only a few typical PB II areas available for allotment to this PB.
- PBIII (573.44 ha): Included predominantly middle aged woods with scattered mature trees.
- PV-IV (627.65 ha): Included young forests regenerated in the last two plans.

7.7.2 The annual yield prescribed in different PBs is given in Table No. 7.5.

Table No. 7.5
Prescribed yield of 16" (40cm) d.b.h. and over in cum

Species	PB-I	PB-II	PB III	PB IV	Total
Deodar	680	No commercial fellings were prescribed	710	820	2210
Kail	400		420	420	1240
Spruce	340		340	140	820
Silver Fir	790		200	400	1390
Total	2210		1670	1780	5660

7.7.3 Control of Yield:- Based on the past experience, variation from the annual yield was permitted, provided the accumulated surplus or deficit did not exceed 10% at the end of every five years. The final yield from PB-I and from other PBs was to be controlled jointly and transfer from one PB to another was allowed. Transfer between Deodar and Kail was also permissible. The yield of Spruce, Silver Fir and Chil was to be controlled jointly. Artificial regeneration of 50 acres (20 ha) a year was essential to sustain the calculated yield in perpetuity. If for any reason an average of 50 acres (20 ha.) in a year was not successfully planted up, the calculated yield was to be reduced proportionately. This type of calculation was to be made at the end of every fifth control year.

7.7.4 The forest allotted to PB-I were not true PB-I areas and considerable elasticity in Marking was anticipated. The technique of regeneration fellings was as per Punjab Forest Leaflet No. 2. The areas had already been gone over under some or the other kind of fellings in the past and, therefore, felling of heavier intensity followed by artificial stocking without waiting for natural regeneration

was suggested. Compact groups of poles upto 16" (40cm) d.b.h., not less than 0.5 acres (0.2 ha.) in extent were to be retained as advance growth. Kail crops were to be opened sufficiently to allow pure Spruce and Silver Fir pockets were to be gone over under seeding felling.

Areas allotted to PB-II were also not representative. The areas were under- stocked and in light of this no commercial fellings were prescribed. However, thinning in congested crops was recommended.

Partially converted forests were allotted to PB-III. The forests were to be gone over silviculturally with a view to realize the dead, diseased and a certain proportion (about 25%) of the mature and over- mature stock whose retention was not justifiable. A part from this thinning and improvement fellings was prescribed to maintain hygienic conditions.

Areas allotted to PB-IV had been regenerated in the last two plans. Thinnings and improvement fellings were prescribed for these areas.

7.7.5 Result of Working:- The prescriptions of the Working Plan were not followed in later and spirit. The control on yield was not exercised nor any step was taken to revise the yield of this working circle. The position of yield prescribed and removed during the plan period given in table No. 7.6.

Table No. 7.6

Species	PB I			PB II		
	Yield prescribed in m ³	Removal in m ³	Deviation	Yield prescribed in m ³	Removal in m ³	Deviation
Deodar	10200	16714.2	(+)6514.20	No commercial felling were prescribed	4135.05	(+)4135.05
Kail	6000	12756.7	(+)6757.70		3578.55	(+)3578.55
Spruce	5100	20869.9	(+)15796.90		2372.8	(+)2372.80
Fir	11580	26374.8	(+)14524.80		5600.6	(+)5600.60
Total	33150	76742.6	(+)43592.60		15687	(+)15687.00

Species	PB III			PB IV		
	Yield prescribed in m ³	Removal in m ³	Deviation	Yield prescribed in m ³	Removal in m ³	Deviation
Deodar	10650	5612.05	(-)5037.95	12300	3804.9	(-)8495.10
Kail	6300	888.1	(-)5411.90	6300	1703.8	(-)4596.20
Spruce	5100	528.2	(-)4571.80	2100	1904.7	(-)195.30
Fir	3000	548.45	(-)2451.55	6000	5476.5	523.5
Total	25050	7576.8	(-)17473.20	26700	12889.9	(-)13810.10

Thinnings were generally light in PB III and IV. Though no commercial fellings were prescribed in PB II, quite a sizeable volume was removed. The regeneration of PB I areas did not keep pace with the fellings. The regeneration survey done during the field works is given in Table No. 7.7

Table No 7.7

Sr. No	Particulars	Area	%-age
1	Total area of PB II	514.76	100%
	Area gone over in seeding felling for inducing regeneration	514.76	100%
	Fully regenerated (pole crop density more than 75%)	-	-
	Moderately regenerated (pole crop density less than 75%) (Sapling 25%, Seeding 75%)	24.30	4.2
	Inadequately regenerated (regeneration present but not established so far)	147.17	28.59
	Blanks		
	a. Culturable	15.15	2.94
	b. Unculturable	5.85	1.14
	Scrub		
	a. Culturable	-	-
	b. Unculturable	-	-
	Advance growth	322.29	62.61

The areas retained as advance growth are mostly occupied by Silver Fir and spruce. These were required to be gone over under shelterwood fellings and natural regeneration was to be supplemented by carrying out planting of Fir and Spruce. Instead, these areas were gone over in heavy selection fellings and regeneration could not be induced.

7.7.6 The Dry Zone Shelterwood Working Circle:- This working circle contained all the better stocked predominantly Deodar and Kail forests. The forests were prescribed to be managed under "Punjab Shelterwood System", with an exploitable diameter of 24" (60cm) d.b.h. and conversion period of 180 years. 15 years felling cycle corresponding to the period of the plan was fixed. Regeneration period of 45 years was fixed and the crop was divided into four periodic blocks as under:-

- Quartier bleu* (633.74 ha):- Forests allotted to this block were having mature woods with or without advance regeneration growth.
- Quartier jaune* (774.57 ha):- Forests approaching maturity were placed in *Quartier jaune*.
- Quartier blanc* (364.62 ha):- Predominantly middle aged woods with a fair proportion of mature and over mature trees were allotted to *quartier blanc*.
- Quartier rubrum* (236.45 ha):- Areas got regenerated in the last plan with or without scattered mother trees were allotted to *quartier rubrum*.

7.7.7 The Table 7.8 shows the annual prescribed yield in different periodic blocks:-

Table 7.8.

Species	Prescribed yield of 16" (40cm) d.b.h and over in m ³				
	Q. bleu	Q. jaune	Q. blanc	Q. rubrum	Total
Deodar	560	No commercial fellings Were prescribed	340	150	1050
Kail	210		100	30	340
Fir & spruce	120		30	10	160
Total	890		470	190	1550

7.7.8 Control of Yield:- All I class green trees of deodar, Kail spruce or fir felled from the Q. blanc and all II class and over green trees felled from the Q. bleu and Q. rubrum for any purpose were to

count against the prescribed yield. The yield from Q. bleu, Q. blanc, Q. rubrum though calculated separately was to be controlled jointly and transfer from one to another quartier was allowed, transfer between deodar and Kail was permitted. The yield of spruce and fir was to be controlled jointly. Variation from the prescribed annual yield was permitted provided accumulated surplus or deficit did not exceed 10% at the end of every five years. An area of about 2.55 ha was prescribed to be regenerated artificially or naturally. To remove a sustained yield from those forests, the prescribed area was to be regenerated. If for any reason an average of about 16 ha was not successfully regenerated in a year, calculated yield was to be reviewed every fifth year. Methods of executing fellings in all the periodic blocks were laid down.

7.7.9 Results:- The prescription of the working plan were not followed. Only one Q. bleu are C.169(a) was gone over in seeding felling during 1973. The seeding felling were too light to induce regeneration. The position of yield prescribed and removed is given in Table No. 7.9.

Table No. 7.9

Species	Q. bleu			Q. jaune		
	Yield Prescribed in M ³	Removal in M ³	Deviation	Yield Prescribed in M ³	Removal in M ³	Deviation
Deodar	8400	4498.00	(-) 3902.00	No Commercial Fellings Were prescribed	2855.00	(+) 2856.00
Kail	3150	1793.20	(-) 1356.80		1913.65	(+) 1913.65
Spruce & Fir	1800	761.00	(-) 1039.00		1913.00	(+) 1913.00
Total	13350	7052.20	(-) 6297.80		6681.65	(+) 6681.65
	Q. blanc			Q. rubrum		
Deodar	5100	1425.50	(-) 3674.50	2250	2139.10	(-) 110.90
Kail	1500	600.35	(-) 899.65	450	904.30	(+) 454.30
Spruce & Fir	450	470.20	(+) 20.20	150	8.10	(-) 141.90
Total	7050	2496.05	(-) 4553.96	2850	3051.50	(-) 201.50

7.7.10 Wet Zone Selection Working Circle:- The working circle contained mixed Silver Fir, Spruce, Deodar and Kail forests with an admixture of broadleaved species and a little Chil situated on generally steep and difficult terrain. The forests were prescribed to be managed under 'Punjab Selection System' with 15 year felling cycle. The exploitable diameter for all the species was fixed at 24" (60cm) d.b.h. and the annual yield of different species was prescribed as given in Table No. 7.10.

Table No. 7.10

Species	No. of trees of exploitable diameter to be removed annually
Deodar	300
Kail	500
Spruce	500
Silver Fir	2000
Chil	20
Total	3320

Subsidiary operation like marking of dead and dying trees and marking for thinning and lopping of inferior species interfering with regeneration were to be carried out in the year following the main felling & an area of 1480 ha was recommended for sowing/ planting during the plan Period.

7.7.11 Result:- The yield position at a glance in Table No.7.11

Table No.7.11

	No of Trees				
	Deodar	Kail	Spruce	Fir	Chil
(1) Yield prescribed during plan period	4500	7500	7500	30000	300
(2) Yield removed during plan period	4281	15465	8616	32229	68
(3) Deviation	(-)219	(+)7965	(+)1116	(+)2229	(-)232

A good many forests, which were prescribed for working, could not be worked for one or other reason and still the yield removed was in excess. The better situated forests such as C.74, C.75, and C.79 were exploited repeatedly, subsidiary operations as prescribed were not carried out. The area suggested for plantation was also not gone over. The selection system adopted did not produce the required results; the crop is now deficient in trees of mature and young age classes.

7.7.12 Dry Zone Selection Working Circle:- This working circle contained mixed or pure Deodar, Kail and Neoza forests of dry zone, with 15 years felling cycle. An exploitable diameter of 20" (50cm) d.b.h. was fixed for deodar, Kail and spruce and 24" (60cm) d.b.h. was fixed for fir. The following annual yield of different species was prescribed:-

Species	No of trees exploitable diameter to be removed annually
Deodar	450
Kail	180
Spruce	40
Silver Fir	100

Subsidiary operations like thinning and improvement fellings and felling or lopping of malformed trees interfering with regeneration was to be carried out. Slash disposal was to be done to be proved a clean bed to natural seed. Programme of sowing/planting was prescribed. An area of 25 ha. was to be sown annually with Deodar, Kail, Spruce or Silver Fir according to the suitability of site.

7.7.13 Results:- No Commercial fellings were carried out in working circle. Only the demands of the right holders were met. The yield position at the expiry of the working plan is as under:-

	No of Trees.			
	Deodar	Kail	Spruce	Fir
(1) Yield prescribed during plan period	6750	2700	600	1500
(2) Yield removed during plan period	1486	442	57	180
(3) Deviation	(-)5264	(-)2258	(-)543	(-)1320

The sowing/planting programme was followed half-heartedly. The status of regeneration in these forests is poor. After the Chinese aggression in 1962, the pressure of grazing increased and tramped.

7.7.14 The Protection Working Circle:- This working circle covered 579745.88 ha. area. The extent of demarcated and un-demarcated forests was 6562.80 and 573183.08 hac. respectively. The forests allotted to this working circle were not commercially exploitable due to inaccessibility, difficult terrain and poor stocking (quantitatively or qualitatively). The extensive alpine pasture and perpetual snow peaks were also included in this circle. The object of management was to preserve the forest cover to reduce the soil erosion. Yield was not anticipated from these areas. The demand of right holders was to be met with as per settlement report and while carrying out markings due regard to silvicultural requirement was to be given. A programme of rotational closure and planting was suggested. A list of forests where demonstration plots were to be laid down for demonstrating

effects of rotational logging was given. Since no commercial fellings were anticipated in this circle, enumerations were not done.

7.7.15 Result:- The ambiguous suggestions made in the working plan could not be followed in practice. After the Chinese aggression in 1962, the pressure of grazing increased and desired area could not be closed to grazing. The climate is so hostile in the dry and arid zones that the sowing/Planting operations done under various schemes did not produce any results.

7.8 Karwasra's Plan (1976-77 to 1990-91):- Under Karwasra's Plan, the forests were divided into six working circle as under:-

1. The Wet Zone Deodar Kail Working Circle.
2. The Dry Zone Deodar Kail Working Circle.
3. The Fir Spruce Working Circle.
4. The Neoza Working Circle.
5. The Protection Working Circle.
6. The Hardwoods Working Circle.

7.8.1 The Wet Zone Deodar Kail Working Circle:- This working circle covered the demarcated and the un-demarcated protected forests of the wet zone situated on comparatively easier ground and having Deodar and Kail as principal species. This working circle included and the forests of the wet zone selection working circle of the Tandon's working plan. The total area allotted to this working circle was 2819.65 ha. constituted by 2507.15 ha. of DPFs and 312.50 of UPFs. Total enumeration was carried out in the 10 cm diameter classes down to 10 cm d.b.h. in PB I. In other PBs partial enumerations were carried out and growing stock estimated. The Punjab Shelterwood system was adopted. The rotation was fixed at 120 years corresponding to an exploitable diameter of 60 cm. The regeneration period was fixed for 30 years. The entire area of the working circle was allotted into for definite periodic blocks:

PB I (type 'A'):- Those areas were allotted to this working circle, which were allotted to PB I of wet zone shelterwood working circle of Tandon's plan. These areas were gone over in seeding fellings in 15 years instead of 30 years and regeneration existed in patches only.

PB I (Type 'B'):- Fire burnt areas requiring regeneration were allotted to this PB.

PB II:- Forests having preponderance of age classes approaching maturity, were allotted to this PB.

PB III:- Forests with preponderance of middle aged crops were allotted to this PB.

PB IV:- Forests allotted to this periodic block consisted of forests regenerated during the last 65 year.

The distribution of areas was as under:-

PB I		PB II	PB III	PB IV	Total
A. Type	B. Type				
504.58	428.13	656.68	703.75	526.51	2819.65

Yield:- The yield was prescribed by volume for PB I and PB IV and is given in Table No 7.12

Table No. 7.12

Species	PB I	PB IV	Total (Volume in m3)
Deodar	600	600	1200
Kail	250	150	400
Spruce	425	160	585
Silver Fir	725	170	895
Total	2000	1080	3080

Only one felling series was constituted, in PB I markings were to induce regeneration, while in PB IV, they were to conform to final fellings. No fellings were prescribed from PB II or III, except removal of dead, dying diseased and malformed trees.

7.8.2 Results:-The various prescriptions and suggestions made in the working plan were not followed in practice. An area of 504.58 was proposed to be gone over in corrective fellings, but only an area of 173.61 was actually gone over, there being no green felling from 1983-84 onwards. Only two compartments were felled i.e. 72 (b) and 84 with an area of 63.95 and 109.66 ha. respectively. On account of salvage markings and removal by right holders there have been excess removals of I B class trees. The forests such as C.No 84 were not properly closed and as such regeneration is poor. In case of PB IV also, the fellings prescribed were not carried out. Out of 526.51 ha. allotted to PB IV requiring removal of overhead shade, only an area of 84.98 ha. was actually gone over fellings in C. No. 86 (a). No green felling was carried out after 1982-83. Similarly, in case of PB III the suggestions of the working plan regarding removal of dead, dying, malformed fallen and suppressed trees was not followed, except in the year 1979-80, when C. No 85 with an area of 35.60 ha. was gone over in thinning. The removals from PB II & III were, however, heavy on account of salvage and right holders removals. The position summarized in Table No. 7.13

Table No. 7.13

PB I			
Species	Yield prescribed.	Yield removed	Deviation
Deodar	9000	4453.13	(-)4546.87
Kail	3750	3064.51	(-)685.49
Spruce	6375	2225.04	(-)4149.96
Fir	10875	1849.75	(-)9025.25
PB II			
Deodar	No. yield prescribed / No fellings were prescribed	4857.77	(+)4857.77
Kail		1667.73	(+)1667.73
Spruce		1537.80	(+)1537.80
Fir		199.27	(+)199.27
PB III			
Deodar	No. yield prescribed	8612.69	(+)8612.69
Kail		2540.47	(+)2540.47
Spruce		452.38	(+)452.38
Fir		105.52	(+)105.52
PB IV			
Deodar	9000	4875.08	(-)4124.92
Kail	2250	2067.75	(-)182.25
Spruce	2400	1431.80	(-)968.20
Fir	2250	1122.28	(-)1427.72
G Total	45900	41064.97	(-)5135.03

7.8.3 Status of Regeneration:- The regeneration assessment done in felled PB-I areas gives the position as detailed in Table No. 7.14.

Table No. 7.14

1.	Total area of PBI 'A' type	504.58
2.	Total area gone over in seeding felling	173.61
3.	Percentage of area gone over in felling	34.41%
4.	Fully regenerated (pole crop density more than 75%)	-
5.	Percentage of area	-
6.	Moderately regenerated (pole crop less than 75% sapling 25% seeking 75%)	30.2
7.	Percentage of area	17.39%
8.	Inadequately regeneration (Regeneration present but not established so far)	57.7 ha.
9.	Percentage of area	33.24
10.	Blanks	
	a. Culturable	8.7
	b. Un-culturable	5.0
11.	Percentage of area	
	a. Culturable	5.01%
	b. Un-culturable	2.88%
12.	Advance growth	72.01ha.
13.	Percentage of area	41.48%.

7.8.4 Dry Zone Deodar Kail Working Circle:- The constitution of this working circle remained nearly the same as that of Dry Zone Shelterwood Working Circle of Tandon's plan except the forests north of Shyang Khad on the left bank, forests in Pangi Nalla and forests north to this on right bank of Sutlej were excluded. The gross area of the working circle was 1814.16 ha.

The distribution of areas was as under:-

PBI	PBII	PBIII	Total
562.5	625.62	626.04	1814.16

Yield:- Yield was prescribed by volume for PB III which is given in Table No.7.15.

Table No. 7.15

Species	PB I	PB IV	Total (Volume in m3)
Deodar	660	600	1260
Kail	95	60	155
Spruce and Silver Fir	195	90	285
Total	950	750	1700

Only one felling series was constituted fellings in PB I were to induce regeneration, in PB-III. They were to conform to final fellings. In PB II, no fellings were prescribed, only removals warranted by Fires or epidemics were to be carried out.

Results:- The various prescriptions and suggestions made in the working plan were not followed in practice. An area of 420.02 ha. was prescribed for regeneration/seeding felling but actually only an area of 162.65 ha. was felled. The fellings were not undertaken from 1978-79 onwards. Similarly in PB III, overwood was to be removed from an area of 626.04 ha, but in practice only an area of

235.14 ha. was gone over. The forests felled were 146,147,148,173&169(a) only. No silvicultural fellings were carried out after 1978-79. However, the removal of trees from both PB I and III have been high on account of right holders requirements. Due to adverse climatic conditions and excessive biotic interference nothing substantial could be done to improve these forests except rotational closures. Even in case of forests which were gone over in prescription, the results of regeneration are moderate, due to poor closure and adverse climatic factors. The removals from all the PB's were however "heavy" on account of salvage and right holders removal. The position is summarized in Table No.7.16

Table No.7.16

PB I			
Species	Yield prescribed.	Yield removed	Deviation
Deodar	9900	5105.76	(-)4794.24
Kail	1425	3641.62	(+)2216.62
Fir and Spruce	2925	5262.16	(+)2337.16
Total	14250	14009.54	(-)243.46
PB II			
Deodar	No. fellings / yield was prescribed	4806.90	(+)4806.90
Kail		466.25	(+)466.25
Fir and Spruce		2611.01	(+)2611.01
Total		7884.16	(+)7884.16
PB III			
Deodar	9000	11766.43	(+)2766.43
Kail	1350	1909.17	(+)559.17
Fir and Spruce	1350	2129.79	(+) 779.79
Total	11700	15805.39	(+)4105.39

7.8.5 Status of Regeneration:- The regeneration assessment done in felled P.B.-I areas gives the positions detailed in Table No.7.17.

Table No. 7.17

1. Total area of the P.B-I	=	662.50 ha
2. Total area to be gone over in seeding felling	=	420.02 ha
3. Total area actually gone over in seeding felling	=	162.65 ha
4. % of area gone over in seeding felling	=	162.65 ha
5. Regeneration assessed in area.	=	34.8 ha
6. Fully regenerated (pole crop density more than 75%)	=	—
7. % age area.	=	—
8. Moderately regeneration (pole crop less than 75%)	=	19.0 ha
9. Percentage of area	=	54.6%
10. Inadequate regenerated (regeneration present but not Established so far)	=	8.04
11. Percentage of area	=	54.6 %
12. Blanks	=	0.5 ha
13. Percentage of area	=	1.44%
14. Advance growth	=	7.26 ha
15. Percentage of area	=	20.86%

From the above, it is also clear that regeneration is inadequate. From the working it is clear that out of 562.50 ha., area under PB I, only 162.65 ha. was actually gone over in seeding felling. However, against 13,300 m³ prescribed yield, removals of 14,009.54 m³ which is in excess by

709.54m³ and this removal has been in the form of TD removals and salvage marking of the trees which were not to be felled on scientific lines. In this way, the object of conversion into uniform too. The excessive removals from PB II are likely to affect the future yield. This will also go against the object of sustained principle.

Note :- The figures in column (v) to (xiv) pertain to areas forming part of this working plan only. The other felled PB I areas now form part of wild life sanctuary and regeneration assessment was not carried out).

7.8.6 Fir Spruce Working Circle:- The working circle included all the commercially exploitable demarcated and un-demarcated forests of silver fir and spruce which were considered fit for management under the Punjab Shelterwood system. This working circle thus included major portion of the forests previously allotted to the wet zone selection working circle and a few sub-compartments of Nichar and Kilba Range of the wet zone shelterwood working circle. The crop consists mostly of mixture of spruce and silver fir with the former predominating along the spurs and the latter in the cooler and the high lying areas. Scattered trees or small groups of Deodar also occur. Broad leaved species like walnut, maple, Birdcherry, Horse Chestnut etc. grow along shady places. The total area of the working circle was 9053.95 ha constituted by 2969.65 ha. and 6085.00 ha. of demarcated and undemarcated forests. The forests were managed under the Punjab Shelterwood system. Rotation was tentatively fixed at 120 years, corresponding to an exploitable diameter of 40-50 cm d.b.h. Regeneration period was fixed for 30 years. The working circle was divided into three periodic blocks.

P B 1:- Areas allotted to this periodic block were predominantly middle aged to mature crop that have been worked under the selection and the irregular shelterwood systems in the past and were devoid of regeneration.

P B II:- Areas with middle aged to mature crops, with better density have been allotted to this periodic block.

PB Unallotted:- Remaining areas have been grouped under this periodic blocks.

Yield:- The yield has been calculated by volume. The prescribed annual yield from PBI is as under:-

Species	volume in m ³ (PBI)
Deodar	200
Kail	800
Silver fir and Spruce	6000
Total	7000

Results:- The prescriptions of the working plan were not followed in practice. While the PB 1 areas were not felled completely, there were heavy removals from other PBs i. e, PB-II and PB U on account of right holder's requirements and for supply of timber for fruit packing cases. During 1979-80 to 1986-87 there were heavy removals from forests of PB un-allotted for fruit packing cases. Against a prescribed area of 1099.36 ha of PBI, which was to be gone over under regeneration/seeding felling an area of only 350.29 ha. was felled which constitutes 31.86% of the prescribed area. The forests felled were UF 40, 175(a) I, 79(a) & 71(b) ii only. Nothing much was done in areas allotted to PB U. The overall removals from all the PBs were heavy on account of salvage markings, right holders markings and marking for fruit packing case. The position is summarized in Table No. 7.18.

Table No:- 7.18

Species	Yield prescribed in m ³	Yield Removed in m ³	Deviation
PB I			
Deodar	3000	1373.52	(-)1626.48
Kail	12000	6016.35	(-)5983.65
Spruce & Silver fir	90000	26240.31	(-)63579.69
Total	98000	33630.18	(-)71369.82
PB II			
Deodar	No yield prescribed	927.77	(+)927.77
Kail		8578.94	(+)8578.94
Spruce & Silver Fir		14403.84	(+)14403.84
Total		23910.55	(+)23910.55
PB Unallotted			
Deodar	No yield prescribed	3327.11	(+)3327.11
Kail		5261.22	(+)5261.22
Spruce & Silver Fir		28855.11	(+)28855.11
Total	-	37443.44	(+)37443.44
Total for AllPBs	98000	94984.17	(-)3015.83

7.8.7 Status of Regeneration:- The regeneration assessment done in felled PB-1 area gives the position in Table 7.19.

Table 7.19

(i) Total area of PB-1 to be gone over in seeding felling	1099.36 ha
(ii) Total area actually gone in seeding felling	350.29 ha
(iii) %-age of area gone over in seeding felling	31.86
(iv) Regeneration assessed in area	195.29 ha
(v) Fully regenerated (Pole crop density more than 75%,	Nil
(vi) %-age	Nil
(vii) Moderately regenerated (Pole crop than 75% Sapling 25%, Seeding 75%)	36.4
(viii) %-age	18.64%
(ix) Inadequately regenerated (Regeneration present not yet established	87.2
(x) %-age	44.65%
(xi) Blanks	15.8 ha
(xii) %-age	8.09%
(xiii) Advance growth	55.89 ha
(xiv) %-age	28.62%

From the above, it is evident that the position of regeneration is far from Satisfactory. The main reason was ineffective closure of plantations in felled area. The plantation efforts were few and indifferent. No heed was paid to the crucial aspect of debris cleaning /slash disposal. The closures were not enforced legally at ground also.

7.8.8 The Neoza Working Circle:- Neoza pine is known for its edible seed and grows the dry inner areas of Himachal Pradesh particularly in the Sutlej Catchment in the tract covered by the plan. The demarcated forests having preponderance of Neoza Pine have been allotted to this circle with the object of inducing natural or artificial regeneration in these forests. Neoza Pine grows mixed with Deodar in varying proportion in the altitudinal limit of 1500-3300 metres in the region outside the

influence of monsoon in the forests of Kalpa, Pooh, Kilba, Moorang ranges. The forests of Neoza Pine are open and highly deficient in natural regeneration. The total area of this working circle was 2833.54 ha. The objects of management were to conserve the existing forests and restock the mature and understocked area. No definite silvicultural system was prescribed, no felling were prescribed either. No yield was prescribed. The forests were to be managed for physical rotation. The areas were to be protected from fire and grass cutting was not to be carried out, till the plants attained a height of 40 cm. A plantation programme was laid down to cover 200 ha during the plan period. Definite forest were also suggested for plantation by way of sowing and planting (50 % each). A plantation time table was also laid down for the guidance of staff.

Result:- The prescription and the suggestion of the working plan were not followed. The closure and suspension of rights for a period of 30 years was nowhere followed. Against a suggestion of 50% sowing and 50% planting, more emphasis remained on sowing and an area of over 717 ha. was sown, while planting was carried out in 144 ha. These have mostly met with failure. Planting and sowing of Deodar also has been carried out in this working circle. In Pooh Forest Division, under the Deserts Development programme scheme, other miscellaneous broad leaved species like Salix and Robinia have also been planted. The sowing and planting of Neoza has largely met with failure on account of inadequate closure, drought and poor sowing /planting techniques. The pits were not dug up in October/November but were dug up just at the time of planting. The size of pits used mainly is 45 cm, whereas, it should have been at least 60 cm deep to accommodate poor polythene bag plant of 45 cm length. As a result of poor enforcement of cone and seed collection, the crop has further deteriorated. The growing stock has been reduced and the situation has only worsened.

7.8.9. The Protection Working Circle:- This working circle comprised the areas which were not commercially exploitable due to inaccessibility, difficult terrain, poor stocking (quantitatively or qualitatively) and thus were not included in the Wet Zone Deodar Kail, the Dry Zone Deodar Kail and the Fir spruce Working Circles. The forests situated on difficult terrain were to be maintained for protection of hills from degradation and erosion by reserving the forest cover. The total area of the working circle was 634818.27ha. of which an area of 5,97,803 ha. was not under management i.e. it included all rocky waste, khads, nallahs, bouldery beds, alpine pastures and areas under permanent snow cover. The remaining area of 27015.27 ha. comprised of 11766.27 ha. of DPF's and 15249 ha. of UPF's.

No enumeration of these forests was carried out. The object of management was to conserve the existing forest. No silvicultural system was prescribed, nor any fellings were envisaged. The major importance of these forests lied in the protection of hill sides against denudation and soil erosion and hence, these forests were to be strictly protected and reserved. A method of treatment was laid down and a total of 1369.38 ha. was to be treated by way of afforestation and soil conservation measures. Other miscellaneous regulations on closure and grazing were also recommended. Rules for lopping were also laid down.

Results:- The prescriptions and suggestions made in the working plan were not followed. The table of treatment was ignored, more due to paucity of funds than anything else. Some plantations were raised but due to poor technique, inadequate closures and grazing, the results have been poor. As against a prescription of afforestation of 1369.38 ha, nearly an area of 1500 ha. was sown while an area of about 900 ha, was planted during the plan period, However there was lack of planning and execution. All the sowings done in the dry and arid zones have come cropper, due to non-irrigation. The plantings and sowings done in the forests of Nichar Range have established to some extent. The result of plantations raised in Dry Zone is rather dismal because of excessive drought and no facilities of irrigation. Even where plantations have been raised, the very important factor of debris

burning/slash disposal has not been kept in mind. Survival is poor in these cases. There has been a tendency to carry out plantations near road –side due to easy accessibility. Forests in real need of afforestation work got thus ignored. Removals were to be carried out only for meeting the right holders requirements. In case of dry and arid zones, even for meeting the requirement of right holders, only dry and fallen trees were to be removed. In practice there have been very heavy removals on account of salvage right holder's demands and for fruit packing cases. The following summaries the position:-

Yield removed from Protection Working Circle (m³)

Wet Zone		Dry and Arid Zone	
Deodar	1156.02	Deodar	23865.67
Kail	5120.40	Kail	5511.95
Silver Fir and Spruce	1785.75	Silver Fir and Spruce	3104.53
G. Total	8062.17		32482.15

The high yield removed from the dry and zone is due to the fact all salvage, departmental and right holder's removals have taken place from the Protection Working Circle, there being no other forest. On account of such heavy removals and poor afforestation, the net result is a steady depletion of the growing stocking and degradation of the forests.

7.8.10 The Hard Woods Working Circle:- Some of the broad –leaved species like Walnut, Birdcherry, Maple and Horse chestnut were getting prominence as raw-material for many wood based industries. These species are found in the forests allotted to the Wet Zone Deodar, Kail Working Circle and Fir-Spruce Working Circle in sizeable patches as well as in mixtures. To exploit these trees for wood based industries, an overlapping working circle by the name of Hard Woods Working Circle was formed. The total area of this working circle was, therefore, 11,873.60 Ha., overlapping the Wet Zone Deodar-Kail Working Circle and the Fir-Spruce Working Circle.

Only one felling series was formed. The relevant trees were enumerated by way of random sampling down to 10cm d.b.h. in 10cm diameter clades. Yield by selection number of trees for each species was fixed according to Smithy's safeguarding formula. The yield was as under:-

Species	Annual yield in no. of trees.	Exploitable size d.b.h in Cm.
Walnut	100	50
Bird cherry	120	40
Maple	200	50
Horse chestnut	60	50

No particular sequence, of felling was laid and it was also remarked that exploitation is not economical. Apart from laying down the general principles of fellings, recommendations were made for closures, weeding and plantation.

Result:- None of the prescriptions of recommendation could be followed in practice. No exploitation whatsoever of the hardwoods was ever carried out being uneconomical. A few trees were removed in salvage only. Thus other operations like planting etc. were also not be taken up.

7.8.11 Works of Improvement:- A list of 15 buildings was recommended by the working Plan Officers which included 7 forest guard huts, 2 forester quarters and 6 inspection huts. Of these, forest guard huts have been constructed at 5 place, and forester quarter at both the places. None of the inspection huts could be constructed due to paucity of funds. Moreover, due to the creation of a separate territorial divisional headquarters at Pooh and also Wild Life Division, Sarahan, the priorities and administrative convenience favoured construction of other, buildings got constructed.

A list of building constructed during the plan period and occurring in the plan area is available at appendix IV.

7.8.12 Bridle and Inspection Path:- No new bridle /inspection path were proposed in expired working plan. However, the existing paths were to be maintained. Washed away bridges were to be constructed. Many new bridle and inspection paths have been constructed during the period, particularly in the forests/areas transferred to Wild Life Division, Sarahan. The paths in the area covered by this working plan, though, remained neglected on account of paucity of funds and majority continues to be in a state of disrepair. A list of existing roads and paths including those constructed during the period is given in Appendix III.

7.8.13 Fire Protection:- No fire line was suggested in the working plan. The area were protected from Fire.

7.8.14 Past Yield:- The yield removed from the various working circles during the plan period is given in Appendix VI.

7.9 Past Revenue and Expenditure:- The figures of annual revenue and expenditure their in Nichar and Pooh Forest Division during Karwasra's working plan period is given.

7.10 Rajiv Kumar's Working Plan for Nichar and Pooh Forest Division (1999-2000 to 2014-15):-

7.10.1 Past System of Management and their Results:- This Working Plan dealt with the DPF's and UPF's of all the areas falling within the jurisdiction of Nichar and Pooh Forest Division. In conformity with objectives of management, seven numbers of Working Circles namely (i) The Wet Zone Deodar - Kail Working Circle (ii) The Dry Zone Deodar - Kail Working Circle (iii) The Fir - Spruce Working Circle (iv) The Neoza Working Circle (v) The Protection cum Rehabilitation Working Circle (vi) The Soil and Water Conservation (overlapping) Working Circle and (vii) The Alpine Grazing Working Circle were constituted under this Working Plan.

- i) **The Wet Zone Deodar - Kail Working Circle(2397.07 ha):-**This Working Circle covered all the demarcated and un-demarcated protected forests, containing Deodar and Kail as a principal species and the forest containing Deodar and Kail as 60% or more in composition. The total area of this Working Circle was 2397.07 hac. including in Nichar and Pooh forest division. The main objective of management was (i) to improve the health of plants by reducing the congestion and by removing over head shade.
- ii) To reduce fire hazards by grazing increasing the proportion of Deodar in suitable localities / creating green belts of fire resistant trees and by doing crown thinning.
- iii) To restock the areas deficient in natural regeneration by artificial means.
- iv) To progressively convert the uneven aged crops into more or less even aged crops.
- v) To provide for bonafied requirements of timber, fuelwood and fodder to the right holders.
- vi) To obtain the maximum yield of timber on sustain basis:-
There was only one felling series for the whole working circle because all the forests fall in Nichar Division only. The total enumeration down to 10 cm d.b.h. was carried out in compartments / sub compartments allotted to PB-I and PB-IV. Partial enumeration was carried out by the method of random sampling taking well defined topographical areas either as a compartment and sub compartments in PB-II and PB-III. All trees in such areas were enumerated down to 10 cm d.b.h. The forests allotted to this Working Circle were to be managed under the Indian Irregular Shelterwood system. This system allows fellings according to the nature of the ground and permits a certain degree of irregularity by avoiding scarific of immature pol crops which was to be retained as advance

growth. The markings were to be done on selection principle. Final felling were to be carried out in PB-IV areas where regeneration had fully established. The rotation of 120 years corresponding to 60 cm dbh was adopted. Regeneration period of 30 years was fixed to regenerate the area naturally supplemented with artificial regeneration. With rotation at 120 years and regeneration period of 30 years, there were four periodic blocks with specific allotment.

7.10.2 Prescribed Annual Yield:- The yield in this Working Circle was calculated by volume separately for PB-I, PB-III and PB-IV areas. As prescribed in para 9.11.5 the P.B. wise annual yield is tabulated in Table No:- 7.20.

Table-7.20

Species	Yield in M ³				
	P.B.I	PBII	PBIII	PBIV	Total
Deodar	775	65	450	1300	2590
Kail	445	0	40	200	685
Spruce	570	0	70	700	1340
Fir	710	0	25	550	1285
Total	2500	65	585	2750	5900

The deviation for a year, a period of five years and a plan period shall not to be exceeded by +/- 25%, +/- 10% and +/- 5% respectively. A critical assessment of progress of regeneration will be carried out every year, and in case it was found that regeneration is unsatisfactory further felling shall be discontinued till the progress of regeneration becomes satisfactory.

7.10.3 Result of the Working Plan: No regeneration fellings were undertaken due to ban on green felling. However, on the basis of selection felling, trees have been marked to the right holders under timber distribution scheme. In addition to this salvage marking has also been carried out. The various prescriptions and suggestions made in the working plan were not followed in practice. The regeneration status in forest which was worked during the plan period is satisfactory. Control burning operations were not followed, fire line maintained as per availability of funds and grass cutting out side regeneration areas was done by the local right holders and as per recommendation of the Working Plan.

a) The total volume removed from this Working Circle as per control forms, during the plan period in Nichar and Pooh Forest Division as it stood on 31.3.2015 is tabulated in Table No:- 7.21

Table-7.21

Species	Balance deviation as on 31-3-2014				Felling during the year in M ³					Cumulative deviation as on 31-3-2015 M ³				
	PB-I	PB-II	PB-III	PB-IV	PB-I	PB-II	PB-III	PB-IV	Total	PB-I	PB-II	PB-III	PB-IV	Total
Deodar	-10903.88	8768.12	-4596.25	-19828.01	0	0	0	0	0	-10903.88	8768.12	-4596.25	-19828.01	-26560.02
Kail	-5267.7	865.44	1067.44	-2854.38	0	0	0	0	0	-5267.7	865.44	1067.44	-2854.38	-6189.2
Spruce	-8514.19	493.49	-692.85	-10905.4	0	0	0	0	0	-8514.19	493.49	-692.85	-10905.4	-19618.95
Fir	-10274.1	1975.56	1442.97	-7164.71	0	0	0	0	0	-10274.1	1975.56	1442.97	-7164.71	-14020.28
B/L	51.17	5.44	11.3	3.72	0	0	0	0	0	51.17	5.44	11.3	3.72	71.63
Total	-34908.7	12108.05	-2767.39	-40748.78	0	0	0	0	0	-34908.7	12108.05	-2767.39	-40748.78	-66316.82

- I. The above result shows that the yield position in this Working Circle as on 31-3-2015 is in deficit overall which is on account of ban on felling of green trees.
- II. No major fellings/green fellings were done in this Working Circle and only occasional TD grants were made besides salvage marking during the plan period.
- III. Plantation proposed in this Working Circle was not followed strictly. However, plantations were carried out subject to availability of funds and man power.

IV. The prescription of the Working Plan in general was not followed. Attention was not given to the subsidiary silvicultural operation and other works.

7.10.4 The Dry Zone Deodar - Kail Working Circle (1122.57ha):- This Working Circle includes all the Deodar and Kail forests having pure crop of Deodar and Kail or having 60% or more of each species on moderate/steep to moderate slope in composition in a compartment of all the demarcated and un-demarcated protected forests of dry zone. With the creation of Wild Life Division, Sarahan and notification Wild Life Sanctuary, Sangla, the dry zone forests of Sangla valley were excluded from this working circle. The total area of this Working Circle was 1122.57 hac. including Nichar and Pooh forest division.

The main objectives of management were:-

- i) To progressively convert the uneven aged crop in to normal even aged forest.
- ii) To restock the areas deficient in natural regeneration artificially.
- iii) To progressively achieve the maximum sustained yield.

Total enumerations were carried out in areas allotted to PB-I in 10 cm diameter classes down to 10 cm d.b.h. In other PBs partial enumerations by method of random sampling taking well defined topographical areas either as full compartments and sub compartments was carried out. All trees in such areas were enumerated down to 10 cm dbh.

The forest of this Working Circle was proposed to be managed under Indian Irregular Shelterwood system. Owing to the several adverse factors such as climate, edaphic, and biotic, the number of mother trees to be retained more than those in the case of Wet Zone Deodar - Kail working circle.

The regeneration period was fixed at 45 years for all the species occurring in this Working Circle. The rotation period at 135 years was fixed, based on age at which the trees would attain the diameter of 60 cms. dbh. The conversion period was also fixed at 135 years, corresponding to an exploitable diameter of 60 cm dbh.

With rotation at 135 years and regeneration period of 45 years, there were three periodic blocks with specific allotment. Only one felling series corresponding to plan period was prescribed.

a) Prescribed Annual Yield:- The yield in this Working Circle was calculated on the basis of volume. As prescribed in para 10.18, the P.B. wise annual yield was prescribed and is tabulated in Table No:- 7.22.

Table-7.22

Species	PBI	PB II	PBIII	Total
Deodar	285	170	120	655
Kail	85	20	60	165
Spruce and Fir	130	10	60	200
Total	500	200	320	1020

No yield should have been prescribed from PB-II but as per past experience, removal on account of salvage and right holders was there. Therefore, to account for these removals, annual yield of 200 m³ was indicated which was strictly to account for salvage and unforeseen circumstances and not due to any prescribed fellings.

b) Result of the Working Plan:- No Regeneration felling have been carried out due to blanket ban on green felling. However, on the basis of selection felling trees has been marked to right holders in TD. Beside these the salvage marking has also been carried out. Due to adverse climatic conditions and excessive biotic interference nothing substantial could be done to improve these forests except rotational closures. No regeneration survey was carried out and no cultural operation prescribed was followed during the plan.

c) The total volume removed from this Working Circle as per control forms, during the plan period as it stood on 31.3.2015 is tabulated in Table No:- 7.23

Table-7.23

Species	Balance deviation as on 31-3-2014			Felling during the year in M3				Cumulative deviation as on 31-3-2015 M3			
	PB-I	PB-II	PB-III	PB-I	PB-II	PB-III	Total	PB-I	PB-II	PB-III	Total
Deo	-840.07	-1822.69	-2000.75	185.3	149.6	149.6	484.5	-654.77	-1673.09	-1851.15	-4179.01
Kail	-679.48	-272.29	-847.46	124.23	5.94	2.26	132.43	-555.25	-266.35	-845.2	-1666.8
Fir Spruce	-2049.69	-156.74	-906.74	0	0	0	0	-2049.69	-156.74	-906.74	-3113.17
Total	-3569.24	-2251.72	-3754.95	309.53	155.54	151.86	616.93	-3259.71	-2096.18	-3603.09	-8958.98

- I. The above result shows that the yield position in this Working Circle as on 31-3-2015 is in deficit overall which is on account of ban on felling of green trees.
- II. No major felling/green felling was carried out during the plan period. Only occasional TD grants were made besides salvage marking during the plan period.
- III. Plantation proposed in this Working Circle was not followed strictly. However plantations were carried out subject to availability of funds and man power.
- IV. The removals from all the PB's were however "heavy" on account of salvage and right holders removal.
- V. The prescription of the Working Plan in general was partially followed. Attention was not given to the subsidiary silvicultural operation and other works.

7.10.5 The Fir and Spruce Working Circle (5101.27 ha): This Working Circle includes all the exploitable demarcated and listed un-demarcated forests for working which predominantly support fir, spruce forests having pure crop of 60% or more in composition in a compartment. These forests have been exploited during the past for packing cases. The natural regeneration in these forests is poor and the artificial regeneration is inadequate. The total area of this Working Circle was 5101.27 hac. The crop consists of Spruce growing on sunny ridges, while Fir occupies in cooler aspect and is predominant in high lying portion of forest.

The main objective of management was:-

- i. To restock the areas deficient in regeneration either naturally or artificially.
- ii. To improve the forest cover for water and soil conservation,
- iii. To achieve progressively increasing sustain yield of Fir and Spruce timber.
- iv. To improve the biodiversity of the area.

There was only one felling series and growing stock was assessed by carrying out total enumeration down to 10 cm d.b.h. in PB-I areas and in other PBs, partial enumeration by the method of random sampling has been carried out by taking well defined areas that is compartment or sub compartment as a whole.

The silviculture system adopted was the Indian Irregular Shelterwood system. Rotation period was fixed at 150 years during which Fir and Spruce crop were expected to attain an average crop diameter of 45 cm and 55 cm respectively. The regeneration period was fixed at 30 years. With the rotation at 150 years and regeneration period of 30 years, the whole Working Circle was divided into three fixed periodic blocks.

a) Prescribed Annual Yield:- The yield in this Working Circle was calculated on the basis of volume. As prescribed in para 11.12, the P.B. wise annual yield was prescribed and is tabulated in Table No:-7.24.

Table-7.24

Species	PBI	PBII	PBU	Total
Deodar	200	0	200	400
Kail	200	0	50	250
Spruce	750	100	850	1700
Fir	3350	100	1100	4550
Total	4500	200	2200	6900

All the removals of all age classes and for all purposes were prescribed to be counted towards the yield. The deviation in a year, a period of five years and plan period was prescribed not exceed 10% of the prescribed yield.

- b) Result of the Working Plan:** The total volume removed from this Working Circle as per control forms, during the plan period of Nichar and Pooh Forest Division as it stood on 31.3.2015, is tabulated in Table No:-7.25

Table-7.25

Species	Balance deviation as on 31-3-2014			Felling during the year in M3			Total	Cumulative deviation as on 31-3-2015 M3			
	PB-I	PB-II	PB-U	PB-I	PB-II	PB-U		PB-I	PB-II	PB-U	Total
Deodar	-2243.65	1389.68	-3336	27.31	45.56	54.48	127.35	-2216.34	1435.24	-3390.48	-4171.58
Kail	-1346.8	1677.92	-1524.27	3.11	2.97	0	6.08	-1343.69	1680.89	-1524.27	-1187.07
Spruce	-9618.65	-1166.78	-14728.69	0	0	0	0	-9618.65	-1166.78	-14728.69	-25514.12
Fir	-44885.34	-891.23	-22598.27	0	0	0	0	-44885.34	-891.23	-22598.27	-68374.84
B/L	9.19	27.821	10.61	0	0	0	0	9.19	27.821	-10.61	26.401
Total	-58085.25	1037.411	-42176.62	30.42	48.53	54.48	133.43	-58054.83	1085.941	-42252.32	-99221.209

- I) The above result shows that the yield position in this Working Circle as on 31-3-2015 is in deficit overall which is on account of ban on felling of green trees.
- II) No major felling/green felling was carried out during the plan period. Only occasional TD grants were made besides salvage marking during the plan period.
- III) Plantation proposed in this Working Circle was not followed strictly. However plantations were carried out subject to availability of funds and man power.
- IV) The removals from all the PB's were, however, "heavy" on account of salvage and right holders removal.
- V) The prescription of the Working Plan in general was partially followed. Attention was not given to the subsidiary silvicultural operation and other works and no regeneration survey was carried out.

7.10.6 The Neoza Working Circle (2844.53ha): This Working Circle includes all the Demarcated Protected Forest of dry zone falling in Nichar and Pooh Forest Division having preponderance of Neoza pine with the object of inducing both natural and artificial regeneration in these forests. The total area of this Working Circle was 2844.53 hac. (Nichar forest division = 777.80hac and Pooh Forest Division 2066.73 hac.).

The special objectives of management were:-

- i) To regenerate degraded and poorly stocked Neoza pine forests.

No enumerations were carried out in areas allotted to this working circle. The object of management was conservation and improvement of the existing forest of Chilgoza and to restock the mature and understocked areas, therefore, no silvicultural felling was prescribed. For obvious reasons, these forests were to be managed for physical rotation. Therefore, only physical rotation was prescribed and no regeneration period was also prescribed.

a) **Prescribed Annual Yield:-**As no commercial fellings were proposed, therefore, no yield was prescribed. Only the legitimate requirement of right holders was required to be met strictly on silvicultural availability.

b) **Result of the Working Plan:-**Noregeneration fellings were prescribed in this working circle. However, on the basis of silvicultural availability, selection felling of trees has been marked to right holders in accordance to the settlement rights. Beside these, the salvage marking has also been carried out. Plantation programme as laid down and prescribed under the para No 12.8 was partially followed as per availability of funds.

c) The total volume removed from this Working Circle as per control forms, during the plan period as it stood on 31.3.2015 is tabulated in Table No:-7.26

Table-7.26

Species	Balance deviation as on 31-3-2014 /2015	Felling during the year in M3	Cumulative deviation as on 31-3-2015 M3
Deodar	844.05	0	844.05
Kail	54.46	0	54.46
Spruce	2.55	0	2.55
Neoza	1.25	0	1.25
Total	902.31	0	902.31

- The above result shows that the yield position in this Working Circle as on 31-3-2015 is in excess overall as no yield was prescribed in this working circle.
- No major felling/green felling was carried out during the plan period. Only occasional TD grants were made besides salvage marking during the plan period.
- Plantation proposed in this Working Circle was not followed strictly. However, plantations were carried out subject to availability of funds and man power.
- The prescription of the Working Plan in general was partially followed. Attention was not given to the assessment of annual production of Neoza seed as suggested under Para No. 12.12.

7.10.7 The Protection cum Rehabilitation Working Circle (13518.63 ha): This Working Circle includes all the forests which were not included in other Working Circle. Besides, all forests situated on precipitous slopes and poor stocking (both quantitatively and qualitatively) which were not fit for working under any silvicultural system had also been included in this Working Circle. The forest allotted to this working circle were required to be preserved only for protection of hills from denudation and erosion because of their location on steep / precipitous slopes and strategic points like source of various streams / nallas and river. Newly created DPFs area 2895.43 hac were also included in this working circle. The total area of this Working Circle was 13518.63 hac, out of which 10246.36 hac in Nichar Forest Division, 3272.27 hac in Pooh Forest Division were allotted to this working circle.

The main objectives of management were:-

- Complete protection of the hills from denudation and erosion by preserving the forest cover.
- Consistent with the principles of soil conservation, to provide for grazing requirements of the local people
- To preserve and improve the biodiversity.

Partial enumerations were carried out to estimate the growing stock in Nichar Forest Division separately for the wet and dry zone. However, the densities of each compartment have been recorded in CH files occularly. Since, the object of the management was to conserve the

existing forests and to restock the under stocked area, therefore, no silvicultural was prescribed. No commercial fellings were required to be carried in this working circle. However, only salvage markings were proposed as and when required. The trees sanctioned in TD to the right holders were to be marked if permanent gaps are not created in canopy. For obvious reason, these forests were required to be managed for physical rotation.

a. Prescribed Annual Yield:- As no silvicultural fellings were proposed, therefore, no yield was prescribed.

b. Result of the Implementation of Working Plan:- Though, no yield was prescribed and only removals were suggested to meet the demand of right holders and salvage removal of trees i.e. dead, dying, dry and uprooted trees in the plan. The status of regeneration in these forests is very poor and artificial regeneration is also inadequate. The total volume removed from this Working Circle during the plan period both in Nichar and Pooh Forest Division as it stood on 31.3.2015, and is tabulated in Table No.-7.27

Table No.-:7.27

Species	Balance deviation as on 31-3-2014	Felling during the year in M3	Cumulative deviation as on 31-3-2015 M3
Deodar	9466.64	340.71	9807.35
Kail	3412.18	86.58	3498.76
Spruce	978.05	0	978.05
Neozsa	48.96	0	48.96
Fir	2615.57	0	2615.57
Chil	150	0	150
B/L	23.03	0	23.03
Total	16694.438	427.29	17121.728

- The above result shows that the yield position in this Working Circle as on 31-3-2015 is in excess overall, as no yield was prescribed in this working circle.
- No major felling/green felling was carried out during the plan period. Only occasional TD grants were made besides salvage marking during the plan period.
- Plantation proposed in this Working Circle was not followed strictly. However, plantations were carried out subject to availability of funds and man power.
- The prescription of the Working Plan in general was partially followed.

7.10.8 The Soil Conservation (overlapping) Working Circle: This Working Circle overlaps all other working circles as by and large all areas require soil conservation measures in varied degrees. Being an overlapping working circle, the general character of vegetation is same as discussed in other working circles.

The main objectives of management were:-

- To conserve soil and water through biological and engineering measures so as to regulate flow of water in the streams.
- To stabilize and rehabilitate the existing landslides and erosion prone nallas and streams.

No enumeration has been carried out in this working circle being overlapping working circle. No definite allotment in to blocks and compartments were made. Only the sides that required specific attention along with treatment were proposed and given in Para No 14.12.

The AIS and LUS has surveyed the Kinnaur District from Chaura to Wangtoo on watershed basis, therefore, Range wise and working circle wise complete list of watersheds were not given and only the sides that required special treatment along with treatment was proposed and given in Para No. 14.12.

Since, the main objective was to rehabilitate and plant up the area by suitable species, therefore, no silvicultural system was required and prescribed. All the plantations were to be carried

according to the side conditions. Since no exploitation was to be done, therefore, no exploitable diameter was required to be fixed. For obvious reason, these forests were required to be managed for physical rotation.

a. Prescribed Annual Yield:- As no silvicultural fellings were proposed therefore no yield was prescribed and only physical rotation was prescribed.

b. Result of the Implementation of Working Plan:-

- i) The result shows that the overall prescriptions were not followed in to during the plan period.
- c. The Choice of Species to be planted in the plantation areas and the treatment table as given under Para No 14.6.2 and 14.12 respectively as suggested in this Working Circle was not followed strictly. However, the treatment works and plantations were carried out subject to availability of funds and man power.

7.10.9 The Alpine Grazing Working Circle:- This Working Circle contained grassy blanks of all high lying un-demarcated and unlisted forest commonly known as alpine pasture and locally called as Kandas, which were fit for pasture development were included in this working circle.

The special objects of management were:-

- (i) To provide for grazing in perpetuity in consistence with the principle of soil and water conservation.
- (ii) Introduction of more nutritious and palatable grass in the areas, which on heavy grazing have been degraded or are occupied by a host of useless growth of no forage value what so ever.
- (iii) To conserve soil and water through biological and engineering measures.
- (iv) Blocks and compartments were not constituted / laid down and only the name of Kandas both in Nichar and Pooh Forest Division (Range wise) were mentioned and given.
- (v) No felling series was required and hence not made.
- (vi) No silvicultural system was laid down and emphasis was only for the improvements of pasture land.
- (vii) The depleted pasture land was required to be protected and improved by rotational closures to grazing. Sowing and planting of suitable and nutritive grasses in suitable areas were also required to be undertaken during the plan period. Further, in the areas prone to soil wash, soil conservation measures were indicated.
- (viii) Two types of closures were recommended as given Para no 15.7
 - 1. Rotational closures for three years.
 - 2. Long closures for ten years.

a) Results of the Implementation of the Working Plan:-

- I. The prescription and suggestions made in the Working Plan were not followed in practice.
- II. The suggestions for improvement as given under Para No. 15.10 were also not followed effectively.

7.11 Miscellaneous Regulations:- By and large, the prescription prescribed under miscellaneous regulations was followed during the currency of the Working Plan. The trees were granted to the right holders as per settlement record and necessary entry for the grant has been made in the form No. 12. No separate compartment or sub compartment were formed, however, the existing boundary pillars have been checked/ repaired as per availability of the budget and as per quinquennial

programme prescribed in the Working Plan during the currency of the plan period. The existing fire lines were maintained and cleared according to the availability of budget. The detail of fire incidence occurred during the plan period is given in Chapter-IX, Part-II.

7.11.1 Past Yield:-The yield removed from the various Working Circle during the plan period is given in **Appendix No-XX, XXI, XXII, XXIII and XXIV**. The average out turn percentage (last four years) for working of the lots handed over to HPSFDC Ltd. is given as under:-

Sr. No.	Type of lot	Out turn %age
1.	Timber	42%

(Source: HPSFDC Ltd. Working Division, Rampur)

7.11.2 Past Revenue and Expenditure:-The statement of summery of revenue and expenditure and net surplus from the forests under various schemes incurred during Rajiv Kumar's plan are given in Table No.-7.28

Table No.-7.28

Past revenue and Expenditure			
Year	Revenue (Rs.)	Expenditure (Rs.)	Surplus (Rs.)
2000-01	2349325	36132561	-33783236
2001-02	1801442	34592446	-32791004
2002-03	28045016	37595100	-9550084
2003-04	2309211	31613332	-29304121
2004-05	38202719	29393900	8808819
2005-06	9609896	30582094	-20972198
2006-07	6506321	35946999	-29440678
2007-08	4309001	32347500	-28038499
2008-09	2956263	47364400	-44408137
2009-10	4229922	49174800	-44944878
2010-11	16788949	13685700	3103249
2011-12	330830884	51093500	279737384
2012-13	15389017	58735869	-43346852
2013-14	12573940	60112650	-47538710
2014-15	59694795	62696143	-3001348
2015-16	5438190	59793333	-54355143
2016-17	7898109	79554765	-71656656
2017-18	1743700	90532677	-88788977
2018-19	8090548	87599767	-79509219

(Source: Kinnaur Forest Division)

CHAPTER-VIII

STATISTICS OF GROWTH AND YIELD

8.1 General:-In order to save time and money and on account of non availability of suitable field staff, no basic data was collected in the field for preparation of volume tables and for finding out the rate of growth of different species occurring in the area. It is also difficult under the current establishment and infrastructure facilities to obtain and analyze the data. However, for compilation of growth and yield statistics of various species, the various available records were consulted.

8.2 Selection of Volume Table:-It was not considered necessary to collect statistical information de-novo, since such data was collected during the preparation of Working Plan under revision. Local volume table as given in the plan under revision may be adopted in revised plan, which was found to be satisfactory and have, therefore, not been revised. The volume table for all the coniferous and broad leaved species of expiring Working Plan of Rajiv Kumar is reproduced and will be adopted in this Working Plan. The same is tabulated in Table No 8.1

Table No. 8.1

Volume of standard stem timber in m ³							
Diameter Classes in cm	Wet Zone					Dry Zone	
	Deodar	Kail	Chil	Spruce	Fir	Deodar	Kail
10-20 (V)	0.06	0.06	0.089	0.06	0.06	0.03	0.03
20-30 (IV)	0.28	0.28	0.328	0.28	0.28	0.23	0.23
30-40 (III)	0.85	0.99	0.775	0.71	0.99	0.71	0.71
40-50 (II A)	1.84	1.42	1.478	1.70	1.70	1.70	1.70
50-60 (II B)	2.83	3.11	2.470	2.55	2.83	2.55	2.26
60-70 (IA)	3.68	4.25	3.789	4.25	4.53	3.40	6.68
70-80 (IB)	4.81	5.66	5.466	6.23	6.51	4.25	5.10
80-90 (IC)	6.09	6.09	7.531	7.65	7.65	4.81	5.10
90 & over (ID)	6.90	8.09	10.013	9.91	9.91	4.81	5.10
100 & above	-	-	12.938	-	-	-	-

8.2.1 Local Volume Tables for *Pinus gerardiana* (Neoza Pine):-The local volume table prepared and adopted in the previous plan will be adopted in this working plan also. The same are given in Table No. 8.2

Table No. 8.2

Age, height, diameter and volume relationship:

Age in years	Height in m	D.b.h. in cm	Volume in m ³
10	1.85	3.7	0
20	3	8.4	0
30	4.9	13	0.005
40	6.8	17.1	0.028
50	8.2	20.6	0.065
60	9.6	24.15	0.115
70	10	27.2	0.185
80	12.25	30.25	0.265

90	13.4	33.6	0.355
100	14.4	36.75	0.46
110	15.3	39.8	0.59
120	16.2	42.45	0.726
130	-3.7	0	0.865

Diameter classes (cm)	Mid diameter (cm)	Number of year to reach the diameter	Passage of time from lower to higher diameter class	Volume (cm ³)
10-20	15	35	35	0.018
20-30	25	64	29	0.15
30-40	35	95	31	0.42
40-50	45	31	36	0.87
50-60	55	70	39	1.25

8.3 In the case of broad leaved miscellaneous species of importance, the data used in the previous working plan was based on working plan of Nanital and Yamuna Forest Division of U.P. and the timber volume factor were taken from F.R.I. publication titled as “*growth and yield statistics of common Indian timber species(Himalayan Region)*”. The same data is reproduce here in Table No.8.3

Table No.8.3

Species	Exploitable diameter in cms	t' years	z' %
<i>Acer largatum</i>	50	40	40
<i>Aesculus indica</i>	50	25	25
<i>Alnus nitida</i>	40	25	25
<i>Betula Alnoides</i>	50	25	25
<i>Buxus wallichiana</i>	20	40	40
<i>Carpinus vimiana</i>	40	25	25
<i>Corylus colurna</i>	50	25	25
<i>Juglans regia</i>	50	25	25
<i>Populus Ciliata</i>	40	25	25
<i>Prunus Cornuta</i>	40	25	25
<i>Taxus Baccatta</i>	40	50	50

‘t’ = time take for the trees in approach class to reach exploitable class in years

‘z’ = Percentage of approach class trees that do not pass into exploitable class due to mortality or removal in thinning (mortality percent), some of the timber volume factors are given in Table No. 8.4

Table No. 8.4

<i>Timber volume in m3 (round)</i>						
Girth class in cm	<i>Acer Spp</i>	<i>Aesculus indica</i>	<i>Alnus nitida</i>	<i>Betula Alnoides</i>	<i>Juglans regia</i>	<i>Populus ciliata</i>
20-30	0.01	0.01	0.01	0.01	0.01	0.01
30-60	0.03	0.06	0.03	0.06	0.03	0.07
60-90	0.11	0.16	0.11	0.16	0.11	0.23
90-120	0.23	0.29	0.23	0.29	0.23	0.44
120-150	0.37	0.46	0.37	0.47	0.37	0.71
150-180	0.57	0.69	0.57	0.69	0.57	1.08
180-210	0.82	0.97	0.82	0.97	0.82	1.54
210-240	1.13	1.29	1.13	1.29	1.13	2.08
240-270	1.48	1.68	1.48	1.68	1.48	2.65
270-300	1.90	2.18	1.90	2.18	1.90	3.29
300-330	2.31	2.72	2.31	2.72	2.31	4.05
330-360	2.72	3.30	2.72	3.30	2.72	4.93

8.4 Diameter Growth:- The rate of diameter growth of all coniferous species was determined by doing stump analysis in the expired working plan. The same data is recommended for use in this working plan and is reproduce in Table No. 8.5

Table No. 8.5

Number of year to reach d.b.h. over bark												
d.b.h. over bark in cm	Wet Zone								Dry Zone			
	Deodar		Kail		Fir		Spruce		Deodar		Kail	
	Tandon's figure	1976-77 figure	Tandon's figure	1976-77 figure	Tandon's figure	1976-77 figure	Tandon's figure	1976-77 figure	Tandon's figure	1976-77 figure	Tandon's figure	1976-77 figure
10	0	25	0	18	0	32	0	25	0	35	0	24
15	0	33	0	24	0	40	0	34	0	45	0	34
20	37	41	34	31	51	49	38	42	56	57	43	42
25	43	49	39	38	60	57	44	51	66	55	50	49
30	49	56	45	44	69	65	51	59	74	72	57	55
35	55	65	51	52	78	74	57	66	83	81	65	63
40	61	73	56	59	88	83	63	75	93	90	73	71
45	67	83	62	67	96	91	70	86	102	100	82	80
50	73	94	67	74	105	103	77	94	112	110	92	91
55	80	1400	74	83	114	113	83	103	122	119	100	99
60	87	108	80	91	123	124	90	112	131	130	109	108
65	93	119	85	101	132	137	98	122	140	140	119	120
70	100	129	91	113	142	148	105	132	150	150	128	135
75	107	140	98	121	151	161	112	143	159	161	135	141
80	0	152	0	133	0	175	0	156	0	0	0	0
85	0	165	0	147	0	191	0	170	0	0	0	0
90	0	178	0	160	0	210	0	185	0	0	0	0
95	0	193	0	175	0	231	0	202	0	0	0	0

Note :-The above table compares the diameter growth data collected by Tandon and that collected during the previous revision by Karwasra and Rajiv.

8.5 Recruitment Period:- The recruitment period as determined in the earlier plan by the above growth chart has been followed in this plan. Therefore, the Table No 8.6 gives the recruitment period.

Table No 8.6

Wet zone							
	Number of years taken for transition from:						
Species	10-20 to 20-30 Class	20-30 to 30-40 cm Class	30-40 to 40-50 cm Class	40-50 to 50-60 cm Class	50-60 to 60-70 cm Class	60-70 to 70-80 cm Class	70-80 to 80-90 cm Class
Deodar	16	16	18	17	19	21	25
Kail	14	14	15	16	18	20	26
Spruce	17	15	21	17	19	21	27
Fir	17	17	17	22	24	24	30
Dry Zone							
Deodar	20	16	19	19	21	21	0
Kail	15	14	17	19	21	21	0

8.6 Quality Class Assessment:- Each compartment and sub-compartment has been allotted to one of the recognized quality classes and this has been given in the compartment history files. The average quality class for Wet Zone Deodar - Kail working Circle is II/III. For Dry Zone Deodar - Kail working Circle, it is II/III. For Fir Spruce Working Circle, it is II/III.

8.7 MAI / CAI increment curves for assessment of rotation:- The rotation that yields the maximum annual quantity of material i. e. age at which the Mean Annual Increment (MAI) culminates. The length of the rotation coincide with the year when the average rate of growth or volume increment per unit area which is the maximum, i.e, the age indicated by the point of intersection of Current Annual Increment (CAI) and MAI curves. This rotation yields are just volume per unit area, per annum and is important rotation which is adopted frequently as such.

CAI is small in early stages (Seedlings and Saplings), increases slowly at first, then more rapidly to the maximum, after which it begins to decline, and finally cases with its mortality. This is true both of individual tree and corps. The sum of the CAIs,laid on for the entire period gives the total volume, which when divided by the age gives the MAI—the average of the past production. It is an arithmetically derived value and coincides with actuality only twice in the life of a crop : once at the end of the first year and once later, when it culminates and equal the CAI.

The Current Annual Increment tends to increase constancy upto a maximum. During this period the volume laid each year to the total volume of the stand is grater then the average or MAI upto the year. The rising CAI raises the MAI also ; but the cover of the latter cannot show as steep a rise as that of the CAI, since the effect of the increasing growth each year is spread over all the previous year. When the CAI curve reaches its culmination and begins to decline, he successive average increments, i.e., the MAI figures for each year still continue to rise inspite of the fact, since the amount of growth added to the stand during the year, although less then formerly, is still grater then the average of mean. When the CAI for the year finally falls to an amount equal to the average or mean for the entire period, the curve of MAI has reached its highest point, i.e., has culminated. During the following years, the CAI is less then the mean, hence the MAI curve begins to drop but only to the extent that it is pulled down by the effect of this lesser CAI for single years, spread over

the age. Hence, as before, the MAI curve shows a fall, more gradual than the CAI curve. Unless the stand is felled, the losses in the stand will finally exceed the growth, and the CAI will then become negative. But until the entire stand is destroyed, the curve of the MAI will still be positive.

This trend is exemplified by the CAI and MAI curves for II/III site quality crops of Deodar, Kail, Fir and Spruce and illustrated for Deodar (WZ), Kail (WZ), Deodar (DZ), Kail (DZ) and Fir Spruce in Figures No.i, ii, iii, iv and v respectively. These curves are indicative only.

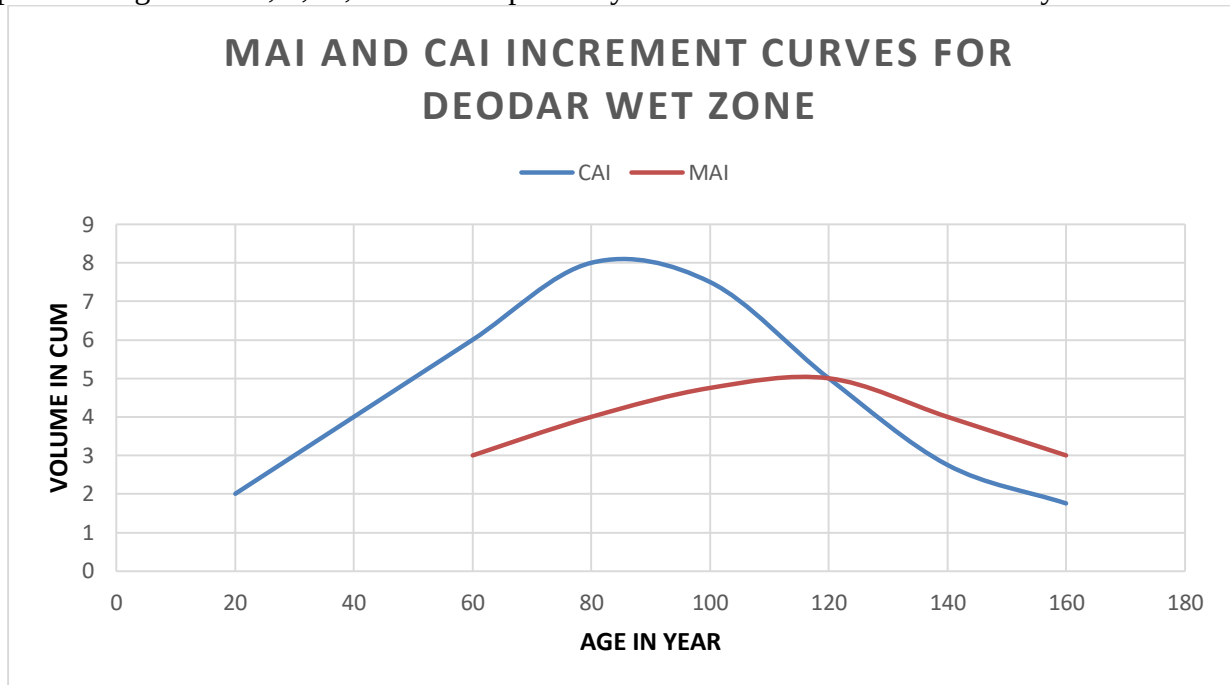


Figure No.i

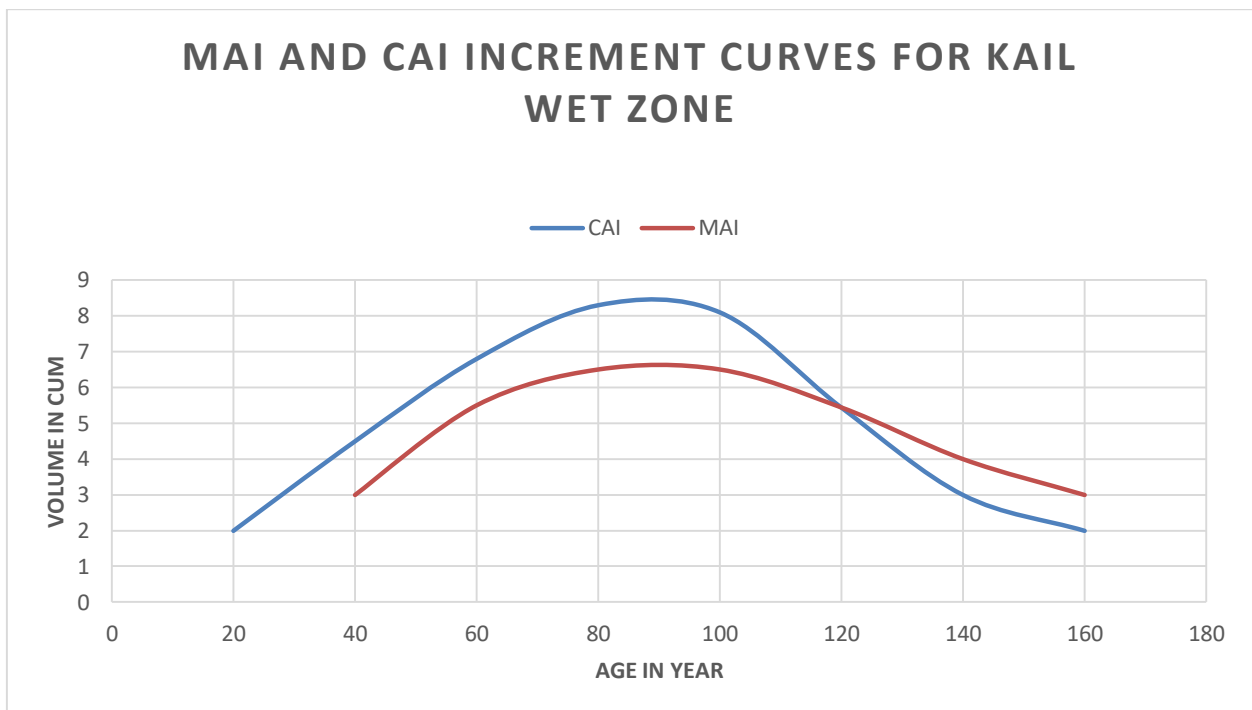


Figure No.ii

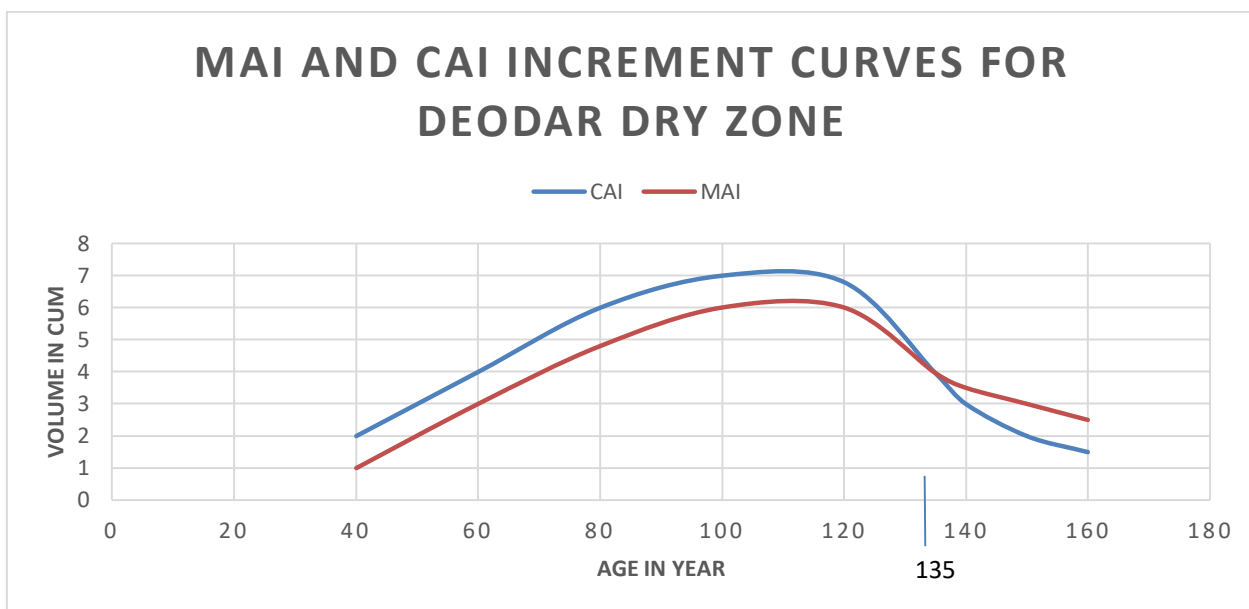


Figure No.iii

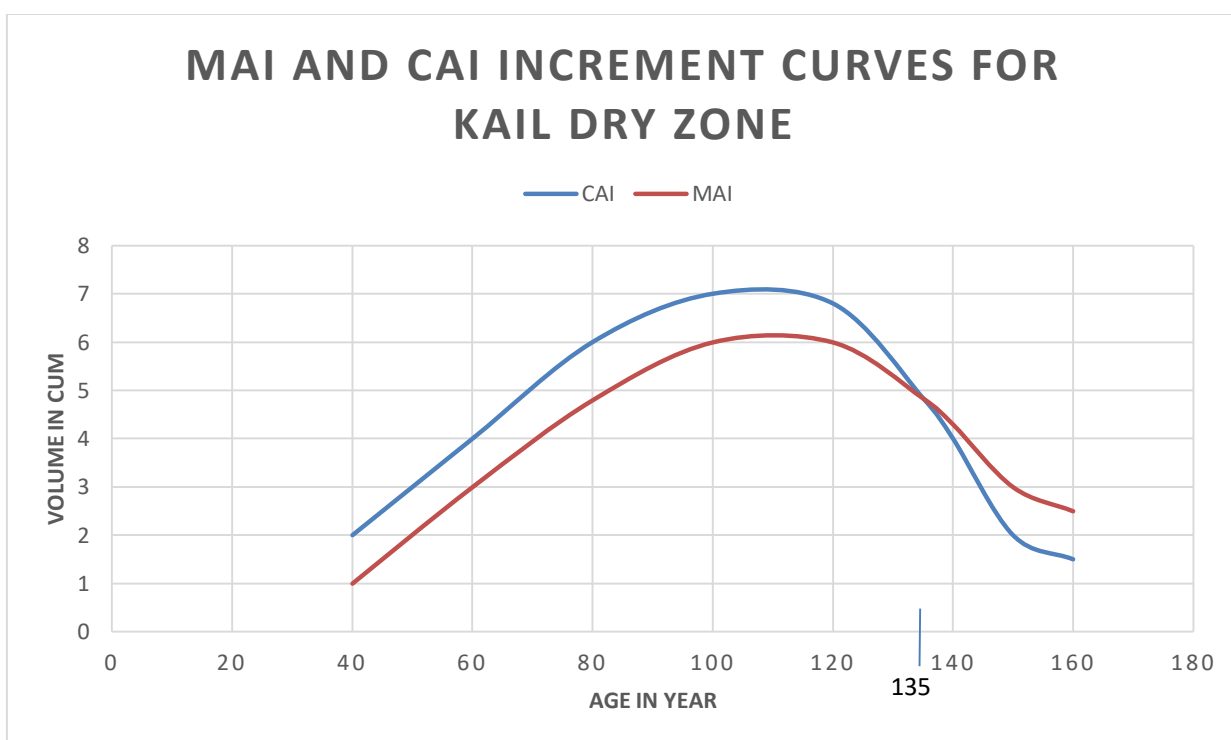


Figure No.iv

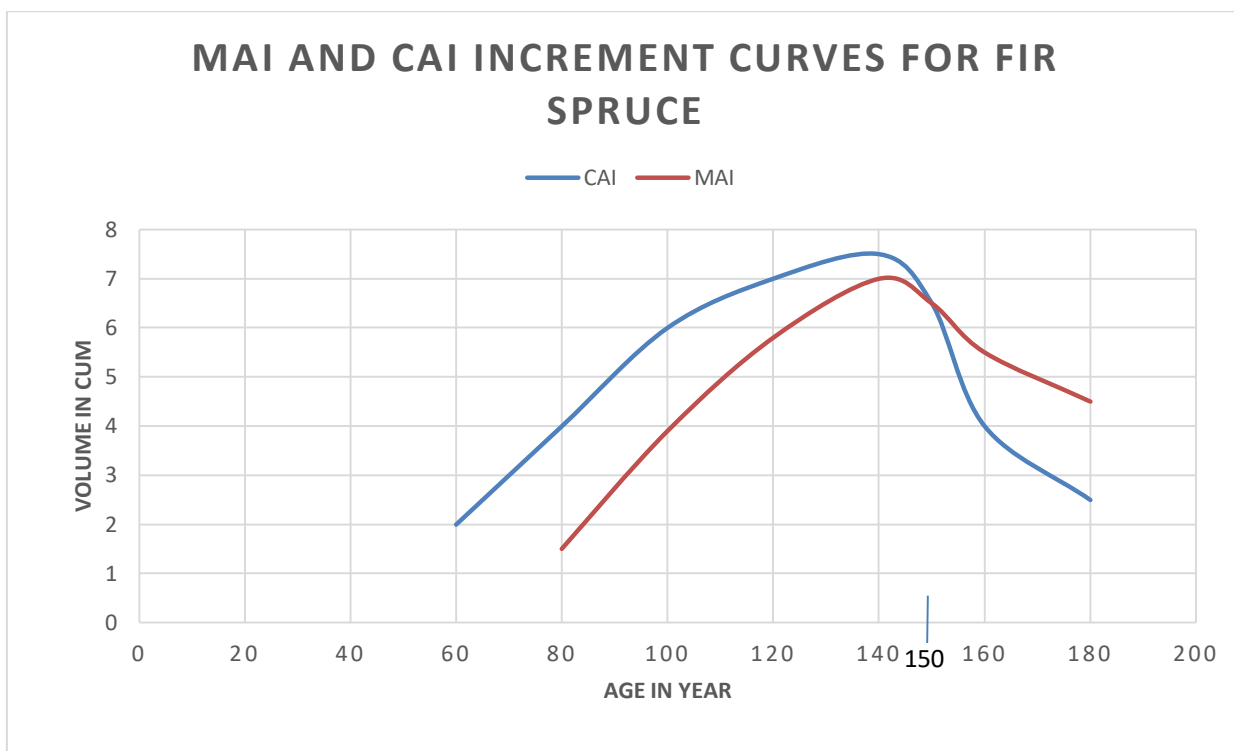


Figure No.v

8.8 Density:- Density as determined by visual estimationn has been entered in thecompartment history files. The average density for wetter areas of the tract is about 0.6, for the dry areas, it is 0.4 while for the arid portion, it is 0.2.

8.9 Enumaration:-The enumeration was carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The whole of the area of the Kinnaur Forest Division was divided into grids and total 150 Nos of samples were taken. The enumeration was carried out with the help of GPS 72, Compass, Haga Altimeter and Callipers. The enumerated data was entered in the Plot Enumeration Form and the description of the plot was entered in Plot Description Form (**Appendix No - IX**).The class wise enumerated data was then analysed / extrapolated to assess the growing stock of Wet Zone Deodar-Kail WC,Dry Zone Deodar-Kail WC, Fir Spruce WC, Neoza WC and Protection working circle. The Working Circle wise analyzed / extrapolated data has been incorporated in the plan.

The detail of samples taken is tabulated in Table No. 8.7

Table No. 8.7

Working circle wise detail of samples taken / collected																	
	Deodar Kail Wet Zone					Deodar Kail Dry Zone					Fir Spruce Working Circle				Neoza Working Circle	Rehabilitati on Working Circle	Total
Name of range	PB -I	PB -II	PB- III	PB IV	To tal	PB -I	PB -II	PB - III	PB- IV	Total	PB - I	PB -II	PB -U	To tal			
Bhaba Nager	3	1	1	1	6	0	0	0	0	0	3	0	1	4	0	9	19
Kalpa	0	0	0	0	0	3	4	3	0	10	0	0	0	0	4	24	38
Katgaon	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	4	6
Kilba	1	1	3	0	5	2	4	5	0	11	0	0	2	2	0	15	33
Moorang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	12	17
Nichar	1	4	2	2	9	0	0	0	0	0	3	4	2	9	0	5	23
Pooh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	10	14
Total	6	6	6	3	21	5	8	8	0	21	6	4	6	16	13	79	150

8.10 Stock Maps:- The old stock maps were up-dated/ digitized on 4" = 1 mile scale incorporating the changes, where necessary. The newly created DPFs have also been stock-mapped.

8.11 Increment:- Annual volume increment has been calculated for all the important species from age – diameter relationship by using the formula:-

$$I\% = \{(V_1 - V_2) \div (V_1 + V_2)\} \times (200 \div n)$$

Where:-

I = Volume increment

V₁ = Volume of a d.b.h. class.

V₂ = Volume of a next lower d.b.h. class.

n = Number of years taken to cross d.b.h. class.

The results are incorporated in the Table No. 8.8

Table No. 8.8

Annual volume increment percentage

Diameter Class	Wet Zone				Dry Zone	
	Deodar	Kail	Spruce	Fir	Deodar	Kail
20-30	8.08	9.24	7.61	7.61	7.69	10.26
30-40	6.31	7.99	5.79	6.58	6.38	7.29
40-50	4.09	4.44	3.17	3.11	4.32	4.83
50-60	2.49	2.78	3.35	2.27	2.11	1.49
60-70	1.37	1.72	2.63	1.92	1.36	2.28
70-80	1.27	1.42	1.8	1.49	1.06	1.54
80-90	0.94	0.28	0.76	0.54	0	0
90-100	0	0	0.8	0.64	0	0

8.12 Comparison of Actual Growing Stock with the Normal:- Strictly speaking, comparsion with the growing stock is not possible due to unevenness of the crop.

As per the multiple yield tables for Deodar (*Cedrus deodara*) the normal growing stock 100 acres for site quality II, 'C' grade thinning with a roatation of 120 years is 443.542 cft., which when converted into metric units works out to 310.347 m³/ha or say 310.35 m³/ha.

In comparison to this, the entire GS of Wet Zone of Deodar - Kail working Circle is estimated as 284.84 m³/ha which is below normal. In case of Dry Zone, the normal growing stock

for site quality III with 'C' grade thinning and rotation of 140 years is 314.286 cft/100 acres, which when converted into metric units works out to 219.906 m³/ha or say 219.91m³/ha.

In comparison to this the entire GS of Dry Zone Deodar - Kail Working Circle works out to 189.87 m³/ha which is again below normal.

The comparison show that the growing stock is below normal at present.

CHAPTER IX

ESTIMATE OF CAPITAL VALUE OF THE FOREST

9.1 General:-It is very difficult to ascertain the exact value of forests especially when intangible benefits derived from these renewable resources are taken into account. However, present capital value has been estimated on the basis of value of land, growing stock of various species and other non timber forest produce.

9.2 Estimation of Capital Value of Land under Forests:-The capital value of land has been arrived at as per order dated 28-3-2008 passed by Hon'ble Supreme Court of India in writ petition No. 202 of 1995 in which the NPV have been fixed. The value applied is an average of eco value class VI, since the forest of this division falls under this eco value. An estimated capital value of forests based on existing average value of eco class applicable for NPV for the land is also estimated. The Capital value is however, subject to variation. The capital value of forests and land as worked out is tabulated in Table No: 9.1.

9.2.1 Capital Value of Forest Land:-

Table-9.1

Gradation of the land	Total forest area in hac.	Approximate cost of land per hac.	Total cost (Rs. in crore)
DPF	23799.6	897000	2134.83
UPF	10705	897000	960.239
Total	34504.6	1794000	3095.07

9.2.2 Capital Value of Growing Stock: The estimated capital value of the growing stock present in the forest of Kinnaur Forest Division is given in the table below. The estimation has been done on the basis of rates fixed by the pricing committee for the year 2018-19 and as conveyed by the H.P. State Forest Development Corporation Ltd. for the year 2018-19.

Table-9.2

Sr. No.	Species	Growing stock in m³	Royalty (in Rs. per m³)	Total value (in Rs. crores)
1	Deodar	5109505	2194	1121.03
2	Kail	834906	1296	108.20
3	Chil	336880	219	7.38
4	Rai	1050411	382	40.13
5	Fir	1791558	382	68.44
6	Chilgoza	321750	0	0
7	Other miscellaneous B.L.	514564	0	0
Total		9959573	4473	1345.18

9.3 Capital Value of Non-Timber Forest Produce:-The main NTFP are medicinal herbs, Guchi, grass Chulli oil, Behmi oil and Apricot etc. and the income from these minor forest produce in Kinnaur Forest Division is given in the following table. The average value accrued from the NTFP has been based on the average figures for the last nineteen years as per information received from ranges of Kinnaur Forest Division. Their values are tabulated in Table No. 9.3.

Table-9.3

Sr. No.	Type of produce	App. Estimated value in crores
1	Resin	0
2	Medicinal herbs & grasses	0.15
Total		0.15

9.4 Total Capital Value of the Forests: Total capital value of the forests works out to be Rs. **4440.4** and summarized in Table No. 9.4.

Table-9.4

Sr. No.	Capital Value of	App. Estimated value in crores
1	Land	3095.07
2	Growing stock	1345.18
3	NTFP	0.15
Total		4440.40

The above estimate of the capital value of forests includes only tangible benefits such as; production of wood, medicinal herbs, grasses etc. It does not include in direct benefits like their significant role in water conservation, stabilization of terrain, influences on local climate and rainfall, aesthetic value and benefits conferred on agriculture, socio economic support for rural communities. It is not possible to reckon these values in monetary terms.

PART-II

FUTURE MANAGEMENT

DISCUSSED

AND

PRESCRIBED

CHAPTER-I

BASIS OF PROPOSALS

1.1 Introduction:- The forests play an important role in the economic life of the village communities and are assemblage of versatile natural resources. Forest resources are a vital component to sustain life support system on the earth being the major natural resources and these resources have been exploited by human race since the beginning of civilization. Mankind's indiscriminate use of natural resources in the course of development has led to serious environmental problems and degradation.

The forests of Himachal Pradesh are very important, being an integral part of Himalayan ecosystem. The forests of Himachal Pradesh are not only of importance for the State, but have also a strong influence on the ecology, environment, watershed, climate and bio-sphere of neighboring States of Punjab, Uttarakhand, Haryana, Chandigarh, Delhi and Rajasthan. The forest cover of Himalayas not only regulates the rainfall in the neighboring states but also ensures snow fall in higher mountains and maintain ecological balance. A reduction in the forest cover of the State of Himachal Pradesh will prevent the formation of glaciers and snow, resulting in less water in rivers and lakes and adverse effects on climate, ecology, environment and agriculture production besides harnessing of Hydro Electric Projects in the State of Himachal Pradesh. The forests of Himachal Pradesh have undergone a sea change in the past few decades and are presently under great stress. Forestry in the present time has undergone many changes and there has been a paradigm shift in the approach to the forestry sector nationally and internationally. The focus of management has shifted from production forestry to conservation of biological diversity, restoration of ecological balance of the disturbed areas. Non timber forest produce has become the fore front of forestry management. The role of local people in protection and management of forests through the joint forest management has taken a formal shape. The decentralized planning process for area specific forest management approach has resulted in formulation of micro plans. Watershed development approach is also gaining importance in planning and implementation of natural resource management programme.

1.1.1 National Forest Policy and Legislation:- The first National Policy of India was enunciated by the government of India in 1894. This policy forms the basis of future management strategies of forest in India. In 1904, special rule known as Shimla Forest Conservancy Rule were introduced by the Government of Punjab, under the policy laid down in 1894. Finally, new National Forest Policy was formulated in 1952, as notified vide Government of India No. 13-1/52-p dated 12th May 1952. This policy was based on the following paramount needs:

- i) The need for evolving a system of balanced and complementary land use, under which each type of land is allotted to that form of use under which it would produce the most and deteriorated the least.
- ii) The need for checking:
 - (a) Denudation in mountainous regions on which depends the perennial water supply of river systems whose basin constitute the fertile core of the country.
 - (b) The erosion progressing along the tree less banks of the great rivers leading to ravine formation and on vast stretches of undulating waste lands depriving the adjoining fields of fertility.
 - (c) The invasion of sea sands on coastal tracts, and the shifting of sand dunes more particularly in the Rajputana desert.
- iii) The need for establishing tree lands where ever possible for the amelioration of physical and climatic conditions promoting the general well being of the people.

- iv) The need for ensuring progressively increasing supplies of grass for cattle, small wood for agricultural implements and in particular of firewood and to get increased quantity of cattle dung for manure to step up food production.
- v) The need for sustained supply of timber and other forest produce required for defense, communication and industry.
- vi) The need for the realization of maximum annual revenue in perpetuity consistent with the fulfillment of the needs enumerated above. To fulfill the aforesaid needs, the following broad principles have been defined in the National Forest Policy.
 - (a) To ensure the full protective influence of the forests on the soil, water regime and the physical and climatic factors of the locality.
 - (b) To meet the domestic and agricultural requirements of the local population without subordination of the national interest or the interests of future generations.
 - (c) To combat the indiscriminate extension of agriculture over the forest lands.
 - (d) To regulate and control grazing.
 - (e) To conserve forest resources in perpetuity.
 - (f) To provide protection to the wild life.

1.1.2 National Forest Policy of 1988:- The forests policy of 1952 was revised in 1988. The principal aim of the new policy is maintenance of environmental stability and ecological balance through preserving the natural forests. Derivation of direct economic benefit has been subordinated to this principal aim. The policy, for the first time, has given emphasis to the involvement of people, including women, in the protection and development of forests. The salient features of the Forest Policy of 1988 are:

- i) Setting of a national goal to have a minimum of one third of the total land area of the country under forest or tree cover.
- ii) Initiating need-based and time-bound programme for afforestation and tree planting on all degraded and denuded lands with emphasis on participatory forestry and common property management.
- iii) Increasing productivity of forests through scientific management, based on management plans to be approved by the Government.
- iv) Rights and concessions of the rural people, including that of grazing, to be in accordance with the carrying capacity of the forests; the rights and concessions enjoyed by the tribal and other poor people living within and around forest to be fully protected; minor forest produce and construction timber to be the first charge on forest produce.
- v) Greater emphasis on forest protection and wild life conservation in all management plans.
- vi) Strengthening of forest extension, forestry education and research.
- vii) Supply of forests produce to industries at concessional prices to cease, no forest based enterprise, except at the cottage level, to be permitted in future, unless, it has been first cleared with regard to assured availability of forest produce; forest based enterprises to raise their own material requirement by establishing direct relationship with individual farmers;
- viii) Creating a massive people's movement with the involvement of women for achieving objectives of the policy.

1.1.3 Himachal Forest Policy:- Himachal Pradesh Government has formulated a Forest Policy for the Pradesh vide No. Fts (8)17-5/10 dated 3rd September, 1980. Important features of this policy areas under:-

- i) To have 50% of the geographical area of the state under forest by 2000 AD and to raise this percentage to 60% ultimately.

- ii) Felling to be carried strictly in accordance with the prescriptions of sectioned Working Plans and all kinds of removals from the forests to be counted against the prescribed yield.
- iii) Felling to be followed by regeneration.
- iv) No felling upto 30 m on either side of the roads.
- v) All forest areas to be properly demarcated.
- vi) Forests and Revenue Settlements to be taken up simultaneously and the right to be defined and regulated by an Act of Legislation.
- vii) The requirement of local right-holders to be met with judiciously keeping in view the conditions of forests.
- viii) There being hardly any scope for further extension of agriculture, the people should be encouraged to adopt some alternative professions.
- ix) Transfer of areas under reserved, demarcated protected forests and plantations for non-forestry purposes to be totally banned.
- x) Management of water sheds to be given due importance.
- xi) The methodology of planting and standards of protection to be improved to reduce mortality percentage.
- xii) The vast blank stretches in the productive waste lands to be afforested under Social Forestry Programme with appropriate involvement and cooperation of the people especially youth and school children.
- xiii) Planting of fast growing fuel and fodder species to be preferred near habitations to meet the requirements of the local people.
- xiv) Steps to be taken to reduce cattle population rationally, fixing norms of grazing under comprehensive legislation.
- xv) To promote tourism along with improvement of forest vegetation.
- xvi) Shooting of big and small game should be banned in the Pradesh for the development of Wild Life. Game sanctuaries should be established and properly managed all over the State.
- xvii) No lease for the extraction of minerals to be granted without the prior consent of Forest Department.
- xviii) Research facilities to be created in the Forest Department to solve problems of applied nature.
- xix) Co-ordination between the Forest, Animal Husbandry, Agriculture and other concerned department will be increased to improve cattle breeds augment fodder development, improve pasture land and promote more livelihood opportunities.
- xx) Watershed programmes will also give due emphasis to grazing and pasture lands.
- xxi) Cropping patterns will be reviewed in the context of climate changes especially for judicious use of water and forest resources in the hill context.

The government of Himachal Pradesh has developed the Forest Sector Policy and Strategy 2005 in consonance with the Government of India Policy guidelines and by making important amendments to the previous HP Forest Policy, 1980. The salient features of the **HP Forest Sector Policy & Strategy, 2005** are:-

- i) Conserve and improve the status of natural resources in the state, especially forests wildlife and biodiversity through effective watershed management practices.
- ii) Conserve and manage forests scientifically, contemporarily and incorporating the best practices from within and outside the state, for the present and future generations, and to increase their value- historical, culture, religious, economic and aesthetic – for communities and the environment on a sustainable basis.
- iii) Strive for livelihood security of forest department communities through protection of rights to forest goods and services.

- iv) Establish and support an integrated governance system that effectively involves all stakeholders in protecting, conserving, using, managing and restoring forests and other natural resources of the State.
- v) Strive towards an appropriate land use in the state especially in the context of sustainable forest management, focusing on the primary land use sectors such as agriculture, animal husbandry and those related to infrastructure development.
- vi) Strengthen the capacity for research, training, extension, education and awareness of government and non-government institutions, related to her forest sector.
- vii) Apply the best scientific information, resources, management practices and strategies available to implement the forest sector policy and create a mechanism to periodically review the policy keeping in view the changing circumstances and needs.

The detail HP Forest sector policy & strategy, 2005 on forestry, wildlife watershed, Bio-diversity conservation, etc. are available on Govt. of H.P. Forest Department web site www.himachal.nic.in.

1.2 Supreme Court on Green Felling and Regeneration:- The T.N. Godavarman case attracted significant attention when on 12-12-1996, the Apex Court with order ‘Suspended’ the felling of trees in all forest except in accordance with the Working Plans of the State Governments which were approved by the Central Government. The land mark orders passed by the Apex Court in an effort to save the fast diminishing forest cover of the country against the greedy and wanton plundering of its natural resources, on 15-01-1998, the Hon’ble Supreme Court held that Working Plan for all forest divisions shall be prepared by the State Government and get approval from the Govt. of India. Forest working shall be carried out strictly in accordance with the approved prescriptions of the Working Plans.

On 12-5-2001, the Apex Court laid down detailed guidelines for the felling of trees from forest areas as well as non-forest areas including plantation. As per the order, the felling of trees from forest areas could be allowed only as per the approved Working Plan/scheme, whereas the felling of trees from non forest area could be allowed only as per detailed guidelines which are prepared by the State Govt. with the concurrence of the Central Government. This order, together with the order of the Apex Court on 15-1-1998 forms the guidelines for felling of trees. The highlights of the order in T.N. Godavarman case dated 12-5-2001 were:

- i) Felling of trees from forest shall be only in accordance with Working Plans/schemes or felling schemes approved by the Ministry of Environment and Forests.
- ii) Such Working Plans/schemes shall also be needed for felling of trees from any non-Govt. forest areas including land which is required to be treated as “forest” as the decision of the Apex Court on 12-12-1996.
- iii) While implementing the Working Plans/schemes approved by the Central Govt., the State Govt. or the concerned authority shall ensure that no felling is done unless and until sufficient budgetary provisions exist for the regeneration of such areas.
- iv) For felling of trees from non forest areas, including plantations on concerned State Govt. which will come in force only after concurrence from the MoEF, Govt. of India.
- v) The Guidelines/Rules shall also include provisions for penalties and mode of disposal in respect of any felling done in violation of such rules/guidelines.
- vi) Till such guidelines/Rules become effective, no felling from any area other than that under approved Working Plans/schemes or felling schemes shall be permitted.
- vii) The schemes are to be prepared within a period of three months and the MoEF has to take a decision on the same within a period of one month of the date of receipt.

For the State of Himachal Pradesh, the **Hon’ble Supreme Court’s order dated 12-12-1996** held that there will be no felling of trees permitted in any forest, public or private. This ban will not

affect felling in any private plantation comprising of trees planted in any area which is not a “forest”, and which has not been converted from an earlier “forest”. This ban will not apply to permits granted to the right holders for their bonafide domestic use. Further, in a forest, the state Government may either departmentally or through the state Forest Corporation remove fallen tree or fell and remove diseased or dry standing timber from areas other than those notified under section 18 or section 35 of the Wild Life Protection Act, 1972 or any other act banning such felling or removal of trees. For this purpose, the state Government is to constitute an Expert Committee comprising a representative from MoEF, a representative of the state government, two private experts of eminence and the MD of the State Forest Corporation (as Member Secretary), who will fix the qualitative and quantitative norms for the felling of fallen trees and diseased and standing timber. The state shall ensure that the trees of felled and removed are in accordance with these norms. Felling of trees in any forest of any clearance of forest land in execution of projects shall be strict conformity with the Forest Conservation Act, 1980 and any other laws applying thereto. Moreover, any trees so felled, and the disposal of such trees shall be done exclusively by the state Forest Corporation and no private agency is to be involved in any aspect thereof. There is also a complete ban on felling of Oak trees.

Again, immediately two questions arise for consideration in the Hon’ble Supreme Court in T.N. Godavarman Thirumulpad V. Union of India, IA 424 in WP (c) No. 202/95 dated 8-1-2001. One is with regard to the implementation of the Working Plans in so far as felling is concerned and the Second is with regard to the regeneration of forests. It is quite obvious that the two activities must co-exist. There cannot be regeneration without felling because that will over a period of time only result in the forests vanishing. There has been shortfall with regard to the regeneration and as a result thereof forest cover is depleting. That shortfall has to be made up and for the future such felling has to be done which will ensure that there is at least no further depletion of the forest cover, and the targets for increase in forest cover, as contemplated in the Working Plans, are met. In other words, regeneration should be commensurate with the felling, and to the extent stipulated in the Working Plan.

Keeping in view of the aforesaid reason and the National Working Plan Code, MoEF, Govt. of India, March, 2014, the present Working Plan has been revised thoroughly notwithstanding the present moratorium on green felling, the revised Working Plan includes all regular Working Circles prescribing yield and felling cycles, depending on the condition of the forests in each Working Circles. This green felling in any forest or in public forest will be allowed/carried out strictly in accordance with the approved prescription of the Working Plan subject to the decision of the Hon’ble Supreme Court.

1.3 Objectives of Management:- As per National Working Plan Code 2014, the main objective of forest management should be more people centric and oriented to provide the goods and services from forest on sustainable basic with an emphasis on ecological services and harvest of usufructs as well. The general objectives of management of forests of Kinnaur forest division are as under:-

- i) To conserve biodiversity and natural habitat through preservation of natural forest with vast variety of flora and fauna
- ii) To preserve the hill sides against denudation and erosion so as to ensure equitable flow of water in the streams and rivers that originate from these hills.
- iii) To improve moisture regime of soil, maintain water table and recharge ground water through watershed management.
- iv) To conserve, sustain, protect and improve the quality and stocking of the existing forests and regeneration as near normal as possible through participatory forest management.
- v) To improve the stocking of the forest and to bring them gradually to a condition as near to the normal as possible by obtaining a more normal distribution of age classes with normal

regeneration and normal density of stocking. Also to restock the blank and barren land with valuable native tree species with special preference to Chilgoza and other more valuable tree species suitable to locality, through artificial means.

- vi) To fulfill the legitimate and bonafide domestic and agricultural requirements of the local people especially for timber, fuel, grass and grazing and other forest produce subject to the silvicultural carrying capacity of the forests.
- vii) To ensure systematic development and exploitation of Non Timber Forest Produce that is found in the tract and to increase their productivity by artificial means wherever possible.
- viii) To identify fauna which is getting extinct or dwindling fast in numbers and suggest measures aiming at conservation & rehabilitation of natural habitat along with combating man-animal conflict.
- ix) To increase the size of carbon sinks so as to reduce green house effect.
- x) To protect the Chilgoza forests from indiscriminate exploitation and to preserve these as representative eco-system of the region.
- xi) To improve and maintain the forest fringe areas of the tract. As well as the trees outside forests (TOF) which are located on the land other than forest.
- xii) In consistent with above, to obtain maximum sustained annual yield of timber and other forest produce.
- xiii) To improve and conserve the genetic resources (both floral and faunal including microorganism) and their sustainable use.
- xiv) To protect & detect encroachment and illegal mining on forest land through effective enforcement of law and rules.
- xv) To raise wild fruit trees plantations to augment the food base to wild animals and birds.
- xvi) Nature based tourism will be promoted in Forest areas having such potential and Eco-tourism societies as another institutional mechanisms will be established for sustaining it.
- xvii) Survey, measurement and demarcation with boundary/ pillars of remaining un-demarcated/new demarcated forest and their entry in revenue records will be completed within five years. Entries of forest already declared as protected forests in revenue records will be revisited and confirmed.
- xviii) Appropriate educational, extension and training programmes to create great awareness of the causes and ill effects of forest fires will be undertaken and people participation will be encouraged and motivated to reduce fire incidences.

1.4 Methods of Treatment to be Adopted:- To achieve the above objectives of management, the following treatment and methodology will be followed:

- i) All the conifer forests which are on comparatively moderate slopes will be managed under Indian Irregular Shelter wood System. The mode of regeneration will be both natural and artificial ensuring the completion of regeneration of the blank areas within the currency of plan and there shall be no felling of tree in any forest area except in accordance with the orders given by the Apex Court.
- ii) The riparian zones among the most diverse, productive, vulnerable, habitat and perform several critical ecological functions. The habitat use pattern in this system by the people is often unsustainable, hence the riparian zones are constantly under threat. No fellings along the bank, nalla or streams or riparian zone will be allowed and necessary preventing measures will be taken during the plan period.
- iii) To conserve and improve the status of natural resources and bio-diversity through effective watershed management practices.
- iv) All the Chilgoza forests and open crop of conifer species which were subjected to indiscriminate hackings in the past and require rest for recuperation will be protected from

further degradation through effective closure notification under Section 30 (b) of Indian Forest Act, 1927.

- v) All poorly stocked and blank forests will be re-afforested by planting suitable species to meet local demand of fuel, fodder, timber and demand of forest based industries.
- vi) Participation of community will be ensured in the process of management, protection and conservation through the concept of Joint Forest Management.
- vii) Working with the local communities to maintain ecological balance for the preservation and improvement of wild life especially in and outside the protected area.
- viii) Soil conservation works with focus on water shed management in a planned manner, where ever necessary will be undertaken to protect hill side/slopes from further denudation & erosion through vegetative manner.
- ix) Survey, measurement & demarcation of forest land will be ensured under the provision of the HP Land revenue Act, 1954 and construction of Boundaries/Pillars would be taken place in planned manner.
- x) Encroachment on forest land will be detected and prosecuted in planned manner / way.

1.5 Constitution of Working Circles:- A tree is no more looked upon as mere source of timber or fuel wood for sustenance. It is now considered as indispensable for every human survival and an almost only natural agent for carbon sequestration and carbon deposition. It is most effective tool for controlling global warming and eventual climatic change. We can no more afford heavy or large scale commercial fellings in forests as also envisaged in the order of Hon'ble Supreme court. The thrust now must shift from commercialization of forests to their conservation. Instead of direct benefits from forest by way of timber and fuel wood, we must now look out for the more sustainable and perpetual resources like air, water, medicinal resources, eco tourism etc.

Keeping in view the objects of managements out lined above, the following Working Circles have been constituted:

1. The Wet Zone Deodar- Kail Working Circle.
2. The Dry Zone Deodar- Kail Working Circle.
3. The Fir/Spruce Working Circle.
4. The Neoza Working Circle
5. The Rehabilitation Working Circle.
6. The Plantation (overlapping) Working Circle
7. The NTFP (overlapping) Working Circle
8. The Forest Protection (Overlapping) Working Circle,(Fire, Illicit felling, Encroachment, Illegal mining and Poaching etc.).
9. The Joint Forest Management/ ParticipatoryForest Management (overlapping) Working Circle.
10. The Wild Life Management (overlapping) Working Circle.

The areas suggested to be constituted in these Working Circles are tabulated in table No: 1.1.

Table 1.1

Sr. No.	Name of WC	Protected Forest			Total
		(Area in Hac.)			
		DPF	NDPF	Listed UPF's	
1	Deodar/Kail Wet Zone	2406.39	0	73	2479.39
2	Deodar/Kail Dry Zone	1662.81	0	0	1662.81
3	Fir/Spruce	3846.15	0	2677	6523.15
4	Neoza	2844.53	0	0	2844.53

5	Rehabilitation	13039.75	971.45	7955	21966.2
Total		23799.63	971.45	10705.00	35476.08

1.5.1 The Wet Zone Deodar - Kail Working Circle:-This Working Circle includes all DPFs and UPFs containing Deodar and Kail having more than 60% of Deodar and Kail as major species, situated on comparatively easy ground and small admixture of Spruce and Fir in upper reaches. This working circle is almost same as was in the Rajiv's Plan except that the areas transferred from Wild Life Division, Sarahan, and the areas which were not included in the plan under revision, have been included in this working circle. These forests are not even aged and generally contain all age classes more or less intimately mixed up except in the areas regenerated during the past. More stress shall be laid on regenerating the felled/open areas within the shortest possible time and to regenerate the areas allotted to P.B.I fully within the regeneration period of 30 years. The forests will be managed under Indian Irregular Shelter Wood System. The emphasis will be laid on natural regeneration supplemented with artificial regeneration. No discrimination will be made between different species coming up naturally in the felled areas.

1.5.2 The Dry Zone Deodar - Kail Working Circle:-The constitution of this Working Circle will remain same as in the previous Rajiv's plan except that the areas transferred from Wild Life Division, Sarahan, and the areas which were not included in the plan under revision, have been included in this working circle. The major part of the area bears Deodar, Kail and some Neoza in the lower reaches and Silver Fir and Spruce in the higher reaches. High level kail is also found above the Fir zone. These forests are not even aged and generally contain all age classes more or less intimately mixed up except in the areas regenerated during the past. More stress shall be laid on regenerating the felled/open areas within the shortest possible time and to regenerate the areas allotted to P.B.I fully within the regeneration period of 45 years. The forests will be managed under Indian Irregular Shelterwood System. The emphasis will be laid on natural regeneration supplemented with artificial regeneration. No discrimination will be made between different species coming up naturally in the felled areas.

1.5.3 The Fir Spruce Working Circle:-All the forests containing predominately Fir and Spruce with little admixture of Deodar and Kail at the low elevation and broad leaved species along nalla and depressions has been allotted to the Working Circle. The basic constitution of this Working Circle will remain same as in the previous Rajiv's Plan except that the areas transferred from Wild Life Division, Sarahan and the areas which were not included in the plan under revision, have been included in this working circle. The forest shall be worked under Indian Irregular Shelterwood System. Most of the forest allotted to this Working Circle, have been felled in the past for apple packing cases. Fellings done in the past in the majority of the areas have not been followed by regeneration. Emphasis will be laid to regenerate PB-I areas by artificial means as quickly as possible with in the regeneration period of 30 years in a time bound manner. The conversion of uneven aged crop to even age will continue.

1.5.4 The Neoza Working Circle:The Neoza Pine (*Pinus gerardiana*) areas occurring in the altitudinal limit of 1500 mtrs to 3300 mtrs. in the Dry Zone, in the demarcated and undemarcated Forest have been allotted to this working circle with the objective of inducing natural and artificial regeneration. The major attention is required for these important forest, which otherwise have been neglected in the past. The timber of this pine is of little importance but the forests are subjected to the rights of user by the local inhabitants for the collection of Neoza Seed. The incidence of grazing is very high and the natural regeneration is very deficient. There is no change in the areas from the earlier plan except that the areas transferred from Wild Life Division, Sarahan and the areas which were not included in the plan under revision, have been included in this working circle. The latest research and technology as evolved in the recent years is to be given due consideration.

1.5.5 The Rehabilitation Working Circle:-This Working Circle includes all the coniferous, broad leaved forests which lie on precipitous and difficult terrain and can not be managed under Shelterwood System and thus not included in the other working circles described. These forests were under Protection Working in the Rajiv's Plan. These forests are mainly situated on difficult, steep and precipitous slopes where concentrated fellings are not advisable due to environmental hazards and regeneration problems. The blanks and other degraded areas are to be rehabilitated by planting species suitable to the area. The chief value of these forests lies in the protection of hill side against denudation and erosion and in maintaining a green cover. The difference of areas in this working circle is on account of transfer of areas from Wild Life Division, Sarahan and the areas which were not included in the plan under revision, creation of NDPF, and unlisted undemarcated protected forest which bear compact wooded areas.

1.5.6 The Plantation (overlapping) Working Circle:- This Overlapping Working Circle includes areas which are devoid of vegetation, having open crop or have young plantations or crop which still requires protection. Beside this, the blank areas and poorly stocked but are suitable for raising plantation of value-able and economically important species have also been included in this working circle. The plantations raised in UPFs in the past which are not fully established are also included in this circle. The special objectives of management of this Working Circle are:

- (i) To develop and augment the forests resources of the area by afforestation of blank and scrub areas with suitable species.
- (ii) To conserve soil and water through afforestation.
- (iii) To rehabilitate degraded forests.
- (iv) To assess the old plantations and derive critical conclusions therein.
- (v) To eradicate Invasive Alien Species from forest ecosystem and restore their productivity and biodiversity values.

1.5.7 The NTFP (overlapping) Working Circle:-This is an Overlapping Working Circle and is constituted to ensure systematic development and exploitation of non timber forest produce species that occur or can be introduced in this division. It will include all the areas which have high potential for raising NTFP through natural or artificial regeneration techniques. The main non timber forest produce found/extracted in the division are Chilgoza, Medicinal plants, Resin and grass.

1.5.8 The Forest Protection Overlapping Working Circle (Fire, Illicit felling, Encroachment, Illegal mining & Poaching etc.):-This is an overlapping Working Circle and is constituted to address the forest protection problems like (Fire, Illicit felling, Encroachment, Boundary pillars, Illegal mining, Poaching etc.) in this division. This Working Circle includes the areas of all the other Working Circles. The forest areas which are vulnerable to encroachments, status of damage reports, progress in prosecution/ compounding, disposal of seized timber and illicit felling etc. along with their future strategies are also discussed in detail under this Working Circle.

1.5.9 The JFM/ PFM(overlapping) Working Circle:-This Overlapping Working Circle includes the forest areas near to the habitations, where active participation of local people has been taken in the past along with potential new areas. Involvement of rural communities living close to forests in protection and management of forest resources is enshrined in the National Forest Policy, 1988 and as well as in the National Working Plan Code, 2014. The experience gained from various projects like social forestry umbrella project, Sanji Van Yojna etc. have been incorporated to enlist the potential panchayat / villages where JFM approach can be successfully implemented. The selected forests areas are mostly UPFs/DPFs situated near to habitations that have become degraded, the UPFs and waste land that are in small bits, honeycombed, surrounded by cultivation and are left out after demarcation and settlement.

This Working Circle also lays emphasis on man-forest interface and channelizing human resources for conservation of forests and vice versa. People of the division depend on Chilgoza

forests for collection of seed and Oak forest for collection of fodder on a large scale. In the process, most of these Chilgoza and Oak forest have been exploited and lopped with high intensity leaving these trees at the verge of perishing. It is, therefore, suggested in this Working Circle about the needs of these people and sustainable utilization of Chilgoza and Oak forest with active participation of local communities.

1.5.10 The Wild Life Management (overlapping) Working Circle:- This Overlapping Working Circle is constituted for emphasizing the necessity of conservation of wildlife and collection of information for better management of wild life. The whole tract has a variety of wild animals and birds since the forests are distributed from low elevation to the high snow bound areas. The provisions of the Wild Life Protection Act, 1972 are to be enforced and the man animal, conflict reduced. Therefore, this Working Circle overlaps all other Working Circles.

1.6 Working Circle, their area and distribution:- The detail of forests, demarcated and undemarcated allotted to various Working Circles along with their areas are given in **Appendix No.-IV & VII**. The total area in hac, Working Circle wise and their distribution range wise is tabulated in Table No: 1.2

Table-1.2

Sr. No.	Name of Range	WZ DK WC (hac.)	DZ DK WC (hac.)	FSWC (hac.)	NWC (hac.)	Rehabilitation WC (hac.)	G. Total (hac.)
1	Bhabanager	709.03	0	2903.82	0	1170.03	4782.88
2	Kalpa	0	595.68	212.89	777.8	4139.76	5726.13
3	Katgaon	9.3	0	1212	0	1751.62	2972.92
4	Kilba	518.4	1067.13	209.23	0	5528.6	7323.36
5	Moorang	0	0	0	1435.83	2530.59	3966.42
6	Nichar	1242.66	0	1985.21	0	6088.64	9316.51
7	Pooh	0	0	0	630.9	756.96	1387.86
8	Malling	0	0	0	0	0	0
	Total	2479.39	1662.81	6523.15	2844.53	21966.2	35476.08

1.7 Reasons for Constitution of Working Circle:- The coniferous forests are silviculturally suited for regeneration under a system of concentrated regeneration felling and the overriding factor for allotting those workable areas as lie on comparatively easy ground to Deodar and Kail Working Circle. In case of Fir Working Circle, for regeneration, under the system is necessity for closure against grazing. Even otherwise, too, it is silvicultural treatment of the forests as on largely on moderate slopes which are conveniently suited for treatment under a system of concentrated regeneration fellings. The experience during the past Working Plan has been that the Indian Irregular Shelter wood System along with supplementing the natural regeneration by artificial means combined with closure of areas under regeneration has been most successful. The experience of managing the over mature fir forests under clear felling system has proved the failure because of immense weed growth that comes up after the opening up of the forests under clear felling system.

The separate Working Circle for Deodar, Kail, Neoza and Fir Spruce have been created on the basis of physiographic, growing stock, managerial requirements to meet specific objectives as enlisted in detail in the respective chapter ahead.

The fellings are to be linked with the pace of regeneration. Sufficient nurseries should be raised in advance before carrying out the regeneration felling.

1.8 Blocks and Compartments: All the forests have been divided into compartments and sub-compartments based on the natural features, composition of crop and treatment required. No further division is required. Invariably the natural features like ridges, nallas and path etc. form the boundaries. The nomenclature/numbering of the forests have been changed with the addition of new

DPFs and transfer of areas from the Wild Life Division, Saharan. The unlisted undemarcated protected forest adjoining to the demarcated protected forest which has been taken over from the Wild Life Division, Saharan has also been brought under the forest management. In addition to this, other land, the grassy blanks of high line undemarcated and unlisted forest commonly known as Alpine pastures (kandas) have also been listed out and included. The range wise detail of these areas is given in Appendix No-III.

1.9 Enumerations: As given in the Chapter VIII of Part I and under paragraph 8.8 the enumeration was carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The whole of the area of the Kinnaur Forest Division was divided into grids and total 150 Nos of samples were taken. The enumeration was carried out with the help of GPS 72, Compass, Haga Altimeter and Callipers. Sampled enumerations have been carried out in all the forest. Accordingly, complete enumerations have been carried out in the selected sample plot of size 0.1 ha in the forests after selecting the samples. The results have been analyzed, growing stock has been assessed and extrapolated. The results of enumerations are given in **Appendix No. X, XI, XII, XIII and XIV**. The growing stock has been assessed / extrapolated and is given in **Appendix No. XV, XVI, XVII, XVIII and XIX**.

1.10 Stock Mapping: The stock maps of all the forests have been taken from survey sheets 4" = 1 mile scale and after getting them digitized, have been placed in the respective compartment history file.

1.11 Felling series: There will be only one felling series i.e. Sutlej felling series conforming to the territorial jurisdiction of Kinnaur Forest Division.

1.12 Period of Working Plan and necessity for intermediate revision

During the year 2015-16 to 2018-19 all operations/activities have been carried out as per APO. No felling except that of salvage removal of forests has been carried out in compliance of the Hon'ble Supreme Court's order dated 12-12-1996. Felling of trees or clearance of forest land in execution of projects has been carried out strictly in conformity with Forest (Conservation) Act, 1980. Hence, period of 4 years has been treated as interim period and regularized. The period of Working Plan is 10 years from 2019-20 to 2028-29 during the period, the prescription of this Working Plan will come into force w.e.f. 01-04-2019. The effective period of the plan shall be 10 years. As per Working Plan Code 2014 and in compliance of the Hon'ble Supreme Court's order, a midterm review of WP should be undertaken for mid-course correction by the consultative committee under the chairmanship of PCCF (HoFF) with representation from RAPCCF (MoEF). Similarly, based on the performance of the WP prescriptions the plan period may be extended up to 5 years beyond the stipulated plan period by designated authority on the recommendations of the standing consultative committee authorized for this purpose.

CHAPTER II

THE WET ZONE DEODAR-KAIL WORKING CIRCLE

2.1 General Constitution:-This Working Circle includes all the demarcated and undemarcated protected forests of wet zone, having Deodar and Kail as principal species or the crop having 60% or more of these species as its component in a compartment situated on comparatively easier/moderate to steep slopes. This working circle includes all the forests of wet zone Deodar Kail working circle of Rajiv's Working Plan, the forests which were not included in the plan under revision and the forests transferred from Wild Life Division, Sarahan to Kinnaur Forest Division. This Working Circle covers an area of **2479.39hac.**

2.2 General Character of Vegetation:-The detailed description of the forests are given and described in the Chapter II Part- I. The forest of this Working Circle falls under type Group 12 (Himalayan Moist Temperate Forest) and sub type 12/C.I.c of the forest types given by *Champion and Seth*. The overall condition of the crop varies from young to middle and few mature trees. The natural regeneration in these forests especially of kail is very good, compared to deodar except in the areas where the incidence of grazing is very high. The small scattered patches of other species like Spruce, Broad leaved and in rare cases Fir species interrupts the purity of the vegetation and it is not practicable to isolate them in each and every compartment, even though effort have been made to do so. Considerable area once occupied by Kail is now under Deodar and few excellent Deodar plantations such as in DPF 1 (a) and DPF 5 (a) in Bhaba Nagar and Nichar Ranges respectively have been raised underneath the canopy of Kail. Kail is, however, rapidly losing ground owing to the damage caused to it by fires. Ever since the introduction of scientific management in these forests Deodar has been the prized species. In some areas fire has created blanks. Selective and indiscriminate fellings by right holders has also caused extensive damage to these forests. Infections of blue pine trees near habitations with *Tremetes pinii* fungus and an angiosperm parasite *Arceuthobium minutissimum* are very common.

The crop is generally uneven aged except for those forests which have been successfully regenerated over the past under various Working Plans. The crops are fairly stocked except on a steep ground and habitation where unsilvicultural marking have created large gaps due to heavy pressure of TD marking. The Deodar forest in the track conform II/III of the FRI quality classes.

2.3 Special objects of Management:-Without prejudice to general objects of managements of the forests, the special objects of managements of this Working Circle are:-

- (i) To progressively convert the irregular/uneven aged stock into more or less even aged/normal stock and thus to build up growing stock to the extent possible under the prevailing conditions.
- (ii) To improve the existing condition of crop with selective and specific treatments.
- (iii) To regenerate the PB-I areas as speedily as possible by resorting to artificial regeneration wherever necessary.
- (iv) To obtain the maximum possible sustained yield of timber without further denuding/worsening the condition of vegetation.
- (v) To protect the forests from fires as well as biotic interferences.

2.4 Area Statement:-The total area of this Working Circle is **2479.39hac.** which works out to be **6.99%** of the total area of the division. The range wise distribution of these forests is given in Table No. 2.1.

Table 2.1

Name of Range	DPF	UPF	Total in hac.
Bhabanagar	636.03	73	709.03
Kalpa	0	0	0

Katgaon	9.3	0	9.3
Kilba	518.4	0	518.4
Moorang	0	0	0
Nichar	1242.66	0	1242.66
Pooh	0	0	0
Malling	0	0	0
Total	2406.39	73	2479.39

The forest wise detail of specific allotment is given in **Appendix No.-IV**.

2.5 Block and Compartment:-The compartments and sub compartments remains unchanged from the Rajiv's Working Plan under revision. The compartments and sub compartments have been re-numbered systematically both for DPFs and listed UPFs which was necessitated due to transfer of areas from Wild Life Division, Sarahan, and the areas which were not included in Rajiv's plan, and creation of new DPFs.

2.6 Felling Series:-There will be only one felling series i.e. **Sutlej felling series**, conforming to the territorial jurisdiction of Kinnaur Forest Division.

2.7 Analysis and Valuation of the Crop:-Except for the converted crop during the period of previous plans (before the ban on green felling) the crop is irregular having all the age classes in the same areas. The converted crop, however, is generally well stocked having more or less represented almost generally in mixtures and sometimes as pure crops of Deodar and Kail separately. Spruce and Fir are found in the higher reaches of the compartment bearing Deodar and Kail. The broad leaved species are confined to depressions and along nallas.

(i) Stock Maps:- The digitized stock maps on 4"=1 Miles scale, have been prepared for all the forests separately.

(ii) Density:-The crown density of each compartment has been estimated ocularly and has been recorded in respective compartment history files. The average density of the crop varies from 0.4 to 0.6

(iii) Site quality:-The site quality of the crop varies from place to place overall quality conform to II/III of the FRI quality classes. The site quality of individual compartments/ sub compartment has been indicated in the compartment history files.

(iv) Age Classes:-The crop is very irregular. All age classes are represented and the crop is seldom uniform over large areas.

(v) Enumerations:-As given in the Chapter VIII under paragraph 8.8, sampled enumerations has been carried out. The enumeration was carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. Total 21 Nos. Sample plots pertaining to this working circle were enumerated. The detailed forest wise enumeration results are given in **Appendix No-X**. The results have been analyzed statistically and growing stock has been assessed / extrapolated.

Table- 2.2**PB-I (Area = 617.99)****Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle**

Sr. No	Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	0241	Deodar	Number	14420	10300	5150	12360	8240	12360	4120	2060	0	1030	70039
			Volume in Cubic Mtrs	865.19	2883.95	4377.43	22742.03	23318.82	45484.06	19816.88	12545.2	0	7106.89	139140.45
2	0926	Kail	Number	6180	2060	6180	0	0	0	1030	0	1030	0	16480
			Volume in Cubic Mtrs	370.79	576.79	6118.1	0	0	0	5829.71	0	8332.57	0	21227.96
3	0002	Fir	Number	47379	14420	4120	4120	0	0	0	0	0	0	70039
			Volume in Cubic Mtrs	2842.75	4037.53	4078.73	7003.89	0	0	0	0	0	0	17962.91
4	0921	Spruce	Number	11330	5150	4120	4120	1030	4120	2060	2060	1030	1030	36049
			Volume in Cubic Mtrs	679.79	1441.98	2925.15	5850.31	2626.46	17509.72	12833.59	15758.75	10207.13	10207.13	80040
5	0965	Birdcherry	Number	0	0	1,030	0	0	0	0	0	0	0	1,030
			Volume in Cubic Mtrs	0	0	236.9	0	0	0	0	0	0	0	236.9
6	0038	Aescules	Number	0	1030	0	1030	0	0	0	0	0	0	2060
			Volume in Cubic Mtrs	0	61.8	0	298.7	0	0	0	0	0	0	360.49
7	0047	Ailanthus	Number	1030	0	0	0	0	0	0	0	0	0	1030
			Volume in Cubic Mtrs	10.3	0	0	0	0	0	0	0	0	0	10.3
8	1038	Rhododendron	Number	0	1030	0	0	0	0	0	0	0	0	1030
			Volume in Cubic Mtrs	0	72.1	0	0	0	0	0	0	0	0	72.1
9	2000	Other B/L	Number	0	1030	0	0	0	0	0	0	0	0	1030
			Volume in Cubic Mtrs	0	72.1	0	0	0	0	0	0	0	0	72.1
			Number	80339	35019	20600	21630	9270	16480	7210	4120	2060	2060	198787
		G Total	Volume in Cubic Mtrs	4768.82	9146.25	17736.31	35894.92	25945.28	62993.78	38480.18	28303.94	18539.7	17314.02	259123.21

PB-II (Area = 659.09)														
Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle														
Sr. No	Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	0241	Deodar	Number	51629	21970	18674	36250	21970	15379	4394	1098	1098	0	172462
			Volume in Cubic Mtrs	3097.72	6151.51	15873.08	66699.91	62174.16	56593.86	21134.82	6689.76	7579.54	0	245994.36
2	0926	Kail	Number	23068	2197	2197	0	0	0	1098	0	1098	0	29659
			Volume in Cubic Mtrs	1384.09	615.15	2175	0	0	0	6217.42	0	8886.73	0	19278.38
3	0002	Fir	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
4	0921	Spruce	Number	0	1098	0	2197	1098	1098	4394	1098	0	0	10985
			Volume in Cubic Mtrs	0	307.58	0	3119.69	2801.13	4668.55	27374.2	8403.4	0	0	46674.56
5	0019	Mapple	Number	1098	0	0	0	0	0	0	0	0	0	1098
			Volume in Cubic Mtrs	10.98	0	0	0	0	0	0	0	0	0	10.98
6	0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
7	0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
8	1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
9	2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
			Number	75795	25265	20871	38447	23068	16477	9886	2197	2197	0	214204
		G Total	Volume in Cubic Mtrs	4492.8	7074.23	18048.08	69819.6	64975.29	61262.42	54726.44	15093.16	16466.27	0	311958.28

PB-III (Area = 603.38)														
Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle														
Sr. No	Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	0241	Deodar	Number	16090	19107	33186	36203	22124	15085	10056	4023	0	0	155873
			Volume in Cubic Mtrs	965.41	5349.97	28208.02	66613.15	62610.73	55510.96	48370.96	24497.23	0	0	292126.43
2	0926	Kail	Number	0	0	1006	1006	5028	3017	1006	0	0	0	11062
			Volume in Cubic Mtrs	0	0	995.58	1991.15	15637.6	12821.83	5691.88	0	0	0	37138.04
3	0002	Fir	Number	0	1006	0	0	0	0	0	0	0	0	1006
			Volume in Cubic Mtrs	0	281.58	0	0	0	0	0	0	0	0	281.58
4	0921	Spruce	Number	0	0	0	0	0	0	1006	0	0	0	1006
			Volume in Cubic Mtrs	0	0	0	0	0	0	6265.1	0	0	0	6265.1
5	0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
6	0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
7	0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
8	1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
9	0651	Walnut	Number	0	0	0	0	0	1006	0	0	0	0	1006
			Volume in Cubic Mtrs	0	0	0	0	0	573	0	0	0	0	573
10	0630	Bray	Number	5028	1006	1006	0	0	0	0	0	0	0	7039
			Volume in Cubic Mtrs	2212	714	1086	0	0	0	0	0	0	0	4012
11	0965	Bird Cherry	Number	0	1006	0	0	0	0	0	0	0	0	1006
			Volume in Cubic Mtrs	0	70	0	0	0	0	0	0	0	0	70
12	2000	Other B/L	Number	1006	0	0	0	0	0	0	0	0	0	1006
			Volume in Cubic Mtrs	10	0	0	0	0	0	0	0	0	0	10
			Number	22124	22124	35197	37208	27152	19107	12068	4023	0	0	179003
		G Total	Volume in Cubic Mtrs	3187.86	6415.94	30289.68	68604.31	78248.33	68906	60327.94	24497.23	0	0	340477.28

PB-IV (Area = 598.93)														
Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle														
Sr. No	Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	0241	Deodar	Number	49911	17968	9982	1996	9982	3993	1996	0	1996	0	97825
			Volume in Cubic Mtrs	2995	5031	8485	3673	28250	14694	9603	0	13775	0	86505
2	0926	Kail	Number	7986	3993	1996	1996	7986	1996	0	0	0	0	25954
			Volume in Cubic Mtrs	479	1118	1976	3953	24836	8485	0	0	0	0	40847
3	0002	Fir	Number	0	0	1996	5989	1996	0	0	0	0	0	9982
			Volume in Cubic Mtrs	0	0	1976	10182	5650	0	0	0	0	0	17808
4	0921	Spruce	Number	5989	3993	1996	0	0	0	0	0	1996	0	13975
			Volume in Cubic Mtrs	359	1118	1417	0	0	0	0	0	19785	0	22679
5	0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
6	0038	Aesculus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
7	0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
8	1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
9	0651	Walnut	Number	0	0	1996	1996	0	0	1996	0	0	0	5989
			Volume in Cubic Mtrs	0	0	220	459	0	0	1637	0	0	0	2316
10	0630	Prunus	Number	1996	0	0	0	0	0	0	0	0	0	1996
			Volume in Cubic Mtrs	20	0	0	0	0	0	0	0	0	0	20
11	0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
12	2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
			Number	65882	25954	17968	11979	19964	5989	3993	0	3993	0	155722
		G Total	Volume in Cubic Mtrs	3853.12	7267.02	14074.86	18267.37	58735.07	23178.59	11239.92	0	33560.04	0	170175.98

Table- 2.3
Yield Calculation Table Growing Stock in PB-I & PB-IV (Area = 1216.92)

Sr. No	Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	241	Deodar	Number	64331	28268	15132	14356	18222	16353	6116	2060	1996	1030	167864
			Volume in Cubic Mtrs	3859.84	7914.97	12862.27	26415.47	51568.35	60177.81	29419.72	12545.2	13775.39	7106.89	225645.9
2	926	Kail	Number	14166	6053	8176	1996	7986	1996	1030	0	1030	0	42433
			Volume in Cubic Mtrs	849.94	1694.79	8094.57	3952.94	24835.63	8484.84	5829.71	0	8332.57	0	62074.98
3	2	Fir	Number	47379	14420	6116	10109	1996	0	0	0	0	0	80021
			Volume in Cubic Mtrs	2842.75	4037.53	6055.2	17185.7	5649.91	0	0	0	0	0	35771.09
4	921	Spruce	Number	17319	9143	6116	4120	1030	4120	2060	2060	3026	1030	50024
			Volume in Cubic Mtrs	1039.15	2559.98	4342.62	5850.31	2626.46	17509.72	12833.59	15758.75	29991.79	10207.13	102719.49
5	630	Bray	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
6	19	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
7	38	Aescules	Number	0	1030	0	1030	0	0	0	0	0	0	2060
			Volume in Cubic Mtrs	0	61.8	0	298.7	0	0	0	0	0	0	360.49
8	47	Ailanthus	Number	1030	0	0	0	0	0	0	0	0	0	1030
			Volume in Cubic Mtrs	10.3	0	0	0	0	0	0	0	0	0	10.3
9	1038	Rhododendron	Number	0	1030	0	0	0	0	0	0	0	0	1030
			Volume in Cubic Mtrs	0	72.1	0	0	0	0	0	0	0	0	72.1
10	651	Walnut	Number	0	0	1996	1996	0	0	1996	0	0	0	5989
			Volume in Cubic Mtrs	0	0	219.61	459.18	0	0	1637.08	0	0	0	2315.86
11	969	Prunus	Number	1996	0	0	0	0	0	0	0	0	0	1996
			Volume in Cubic Mtrs	19.96	0	0	0	0	0	0	0	0	0	19.96
12	965	Bird Cherry	Number	0	0	1,030	0	0	0	0	0	0	0	1,030
			Volume in Cubic Mtrs	0	0	236.9	0	0	0	0	0	0	0	236.9
13	2000	Other B/L	Number	0	1030	0	0	0	0	0	0	0	0	1030
			Volume in Cubic Mtrs	0	72.1	0	0	0	0	0	0	0	0	72.1
			Number	146221	60973	38568	33608	29234	22469	11203	4120	6053	2060	354509
		G Total	Volume in Cubic Mtrs	8621.94	16413.27	31811.17	54162.28	84680.35	86172.37	49720.1	28303.94	52099.74	17314.02	429299.18

Table- 2.4
General Abstract Growing Stock in all PBs

Sr. No	Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	241	Deodar	Number	132049	69344	66992	86809	62316	46816	20567	7181	3095	1030	496199
			Volume in Cubic Mtrs	7922.967	19416.441	56943.37	159728.53	176353.24	172282.64	98925.506	43732.189	21354.925	7106.885	763766.69
2	926	Kail	Number	37234	8250	11379	3002	13014	5013	3134	0	2128	0	83154
			Volume in Cubic Mtrs	1754.88	1191.94	11285.11	7980.45	17634.03	12821.83	17739.01	0	17219.3	0	87626.54
3	2	Fir	Number	47379	15425	6116	10109	1996	0	0	0	0	0	81027
			Volume in Cubic Mtrs	2842.754	4319.112	6055.203	17185.697	5649.9063	0	0	0	0	0	36052.672
4	921	Spruce	Number	17319	10241	6116	6317	2128	5218	7460	3158	3026	1030	62015
			Volume in Cubic Mtrs	1039.147	2867.5547	4342.6203	8969.998	5427.59	22178.271	46472.893	24162.143	29991.789	10207.135	155659.14
5	630	Bray	Number	5028	1006	1006	0	0	0	0	0	0	0	7039
			Volume in Cubic Mtrs	2212.3933	713.99967	1086.084	0	0	0	0	0	0	0	4012.477
6	19	Maple	Number	1098	0	0	0	0	0	0	0	0	0	1098
			Volume in Cubic Mtrs	10.98	0	0	0	0	0	0	0	0	0	10.98
7	38	Aescules	Number	0	1030	0	1030	0	0	0	0	0	0	2060
			Volume in Cubic Mtrs	0	61.8	0	298.7	0	0	0	0	0	0	360.49
8	47	Ailanthus	Number	1030	0	0	0	0	0	0	0	0	0	1030
			Volume in Cubic Mtrs	10.3	0	0	0	0	0	0	0	0	0	10.3
9	1038	Rhododendron	Number	0	1030	0	0	0	0	0	0	0	0	1030
			Volume in Cubic Mtrs	0	72.1	0	0	0	0	0	0	0	0	72.1
10	651	Walnut	Number	0	0	1996	1996	0	1006	1996	0	0	0	6995
			Volume in Cubic Mtrs	0	0	219.61	459.18	0	573.21	1637.08	0	0	0	2889.07
11	969	Prunus	Number	1996	0	0	0	0	0	0	0	0	0	1996
			Volume in Cubic Mtrs	19.96	0	0	0	0	0	0	0	0	0	19.96
12	965	Bird Cherry	Number	0	1,006	1,030	0	0	0	0	0	0	0	2,036
			Volume in Cubic Mtrs	0	70.39	236.9	0	0	0	0	0	0	0	307.29
13	2000	Other B/L	Number	1006	1030	0	0	0	0	0	0	0	0	2036
			Volume in Cubic Mtrs	10.06	72.1	0	0	0	0	0	0	0	0	82.16
			Number	244140	108362	94636	109264	79454	58053	33157	10339	8250	2060	747716
		G Total	Volume in Cubic Mtrs	16302.59	29903.44	80148.93	192586.19	227903.97	216340.78	164774.48	67894.33	68566.01	17314.02	1081734.7

Table- 2.5
No of samples taken

Name of range	PB I	PB II	PB III	PBIV	Total
Bhabanagar	3	1	1	1	6
Kalpa	0	0	0	0	0
Katgaon	1	0	0	0	1
Kilba	1	1	3	0	5
Moorang	0	0	0	0	0
Nichar	1	4	2	2	9
Pooh	0	0	0	0	0
Malling	0	0	0	0	0
Total	6	6	6	3	21

2.8 Comparrative Statement:- As discussed under para no 2.7 above, sampled enumerations has been carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The whole of the area of the Kinnaur Forest Division was divided into grids and total **150 Nos** of samples were taken. **Total 21 Nos.** sample plots pertaining to this working circle were enumerated down to 10cm d. b. h. and annalized. Thereafter, the growing stock has been assessed / extrapolated as given in the Table No 2.2, 2.3 and 2.4.

The Abstract showing the growing stock of PB-I PB-II PB-III PB-IV and total for the working circle in Rajiv's working plan and in the Plan under revision is given is Table No. 2.6, 2.7, 2.8, 2.9 and 2.10.

Table No. 2.6

Rajiv's Plan	PB-I (Area = 575.69)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	14034	8132	6878	5347	3679	2082	1083	535	744	42514	49907.94
	Kail	Number	5046	2695	2625	2703	2276	1341	668	213	197	17764	28063.44
	Fir	Number	8542	7685	6135	4495	3013	1320	711	385	766	33052	36833.62
	Spruce	Number	8257	6412	4690	3580	2443	1267	624	428	742	28443	46050.78
			35879	24924	20328	16125	11411	6010	3086	1561	2449	121773	160855.78

Present Plan (Plan Under Revision)	PB-I (Area = 617.99)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	14420	10300	5150	12360	8240	12360	4120	2060	0	1030	70040	139140.45
	Kail	Number	6180	2060	6180	0	0	0	1030	0	1030	0	16480	21227.96
	Fir	Number	47379	14420	4120	4120	0	0	0	0	0	0	70039	17962.91
	Spruce	Number	11330	5150	4120	4120	1030	4120	2060	2060	1030	1030	36050	80040
			79309	31930	19570	20600	9270	16480	7210	4120	2060	2060	192609	258371.32

Table No. 2.7

Rajiv's Plan	PB-II (Area = 619.09)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	32021	31586	30048	24064	18837	10130	4555	2064	1335	154640	213780.47
	Kail	Number	1153	1266	1185	1049	977	561	336	203	75	6805	12691.33
	Fir	Number	125	67	56	40	21	3	2	0	0	314	7176.96
	Spruce	Number	1348	1271	1244	956	539	334	165	51	29	5937	238.02
			34647	34190	32533	26109	20374	11028	5058	2318	1439	167696	233886.78

Present Plan (Plan Under Revision)	PB-II (Area = 659.09)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	51629	21970	18674	36250	21970	15379	4394	1098	1098	0	172462	245994.36
	Kail	Number	23068	2197	2197	0	0	0	1098	0	1098	0	29659	19278.38
	Fir	Number	0	0	0	0	0	0	0	0	0	0	0	0
	Spruce	Number	0	1098	0	2197	1098	1098	4394	1098	0	0	10985	46674.56
			74697	25265	20871	38447	23068	16477	9886	2196	2196	0	213106	311947.3

Table No. 2.8

Rajiv's Plan	PB-III (Area = 603.38)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	41379	28766	25702	16927	10604	5005	2487	1229	801	132900	136282.43
	Kail	Number	4946	3008	1858	1107	763	507	221	108	52	12570	11923.22
	Fir	Number	4210	2771	2197	1309	758	219	116	36	41	11657	10012.95
	Spruce	Number	3905	2391	1627	1100	773	482	234	134	103	10749	11144.25
	Total		54440	36936	31384	20443	12898	6213	3058	1507	997	167876	169362.85

Present Plan (Plan Under Revision)	PB-III (Area = 603.38)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	16090	19107	33186	36203	22124	15085	10056	4023	0	0	155873	292126.43
	Kail	Number	0	0	1006	1006	5028	3017	1006	0	0	0	11062	37138.04
	Fir	Number	0	1006	0	0	0	0	0	0	0	0	1006	281.58
	Spruce	Number	0	0	0	0	0	0	1006	0	0	0	1006	6265.1
	Total		16090	20113	34192	37209	27152	18102	12068	4023	0	0	168947	335811.15

Table No. 2.9

Rajiv's Plan	PB-IV (Area = 598.93)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	22338	6510	5699	5447	4107	2077	1092	651	610	48531	50326.85
	Kail	Number	11149	2959	1190	910	631	363	189	88	67	17546	9877.41
	Fir	Number	6099	2986	2683	2115	1227	675	413	271	402	16871	22729.43
	Spruce	Number	8754	3156	2649	2257	1790	1134	645	403	458	21246	27553.1
	Total		48340	15611	12221	10729	7755	4249	2339	1413	1537	104194	110486.79

Present Plan (Plan Under Revision)	PB-IV (Area = 598.93)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	49911	17968	9982	1996	9982	3993	1996	0	1996	0	97825	86505
	Kail	Number	7986	3993	1996	1996	7986	1996	0	0	0	0	25954	40847
	Fir	Number	0	0	1996	5989	1996	0	0	0	0	0	9982	17808
	Spruce	Number	5989	3993	1996	0	0	0	0	0	1996	0	13975	22679
	Total		63886	25954	15970	9981	19964	5989	1996	0	3992	0	147736	167839

Table No. 2.10

Estimated growing Stock of wet zone deodar Kail circle (Total for Circle, i.e all PBs)

Rajiv's Plan	All PBs (2397.09)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle												
	No. of Trees in diameter classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	109772	74994	68327	51785	37227	19294	9217	4479	3490	378585	450297.69
	Kail	Number	22294	9928	6858	5769	4647	2772	1414	612	391	54685	62555.4
	Fir	Number	18976	13509	11071	7959	5019	2217	1242	692	1209	61894	76752.96
	Spruce	Number	22264	13230	10210	7893	5545	3217	1668	1016	1332	66375	84986.15
		Total	173306	111661	96466	73406	52438	27500	13541	6799	6422	561539	674592.2

Present Plan (Plan Under Revision)	All PBs(2479.39)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Wet Zone Deo / Kail Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	132050	69345	66992	86809	62316	46817	20566	7181	3094	1030	496200	763766.24
	Kail	Number	37234	8250	11379	3002	13014	5013	3134	0	2128	0	83155	118491.38
	Fir	Number	47379	15426	6116	10109	1996	0	0	0	0	0	81027	36052.49
	Spruce	Number	17319	10241	6116	6317	2128	5218	7460	3158	3026	1030	62016	155658.66
	Total		233982	103262	90603	106237	79454	57048	31160	10339	8248	2060	722398	1073968.77

2.9 Silvicultural System:-The forests allotted to this Working Circle shall be managed under the Indian Irregular Shelter Wood System. This system permits retention of compact group of well grown poles over certain minimum area and also permits selection management over on steep slopes, thus, bringing in an element of irregularity in the final crop. Therefore, this system is called as Irregular Shelter wood System. This system allows fellings according to the nature of ground and permits of a certain degree of irregularity by avoiding sacrifice of immature pole crops which is retained as advance growth. On broken and steep terrain liable to erosion, marking conform to selection principles. Removal of over wood in secondary and final felling will be done only after keeping in view the progress of regeneration and establishment thereof. Natural regeneration will be supplemented by artificial regeneration.

2.10 Choice of Species:- The coniferous species most suited to the locality will be favoured. In depressions which is generally unsuitable for conifers, suitable broad leaved species will be planted. The species perfectly suited to the locality will be preferred and shall get preference over all other species. Economically, both Deodar and Kail are important species but Kail is more susceptible to fire damage and is often damaged by fire. It is also lopped heavily and is more prone to fungus attack which renders the timber of Kail trees unsuitable for use. Therefore, all reasonable attempts must be made to increase the proportion of Deodar. This can also be done at the time of cleaning, thinning and improvement fellings. However, the Deodar should never be tried on hot southern aspects and exposed ridges in its zone, which is best suited for Kail. Similarly, on moist locations and along nalas or in the area occupied by Spruce and Fir, Deodar should never be tried for introduction. The detailed suitability and treatment map of the area should be prepared before taking up sowing and planting.

2.11 Regeneration Period:-The results of past management shows that the period of 30 years or more is enough to regenerate any PB-I areas. Therefore, regeneration period of 30 years has been adopted for this Working Circle. Besides restocking P.B.I areas, during the Working Plan period, all the un-regenerated and blank areas included in the P.B.IV shall also be regenerated artificially depending upon availability of funds. Efforts will be made to regenerate the area naturally, supplemented with artificial planting.

2.12 Rotation Period:-The rotation period is fixed at 120 years because it is economical both for Deodar and Kail. For production of structural timber in demand, the exploitable diameter of 60 cms dbh is best suitable size and therefore, the exploitable diameter to 60 cms dbh has been fixed.

2.13 Exploitable Diameter:- Exploitable diameter fixed is 60 cm dbh being the most suited to yield better out turn in the form of sleeper size which fetches better price in the market.

2.14 Felling Cycle:- The felling cycle of 30 years corresponding to the regeneration period of the plan will be adopted, keeping in view the silvicultural requirements.

2.15 Division into Periodic Blocks:- With the rotation of 120 years and regeneration period of 30 years, the area of the whole Working Circle has been divided into four periodic Blocks as P.B.I, P.B.II, P.B.III and PB-IV. Definite areas have been allotted to each periodic block. The forests included in this Working Circle are in conversion stage and the crop is irregular/uneven aged with preponderance of lower classes, so PBs can not be divided on text book pattern. Yet, every attempt is made to allot areas as to fit in PBs depending on dia classes available. The allotment is discussed as under:-

2.15.1 PB-I (617.99 hac):- It consists of those areas which has not been felled during the previous plan for regeneration and consists of the areas which are mature and ready for harvesting. It also consists of those areas that remained under stock during the previous plan and where regeneration is either still progressing or has not come at all. The forests with generally blanks & having majority of mature trees are allotted to this PB. No fellings were generally done in the plan under revision in PB-I due to complete moratorium on green fellings. However, only salvage markings and green felling

under FCA cases were carried out during the period of Working Plan under revision. No change is made in PB-I area except for the areas transferred from Wild Life Division, Sarahan and left out areas which were not included in the previous plan under revision. The distribution of number of trees and volume per hac. is tabulated in Table No.2.11

Table- 2.11
Species wise distribution of number of trees and volume per hac.

Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	23	17	8	20	13	20	7	3	0	2	113
		Volume in Cubic Mtrs	1.40	4.67	7.08	36.80	37.73	73.60	32.07	20.30	0.00	11.50	225.15
0926	Kail	Number	10	3	10	0	0	0	2	0	2	0	27
		Volume in Cubic Mtrs	0.60	0.93	9.90	0.00	0.00	0.00	9.43	0.00	13.48	0.00	34.35
0002	Fir	Number	77	23	7	7	0	0	0	0	0	0	113
		Volume in Cubic Mtrs	4.60	6.53	6.60	11.33	0.00	0.00	0.00	0.00	0.00	0.00	29.07
0921	Spruce	Number	18	8	7	7	2	7	3	3	2	2	58
		Volume in Cubic Mtrs	1.10	2.33	4.73	9.47	4.25	28.33	20.77	25.50	16.52	16.52	129.52
0965	Birdcherry	Number	0	0	2	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38
0038	Aescules	Number	0	2	0	2	0	0	0	0	0	0	3
		Volume in Cubic Mtrs	0.00	0.10	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.58
0047	Ailanthus	Number	2	0	0	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
1038	Rhododendron	Number	0	2	0	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
2000	Other B/L	Number	0	2	0	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
		Number	130	57	33	35	15	27	12	7	3	3	322
	G Total	Volume in Cubic Mtrs	7.72	14.80	28.70	58.08	41.98	101.93	62.27	45.80	30.00	28.02	419.30

2.15.2 PB-II (659.09 hac.):- Forests, having preponderance of age classes, approaching maturity, have been allotted to this periodic block. No change is made in PB-II areas of the plan under revision except for the areas transferred from Wild Life Division, Sarahan and left out areas which were not included in the previous plan under revision. The distribution of number of trees and volume per hac. is tabulated in Table No. 2.12

Table- 2.12
Species wise distribution of number of trees and volume per hac.

Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	78	33	28	55	33	23	7	2	2	0	262
		Volume in Cubic Mtrs	4.70	9.33	24.08	101.20	94.33	85.87	32.07	10.15	11.50	0.00	373.23
0926	Kail	Number	35	3	3	0	0	0	2	0	2	0	45
		Volume in Cubic Mtrs	2.10	0.93	3.30	0.00	0.00	0.00	9.43	0.00	13.48	0.00	29.25

0002	Fir	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0921	Spruce	Number	0	2	0	3	2	2	7	2	0	0	17
		Volume in Cubic Mtrs	0	0.47	0	4.73	4.25	7.08	41.53	12.75	0	0	70.82
0019	Maple	Number	2	0	0	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0.02	0	0	0	0	0	0	0	0	0	0.02
0038	Aescules	Number		0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
		Number	115	38	32	58	35	25	15	3	3	0	325
	G Total	Volume in Cubic Mtrs	6.82	10.73	27.38	105.93	98.58	92.95	83.03	22.90	24.98	0	473.32

2.15.3 PB-III (603.38 ha):- The forests having preponderance of middle aged crops with few scattered matured and maturing trees have been allotted to this PB. No change has been made in the plan under revision. The distribution of number of trees and volume per hac. are tabulated in Table No. 2.13

Table- 2.13
Species wise distribution of number of trees and volume per hac.

Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	27	32	55	60	37	25	17	7	0	0	258
		Volume in Cubic Mtrs	1.60	8.87	46.75	110.40	103.77	92.00	80.17	40.60	0.00	0.00	484.15
0926	Kail	Number	0	0	2	2	8	5	2	0	0	0	18
		Volume in Cubic Mtrs	0.00	0.00	1.65	3.30	25.92	21.25	9.43	0.00	0.00	0.00	61.55
0002	Fir	Number	0	2	0	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47
0921	Spruce	Number	0	0	0	0	0	0	1.67	0	0	0	1.67
		Volume in Cubic Mtrs	0	0	0	0	0	0	10.38	0	0	0	10.38
0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0

0651	Walnut	Number	0	0	0	0	0	2	0	0	0	0	2
		Volume in Cubic Mtrs	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.95
0630	Bray	Number	8	2	2	0	0	0	0	0	0	0	12
		Volume in Cubic Mtrs	4	1	2	0	0	0	0	0	0	0	7
0965	Bird Cherry	Number	0	2	0	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0	0.12	0	0	0	0	0	0	0	0	0.12
2000	Other B/L	Number	2	0	0	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
		Number	37	37	58	62	45	32	20	7	0	0	297
	G Total	Volume in Cubic Mtrs	5.28	10.63	50.20	113.70	129.68	114.20	99.98	40.60	0.00	0.00	564.28

2.15.4 PB-IV (598.93hac):- All the compartments carrying established young pole crop with scattered mother trees, un-regenerated forests and areas requiring immediate restocking have been allotted to PB-IV as in the plan under revisions no change has been made therein. The species wise distribution in different classes is tabulated in Table No. 2.14

Table- 2.14
Species wise distribution of number of trees and volume per hac.

Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	83	30	17	3	17	7	3	0	3	0	163
		Volume in Cubic Mtrs	5.00	8.40	14.17	6.13	47.17	24.53	16.03	0.00	23.00	0.00	144.43
0926	Kail	Number	13	7	3	3	13	3	0	0	0	0	43
		Volume in Cubic Mtrs	0.80	1.87	3.30	6.60	41.47	14.17	0.00	0.00	0.00	0.00	68.20
0002	Fir	Number	0	0	3	10	3	0	0	0	0	0	17
		Volume in Cubic Mtrs	0.00	0.00	3.30	17.00	9.43	0.00	0.00	0.00	0.00	0.00	29.73
0921	Spruce	Number	10	7	3	0	0	0	0	0	3	0	23
		Volume in Cubic Mtrs	0.60	1.87	2.37	0.00	0.00	0.00	0.00	0.00	33.03	0.00	37.87
0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	0	3	3	0	0	3	0	0	0	10
		Volume in Cubic Mtrs	0.00	0.00	0.37	0.77	0.00	0.00	2.73	0.00	0.00	0.00	3.87
0969	Prunus	Number	3	0	0	0	0	0	0	0	0	0	3
		Volume in Cubic Mtrs	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0

		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
		Number	110	43	30	20	33	10	7	0	7	0	260
	G Total	Volume in Cubic Mtrs	6.43	12.13	23.50	30.50	98.07	38.70	18.77	0.00	56.03	0.00	284.13

2.15.5 General abstract of areas allotted PB wise:-

The PB wise allotment of the areas to different Ranges is tabulated in Table No: 2.15

Table – 2.15

Sr. No.	Name of Range	Forest category	Deo/Kail WC				
			PBI	PBII	PBIII	PBIV	Total
1	Bhaba Nagar	DPF	315.93	113.3	137.2	69.6	636.03
		Listed UPF	33	40	0	0	73
		Total	348.93	153.3	137.2	69.6	709.03
2	Kalpa	DPF	0	0	0	0	0
		Listed UPF	0	0	0	0	0
		Total	0	0	0	0	0
3	Katgaon	DPF	9.3	0	0	0	9.3
		Listed UPF	0	0	0	0	0
		Total	9.3	0	0	0	9.3
4	Kilba	DPF	66.75	124.65	289.75	37.25	518.4
		Listed UPF	0	0	0	0	0
		Total	66.75	124.65	289.75	37.25	518.4
5	Malling	DPF	0	0	0	0	0
		Listed UPF	0	0	0	0	0
		Total	0	0	0	0	0
6	Moorang	DPF	0	0	0	0	0
		Listed UPF	0	0	0	0	0
		Total	0	0	0	0	0
7	Nichar	DPF	193.01	381.14	176.43	492.08	1242.66
		Listed UPF	0	0	0	0	0
		Total	193.01	381.14	176.43	492.08	1242.66
8	Pooh	DPF	0	0	0	0	0
		Listed UPF	0	0	0	0	0
		Total	0	0	0	0	0
Total DPF			584.99	619.09	603.38	598.93	2406.39
Total Listed UPF			33	40	0	0	73
G. Total			617.99	659.09	603.38	598.93	2479.39

2.16 Calculation of Yield:- Although the yield calculations are redundant considering that there is a total ban on green felling, however, just for academic interest, yield calculations have been done for PBI and PBIV on the basis of extrapolated enumeration results of working circle. Increment has been ignored for the reasons of safety against fire and other natural calamities and also to serve as emergency reserve.

The yield we get from PBI and PBIV is designated as final yield while the yield from PBIII is called intermediate yield. Removals on account of TD must feature in the yield and must be strictly controlled.

2.16.1 For computation of the total yield from Deodar Kail (Wet Zone) working circle, the three methods was tried and out of which the one that gave minimum yield have been prescribed. These methods are as under :-

1. **Von Mantel' Formula**
2. **Smythies Formula**
3. **Hufnagels Formula**

2.16.2 Calculations from Von Mantel' formula:- The Von Mental's Formula based on the volume of the growing stock only. The Von Mental's Formula have been arrived from the relation that the volume of normal growing stock is equal to the MAI of the FS, multiplied by half the rotation that is $NGS = I \times r/2$ where I represents the volume of oldest age gradation (and also the total annual increment of the FS) and is a normal annual yield. I is, therefore, equal to $NSG/r/2 = 2 \times NSG/r$. Von Mantal's simple formula derived from the above relation is:-

$$\text{Annual yield} = \frac{\text{Actual volume of growing stock}}{\frac{1}{2} \text{ Rotation.}}$$

Therefore, the $AY = \frac{2(GS)}{R}$

Where AY = Annual Yield.

GS = Total Volume of Growing Stock (at lower confidence limit).

R = Rotation.

Yield from Total growing stock

Deodar

Total Growing Stock = 763766.69 M³

Rotation = 120 Years

Therefore, the $AY = \frac{2 \times 763766.69}{120} = 12729.44 \text{ or say } 12725 \text{ M}^3$

Kail

Total Growing Stock = 87626.54 M³

Rotation = 120 Years

Therefore, the $AY = \frac{2 \times 87626.54}{120} = 1460.44 \text{ or say } 1460 \text{ M}^3$

Fir

Total Growing Stock = 36052.67 M³

Rotation = 120 Years

$$\text{Therefore, the AY} = \frac{2 \times 36052.67}{120} = 600.88 \text{ or say } 600 \text{ M}^3$$

Spruce

Total Growing Stock = 155659.14 M³

Rotation = 120 Years

$$\text{Therefore, the AY} = \frac{2 \times 155659.14}{120} = 2594.32 \text{ or say } 2590 \text{ M}^3$$

Total Growing Stock	
Species	Volume (in Cum)
Deodar	12725
Kail	1460
Fir	600
Spruce	2590
Total	17375

2.16.3 Calculations from Smythies formula:- This is also known as UP safe-guarding Formula. It was evolved by Smythies in the thirties, mainly for Sal Forests of UP; which were worked under selection system and where the chief objective of management was the production of trees of large size. Smythies found that in most of the plans there was tendency to regard everything above the selection limit as surplus stock. Therefore, this tendency had been responsible for decrease in the yield from the selection trees.

The yield from this formula is calculated by the number of selection trees calculated by this formula, which defines the yield available during the felling cycle as the number of trees of the next lower diameter class may be expected to grow up the exploitable sizeduring the felling cycle, i.e.:-

$$X = \frac{f}{t} \text{ (II- } z\% \text{ of II)}$$

Where X = Basic yield.

f = the felling cycle in years.

t = the period it take for the approach class into exploitable size.

II = the existing number of trees of approach class.

Z = the mortality percentage.

The value of 't' and 'z' for various species, as given in the chapter will be used for the yield calculations.

The annual yield will be expressedas the percentageof selection trees to be removedaccording to the following formula :-

$$Y = \frac{x}{I + \frac{x}{2}} \times 100 \pm A$$

Where Y = the annual yield expressed as a percentage.

X = the yield during the felling cycle

I = the number of I class trees, as enumerated.

A = an arbitrary value adopted for purposes of empirical adjustment etc.

After calculating 'x' the area of the working circle of the Felling Series, its further divided into 'f' annual coupes .

Since this formula is mainly to prescribe and area yield by divideing the forest into 'f' annual coupes and limiting the removal of I class trees to a percentage (p) there number per hectare 'N' in the coupes of the year at the time of the marking. This formula is basically when the yield is prescribed by area.

Perusal of the above paragraphs reveals that this formula is not applicable for calculating the yield in this division.

2.16.4 Calculation of Yield from Hufnagels Formula:-

2.16.4.1 Yield from PB-I areas:- The enumeration of this working circle has been carried out in 6 Nos. sample plots of size 0.1 Ha, down to 10 cms dbh in 10 cms dia classes and the details are given in the **Appendix No.-X**. The per Hectare Stems and Volume was then extrapolated to PB-I area (617.99) to calculate the yield, just for academic interest. The abstract showing the growing stock of class wise and species wise of PB-I areas is tabulated in Table No. 2.16

Table-2.16
Species wise No. and Volume in cubic mts.(Estimated growing stock) for Deo/Kail Working Circle

PB-I (Area = 617.99)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	14420	10300	5150	12360	8240	12360	4120	2060	0	1030	70039
		Volume in Cubic Mtrs	865.19	2883.95	4377.43	22742.03	23318.82	45484.06	19816.88	12545.20	0.00	7106.89	139140.45
0926	Kail	Number	6180	2060	6180	0	0	0	1030	0	1030	0	16480
		Volume in Cubic Mtrs	370.79	576.79	6118.10	0.00	0.00	0.00	5829.71	0.00	8332.57	0.00	21227.96
0002	Fir	Number	47379	14420	4120	4120	0	0	0	0	0	0	70039
		Volume in Cubic Mtrs	2842.75	4037.53	4078.73	7003.89	0.00	0.00	0.00	0.00	0.00	0.00	17962.91
0921	Spruce	Number	11330	5150	4120	4120	1030	4120	2060	2060	1030	1030	36049
		Volume in Cubic Mtrs	679.79	1441.98	2925.15	5850.31	2626.46	17509.72	12833.59	15758.75	10207.13	10207.13	80040.00
0965	Birdcherry	Number	0	0	1,030	0	0	0	0	0	0	0	1,030
		Volume in Cubic Mtrs	0.00	0.00	236.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	236.90
0038	Aescules	Number	0	1030	0	1030	0	0	0	0	0	0	2060
		Volume in Cubic Mtrs	0.00	61.80	0.00	298.70	0.00	0.00	0.00	0.00	0.00	0.00	360.49
0047	Ailanthus	Number	1030	0	0	0	0	0	0	0	0	0	1030
		Volume in Cubic Mtrs	10.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.30
1038	Rhododendron	Number	0	1030	0	0	0	0	0	0	0	0	1030
		Volume in Cubic Mtrs	0.00	72.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.10
2000	Other B/L	Number	0	1030	0	0	0	0	0	0	0	0	1030
		Volume in Cubic Mtrs	0.00	72.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	72.10
		Number	80339	35019	20600	21630	9270	16480	7210	4120	2060	2060	198787
	G Total	Volume in Cubic Mtrs	4768.82	9146.25	17736.31	35894.92	25945.28	62993.78	38480.18	28303.94	18539.70	17314.02	259123.21

Calculation of the yield has been based on the volume of the trees of 40 cms dbh and over. Increment has been ignored. From the management point of view and theoretically, the entire growing stock except the mother trees above 40 cms diameter should be available during the plan period. Since a compact group of poles shall be retained as advance growth and some trees will be left on broken and steep grounds, only a part of II and III/IV class trees will be available. Similarly, the yield from I and II class trees will be further restricted as some trees have to be retained as emergency reserve and fire insurance trees. The trees standing on blanks or over patches where regeneration has not established shall also be not available. Therefore, the yield on the basis of silvicultural availability is calculated as under:-

$$Y = \frac{C1V1 + C2V2 + C3V3}{P}$$

Where V1, V2 and V3 are the volumes of I class, II class trees and III and IV class trees respectively.

P= Plan period i.e. 10 years.

C1, C2, C3 are the constants representing percentage of I class, II class and III class and IV class trees respectively, estimated to be available for felling during the regeneration period. The values of constants of C1, C2, C3 have been fixed as under after detailed examination of forests during field inspections. These figures are arrived at after analysis number of stems per hacand emerged after considering field conditions is tabulated in Table No. 2.17.

Table – 2.17

Species	C1	C2	C3	
Deodar	0.1	0.1	0.1	% is lower for Deodar as these are to be retained as seed bearers as far as possible in preference to Kail
Kail	0.4	0.4	0.3	
Fir	0.8	0.8	0.8	
Spruce	0.1	0.3	0.3	

The above proportion is based on purely theoretical consideration. This combined with field observations gives following well suiting proportions.

Deodar = 0.1

Kail = 0.4

Spruce = 0.3

Fir = 0.1

This was in respect of IIA and above classes. Field inspections indicate that 60% of V, IV and III classes' trees will also be available for felling.

The yield is now calculated by Hufnagels formula as under:-

$$Y = \frac{C1V1 + C2V2 + C3V3}{P}$$

(Deodar) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.1.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.1.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.1.

(Deodar) V1= Volume of trees of I class trees of conifers = 84983.03 M³
V2= Volume of trees of II class trees of conifers = 46068.90 M³
V3= Volume of trees of IV and III class trees of conifers = 7261.38 M³
P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.1 \times 84953.03 + 0.1 \times 46068.85 + 0.1 \times 7261.38}{10} = 1382.83 \text{ or say } 1350 \text{ M}^3$$

(Kail) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.4.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.4.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.3.

(Kail) V1= Volume of trees of I class trees of conifers = 14162.27 M³
V2= Volume of trees of II class trees of conifers = 0 M³
V3= Volume of trees of IV and III class trees of conifers = 6694.89 M³
P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.4 \times 14162.27 + 0.4 \times 0 + 0.3 \times 6694.89}{10} = 767.34 \text{ or say } 750 \text{ M}^3$$

(Fir) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.8.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.8.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.8.

(Fir) V1= Volume of trees of I class trees of conifers = 0.00 M³
V2= Volume of trees of II class trees of conifers = 7003.88 M³
V3= Volume of trees of IV and III class trees of conifers = 8116.26 M³
P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.8 \times 0.00 + 0.8 \times 7003.88 + 0.8 \times 8116.26}{10} = 1209.61 \text{ or say } 1200 \text{ M}^3$$

(Spruce) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.1.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.3.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.3.

(Spruce) V1= Volume of trees of I class trees of conifers = 66516.32 M³

V2= Volume of trees of II class trees of conifers = 8476.76 M³

V3= Volume of trees of IV and III class trees of conifers = 4367.12 M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1 + C2V2 + C3V3}{P}$$

$$Y = \frac{0.1 \times 66516.32 + 0.3 \times 8476.76 + 0.3 \times 4367.12}{10} = 1050.48 \text{ or say } 1050 \text{ M}^3$$

Therefore, the annual yield of different species is summarized as under for P.B.I:-

Table – 2.18

Sr. No.	Species	Annual yield (in m ³)
1	Deodar	1350
2	Kail	750
3	Fir	1200
4	Spruce	1050
Total		4350

2.16.4.2 Yield from PB-II:-Strictly speaking, no felling should be carried out in this PB as the growing stock is to be enriched and it is the future PB-I. However, realistically, removals on account of salvage caused by fires, land slides/slips or wind thrown only can and do occur. These removals have to be counted for in order to safe guard the future yield, no major fellings are prescribed and therefore, no yield has been calculated for this periodic block. The enumeration samples down to 10 cms dbh in 10 cms dia classes has been carried out in Six numbers of PB-II areas and the details are given in the **Appendix No.- X**. The abstract showing the growing stock of class wise and species wise of PB-II areas is tabulated in Table No. 2.2. The detail of enumeration done in the sample areas are given in **Appendix No.-X**.

2.16.4.3 Intermediate yield from P.B.III:- Most of the forests of this block are generally open. These forests are open and having stock less than that should be available as per growing stock mention in the yield table. However, removals of fallen uprooted and snow damaged trees is to be carried out periodically. The over mature trees of 70 cm and over, if suppressing middle age crop and deteriorating should also be removed provided that their removal does not create ever lasting gap. The demand of right holders used to be invariably met from the forests of this periodic block before imposition of ban on green fellings and recently, the ban on grant of TD to the right holders has been lifted and only dry and fallen trees are now being given to the right holders. With the improvement in socio economic condition of the people on account of development of horticulture and other cash crops, the demand for timber has also increased correspondingly and is likely to increase further year after year. There will be no volume control of yield from thinning, since, there is hardly any scope of thinning except in Deodar plantations. Hence, no green fellings are prescribed. The removals will, however, count toward the yield of PB-I.

As given in the Chapter-VIII under paragraph 8.8 sampled enumeration of the sample size 0.1 ha, down to 10 cms dbh in 10 cms dia classes has been carried out in Six numbers of PB-III areas and the details are given in the **Appendix No.-X**. The abstract showing the growing stock of class wise and species wise of PB-III areas is tabulated in Table No. 2.2. The detail of enumeration done in the sample areas is given in **Appendix No.-X**.

2.16.4.4 Yield from PB-IV Area. The enumeration samples down to 10 cms dbh in 10 cms dia classes has been carried out in three numbers of PB-IV areas and the details are given in the **Appendix No.-X**. The abstract showing the growing stock of class wise and species wise of PB-IV areas is tabulated in Table No. 2.2

The results have been analyzed statistically and growing stock has been assessed. All the trees in such units down to 10 cms dbh were enumerated in three numbers of PB-IV areas. The results of enumeration samples taken Range wise is tabulated in table No. 2.19.

Table – 2.19

Sr. No.	Name of Range	Sample Taken
1	Bhaba Nagar	1
2	Kalpa	0
3.	Katgaon	0
4.	Kilba	0
5.	Moorang	0
6.	Nichar	2
7.	Pooh	0
8.	Malling	0
	Total	3

The abstract of growing stock is tabulated in the Table No 2.20.

Table – 2.20

	PB-IV (Area = 598.93)												
Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	49911	17968	9982	1996	9982	3993	1996	0	1996	0	97825
		Volume in Cubic Mtrs	2995	5031	8485	3673	28250	14694	9603	0	13775	0	86505
0926	Kail	Number	7986	3993	1996	1996	7986	1996	0	0	0	0	25954
		Volume in Cubic Mtrs	479	1118	1976	3953	24836	8485	0	0	0	0	40847
0002	Fir	Number	0	0	1996	5989	1996	0	0	0	0	0	9982
		Volume in Cubic Mtrs	0	0	1976	10182	5650	0	0	0	0	0	17808
0921	Spruce	Number	5989	3993	1996	0	0	0	0	0	1996	0	13975
		Volume in Cubic Mtrs	359	1118	1417	0	0	0	0	0	19785	0	22679
0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	0	1996	1996	0	0	1996	0	0	0	5989
		Volume in Cubic Mtrs	0	0	220	459	0	0	1637	0	0	0	2316
0630	Prunus	Number	1996	0	0	0	0	0	0	0	0	0	1996
		Volume in Cubic Mtrs	20	0	0	0	0	0	0	0	0	0	20
0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
		Number	65882	25954	17968	11979	19964	5989	3993	0	3993	0	155722
	G Total	Volume in Cubic Mtrs	3853.12	7267.02	14074.86	18267.37	58735.07	23178.59	11239.92	0.00	33560.04	0.00	170175.98

The calculation of yield has based on the total volume of trees in PB-IV. Increment has not been taken into account. All I and II class trees do not warrant their retention in this periodic block and as such can be removed during the plan period. Silviculturally, it is not possible to remove all such trees. Trees standing on precipitous and broken ground have to be retained. Besides this, some I and II class trees will have to be kept as fire insurance and national emergency reserves. Similarly, the II class trees standing amongst the patches of advance growth will not always be available for fellings. This being so, it has been estimated that only 75% of the volume of I and II class trees can be removed during the Working Plan period. In addition to this, another 10% volume of trees 20 cms to 40 cms dbh will be available under thinning. The annual yield of different species is accordingly fixed as under:-

The yield is now calculated by Hufnagels formula as under:-

$$Y = \frac{C1V1+C2V2+C3V3}{P}$$

(Deodar) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.1.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.3.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.4.

(Deodar) V1= Volume of trees of I class trees of conifers = 38071.98 M³

V2= Volume of trees of II class trees of conifers = 31922.97 M³

V3= Volume of trees of IV and III class trees of conifers = 13515.85M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.1 \times 38071.98 + 0.3 \times 31922.97 + 0.4 \times 13515.85}{10} = 1879.04 \text{ or say } 1900 \text{M}^3$$

(Kail) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.1.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.2.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C2 has been taken as 0.4.

(Kail) V1= Volume of trees of I class trees of conifers = 8484.84M³

V2= Volume of trees of II class trees of conifers = 28788.57 M³

V3= Volume of trees of IV and III class trees of conifers = 3094.47M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.1 \times 8484.84 + 0.2 \times 15831.72 + 0.4 \times 1976.46}{10} = 480.54 \text{ or say } 500 \text{M}^3$$

(Fir) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.6.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.5.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.4.

(Fir) V1= Volume of trees of I class trees of conifers = 0.00 M³

V2= Volume of trees of II class trees of conifers = 15831.72 M³

V3= Volume of trees of IV and III class trees of conifers = 1976.49M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$C1V1+C2V2+C3V3$$

Yield = $Y = \frac{\text{C1V1+C2V2+C3V3}}{\text{P}}$

$$Y = \frac{0.6 \times 0.00 + 0.5 \times 15831.72 + 0.4 \times 1976.46}{10} = 870.65 \text{ say } 870 \text{ M}^3$$

(Spruce) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.4.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.5.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.3.

(Spruce) V1= Volume of trees of I class trees of conifers = 19784.65 M³

V2= Volume of trees of II class trees of conifers = 0.00 M³

V3= Volume of trees of IV and III class trees of conifers = 2535.47 M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$C1V1+C2V2+C3V3$$

Yield = $Y = \frac{\text{C1V1+C2V2+C3V3}}{\text{P}}$

$$Y = \frac{0.4 \times 19784.65 + 0.5 \times 0.00 + 0.3 \times 2535.47}{10} = 867.45 \text{ or say } 850 \text{ M}^3$$

Therefore, the annual yield of different species is summarized as under for P.B.I:-

Table – 2.21

Sr. No.	Species	Annual yield
1	Deodar	1900
2	Kail	500
3	Fir	870
4	Spruce	850
Total		4120

2.17 Total Prescribed Annual yield:-The total Annual prescribed yield from the forests of this Working Circle is tabulated in Table 2.22 as under. However, the yield from PBIII as mentioned above will counted toward the yield of PB-I, since no forest will be available for commercial felling.

Table – 2.22

Species	PBI	PBIV	Total
Deodar	1350	1900	3250
Kail	750	500	1250
Fir	1200	870	2070
Spruce	1050	850	1900
Total	4350	4120	8470

2.17.1 Comparative Statement:- The comparative Statement of Annual Yield obtain by using both the Methods is given below:-

Methodology		
Von Mantel's		Hufnagels Formula
Name of Species	Volume (in Cum)	Total Volume (in cum)
Deodar	12725	3250
Kail	1460	1250
Fir	600	2070
Spruce	2590	1900
Total	17375	8470

The yield calculated by adopting the Hafunagel's formula is only 48.75 percent of the yield obtained by using Von Mantel's method and it is conservative.

Therefore, Hafnagel's formula is adopted in the current plan which is conservative.

2.18 Control of yield:-All the removals of whatever nature down upto V class shall count towards yield of this Working Circle. It is indeed impossible that the removal of various species in a particular year will conform to or equalize the prescribed yield for each species. In actual practice this is ruled out. It is, therefore, imperative that the marking in the forests should be carried out strictly on silvicultural principles. However, yield will be shown by species in the control forms and deviation statement. The deviation for a year, a period of five year and a plan period shall not exceed +/- 25%, +10% and +/-05% respectively, of the annual prescribed yield. Felling in the PBI areas will depend on the progress of regeneration. It is, therefore, most essential that critical regeneration survey of felled PBI areas is carried out annually so as to assess the progress of regeneration. In case, it is observed and revealed that regeneration is not keeping pace with the felling, further fellings shall be discontinued or deferred till such time by which regeneration in the felled PBI areas gain momentum. The detailed report should be sent to Pr. CCF HP through CCF Working Plan and CF Working Plan for information, scrutiny and orders. All the removals, what so ever, down to 10 cms dbh in all the periodic blocks will count towards the prescribed yield.

2.19 Method of executing the felling:-

2.19.1 In PB-I Areas:- The technique of regeneration marking is given in CCFs, Technical Order No. 2 of the Punjab Forest Manual - Volume III and must be carefully studied by the marking officer and complied. It must be emphasized that marking must aim at obtaining natural rather than artificial regeneration on suitable ground. The skill of the forester in manipulating the canopy lies in his getting natural regeneration. A little patience will bring in considerable quantities of natural regeneration of Deodar on suitable ground in Deodar and mixed Deodar and Kail forests and subsequent, opening of canopy will bring in sufficient Kail. In upper part of the compartment at present being occupied by Spruce and Fir on well drained ground suitable for Deodar, the canopy

must be opened out some what heavily and followed by artificial sowing and planting. Elsewhere, i.e. in diameter per parts the aim must be to get Spruce and Fir regeneration and the opening here must conform to the silvicultural requirements of these species. Spruce requires nearly the same amount of opening as Deodar. The detailed treatment map of forest indicating the type of marking carried out shall be prepared and posted in compartment history file.

The following general principles are, however, laid down for guidance of marking officer:-

- (i) In seeding fellings, in case of pure crop of Deodar the number of seed bearers retained will be 35-50 (65 m³) volume per hac. In case of Kail, this number will be 30 to 35 trees (56 to 65 M³ volumes) per hac. In both the cases, these trees will invariably be of 35 to 55 cms diameter classes and uniformly spaced all over the areas. The average distance of seed bearers shall be 16 to 18 mts. in case of Deodar and 18 to 20 mts. in case of Kail. In case of mixture of Deodar and Kail 30 to 45 trees (56.5 to 84.74 M³ volumes) per hac. of both Deodar, Kail of dia 35 to 55 cms per hac. shall be retained uniformly spaced all over the area.
- (ii) Well grown healthy, tall and clean boled trees preferably II to I A class trees should be selected as Seed bearers.
- (iii) In conformity with the distance consideration as far as possible seed bearers shall be left on Spurs and ridges and not in depressions for better seed dispersal.
- (iv) Compact group of healthy poles upto 40cms. dbh and not less than 0.1 hac. in extent will be retained as advance growth/future crop. It must be clearly understood and remembered that the diameter fixed for retention applies to the diameter at the time of first marking i.e. seedling felling. Once a group is retained it shall not be opened up for regeneration in the subsequent years. Vigour and condition of pole crop must determine its retention rather than its extent.
- (v) On the very steep and broken ground the marking should conform to the selection principle.
- (vi) In mixed crops, Deodar shall be preferred to Kail as seed bearer.
- (vii) Groups of pole crop retained as part of future crop shall be thinned.
- (viii) Valuable broad leaved trees such as Maple, Walnut, Bird cherry and Carpinus etc. will be preferred to other less valuable species. The seed bearer of these species should be spaced about 20 mts. apart.
- (ix) Before undertaking any forest for seeding felling it shall be ensured that the nursery stock is ready to replace the fellings immediately after timber have been extracted from the forest. To achieve this objective the nurseries should be raised 2 to 3 years in advance in the vicinity of the areas to be undertaken for fellings. In case neither nurseries has been raised nor is the stock available for planting. No marking/felling shall be done and the yield for that particular year should be considered as obtained.
- (x) The secondary felling will be carried out keeping in view the progress of regeneration and when the seedlings have retained height of over two meters. The Number of trees retained during the seeding fellings shall reduce to 50% during secondary fellings.
- (xi) The final fellings shall be carried out when average height of new crop exceeds three meters and 4-5 healthy clean bole and vigorously growing trees per hac. shall be retained as mother trees.

2.19.2 In PB-II Areas:-This being sacred periodic block, no major felling of any kind and magnitude will be done in PB-II. However, only salvage marking of dead, uprooted trees will be done to clear these forests from fire hazards and improvement of the crop. The yield removed from these PBs shall be counted for yields towards the yield of the Working Circles.

2.19.3 PB-III Areas:-To improve the condition of crop, hygienic removals should be done. The following broad guidelines are laid down for the marking officer to carry out the marking in this periodic block:

- (i) All removals shall aim to improving the composition and condition of the crop. Thinnings will be made in favour of vigorously growing trees irrespective of size.
- (ii) No tree shall be marked to induce regeneration.
- (iii) Dead, dying, diseased and wind broken or fallen trees will be marked.
- (iv) Malformed, stunted and unhealthy trees may be marked under improvement felling.
- (v) If the stocking is less than what normally can be expected as per yield table figures, than no removal are to be carried out.
- (vi) Mature trees interfering with or suppressing young crop will be removed.
- (vii) Valuable species are to be preferred to inferior ones.
- (viii) Broad leaved species should not be cut unnecessarily on the pretext of improvement fellings. These may, however, be lopped where suppressing of promising young conifer persist.
- (ix) All trees marked for any purpose shall be removed within a year.

2.19.4 Thinning:-A thinning consists lessening the crowded condition of the crowns of the best trees in a canopy so as to favour their development. The main aim of thinning will be to assist the elite trees by providing them optimum growing space.

According to the British Commonwealth Forest Terminology Part-I (Empire Forestry Association, London, 1953) thinning means “Thinning is a felling made in an immature stand for the purpose of improving the growth and form of the trees that remain without permanently breaking the canopy.”

Thinning is done to regulate the distribution of growing space for the purpose of improving the growth and form of tree that are left. The object of thinning is to distribute growth potential of site amongst the trees retained, increase the net yield of timber and money from a stand, obtain earlier returns from capital invested in a stand, produce different smaller size of timber which can meet a different object of management, maintain hygienic conditions in the stand, obtain timber of the desired quality and mechanical strength, and to ensure decomposition of raw humus in temperate forests.

Thinnings vary with the nature of the crop and the methods of thinning used in regular crops are different from that used in irregular crops. In present plan, thinning will be carried out in accordance with the principles of thinnings laid down in Punjab Forest Leaflet No. 1, 1A and book Principles and Practices of silviculture by L.S. Khanna. The crops to be thinned fall mainly in the categories discussed in the following paragraphs:-

- i) Pure Deodar crops.
- ii) Pure Kail crops.
- iii) Mixed Deodar crops and Kail crops.
- iv) Deodar or Kail mixed with Spruce.

Thinning in pure Deodarcrop:- Selective and increment thinnings as discussed above will be carried out in deodar crops. In young crops, spacing equal to four times the girth will be quite suitable. In crops beyond pole stage, C/D grade thinning will be carried out.

Thinning in pure Kailcrop:- Kail crop suffers severely from snow damage, if not properly thinned in its early stages. The thinning should be light in the early stages, so that the boles get cleaned. Light and frequent thinnings should, therefore, be the rule in early stages. After the boles have been cleaned of their side branches, the intensity of thinning should be increased and should be heavier than in case of deodar. In young pole crops, the thumb rule will be to have the spacing in feet equal

to one and a half times the average diameter in inches. Beyond pole stage, D grade thinning should be carried out.

Thinning in Mixed Crops of Kail and Deodar:- Thinning in mixed crops require greater skill and will depend upon the type of mixture. For carrying out thinnings in usual types of deodar-kail mixtures met with in these forests, the following general principles are laid down:-

- i) In even-aged stands, where the mixture is by single trees of deodar and kail, the thinning will be carried out as in pure deodar crop favouring deodar over kail.
- ii) Where the mixture is by groups, each group will be thinned in the same way as pure stands of that crop. Along the periphery of these groups where kail and deodar grow mixed, thinning will be done as in deodar crop favouring deodar over kail.
- iii) Isolated kail trees, standing over compact groups of promising saplings or poles of deodar, will be removed and deodar will be encouraged to fill up the gaps created by felling of kail. But where deodar poles or saplings are already suppressed and are not likely to respond to the opening, kail trees should not be marked to free such suppressed deodar.

Thinning in Mixed Crops of Deodar and Kail with Spruce:- In deodar-spruce mixed crops, thinning will be carried out to favour deodar and to suit its silvicultural requirements. Spruce will be treated in the same way as kail in deodar-kail mixture. In mixed crop of kail and spruce, thinning will be carried out strictly in accordance with the silvicultural requirement of the crop, treating kail and spruce alike and removing inferior trees of either species for the benefit of better individuals.

Necessity:-

- i) Thinnings are made not only to increase increment but also as a measure of fire protection; woods which are well thinned at an early date and which are free from an excess of suppressed and inflammable material are much less subject to fire damage than unthinned crops.
- ii) In areas under concentrated regeneration (i.e. PB I and the youngest PB under the Shelter Wood System) early and repeated thinning are so important for the optimum development of the crop that periodical thinning must be carried out, even though the disposal of the cut material involves expenditure of considerable sums of money. Thinning promote not only diameter but height increment also.
- iii) The frequency of thinning cannot be rigidly prescribed, as it depends upon the species; Kail closes up in shorter time than deodar and thus requires shorter thinning interval. The aim should be to prevent crowding rather than to await it and then thin the crop.
- iv) Crown thinning can be carried out in PB II areas to ensure optimum space for the crowns of elite trees by removing their competitors and also the dominated trees which press the crowns of the elites strongly upwards and rest their growth.

2.19.5 In PB-IV Areas:- These markings require the removal of overhead shade, wherever, standing on established regeneration. These final fellings, therefore, correspond to more or less to the fellings in PB-I. Besides this, thinning in patches of advance growth is to be done. The following general principles are laid down for the guidance of marking officer:-

- (i) No attempt should be made to obtain or induce regeneration. The marking should aim at freeing the established regeneration by removing the over wood. Thus, first and second class trees standing over the established regeneration will be marked.
- (ii) The object of marking is to free established regeneration by removal of overhead shade. Thus, all class I and II should be removed except those standing on precipitous slopes
- (iii) All isolated Class II and III trees standing amidst young crop should be marked.
- (iv) Saleable and unsaleable thinnings must be carried out in congested groups of trees, poles or saplings. These should correspond to "C" Grade thinning.

- (v) All marked trees likely to damage young crop underneath should be lopped before felling.
- (vi) Broad leaved tree should not be marked unnecessarily on the pretext of improvement fellings. These should, however be lopped where found suppressing the young crop.

2.20 Table of felling: The following tabular statement gives the order of fellings in PB-I and PB-IV areas:-

Table 2.23

Year	Range	Name of Forest	Comptt. No.		Area in Hac.	Allotment	Nature of felling
			Old	New			
1	2	3	4	5	6	7	8
2019-20	-	-	-	-	-	-	-
2020-21	-	-	-	-	-	-	-
2021-22	Nichar	Chhachi Dhar	84 Part	17 Part	40	PB-I	Seeding felling
2022-23	Nichar	Chhachi Dhar	84 Part	17 Part	35	PB-I	Seeding felling
2023-24	Nichar	Chhachi Dhar	84 Part	17 Part	34.66	PB-I	Seeding felling
2024-25	Bhaba Nagar	Kandlu-Chhonda (Dhaura)	68 (c) Part	1 (f) Part	55	PB-I	Seeding felling
2025-26	Bhaba Nagar	Kandlu-Chhonda (Dhaura)	68 (c) Part	1 (f) Part	65	PB-I	Seeding felling
2026-27	Bhaba Nagar	Kandlu-Chhonda (Dhaura)	68 (c) Part	1 (f) Part	47.13	PB-I	Seeding felling
2027-28	Nichar	Kutangang	71 (b) iii Part	4 (e) Part	20	PB-I	Seeding felling
2028-29	Nichar	Kutangang	71 (b) iii Part	4 (e) Part	21.27	PB-I	Seeding felling

PB-IV

Year	Range	Name of Forest	Comptt. No.		Area in Hac.	Allotment	Nature of felling
			Old	New			
1	2	3	4	5	6	7	8
2019-20	-	-	-	-	-	-	-
2020-21	-	-	-	-	-	-	-
2021-22	Bhaba Nager	Kandlu - Chhonda	69 (c)	2 (c)	69.6	PB-IV	Final felling and removal of overhead shade.
2022-23	Nichar	Dippi	127	33	122.2	PB-IV	Seedling Final felling and removal of overhead shade.ng felling
2023-24	Kilba	Phinla-II	136 (a)	42 (a)	37.25	PB-IV	Final felling and removal of overhead shade.
2024-25	Nichar	Tranda	72 (b)	5 (b)	63.95	PB-IV	Final felling and removal of overhead shade.
2025-26	Nichar	Kaksthal	128 (a) Part	34 (a) Part	98	PB-IV	Final felling and removal of overhead shade.
2026-27	Nichar	Kaksthal	128 (a) Part	34 (a) Part	93	PB-IV	Final felling and removal of overhead shade.
2027-28	Nichar	Kaksthal	128 (b) Part	34 (b) Part	70	PB-IV	Final felling and removal of overhead shade.
2028-29	Nichar	Kaksthal	128 (b) Part	34 (b) Part	44.93	PB-IV	Final felling and removal of overhead shade.

2.21 Subsidiary silvicultural operations, cleaning and thinning:-

Following subsidiary silvicultural operations are prescribed:-

2.21.1 Subsidiary silvicultural operations in PB-I:-

The following subsidiary operations will be carried out soon after the fellings in this Periodic block:-

- (a) Disposal of felling refuse in accordance with the instructions lay down in Punjab Forest leaflet No. 6 shall be referred to for details.
- (b) Removal of trees of inferior species interfering with the young regeneration, if any, left unfelled.
- (c) Lopping of broad leaved species interfering with the growth of young crop of coniferous.
- (d) Cleaning in the existing regeneration patches and climber cutting should be carried out, wherever, necessary.
- (e) Shrub cutting shall be done, wherever needed, for providing clean seed bed.
- (f) The villagers should be encouraged to collect the left out material from the sold lot, so as to reduce the cost.
- (g) Unfit refuse should be burnt under control which will provide a clean bed and also act as stimulant to boost up regeneration.

2.21.2 Artificial regeneration: Effective closure coupled with judicious manipulation of the canopy is very important, to induce good natural regeneration. Although, by creating optimum light conditions and effective closure, natural regeneration is expected to come up, but still to speed it up, artificial regeneration should be taken up in hand and then immediately without waiting for natural regeneration to come out. The technique of artificial regeneration is described in Punjab Forest Leaflet No. 4 and Himachal Pradesh Forest Manual-Volume IV and shall be followed. The natural regeneration, however, depends on good seed year which may not synchronize with the year of fellings. Thus, if only natural regeneration relied upon, there is the danger of the area being invaded by weeds and bushes. In view of these impediments, artificial sowing and planting will be taken up immediately after fellings. This will on one hand reduce the period of closure and on the other restock the area expeditiously.

Temporary nurseries of Deodar, Fir, Spruce and broad leaved species like Walnut, Horse chestnut, Poplar etc. should be laid at least in advance in the proximity to the area to be felled. Each of the felled area will be planted up in rainy season following the year of exploitation. Subject to the year of fellings, sowing of this species can be taken up even during the year of fellings. The nurseries should be extended to the subsequent years depending upon regeneration. The guidelines issued by PrCCF HP. regarding nursery techniques for raising the good Deodar seedlings should be followed and plants less than 25 cms in height should not be planted at all. The patch/line sowing of Kail will be done on the dry and exposed sites, where Deodar is not expected to do well. No attempt should be made to convert Spruce and Silver Fir forest into Deodar except in tension belt below 2400 mts. where site conditions are favourable for Deodar. Similarly, broad leaved species should be planted along nalas and in moist location where these grow naturally as well. The technique of raising Deodar and Kail is well established. However, Punjab Forest Manual technical order No. 3 and 4 along with Himachal Pradesh Forest Manual Volume IV Should also be consulted.

It is also important to note that the locality factors are favourable to natural regeneration in the areas where plants like Sarcococa, Strawberry, Viola, Indigofera and Desmodium etc. predominates in the ground flora but do not form dense cover. In such areas reliance can be placed on natural regeneration also to some extent. On the other hand, in the areas where weeds/shrubs like Iris, Berberis, Strobilanthus, Spirea and Placranthus are dominant, the conditions are quiet

unsuitable. Artificial regeneration shall have to be mainly relied upon in such refractory areas. However, it must always be remembered that the more quickly an area is regenerated after seeding felling, lesser will be the overall expenditure and the area will be ready for being thrown open to grazing earlier.

It is also pointed out that it is futile to attempt to fill Thaches/Pats and shallow rocky southern and south west slopes with deodar where at best an open crop of Kail is all that nature intended. Moreover, these grassy plots in the forest areas is of immense value of grazing ground to the villages and keep them contended, whereas their value to the forest department is at best secondary.

2.21.3 Planting Programme:-The yield prescribed from the forest area in this Working Circle is directly proportionate to area planted successfully. Any slackness in Plantation is going to reduce for the forest area for obtaining the prescribed yield. To achieve this objective detail planting programme has been given in the Plantation (overlapping) Working Circle.

2.21.4 Tending operations:-Young regeneration has to be nursed and tended so as to produce high quality of timber. The tending is the most essential silvicultural operation in the young plantation area. However, the cost of tending operation is more than repaid by production of high quality stems and stands.

2.21.5 Weeding:-All the regeneration areas should be properly weeded out in the infancy. Normally two weedings, one in June-July and another in August-September are considered sufficient for young plantations. Number and frequency of weedings depends upon the incidence of bushes and weeds as also on the condition of regeneration. If more than two weedings are necessitated, these should be carried out without any hesitation for the betterment of the crop. The weeding should be done judiciously and carefully and young plant should be freed of overhead shade.

2.21.6 Cleaning:-It should be carried out in the early stages of plantations and should be continued till the area is suitable for thinnings, so as to produce healthy stems and minimize fire hazards. Best and vigorously growing stems should be retained. All forked, crooked, sickly and damaged stems should be removed in cleanings so as to provide growing space to better stems. An important point in cleanings is to never cut more than where it is absolutely necessary. In Deodar plantations, Kail has been found coming up naturally in plenty. Kail is two to three times faster than Deodar. Therefore, all Kail competing with healthy Deodar must be cut when it is young or else it may be too late as Deodar may be too suppressed to respond and reach sufficiently. The intensity of cleaning must aim at fairly repaid increment to make the young crop fire resistant within reasonable time and also not to permit the side branches to persist unnecessarily. The cleaning is prescribed in detail in technical order No. 1 of Punjab Forest Manual Volume III and must be studied thoroughly.

2.22 Other Regulations:-

2.22.1 Fire Protection:- The whole Working Circle will be under strict vigil against fire hazard. Preventive measure should be taken advance. Incendiary forest fires are very common and as such the forests are required to be strictly protected from these. The forests floor should be kept clean of inflammable material such as debris, unwanted bushes, weeds, needles and grass. The fire lines, inspection paths and bridle paths should be kept clean of needles especially during summer season. Fire watcher should be employed during dry month's relations with the local protection of the forest from fire. Besides this maintaining cordial relations with the local people and educating them properly with regard and to importance of forest conservation, rights and duties and social obligation as enshrined in Article 51 A(g) of the Constitution of India read with Section 79 of the Indian Forest Act, 1927. The detail description is given in Chapter No. IX, the Forest Protection (overlapping) Working Circle.

2.22.2 Grazing and grass cutting:- Outside the regeneration areas, there will be no restriction on grass cutting. In all the PB-I areas under regeneration, grass cutting will not be allowed till the plants are at least 1 meter in height. Grass cutting in closed areas shall be allowed under the supervision of forest guard that no young, seedlings/sapling are cut. Grazing shall be strictly prohibited in the regeneration areas during the closure period under Section 30 (b) of Indian Forest Act, 1927.

2.22.3 Right Holder's Demand:- Demand of right holder for timber will be met as per H.P. Govt. notification dated 2nd January, 2010 and latest revised **Notification No.FFE-B-A (3) 4/2015 Dated: Shimla -2, the 26 February, 2016.** By this notification, now the right holders are entitled to get T.D for construction/repair of house and cow shed etc. from the forest directly in which such rights has been recorded in Forest Settlement Report and as per revised timber distribution policy. Rest of the demand of rights holders will be met from the forest as per the provision of Forest Settlement Report, 1921 and right and concessions shall be exercised strictly in accordance with the silviculture principles. Thus, all rights can be exercised subject to silvicultural availability. No trees should be marked from PB-I area after the marking of seedling fellings have been done till the regeneration is fully established. Trees should be marked strictly in accordance with the silvicultural principles and not necessarily according to the convenience of right holders. No trees should be marked from the PB-I area. From other PBs, the trees to be marked to meet out the demand of right holder should be such as are required to be removed during the course of thinning and improvement fellings and final fellings. The trees can be removed/felled from forest irrespective of the prescribed year of fellings. All the trees marked to meet the demand of right holders shall count towards the prescribed yield. Dry and fallen trees should primarily be utilized to meet the right holders demand etc.

2.22.4 Closures:- After the seedling fellings are over, the all PB-I areas should be closed immediately till the regeneration is established. The area will have to be closed for grazing till the regeneration is established. Normally, this period is 10-15 years, Govt. notification for such closure should be got issued under Section 30 (b) of Indian Forest Act, 1927 well in time, after approval of felling programme by the competent authority to avoid any litigation.

2.22.5 Lopping:- Lopping generally is heavy near habitation and also in those forests which are on the road side or approach to road side etc. It should be stopped immediately, as it makes trees susceptible to disease and retards growth in future. However, lopping may be allowed to the right holders strictly as per the provision of Forest Settlement Report, 1921 and action as per the provision of Indian Forest Act, 1927 should be taken, if any, person or authority or agent violated the rules or provision of Forest Settlement Report, 1921. The detail/description is given in Chapter-IX in the Forest Protection (overlapping) Working Circle.

2.22.6 Regeneration Survey:- The regeneration survey of felled PB-I areas shall be carried out every year till the stock is established. If regeneration is in adequate further fellings will be curtailed for the next year. The reasons for failure should be detailed and corrective measures taken. The regeneration should be made to keep pace with the fellings and in case there are short falls on this account with reference to the prescription of the Working Plan, the further fellings should not be carried out and deferred till the problem is resolved.

CHAPTER III

THE DRY ZONE DEODAR-KAIL WORKING CIRCLE

3.1 General Constitution:- This Working Circle includes all the demarcated and undemarcated protected forests of dry zone situated on comparatively easier/moderate to steep slopes having Deodar and Kail as principal species or the crop having 60% or more of these species as its component in a compartment. The constitution of this Working Circle will remain same as in the previous Rajiv's Plan except that the areas transferred from Wild Life Division, Sarahan have been included in this working circle. The major part of the area bears Deodar, Kail and some Neoza in the lower reaches and Silver Fir and Spruce in the higher reaches. High level kail is also found above the Fir zone. This Working Circle covers an area of **1662.81 hac.**

3.2 General Character of Vegetation:- The detailed description of the forests are given and described in the Chapter II Part- I. The forest of this Working Circle falls under type Group 13 (Himalayan Dry Temperate Forest) and sub type C₁ C_{2b} C₄ of the forest types given by *Champion and Seth*. The overall condition of the crop varies from young to middle and few mature trees. Deodar, a gregarious species, occupies considerable areas in its growth zone. Heavy pace of exploitation of accessible forests such as Barang and Runag in Kalpa Range, in the early years of this century had resulted in the removal of bulk of bigger sized and better shaped stems. Careful tending during the last 95 years has helped established regeneration in Barang and Runag forest. But in other forests, for want of closure of area gone over in selection and improvement fellings, the status of regeneration is poor the crops are mostly uneven aged and forests area irregularly stocked. There is a marked paucity of mature woods and those approaching maturity. Mature stems are found scattered amidst middle aged and young woods. High level Kail forms pure patches around 2500 meter elevation. The crops are of III quality. The infections of blue pine trees near habitations with *Tremetes pinii* fungus and an angiosperm parasite *Arceuthobium minutissimum* are very common, resulting in opening out of crop. In favourable localities, plantations of Deodar have been raised under a dying and dwindling overwood such as seen in C-138 (a), C-148 and C-150 of Kalpa Range. Spruce and Fir are restricted to the summits only and that too in moist localities. Also in moist localities, broad leaved species such as Walnut, Bird Chery and Maple are found mixed with them. In lower portion and on southern and south western aspects, *Quercus illex* occurs as an under storey in a few forest such as C-152 (b) and C-71. In general, the Deodar forest in the track conform II/III of the FRI quality classes and the Deodar stems are stunted, slow grown and heavily lopped. Neoza pine occurs in mixture with Deodar in varying proportions in the forest of transitional zone between the dry and arid zones such as in C-144 (a) and C-134.

3.3 Special Objects of Management:- Without prejudice to general objects of managements of the forests, the special objects of managements of this Working Circle are:

- (i) To progressively convert the irregular/uneven aged stock into more or less even aged/normal stock and thus to build up growing stock to the extent possible under the prevailing conditions.
- (ii) To restock the areas deficient in natural regeneration either naturally or artificially.
- (iii) To regenerate the PB-I areas as speedily as possible by resorting to artificial regeneration, wherever, necessary.
- (iv) To obtain the maximum possible sustained yield of timber without further denuding/worsening the condition of vegetation.
- (v) To protect the forests from fires as well as biotic interferences.

3.4 Area Statement:- The total area of this Working Circle **1662.81 Hac.**, which works out to be **4.69%** of the total area of the division. The range wise distribution of these forests is given in Table No. 3.1.

Table 3.1

Name of Range	DPF	NDPF	UPF	Total in hac.
Bhaba Nagar	0	0	0	0
Kalpa	595.68	0	0	595.68
Katgaon	0	0	0	0
Kilba	1067.13	0	0	1067.13
Moorang	0	0	0	0
Nichar	0	0	0	0
Pooh	0	0	0	0
Malling	0	0	0	0
Total	1662.81	0	0	1662.81

The forest wise detail of specific allotment is given in **Appendix No.-IV**.

3.5 Block and Compartment:- The compartments and sub compartments remains unchanged from the Rajiv's Working Plan under revision except for the areas transferred from wild life Division, Sarahan and areas left over in the previous Rajiv's plan. The compartments and sub compartments have been numbered systematically both for DPFs and listed UPFs, which was necessitated due to creation of new DPFs and revision of the present plan.

3.6 Felling Series:- There will be one felling series i.e. **Sutlej felling series**, conforming to the territorial jurisdiction of Kinnaur Forest Division.

3.7 Analysis and Valuation of the Crop:- Except for the converted crop during the period of previous plans (before the ban on green felling) the crop is irregular having all the age classes in the same areas. The converted crop, however, is generally well stocked having more or less represented almost generally in mixtures and some times as pure crops of Deodar and Kail separately. Spruce and Fir are found in the higher reaches of the compartment bearing Deodar and Kail is also found mixed with Kail and Deodar in the lower extremities of the compartments of this Working Circle. The broad leaved species are confined to depressions and along nallas.

(i) Stock Maps:- The stock maps of all the forests have been taken from survey sheets 4" =1 miles scale and after getting them digitized, have been placed in the respective compartment history file.

(ii) Density:- The crown density of each compartment has been estimated ocularly and has been recorded in respective compartment history files. The average density of the crop varies from 0.2 to 0.4

(iii) Site Quality:- The site quality of the crop varies from place to place overall quality conform to II/III or III of the FRI quality classes. The site quality of individual compartments/ sub compartment has been indicated in the compartment history files.

(iv) Age Classes:- The crop is very irregular. All age classes are represented and the crop is seldom uniform over large areas.

(v) Enumerations:- As given in the Chapter VIII under paragraph 8.8 sampled enumerations has been carried out. The enumeration was carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. Total 21 Nos. Sample plots pertaining to this working circle were enumerated. The detailed forest wise enumeration results are given in **Appendix No-XI**. The results have been analyzed statistically and growing stock has been assessed / extrapolated and is given in **Appendix No-XVI**.

Table- 3.2
Species wise No. and Volume in cubic mts. (Estimated growing stock) for Dry Zone Deo/Kail Working Circle

PB-I (Area = 560.48)														
Sr. No	Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	241	Deodar	Number	4484	14572	15693	12331	5605	7847	2242	1121	0	1121	65016
			Volume in Cubic Mtrs	134.52	3351.67	11142.34	20961.95	14292.24	26678.85	9528.16	5391.82	0	5391.82	96873.36
2	926	Kail	Number	2242	2242	2242	1121	1121	1121	0	0	0	0	10089
			Volume in Cubic Mtrs	67.26	515.64	1591.76	1905.63	2533.37	4125.13	0	0	0	0	10738.8
3	2	Fir	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
4	921	Spruce	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
5	19	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
6	38	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
7	47	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
8	1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
9	651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
10	969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
11	965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
12	1010	Ban Oak	Number	1121	0	0	0	0	0	0	0	0	0	1121
			Volume in Cubic Mtrs	493.22	0	0	0	0	0	0	0	0	0	493.22
13	2000	Other B/L	Number	0	0	1121	0	0	0	0	0	0	0	1121
			Volume in Cubic Mtrs	0	0	257.82	0	0	0	0	0	0	0	257.82
			Number	7847	16814	19056	13452	6726	8968	2242	1121	0	1121	77347
		G Total	Volume in Cubic Mtrs	694.9952	3867.312	12991.93	22867.584	16825.61	30803.98	9528.16	5391.818	0	5391.818	108363.2

Species wise No. and Volume in cubic mtrs. (Estimated growing stock) for Dry Zone Deo / Kail Working Circle PB-II (Area = 737.30)														
Sr. No	Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	0241	Deodar	Number	23041	70965	84790	36865	15668	2765	8295	1843	922	0	245152
			Volume in Cubic Mtrs	691.22	16321.98	60200.55	62670.5	39952.44	9400.58	35252.16	8866.03	4433.02	0	237788.5
2	0926	Kail	Number	922	0	1843	0	0	0	0	0	0	0	2765
			Volume in Cubic Mtrs	27.65	0	1308.71	0	0	0	0	0	0	0	1336.36
3	0002	Fir	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
4	0921	Spruce	Number	922	0	0	0	0	0	0	0	0	0	922
			Volume in Cubic Mtrs	55.3	0	0	0	0	0	0	0	0	0	55.3
5	0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
6	0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
7	0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
8	1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
9	0651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
10	0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
11	0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
12	1010	Ban Oak	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
13	2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
			Number	24884	70965	86633	36865	15668	2765	8295	1843	922	0	248839
		G Total	Volume in Cubic Mtrs	774.17	16321.98	61509.25	62670.5	39952.44	9400.58	35252.16	8866.03	4433.02	0	239180.1

Species wise No. and Volume in cubic mtrs. (Estimated growing stock) for Dry Zone Deo / Kail Working Circle PB-III (Area = 365.03)														
Sr. No.	Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	0241	Deodar	Number	10038	15970	18252	10951	7301	3650	0	0	0	0	66162
			Volume in Cubic Mtrs	301.15	3673.11	12958.57	18616.53	18616.53	12411.02	0	0	0	0	66576.91
2	0926	Kail	Number	913	1369	1369	0	456	0	0	0	0	0	4107
			Volume in Cubic Mtrs	27.38	314.84	971.89	0	1031.21	0	0	0	0	0	2345.32
3	0002	Fir	Number	0	456	0	0	0	456	0	0	0	0	913
			Volume in Cubic Mtrs	0	127.76	0	0	0	2066.98	0	0	0	0	2194.74
4	0921	Spruce	Number	2281	1825	5475	1825	913	913	1825	0	0	0	15057
			Volume in Cubic Mtrs	136.89	511.04	3887.57	2591.71	2327.07	3878.44	11370.68	0	0	0	24703.41
5	0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
6	0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
7	0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
8	1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
9	0651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
10	0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
11	0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
12	1010	Ban Oak	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
13	2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
			Number	13232	19620	25096	12776	8669	5019	1825	0	0	0	86238
		G Total	Volume in Cubic Mtrs	465.41	4626.76	17818.03	21208.24	21974.81	18356.45	11370.68	0	0	0	95820.38

Table- 3.3
Yield Calculation Table Growing Stock in PB-I & PB-III

Species wise No. and Volume in cubic mts.(Estimated / Extrapolated Growing stock) for Dry Zone Deo/Kail WC P.B.-I & P.B.III (Area = 925.51)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	14522	30543	33945	23281	12905	11497	2242	1121	0	1121	131177
		Volume in Cubic Mtrs	435.66	7024.78	24100.91	39578.48	32908.77	39089.87	9528.16	5391.82	0.00	5391.82	163450.27
0926	Kail	Number	3154	3611	3611	1121	1577	1121	0	0	0	0	14195
		Volume in Cubic Mtrs	94.63	830.48	2563.66	1905.63	3564.58	4125.13	0.00	0.00	0.00	0.00	13084.11
0002	Fir	Number	0	456	0	0	0	456	0	0	0	0	913
		Volume in Cubic Mtrs	0.00	127.76	0.00	0.00	0.00	2066.98	0.00	0.00	0.00	0.00	2194.74
0921	Spruce	Number	2281	1825	5475	1825	913	913	1825	0	0	0	15057
		Volume in Cubic Mtrs	136.89	511.04	3887.57	2591.71	2327.07	3878.44	11370.68	0.00	0.00	0.00	24703.41
0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0630	Bray	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1010	Ban oak	Number	1121	0	0	0	0	0	0	0	0	0	1121
		Volume in Cubic Mtrs	493.22	0	0	0	0	0	0	0	0	0	493.22
0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0.00
2000	Other B/L	Number	0	0	1121	0	0	0	0	0	0	0	1121

		Volume in Cubic Mtrs	0.00	0.00	257.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	257.82
		Number	21079	36435	44152	26228	15395	13987	4067	1121	0	1121	163585
	G Total	Volume in Cubic Mtrs	1160.41	8494.07	30809.95	44075.83	38800.42	49160.43	20898.84	5391.82	0.00	5391.82	204183.58

Table- 3.4
General Abstract
Growing Stock in all PBs

General Abstract Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Dry Zone Deo / Kail Working Circle (Area = 1662.81)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	37563	101508	118734	60146	28573	14262	10537	2964	922	1121	376330
		Volume in Cubic Mtrs	1126.88	23346.76	84301.45	102248.98	72861.21	48490.44	44780.32	14257.85	4433.02	5391.82	401238.74
0926	Kail	Number	4076	3611	5454	1121	1577	1121	0	0	0	0	16960
		Volume in Cubic Mtrs	122.28	830.48	3872.36	1905.63	3564.58	4125.13	0.00	0.00	0.00	0.00	14420.47
0002	Fir	Number	0	456	0	0	0	456	0	0	0	0	913
		Volume in Cubic Mtrs	0.00	127.76	0.00	0.00	0.00	2066.98	0.00	0.00	0.00	0.00	2194.74
0921	Spruce	Number	3203	1825	5475	1825	913	913	1825	0	0	0	15979
		Volume in Cubic Mtrs	192.18	511.04	3887.57	2591.71	2327.07	3878.44	11370.68	0.00	0.00	0.00	24758.70
0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0630	Bray	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0

1010	Ban oak	Number	1121	0	0	0	0	0	0	0	0	0	1121
		Volume in Cubic Mtrs	493.22	0	0	0	0	0	0	0	0	0	493.22
0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0.00
2000	Other B/L	Number	0	0	1121	0	0	0	0	0	0	0	1121
		Volume in Cubic Mtrs	0.00	0.00	257.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	257.82
		Number	45963	107400	130785	63093	31063	16752	12362	2964	922	1121	412424
	G Total	Volume in Cubic Mtrs	1934.57	24816.05	92319.21	106746.33	78752.86	58561.00	56151.00	14257.85	4433.02	5391.82	443363.70

Table- 3.5
Statistically analysis of enumeration results:
Table- 3.5
No of samples taken

Name of range	PB I	PB II	PB III	PBIV	Total
Bhaba Nagar	0	0	0	0	0
Kalpa	3	4	3	0	10
Katgaon	0	0	0	0	0
Kilba	2	4	5	0	11
Moorang	0	0	0	0	0
Nichar	0	0	0	0	0
Pooh	0	0	0	0	0
Malling	0	0	0	0	0
Total	5	8	8	0	21

3.8 Comparrative Statement:- As discussed under para no 3.7 above, sampled enumerations has been carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The whole of the area of the Kinnaur Forest Division was divided into grids and total **150 Nos** of samples were taken. **Total 21 Nos.** sample plots pertaining to this working circle were enumerated down to 10cm d. b. h. and annalized. Thereafter, the growing stock has been assessed / extrapolated as given in the Table No 3.2, 3.3 and 3.4.

The Abstract showing the growing stock of PB-I PB-II and PB-III total for the working circle in Rajiv's working plan and in the Plan under revision is given is Table No. 3.6, 3.7, 3.8 and 3.9.

Table No. 3.6

Rajiv's Plan	PB-I (Area = 354.11)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Dry Zone Deo / Kail Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	10695	9000	6924	4806	3028	1469	669	306	203	37100	33484.63
	Kail	Number	3206	2633	2399	1882	920	407	102	29	17	11595	9936.22
	Fir	Number	2651	1603	1153	725	319	141	29	10	2	6633	4808.48
	Spruce	Number	2804	2003	1544	1009	678	448	232	109	106	8933	10220.67
	TOTAL		19356	15239	12020	8422	4945	2465	1032	454	328	64261	58450

Present Plan Under Revision	PB-I (Area = 560.48)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Dry Zone Deo / Kail Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	4484	14572	15693	12331	5605	7847	2242	1121	0	1121	65016	96873.36
	Kail	Number	2242	2242	2242	1121	1121	1121	0	0	0	0	10089	10738.8
	Fir	Number	0	0	0	0	0	0	0	0	0	0	0	0
	Spruce	Number	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL		6726	16814	17935	13452	6726	8968	2242	1121	0	1121	75105	107612.16

Table No. 3.7

Rajiv's Plan	PB-II (Area = 420.44)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Dry Zone Deo / Kail Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	49453	43676	23738	9613	4086	2386	909	859	646	135366	74359.15
	Kail	Number	3370	2758	1930	1139	619	493	61	3	0	10373	7581.62
	Fir	Number	0	0	0	0	0	0	0	0	0	0	0
	Spruce	Number	1460	1555	1007	416	277	176	68	57	41	5057	4549.04
	TOTAL		54283	47989	26675	11168	4982	3055	1038	919	687	150796	86489.81

Present Plan (Plan Under Revision)	PB-II (Area = 737.30)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Dry Zone Deo / Kail Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	23041	70965	84790	36865	15668	2765	8295	1843	922	0	245154	237788.5
	Kail	Number	922	0	1843	0	0	0	0	0	0	0	2765	1336.36
	Fir	Number	0	0	0	0	0	0	0	0	0	0	0	0
	Spruce	Number	922	0	0	0	0	0	0	0	0	0	922	55.3
	TOTAL		24885	70965	86633	36865	15668	2765	8295	1843	922	0	248841	239180.16

Table No. 3.8

Rajiv's Plan	PB-III (Area = 348.02)												
	Species wise No. and Volume in cubic mtrs. (Estimated growing stock) for Dry Zone Deo / Kail Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	11967	9772	6627	4442	3182	1986	880	689	723	40268	39875.52
	Kail	Number	5019	4106	3210	2239	1237	694	206	57	18	16786	13962.99
	Fir	Number	331	196	123	81	39	21	5	3	0	799	595.21
	Spruce	Number	2868	2487	1556	1094	880	527	344	238	144	10138	13401.29
	TOTAL		20185	16561	11516	7856	5338	3228	1435	987	885	67991	67835.01

Present Plan (Plan Under Revision)	PB-III (Area = 365.03)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Dry Zone Deo / Kail Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	10038	15970	18252	10951	7301	3650	0	0	0	0	66162	66576.91
	Kail	Number	913	1369	1369	0	456	0	0	0	0	0	4107	2345.32
	Fir	Number	0	456	0	0	0	456	0	0	0	0	912	2194.74
	Spruce	Number	2281	1825	5475	1825	913	913	1825	0	0	0	15057	24703.41
	TOTAL		13232	19620	25096	12776	8670	5019	1825	0	0	0	86238	95820.38

Table No. 3.9**Estimated growing Stock of Dry Zone Deodar Kail circle (Total for Circle, i.e all PBs)**

Rajiv's Plan	All PBs (Area = 1122.57)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Dry Zone Deo / Kail Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	72115	62448	37289	18861	10296	5841	2458	1854	1572	212734	147719.3
	Kail	Number	11595	9497	7539	5260	2776	1594	369	89	35	38754	31480.83
	Fir	Number	2982	1799	1276	806	358	162	34	13	2	7432	5403.69
	Spruce	Number	7132	6045	4107	2519	1835	1151	644	404	291	24128	28171
	Total		93824	79789	50211	27446	15265	8748	3505	2360	1900	283048	212774.82

Present Plan (Plan Under Revision	(Area = 1662.81)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Dry Zone Deo / Kail Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	37563	101507	118735	60147	28574	14262	10537	2964	922	1121	376332	401238.74
	Kail	Number	4077	3611	5454	1121	1577	1121	0	0	0	0	16961	14420.47
	Fir	Number	0	456	0	0	0	456	0	0	0	0	912	2194.74
	Spruce	Number	3203	1825	5475	1825	913	913	1825	0	0	0	15979	24758.7
		Total	44843	107399	129664	63093	31064	16752	12362	2964	922	1121	410184	442612.65

3.9 Silvicultural System:- The forests allotted to this Working Circle shall be managed under the Indian Irregular Shelter Wood System. This system has been described in para no 30 of Punjab Forest Leaflet no 11. These system permits retention of compact group of well grown poles over certain minimum area and also permits selection management over on steep slopes, thus, bringing in an element of irregularity in the final crop. Therefore, this system is also called as Irregular Shelter Wood System. Owing to the several adverse factors such as climatic, edaphic and biotic, the numbers of mother trees to be retained will be more than those in the case of Wet Zone Deodar Kail working circle. This system allows fellings according to the nature of ground and permits of a certain degree of irregularity by avoiding sacrifice of immature pole crops which is retained as advance growth. On broken and steep terrain liable to erosion, marking conform to selection principles. Removal of over wood in secondary and final felling will be done only after keeping in view the progress of regeneration and establishment thereof. Natural regeneration will be supplemented by artificial regeneration.

3.10 Choice of Species:- The coniferous species most suited to the locality will be favoured. In depressions which is generally unsuitable for conifers, suitable broad leaved species will be planted. The species perfectly suited to the locality will be preferred and shall get preference over all other species. Economically both Deodar and Kail are important species but Kail is more susceptible to fire damage and is often damaged by fire. However, the Deodar should never be tried on hot southern aspects and exposed ridges in its zone which is best suited for Kail. Similarly, on moist locations and along nalas or in the area occupied by Spruce and Fir, Deodar should never be tried for introduction. The detailed suitability and treatment map of the area should be prepared before taking up sowing and planting.

3.11 Regeneration Period:- The results of past management shows that the young Deodar and Kail crop is considered established when it attains height of 3 mtr or more and is safe from damage by grazing cattle. On III quality sites, Deodar and Kail attain this height at the age of 15 and 13 years of respectively. In this zone, the regeneration does not get established in less than 30 to 40 years, owing to adverse climatic, edaphic, biotic factors such as long spell of drought, sandy soil and heavy incidence of grazing. Thus, the regeneration period of 45 years is adopted for this working circle. Besides restocking P.B.I areas, during the Working Plan period, all the un-regenerated and blank areas included in the P.B.III shall also be regenerated artificially depending upon availability of funds. Efforts will be made to regenerate the area naturally, supplemented with artificial planting.

3.12 Rotation Period:- The rotation period in case of forest in a state of conversion is of the academic interest only. In this case, the main concern is fixing of conversion period and minimum exploitable dia meter. As per statistical data analyzed, Deodar takes 130 years to attain a dbh of 60 cm, the size best suited as exploitable dia meter for production of structural timer and large sized scantlings. Moreover, for quality III crops with D grade thinning, the main annual increment for stem timber culminates at 130 years. Keeping in view the regeneration period of 45 years, the rotation and conversion period of 135 years corresponding to an exploitable dia meter of 60 cm dbh is adopted. This suits Kail also as it is slightly faster growing than Deodar.

3.13 Exploitable Diameter:- Exploitable diameter fixed is 60 cm dbh being the most suited to yield better out turn in the form of sleeper size which fetches better price in the market.

3.14 Felling Cycle:- The felling cycle of 30 years corresponding to the regeneration period of the plan will be adopted, keeping in view the silvicultural requirements.

3.15 Division into Periodic Blocks:- With the rotation of 135 years and regeneration period of 45 years, the area of the whole Working Circle has been divided into three periodic Blocks as P.B.I, P.B.II and P.B.III. Definite areas have been allotted to each periodic block. The forests included in this Working Circle are in conversion stage and the crop is irregular/uneven aged with preponderance of lower classes, so PBs can not be divided on text book pattern. Yet, every attempt is made to allot areas as to fit in PBs depending on dia classes available. The allotment is discussed as under:-

3.15.1 PB-I (560.48 hac.):- It consists of those areas which has not been felled during the previous plan for regeneration and consists of the areas which are mature and ready for harvesting. It also consists of those areas that remained understock during the previous plan and where regeneration is either still progressing or has not come at all. The forests with generally blanks & having majority of mature trees are allotted to this PB. No fellings were generally done in the plan under revision in PB-I due to complete moratorium on green fellings. However, only salvage markings and green felling under FCA cases were carried out during the period of Working Plan under revision. No change has been made therein except for the areas transferred from Wild Life Division, Sarahan and areas not included in the Rajiv's plan under revision. The distribution of number of trees and volume per hac. is tabulated in Table No. 3.10

Table- 3.10
Species wise distribution of number of trees and volume per hac.

Species wise No. and Volume in cubic mtrs. (Estimated growing stock) for Dry Zone Deo / Kail Working Circle PB-I (Area = 560.48)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
241	Deodar	Number	8	26	28	22	10	14	4	2	0	2	116
		Volume in Cubic Mtrs	0.24	5.98	19.88	37.4	25.5	47.6	17	9.62	0	9.62	172.84
926	Kail	Number	4	4	4	2	2	2	0	0	0	0	18
		Volume in Cubic Mtrs	0.12	0.92	2.84	3.4	4.52	7.36	0	0	0	0	19.16
2	Fir	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
921	Spruce	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
19	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
38	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
47	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1010	Ban Oak	Number	2	0	0	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0.88	0	0	0	0	0	0	0	0	0	0.88
2000	Other B/L	Number	0	0	2	0	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0	0	0.46	0	0	0	0	0	0	0	0.46
		Number	14	30	34	24	12	16	4	2	0	2	138
	G Total	Volume in Cubic Mtrs	1.24	6.9	23.18	40.8	30.02	54.96	17	9.62	0	9.62	193.34

3.15.2 PB-II (737.30 hac.):- Forests, having preponderance of age classes, approaching maturity, have been allotted to this periodic block.No change has been made therein except for the areas transferred from Wild Life Division, Sarahan and areas not included in the Rajiv's plan under revision. The distribution of number of trees and volume per hac. is tabulated in Table No. 3.11

Table- 3.11
Species wise distribution of number of trees and volume per hac.

(Area = 737.30)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	31	96	115	50	21	4	11	3	1	0	333
		Volume in Cubic Mtrs	0.94	22.14	81.65	85.00	54.19	12.75	47.81	12.03	6.01	0.00	322.51
0926	Kail	Number	1	0	3	0	0	0	0	0	0	0	4
		Volume in Cubic Mtrs	0.04	0.00	1.78	0	0	0	0	0	0	0	1.81
0002	Fir	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0921	Spruce	Number	1	0	0	0	0	0	0	0	0	0	1
		Volume in Cubic Mtrs	0.08	0	0	0	0	0	0	0	0	0	0.08
0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1010	Ban Oak	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
		Number	34	96	118	50	21	4	11	3	1	0	338
	G Total	Volume in Cubic Mtrs	1.05	22.14	83.43	85.00	54.19	12.75	47.81	12.03	6.01	0.00	324.40

3.15.3 PB-III (365.03 ha):- All the compartments carrying established young pole crop with scattered mother trees, un-regenerated forests and areas requiring immediate restocking have been allotted to PB-III as in the plan under revisions no change has been made therein except for the areas transferred from Wild Life Division Sarahan and areas not included in the Rajiv's plan under revision. The distribution of number of trees and volume per hac. are tabulated in Table No. 3.12

Table- 3.12
Species wise distribution of number of trees and volume per hac.

Species wise No. and Volume in cubic mtrs. (Estimated growing stock) for Dry Zone Deo / Kail Working Circle PB-III (Area = 365.03)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	28	44	50	30	20	10	0	0	0	0	181
		Volume in Cubic Mtrs	0.83	10.06	35.50	51.00	51.00	34.00	0.00	0.00	0.00	0.00	182.39
0926	Kail	Number	3	4	4	0	1	0	0	0	0	0	11
		Volume in Cubic Mtrs	0.08	0.86	2.66	0.00	2.83	0.00	0.00	0.00	0.00	0.00	6.43
0002	Fir	Number	0	1	0	0	0	1	0	0	0	0	3
		Volume in Cubic Mtrs	0.00	0.35	0.00	0.00	0.00	5.66	0.00	0.00	0.00	0.00	6.01
0921	Spruce	Number	6	5	15	5	3	3	5	0	0	0	41
		Volume in Cubic Mtrs	0.38	1.40	10.65	7.10	6.38	10.63	31.15	0.00	0.00	0.00	67.68
0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1010	Ban Oak	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
		Number	36	54	69	35	24	14	5	0	0	0	236
	G Total	Volume in Cubic Mtrs	1.28	12.68	48.81	58.10	60.20	50.29	31.15	0.00	0.00	0.00	262.50

3.15.4 General Abstract of Areas Allotted PB wise:

The PB wise allotment of the areas to different Ranges is tabulated in table No: 3.13

Table – 3.13

Sr. No.	Name of Range	Forest category	Deo/Kail Dry Zone WC			
			PBI	PBII	PBIII	Total
1	Bhaba Nagar	DPF	0	0	0	0
		Listed UPF	0	0	0	0
		Total	0	0	0	0
2	Kalpa	DPF	285.71	133.53	176.44	595.68
		Listed UPF	0	0	0	0
		Total	285.71	133.53	176.44	595.68
3	Katgaon	DPF	0	0	0	0
		Listed UPF	0	0	0	0
		Total	0	0	0	0
4	Kilba	DPF	274.77	603.77	188.59	1067.13
		Listed UPF	0	0	0	0
		Total	274.77	603.77	188.59	1067.13
5	Malling	DPF	0	0	0	0
		Listed UPF	0	0	0	0
		Total	0	0	0	0
6	Moorang	DPF	0	0	0	0
		Listed UPF	0	0	0	0
		Total	0	0	0	0
7	Nichar	DPF	0	0	0	0
		Listed UPF	0	0	0	0
		Total	0	0	0	0
8	Pooh	DPF	0	0	0	0
		Listed UPF	0	0	0	0
		Total	0	0	0	0
Total DPF			560.48	737.3	365.03	1662.81
Total Listed UPF			0	0	0	0
G. Total			560.48	737.3	365.03	1662.81

3.16 Calculation of Yield: The yield has been calculated by volume separately for PB-I and III on the basis of enumeration results. Increment has been ignored for the reason of safety against fire and other natural calamities and to reserve as emergency reserve. The yield from PB-I and PB-III has been designated as final yield.

3.16.1 For computation of the total yield from Deodar Kail (Wet Zone) working circle, the three methods was tried and out of which the one that gave minimum yield have been prescribed. These methods are as under :-

1. **Von Mantel' Formula**
2. **Smythies Formula**
3. **Hufnagels Formula**

3.16.2 Calculations from Von Mantel' formula:- The Von Mental's Formula based on the volume of the growing stock only. The Von Mental's Formula have been arrived from the relation that the volume of normal growing stock is equal to the MAI of the FS, multiplied by half the rotation that is $NGS = I \times r/2$ where I represents the volume of oldest age gradation (and also the total annual increment of the FS) and is a normal annual yield. I is, therefore, equal to $NSG/r/2 = 2 \times NSG/r$. Von Mantal's simple formula derived from the above relation is:-

$$\text{Annual yield} = \frac{\text{Actual volume of growing stock}}{\frac{1}{2} \text{ Rotation.}}$$

Therefore, the $AY = \frac{2(GS)}{R}$

Where AY = Annual Yield.

GS = Total Volume of Growing Stock (at lower confidence limit).

R = Rotation.

Yield from Total growing stock

Deodar

Total Growing Stock = 401238.74 M³

Rotation = 135 Years

Therefore, the $AY = \frac{2 \times 401238.74}{135} = 5944.28 \text{ or say } 5940 \text{ M}^3$

Kail

Total Growing Stock = 14420.47 M³

Rotation = 135 Years

Therefore, the $AY = \frac{2 \times 14420.47}{135} = 213.64 \text{ or say } 210 \text{ M}^3$

Fir

Total Growing Stock = 2194.74 M³

Rotation = 135 Years

Therefore, the $AY = \frac{2 \times 2194.74}{135} = 32.51 \text{ or say } 30 \text{ M}^3$

Spruce

Total Growing Stock = 24758.70 M³
Rotation = 135 Years

$$\text{Therefore, the AY} = \frac{2 \times 24758.70}{135} = 366.80 \text{ or say } 365 \text{ M}^3$$

Total Growing Stock	
Species	Volume (in Cum)
Deodar	5940
Kail	210
Fir	30
Spruce	365
Total	6545

3.16.3 Calculations from Smythies formula:- This is also known as UP safe-guarding Formula. It was evolved by Smythies in the thirties, mainly for Sal Forests of UP; which were worked under selection system and where the chief objective of management was the production of trees of large size. Smythies found that in most of the plans there was tendency to regard everything above the selection limit as surplus stock. Therefore, this tendency had been responsible for decrease in the yield from the selection trees.

The yield from this formula is calculated by the number of selection trees calculated by this formula, which defines the yield available during the felling cycle as the number of trees of the next lower diameter class may be expected to grow up the exploitable sizeduring the felling cycle, i.e.:-

$$X = \frac{f}{t} \quad (\text{II} - z\% \text{ of II})$$

Where X = Basic yield.

f = the felling cycle in years.

t = the period it take for the approach class into exploitable size.

II = the existing number of trees of approach class.

Z = the mortality percentage.

The value of 't' and 'z' for various species, as given in the chapter will be used for the yield calculations.

The annual yield will be expressedas the percentageof selection trees to be removedaccording to the following formula :-

$$Y = \frac{X}{I + \frac{X}{2}} \times 100 \pm A$$

Where Y = the annual yield expressed as a percentage.

X = the yield during the felling cycle

I = the number of I class trees, as enumerated.

A = an arbitrary value adopted for purposes of empirical adjustment etc.

After calculating 'x' the area of the working circle of the Felling Series, its further divided into 'f' annual coupes .

Since this formula is mainly to prescribe and area yield by divideing the forest into 'f' annual coupes and limiting the removal of I class trees to a percentage (p) there number per hectare 'N' in the coupes of the year at the time of the marking. This formula is basically when the yield is prescribed by area.

Perusal of the above paragraphs reveals that this formula is not applicable for calculating the yield in this division.

3.16.4 Calculation of Yield from Hufnagels Formula:-

3.16.4.1 Yield from PB-I areas:- The enumeration down to 10 cms dbh in 10 cms dia classes has been carried out in Five numbers sample plots of size 0.1 ha. each, of PB-I areas and the details are given in the **Appendix No.-XI**. The abstract showing the growing stock of class wiseand species wise of PB-I areas is tabulated in Table No. 3.14

Table-3.14
Species wise No. and Volume in cubic mts.(Estimated growing stock) for Deo/Kail Working Circle

Species wise No. and Volume in cubic mtrs. (Estimated growing stock) for Dry Zone Deo / Kail Working Circle PB-I (Area = 560.48)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
241	Deodar	Number	4484	14572	15693	12331	5605	7847	2242	1121	0	1121	65016
		Volume in Cubic Mtrs	134.52	3351.67	11142.34	20961.95	14292.24	26678.85	9528.16	5391.82	0	5391.82	96873.36
926	Kail	Number	2242	2242	2242	1121	1121	1121	0	0	0	0	10089
		Volume in Cubic Mtrs	67.26	515.64	1591.76	1905.63	2533.37	4125.13	0	0	0	0	10738.8
2	Fir	Number	0	0	0	0	0	0	0	0	0	0	
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	
921	Spruce	Number	0	0	0	0	0	0	0	0	0	0	
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	
19	Maple	Number	0	0	0	0	0	0	0	0	0	0	
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	
38	Aescules	Number	0	0	0	0	0	0	0	0	0	0	
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	
47	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	
651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	
969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	
965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	
1010	Ban Oak	Number	1121	0	0	0	0	0	0	0	0	0	1121
		Volume in Cubic Mtrs	493.22	0	0	0	0	0	0	0	0	0	493.22
2000	Other B/L	Number	0	0	1121	0	0	0	0	0	0	0	1121
		Volume in Cubic Mtrs	0	0	257.82	0	0	0	0	0	0	0	257.82
		Number	7847	16814	19056	13452	6726	8968	2242	1121	0	1121	77346
	G Total	Volume in Cubic Mtrs	694.9952	3867.312	12991.926	22867.584	16825.61	30803.98	9528.16	5391.818	0	5391.818	108363.2

Calculation of the yield has been based on the volume of the trees of 40 cms dbh and over. Increment has been ignored. From the management point of view and theoretically the entire growing stock except the mother trees above 40 cms diameter should be available during the plan period. Since, a compact group of poles shall be retained as advance growth and some trees will be left on broken and steep grounds, only a part of II and III/IV class trees will be available. Similarly, the yield from I and II class trees will be further restricted as some trees have to be retained as emergency reserve and fire insurance trees. The trees standing on blanks or over patches where regeneration has not established shall also be not available. Therefore, the yield on the basis of silvicultural availability is calculated as under:-

$$Y = \frac{C1V1 + C2V2 + C3V3}{P}$$

Where V1, V2 and V3 are the volumes of I class, II class trees and III and IV class trees respectively:-

P= Plan period i.e. 10 years.

C1, C2, C3 are the constants representing percentage of I class, II class and III class and IV class trees respectively estimated to be available for felling during the regeneration period. The values of constants of C1, C2, C3 have been fixed as under after detailed examination of forests during field inspections. These figures are arrived at after analysis number of stems per hac. emerged after considering field conditions and is tabulated in Table No. 3.15

Table – 3.15

Species	C1	C2	C3	
Deodar	0.1	0.1	0.1	% is lower for Deodar as these are to be retained as seed bearers as far as possible in preference to Kail
Kail	0.7	0.6	0.5	
Fir	0.6	0.5	0.6	
Spruce	0.6	0.6	0.5	

The above proportion is based on purely theoretical consideration as they are reliable and emerged after considering field conditions and are well suiting proportions.

The yield is now calculated by Hufnagels formula as under:-

$$Y = \frac{C1V1 + C2V2 + C3V3}{P}$$

(Deodar) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.1.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.1.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.1.

(Deodar) V1= Volume of trees of I class trees of conifers = 46990.64 M³

V2= Volume of trees of II class trees of conifers = 35254.19 M³

V3= Volume of trees of IV and III class trees of conifers = 14494.01 M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1 + C2V2 + C3V3}{P}$$

$$Y = \frac{0.1 \times 46990.64 + 0.1 \times 35254.19 + 0.1 \times 14494.01}{10} = 967.39 \text{ or say } 950 \text{ M}^3$$

(Kail) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.7.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.6.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.5.

(Kail) V1= Volume of trees of I class trees of conifers = 4125.13 M³

V2= Volume of trees of II class trees of conifers = 4439.00 M³

V3= Volume of trees of IV and III class trees of conifers = 2107.40M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.7 \times 4125.13 + 0.6 \times 4439.00 + 0.5 \times 2107.40}{10} = 660.45 \text{ or say } 660 \text{ M}^3$$

(Fir) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.6.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.5.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.6.

(Fir) V1= Volume of trees of I class trees of conifers = 0.00 M³

V2= Volume of trees of II class trees of conifers = 0.00 M³

V3= Volume of trees of IV and III class trees of conifers = 0.00 M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.6 \times 0.00 + 0.5 \times 0.00 + 0.6 \times 0.00}{10} = 0.00 \text{ say } 0.00 \text{ M}^3$$

(Spruce) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.6.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.6.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.5.

(Spruce) V1= Volume of trees of I class trees of conifers = 0.00 M³

V2= Volume of trees of II class trees of conifers = 0.00 M³

V3= Volume of coniferstrees of IV and III classes = 0.00 M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.6 \times 0.00 + 0.6 \times 0.00 \times 0.5 \times 0.00}{10} = 0.00 \text{ or say } 0.00 \text{ M}^3$$

Therefore, the annual yield of different species is summarized as under for P.B.I:-

Table – 3.15

Sr. No.	Species	Annual yield (m ³)
1	Deodar	950
2	Kail	660
3	Fir	0
54	FirSpruce	0
Total		1610

3.16.4.2 Yield from PB-III Area:- The enumeration samples down to 10 cms dbh in 10 cms dia classes has been carried out in Eight numbers of PB-III areas and the details are given in the **Appendix No.-XI**. The abstract showing the growing stock of class wise and species wise of PB-III areas is tabulated in table No. 3.16

The results have been analyzed statistically and growing stock has been assessed / extaplotted. The results of enumeration samples taken Range wise is tabulated in table No. 3.16

Table – 3.16

Sr. No.	Name of Range	Sample Taken
1	Bhaba Nagar	0
2	Kalpa	3
3.	Katgaon	0
4.	Kilba	5
5.	Moorang	0
6.	Nichar	0
7.	Pooh	0
8	Malling	0
	Total	8

The abstract of growing stock is tabulated in the Table No 3.17

Table – 3.17

Species wise No. and Volume in cubic mtrs. (Estimated growing stock) for Dry Zone Deo / Kail Working Circle PB-III (Area = 365.03)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	10038	15970	18252	10951	7301	3650	0	0	0	0	66162
		Volume in Cubic Mtrs	301.15	3673.11	12958.57	18616.53	18616.53	12411.02	0.00	0.00	0.00	0.00	66576.91
0926	Kail	Number	913	1369	1369	0	456	0	0	0	0	0	4107
		Volume in Cubic Mtrs	27.38	314.84	971.89	0.00	1031.21	0.00	0.00	0.00	0.00	0.00	2345.32
0002	Fir	Number	0	456	0	0	0	456	0	0	0	0	913
		Volume in Cubic Mtrs	0.00	127.76	0.00	0.00	0.00	2066.98	0.00	0.00	0.00	0.00	2194.74
0921	Spruce	Number	2281	1825	5475	1825	913	913	1825	0	0	0	15057
		Volume in Cubic Mtrs	136.89	511.04	3887.57	2591.71	2327.07	3878.44	11370.68	0.00	0.00	0.00	24703.41
0019	Maple	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0965	Bird Cherry	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1010	Ban Oak	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
		Number	13232	19620	25096	12776	8669	5019	1825	0	0	0	86238
	G Total	Volume in Cubic Mtrs	465.41	4626.76	17818.03	21208.24	21974.81	18356.45	11370.68	0.00	0.00	0.00	95820.38

The calculation of yield has based on the total volume of trees in PB-III. Increment has not been taken into account. All I and II class trees do not warrant their intension in this periodic block and as such can be removed during the plan period. Silviculturally, it is not possible to remove all such trees. Trees standing on precipitous and broken ground have to be retained. Besides this, some I and II class trees will have to be kept as fire insurance and national emergency reserves. Similarly, the II class trees standing amongst the patches of advance growth will not always be available for fellings. This being so, it has been estimated that only 75% of the volume of I and II class trees can be removed during the Working Plan period. In addition to this another 10% volume of trees 20 cms to 40 cms dbh will be available under thinning. The annual yield of different species is accordingly fixed as under:-

C1, C2, C3 are the constants representing percentage of I class, II class and III class and IV class trees respectively estimated to be available for felling during the regeneration period. The values of constants of C1, C2, C3 have been fixed as under after detailed examination of forests during field inspections. These figures are arrived at after analysis number of stems per hac. emerged after considering field conditions and is tabulated in Table No. 3.18

Table – 3.18

Species	C1	C2	C3	
Deodar	0.1	0.1	0.1	% is lower for Deodar and Spruce as these are to be retained as seed bearers as far as possible in preference to other species.
Kail	0.6	0.5	0.4	
Fir	0.2	0.3	0.3	
Spruce	0.1	0.1	0.1	

The yield is now calculated by Hufnagels formula as under:-

$$Y = \frac{C1V1+C2V2+C3V3}{P}$$

(Deodar) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.1.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.1.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.1.

(Deodar) V1= Volume of trees of I class trees of conifers = 12411.02 M³

V2= Volume of trees of II class trees of conifers = 37233.06 M³

V3= Volume of trees of IV and III class trees of conifers = 16631.68 M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.1 \times 12411.02 + 0.1 \times 37233.06 + 0.1 \times 16631.68}{10} = 662.76 \text{ or say } 650M^3$$

(Kail) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.6.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.5.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.4.

(Kail) **V1**= Volume of trees of I class trees of conifers = 0.00 M³
V2= Volume of trees of II class trees of conifers = 1031.21 M³
V3= Volume of trees of IV and III class trees of conifers = 1286.73M³
P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.6 \times 0.00 + 0.5 \times 1031.21 + 0.4 \times 1286.73}{10} = 103.03 \text{ or say } 100M^3$$

(Fir) **C1**= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.2.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.3.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.3.

(Fir) **V1**= Volume of trees of I class trees of conifers = 2066.98 M³
V2= Volume of trees of II class trees of conifers = 0.00 M³
V3= Volume of trees of IV and III class trees of conifers = 127.76M³
P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.2 \times 2066.98 + 0.3 \times 0.00 + 0.3 \times 127.76}{10} = 45.17 \text{ or say } 45 M^3$$

(Spruce) **C1**= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.1.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.1.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.1.

(Spruce) **V1**= Volume of trees of I class trees of conifers = 15249.13 M³
V2= Volume of trees of II class trees of conifers = 4918.77 M³
V3= Volume of trees of IV and III class trees of conifers = 4398.61 M³
P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.1 \times 15249.13 + 0.1 \times 4918.77 + 0.1 \times 4398.61}{10} = 245.66 \text{ or say } 245 M^3$$

Therefore, the annual yield of different species is summarized as under for P.B.III:-

Table – 3.16

Sr. No.	Species	Annual yield (m ³)
1	Deodar	650
2	Kail	100
3	Fir	45
4	Spruce	245
Total		1040

3.17 Total Prescribed Annual Yield:-The total Annual prescribed yield from the forests of this Working Circle is tabulated in Table 3.19 as under. However, the yield from PBIII as mentioned above will counted toward the yield of PB-I, since no forest will be available for commercial felling.

Table – 3.19

Species	PBI	PBIII	Total
Deodar	950	650	1600
Kail	660	100	760
Fir	0	45	45
Spruce	0	245	245
Total	1610	1040	2650

3.17.1 Comparative Statement:- The comparative Statement of Annual Yield obtain by using both the Methods is given below:-

Methodology		
Von Mantel's		Hufnagels Formula
Name of Species	Volume (in Cum)	Total Volume (in cum)
Deodar	5940	1600
Kail	210	760
Fir	30	45
Spruce	365	245
Total	6545	2650

The yield calculated by adopting the Hafunagel's formula is only **40.48** percent of the yield obtained by using Von Mantel's method and it is conservative.

Therefore, Hafnagel's formula is adopted in the current plan which is conservative.

3.18 Control of Yield:-All the removals of, whatever, nature down upto V class shall count towards yield of this Working Circle. It is indeed impossible that the removal of various species in a particular year will conform to or equalize the prescribed yield for each species. In actual practice, this is ruled out. It is, therefore, imperative that the marking in the forests should be carried out strictly on silvicultural principles. However, yield will be shown by species in the control forms and deviation statement. The deviation for a year, a period of five year and a plan period shall not exceed +- 25%, +10% and +-05% respectively, of the annual prescribed yield. Felling in the PBI areas will depend on the progress of regeneration. It is, therefore, most essential that critical regeneration survey of felled PBI areas is carried out annually, so as to assess the progress of regeneration. In case, it is observed and revealed that regeneration is not keeping pace with the felling, further fellings shall be discontinued or deferred till such time by which regeneration in the felled PBI areas gain momentum. The detailed report should be sent to Pr. CCF HP through CCF Working Plan and

CF Working Plan for information, scrutiny and orders. All the removals, what so ever, down to 10 cms dbh in all the periodic blocks will count towards the prescribed yield. The yearly regeneration survey and results should be maintained in control forms every year to facilitate check of continuation of operation.

3.19 Method of Executing the Felling:-

3.19.1 In PB-I Areas:- The technique of regeneration marking is given in CCFs, Technical Order No. 2 of the Punjab Forest Manual-Volume III and must be carefully studied by the marking officer and complied. It must be emphasized that marking must aim at obtaining natural rather than artificial regeneration on suitable ground. The skill of the forester in manipulating the canopy lies in his getting natural regeneration. A little patience will bring in considerable quantities of natural regeneration of Deodar on suitable ground in Deodar and mixed Deodar and Kail forests and subsequent, opening of canopy will bring in sufficient Kail. In upper part of the compartment at present being occupied by Spruce and Fir on well drained ground suitable for Deodar, the canopy must be opened out some what heavily and followed by artificial sowing and planting. Elsewhere, i.e. in diameter per parts the aim must be to get Spruce and Fir regeneration and the opening here must conform to the silvicultural requirements of these species. Spruce requires nearly the same amount of opening as Deodar. The detailed treatment map of forest indicating the type of marking carried out shall be prepared and posted in compartment history file.

- The following general principles are, however, laid down for guidance of marking officer:
- (i) In seeding fellings, in case of pure crop of Deodar, the number of seed bearers retained will be 35-50 (65 m³) volume per hac. In case of Kail, this number will be 30 to 35 trees (56 to 65 M³ volumes) per hac. In both the cases, these trees will invariably be of 35 to 55 cms diameter classes and uniformly spaced all over the areas. The average distance of seed bearers shall be 16 to 18 mts. in case of Deodar and 18 to 20 mts. in case of Kail. In case of mixture of Deodar and Kail 30 to 45 trees (56.5 to 84.74 M³ volumes) per hac. of both Deodar, Kail of dia 35 to 55 cms per hac. shall be retained uniformly spaced all over the area.
 - (ii) Well grown healthy, tall and clean boled trees preferably II to I A class trees should be selected as Seed bearers.
 - (iii) In conformity with the distance consideration as far as possible seed bearers shall be left on spurs and ridges and not in depressions for better seed dispersal.
 - (iv) Compact group of healthy poles upto 40cms. dbh and not less than 0.1 hac. in extent will be retained as advance growth/future crop. It must be clearly understood and remembered that the diameter fixed for retention applies to the diameter at the time of first marking i.e. seedling felling. Once a group is retained it shall not be opened up for regeneration in the subsequent years. Vigour and condition of pole crop must determine its retention rather than its extent.
 - (v) On the very steep and broken ground the marking should conform to the selection principle.
 - (vi) In mixed crops, Deodar shall be preferred to Kail as seed bearer.
 - (vii) Groups of pole crop retained as part of future crop shall be thinned.
 - (viii) Valuable broad leaved trees such as Maple, Walnut, Bird cherry and Carpinus etc. will be preferred to other less valuable species. The seed bearer of these species should be spaced about 20 mts. apart.
 - (ix) Before undertaking any forest for seeding felling, it shall be ensured that the nursery stock is ready to replace the fellings immediately after timber have been extracted from the forest. To achieve this objective the nurseries should be raised 2 to 3 years in advance in the vicinity of the areas to be undertaken for fellings. In case neither nurseries has been raised nor is the

stock available for planting. No marking/felling shall be done and the yield for that particular year should be considered as obtained.

- (x) The secondary felling will be carried out, keeping in view the progress of regeneration and when the seedlings have retained height of over two meters. The Number of trees retained during the seeding fellings shall reduce to 50% during secondary fellings.
- (xi) The final fellings shall be carried out when average height of new crop exceeds three meters and 4-5 healthy clean bole and vigorously growing trees per hac. shall be retained as mother trees.

3.19.2 In PB-II Areas:-This being sacred periodic block, no major felling of any kind and magnitude will be done in PB-II. However, only salvage marking of dead, uprooted trees will be done to clear these forests from fire hazards and improvement of the crop. The yield removed from these PBs shall be counted for yields towards the yield of the Working Circles.

3.19.3 In PB-III Areas:-These markings require the removal of overhead shade, wherever, standing on established regeneration. These final fellings, therefore, correspond to more or less to the fellings in PB-I. Besides this, thinning in patches of advance growth is to be done. The following general principles are laid down for the guidance of marking officer:-

- (i) No attempt should be made to obtain or induce regeneration. The marking should aim at freeing the established regeneration by removing the over wood. Thus, I and II class trees standing over the established regeneration will be marked.
- (ii) The object of marking is to free established regeneration by removal of overhead shade. Thus, all class I and II trees should be removed except those standing on precipitous slopes.
- (iii) All class I and II trees standing over established regeneration should be marked, except those not being available silviculturally, such as, on difficult and broken ground.
- (iv) All isolated Class II and III trees standing amidst young crop should be marked as they are likely to develop into wolf trees.
- (v) Saleable and unsaleable thinnings must be carried out in congested groups of trees, poles or saplings. These should correspond to “C” Grade thinning.
- (vi) All marked trees likely to damage young crop underneath should be lopped before felling.
- (vii) Broad leaved tree should not be marked unnecessarily on the pretext of improvement fellings. These should, however, be lopped where found suppressing the young crop.

3.20 Table of Felling:-The following tabular statement gives the order of fellings in PB-I, and PB-III

Table 3.20
PB-I

Year	Range	Name of Forest	Comptt. No.		Area in Hac.	Allotment	Nature of felling
			Old	New			
1	2	3	4	5	6	7	8
2019-20	-	-	-	-	-	-	-
2020-21	-	-	-	-	-	-	-
2021-22	Kalpa	Barang	171 (a)	75 (a)	21.85	PB-I	Seedling Felling
2022-23	Kalpa	Chini	243 (a)	147 (a)	16.2	PB-I	Seedling Felling
2023-24	Kilba	Kumkumi	142 Part	48 Part	25	PB-I	Seedling Felling
2024-25	Kilba	Kumkumi	142 Part	48 Part	25	PB-I	Seedling Felling
2025-26	Kilba	Kumkumi	142 Part	48 Part	18.4	PB-I	Seedling Felling
2026-27	Kalpa	Boktu	238 Part	142 Part	25.37	PB-I	Seedling Felling

2027-28	Kalpa	Boktu	238 Part	142 Part	20	PB-I	Seedling Felling
2028-29	Kalpa	Boktu	238 Part	142 Part	21	PB-I	Seedling Felling

PB-III

Year	Range	Name of Forest	Comptt. No.		Area in Hac.	Allotment	Nature of felling
			Old	New			
1	2	3	4	5	6	7	8
2019-20	-	-	-	-	-	-	-
2020-21	-	-	-	-	-	-	-
2021-22	Kilba	Barang	170 (b)	74 (b)	23.88	PB-III	Final felling and removal of overhead shade.
2022-23	Kilba	Barang	170 (a)	74 (a)	55.04	PB-III	Final felling and removal of overhead shade.
2023-24	Kalpa	Chagaon III	257	161	17.4	PB-III	Final felling and removal of overhead shade.
	Kalpa	Runang	248 (b)	152 (b)	63.53	PB-III	Final felling and removal of overhead shade.
2024-25	Kilba	Sapni	144	50	17.8	PB-III	Final felling and removal of overhead shade.
2025-26	Kalpa	Barang	173	77	13.76	PB-III	Final felling and removal of overhead shade.
	Kilba	Meber	169 (b)	73 (b)	24.68	PB-III	Final felling and removal of overhead shade.
2026-27	Kalpa	Barang	174 (a)	78 (a)	28.33	PB-III	Final felling and removal of overhead shade.
2027-28	Kilba	Meber	169 (a)	73 (a)	21.04	PB-III	Final felling and removal of overhead shade.
2028-29	Kalpa	Barang	175 (b)	79 (b)	53.42	PB-III	Final felling and removal of overhead shade.

3.21 Subsidiary Silvicultural Operations, Cleaning and Thinning:-

Following subsidiary silvicultural operations are prescribed:-

3.21.1 Subsidiary Silvicultural Operations in PB-I:-

The following subsidiary operations will be carried out soon after the fellings in this Periodic block.

- (a) Disposal of felling refuse in accordance with the instructions lay down in Punjab Forest leaflet No. 6 shall be referred to for details.
- (b) Removal of trees of inferior species interfering with the young regeneration, if any, be left unfelled.
- (c) Lopping of broad leaved species interfering with the growth of young crop of coniferous.
- (d) Cleaning in the existing regeneration patches and climber cutting should be carried out, wherever, necessary.
- (e) Shrub cutting shall be done, wherever, needed for providing clean seed bed.
- (f) The villagers should be encouraged to collect the left out material from the sold lot, so as to reduce the cost.
- (g) Unfit refuse should be burnt under control which will provide a clean bed and also act as stimulant to boost up regeneration.

3.21.2 Artificial Regeneration:- Effective closure coupled with judicious manipulation of the canopy is very important, to induce good natural regeneration. But, due to hostile factors, natural regeneration is likely to fall short of the requirements. The plantation raised in the past in this working circle has floundered due to drought. Therefore, raising of irrigated plantations is suggested. Successful example of irrigated plantations can be seen in Barang and Runang forests. Artificial regeneration should be taken up in hand immediately, without waiting for natural regeneration to come out. The technique of artificial regeneration is described in Punjab Forest Leaflet No. 4 and Himachal Pradesh Forest Manual-Volume IV and shall be followed. The natural regeneration, however, depends on good seed year which may not synchronize with the year of fellings. Thus, if only natural regeneration relied upon, there is the danger of the area being invaded by weeds and bushes. In view of these impediments, artificial sowing and planting will be taken up immediately after fellings. This will on one hand reduce the period of closure and on the other restock the area expeditiously.

Temporary nursery of Deodar, Fir, Spruce and broad leaved species like Walnut, Horse chestnut, Poplar etc. should be laid at least in advance in the proximity to the area to be felled. Each of the felled area will be planted up in rainy season following the year of exploitation. Subject to the year of fellings, sowing of this species can be taken up even during the year of fellings. The nurseries should be extended to the subsequent years depending upon regeneration. The guidelines issued by PrCCF HP. regarding nursery techniques for raising the good Deodar seedlings should be followed and plants less than 25 cms in height should not be planted at all. The patch/line sowing of Kail will be done on the dry and exposed sites, where Deodar is not expected to do well. No attempt should be made to convert Spruce and Silver Fir forest into Deodar except in tension belt below 2400 mts. where site conditions are favourable for Deodar. Similarly, broad leaved species should be planted along nalas and in moist location where these grow naturally as well. The technique of raising Deodar and Kail is well established. However, Punjab Forest Manual Technical order No. 3 and 4 along with Himachal Pradesh Forest Manual-Volume IV should also be consulted.

It is also pointed out that it is futile to attempt to fill Thaches/Pats and shallow rocky southern and south west slopes with deodar where at best an open crop of Kail is all that nature intended. Moreover, these grassy plots in the forest areas is of immense value of grazing ground to the villages and keep them contended, whereas, their value to the forest department is at best secondary.

3.21.3 Planting Programme:- The yield prescribed from the forest area in this Working Circle is directly proportionate to area planted successfully. Any slackness in plantation is going to reduce for the forest area for obtaining the prescribed yield. To achieve this objective detail planting programme has been given in the Plantation (overlapping) Working Circle.

3.21.4 Tending Operations:-Young regeneration has to be nursed and tended, so as to produce high quality of timber. The tending is the most essential silvicultural operation in the young plantation area. However, the cost of tending operation is more than repaid by production of high quality stems and stands.

3.21.5 Weeding:-All the regeneration areas should be properly weeded out in the infancy. Normally, two weedings, one in June-July and another in August-September are considered sufficient for young plantations. Number and frequency of weedings depends upon the incidence of bushes and weeds as also on the condition of regeneration. If more than two weedings are necessitated, these should be carried out without any hesitation for the betterment of the crop. The weeding should be done judiciously and carefully and young plant should be freed of overhead shade.

3.21.6 Cleaning:-It should be carried out in the early stages of plantations and should be continued till the area is suitable for thinnings, so as to produce healthy stems and minimize fire hazards. Best and vigorously growing stems should be retained. All forked, crooked, sickly and damaged stems should be removed in cleanings so as to provide growing space to better stems. An important point in cleanings is to never cut more than where it is absolutely necessary. In Deodar plantations, Kail has been found coming up naturally in plenty. Kail is two to three times faster than Deodar. Therefore, all Kail competing with healthy Deodar must be cut when it is young or else it may be too late as Deodar may be too suppressed to respond and reach sufficiently. The intensity of cleaning must aim at fairly rapid increment to make the young crop fire resistant within reasonable time and also not to permit the side branches to persist unnecessarily. The cleaning is prescribed in detail in Technical order No. 1 of Punjab Forest Manual-Volume III and must be studied thoroughly.

3.22 Other Regulations

3.22.1 Fire Protection: The whole Working Circle will be under strict vigil against fire hazard. Preventive measure should be taken advance. Incendiary forest fires are very common and as such the forests are required to be strictly protected from these. The forests floor should be kept clean of inflammable material such as debris, unwanted bushes, weeds, needles and grass. The areas are prone to fire during May to June and then from October to December. Intensive patrolling coupled with regular cleaning of fire line and inspection path should suffice to keep the incidence of fire under control. The fire lines, inspection paths and bridle paths should be kept clean of needles especially during summer season. Fire watcher should be employed during dry month's relations with the local protection of the forest from fire. Besides this, maintaining cordial relations with the local people and educating them properly with regard and to importance of forest conservation, rights and duties and social obligation as enshrined in Article 51 A(g) of the Constitution of India read with Section 79 of the Indian Forest Act, 1927. The detail description is given in Chapter No. IX, the Forest Protection (overlapping) Working Circle.

3.22.2 Grazing and Grass Cutting: Outside the regeneration areas, there will be no restriction on grass cutting. In all the PB-I areas under regeneration, grass cutting will not be allowed till the plants are at least 1 meter in height. Grass cutting in closed areas shall be allowed under the supervision of forest guard that no young, seedlings/sapling are cut. Grazing shall be strictly prohibited in the regeneration areas during the closure period under Section 30 (b) of Indian Forest Act, 1927.

3.22.3 Right Holder's Demand: Demand of right holder for timber will be met as per H.P. Govt. Notification dated 2nd January, 2010 and latest revised Notification No. FFE-B-A (3) 4/2015 Dated: Shimla -2, the 26 February, 2016. Rest of the demand of rights holders will be met from the forest as per the provision of Forest Settlement Report, 1921 and right and concessions shall be exercised strictly in accordance with the silviculture principles. Thus, all rights can be exercised subject to silvicultural availability. No trees should be marked from PB-I areas after the marking of seedling

fellings have been done till the regeneration is fully established. Trees should be marked strictly in accordance with the silvicultural principles and not necessarily according to the convenience of right holders. No trees should be marked from the PB-I area. From other PBs, the trees to be marked to meet out the demand of right holder should be such as are required to be removed during the course of thinning and improvement fellings and final fellings. The trees can be removed/felled from forest irrespective of the prescribed year of fellings. All the trees marked to meet the demand of right holders shall count towards the prescribed yield. Dry and fallen trees should primarily be utilized to meet the right holders demand etc.

3.22.4 Closures: After the seedling fellings are over, the all PB-I areas should be closed immediately till the regeneration is established for the period of 30 years. The area will have to be closed for grazing till the regeneration is established. Normally, this period is 20-30 years, Govt. notification for such closure should be got issued under Section 30 (b) of Indian Forest Act, 1927 well in time after approval of felling programme by the competent authority to avoid any litigation.

3.22.5 Lopping: Lopping generally is heavy near habitation and also in those forests which are on the road side or approach to road side etc. It should be stopped immediately, as it makes trees susceptible to disease and retards growth in future. However, lopping may be allowed to the right holders strictly as per the provision of Forest Settlement Report, 1921 and action as per the provision of Indian Forest Act, 1927 should be taken, if any, person or authority or agent violated the rules or provision of Forest Settlement Report, 1921. The detail/description is given in Chapter-IX in the Forest Protection (overlapping) Working Circle.

3.22.6 Regeneration Survey: The regeneration survey of felled PB-I areas shall be carried out every year, till the stock is established. If regeneration is inadequate, further fellings will be curtailed for the next year. The reasons for failure should be detailed and corrective measures taken. The regeneration should be made to keep pace with the fellings and in case there are short falls on this account with reference to the prescription of the Working Plan, the further fellings should not be carried out and deferred till the problem is resolved.

CHAPTER IV

THE FIR/SPRUCE WORKING CIRCLE

4.1 General Constitution:- This Working Circle includes all the demarcated and undemarcated protected forests which predominantly contain the pure Silver Fir and Spruce or in a mixture containing Fir and Spruce with 60% or more as component and are fit for working under the Indian Irregular Shelter Wood System have been allotted to this Working Circle. The basic constitution of this Working Circle remains the same as in the earlier plan and the areas which were not included in the plan under revision and the areas transferred from Wild Life Division, Sarahan to Kinnaur Forest Division has also been included in this working circle. This Working Circle covers an area of **6523.15Hac.**

4.2 General Character of Vegetation:- The detailed description of the forests is given in Chapter II of Part I and the forests included in this Working Circle mainly conform the Champion and Seths type Group 12 (Himalayan Moist-Temperate Mixed Conifer Forests), 12 C1d (Western Mixed Coniferous Forest) (Spruce, Blue pine Silver Fir forest,) 12/C2b (West Himalayan Upper Oak/Fir forests) and Group 14 (Sub alpine forest) 14/C1 (West Himalayan Sub alpine Birch/Fir forests) (Betula/Abies), 14C1a, C1b (West Himalayan Sub alpine Birch/Fir Forest). The Silver Fir and Spruce are the main species of this Working Circle. The Silver Fir predominates in the upper parts and spruce in lower down. In the cooler localities and depressions, Silver Fir descends up to 2500 meters, whereas Spruce penetrates higher along warmer spurs. Some Deodar is also found in groups on rocks and precipitous areas and Kail on exposed spurs ridges and in the lower reaches of forests such as seen in **C-1 (c), C-12 (a).** Some scattered trees of Deodar also occur singly all in groups. In Wet Zone portion particularly in the forest of Nichar and Bhaba Nagar Ranges, Yew (*Taxus baccatta*) forms an important under storey. Broad leaved species like Acer, Prunus, Juglans, Aesculus, Taxus and Betula etc. occupy the sizeable areas along valleys depressions and moist sites. Kharsu, Oak is found mixed with Fir or pure in top upper belt. The forests are very much under stocked and there is preponderance of mature to over mature trees. These forests had been exploited in the past for packing cases. Many of the over mature trees are unsound and unhealthy, which has been retained, while, meeting the requirement of local saw millers for manufacturing of packing cases. Natural regeneration in the Silver Fir and Spruce forest is generally deficient owing to several inhibiting factors such as heavy weed growth of *Desmodium tiliaefolium*, *Strobilanthes* Spp and *Arundinaria fulcata* etc. The felling refuse of the past fellings and salvage removals is very heavy and the areas are also heavily grazed. The forests are covered with snow for several months in winter. The silver fir regenerates itself freely, whenever, the Oak and other broad leaved trees form a light under storey in the forests.

4.3 Special Objects of Management:- Without prejudice to general objects of managements, the special objects of managements of the forest allotted to this Working Circle are:-

- (i) To restock the areas deficient in regeneration either naturally or through artificial means.
- (ii) Gradual conversion of irregular stock to normal stock, thus, to build up growing stock.
- (iii) To improve the existing Forest covers for soil and water conservation.
- (iv) To obtain normal forests with normal distribution of age classes as far as possible.
- (v) To restock all the poorly stocked areas and blank patches by natural and artificial means.
- (vi) To improve the biodiversity of the areas.
- (vii) To achieve progressively increasing sustained yield of Fir and Spruce timber consistent with the scientific management.

4.4 Areas Statement:- The total area of this Working Circle is **6523.15hac.**, this works out to be **18.39%** of the total area of the division. The Range wise distribution of these forests is tabulated in Table No. 4.1

Table 4.1

Name of Range	DPF	UPF	Total in hac.
Bhaba Nagar	1196.82	1707	2903.82
Kalpa	212.89	0	212.89
Katgaon	242	970	1212
Kilba	209.23	0	209.23
Malling	0	0	0
Moorang	0	0	0
Nichar	1985.21	0	1985.21
Pooh	0	0	0
Total	3846.15	2677	6523.15

The forest wise detail of specific allotment is given in **Appendix No.-IV**

4.5 Blocks and Compartments:-No change in the existing compartments and sub compartments has been made. The compartments and sub compartments have been numbered systematically both for DPFs and UPFs, which was necessitated due to creation of new DPFs and transfer of areas from Wild Life Division, Sarahan and inclusion of the left out areas which were not included in the Rajiv's plan.

4.6 Felling Series:-One Felling series has been formed i.e. **Sutlej felling series**, conforming to the territorial jurisdiction of Kinnaur forest Division.

4.7 Analysis and Valuation of the Crop:-Except for the converted crop during the period of previous plans (before the ban on green felling) the crop is irregular having all the age classes in the same areas. The converted crop, however, is generally well stocked having more or less represented almost equally, generally in mixture and sometimes as pure crop of Fir and Spruce separately. Deodar and Kail trees are also found in groups on rocks and precipitous on exposed spurs respectively. Broad leaved species like Acer, Prunus, Juglans, Aesculus, and Betula etc. occupy the sizeable areas along nalas depressions, Kharsu Oak is found mixed with Fir or pure in top upper belt. The regeneration of Fir and Spruce is deficient owing to the several inhibiting factors like heavy weed growth, accumulation of heavy felling refuse and biotic interferences of which grazing and fires are the most serious.

4.7.1 Stock Map:-The stock maps on 4"=1 Miles scale, have been prepared and digitized for all the forests separately.

4.7.2 Density:-The crown density of each compartment has been estimated ocularly and has been recorded in respective compartments history files. The average density of the crop varies from 0.3 to 0.6.

4.7.3 Site Quality:-The site quality of the crop varies from place to place overall quality conform to II/III of the FRI quality classes. The site quality of individual compartments/ sub-compartment has been indicated in the compartment history files.

4.7.4 AgeClasses:-The crop is very irregular. There is predominance of mature to over mature classes. The overall age condition is tabulated in table No. 4.2

Table 4.2

	Young, 10-29 cms	Middle aged, 30-59 cms	Mature & over Mature 60 cms & above
Stems	503299	566685	370336
Volume	61086.98	697948.61	2061572.96

4.7.5 Enumerations:-As given in the Chapter-VIII under paragraph 8.8 sampled enumeration was carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The whole of the area of the Kinnaur Forest Division was divided into grids and total 16 Nos. Sample plots have been done by sampling in all PB's areas. The results have been analyzed statistically. The results of enumerations are given in **Appendix No-XII**. The growing stock has been assessed / extrapolated and is also given in **Appendix No-XVII**.

Table-4.3

Species wise No. and Volume in cubic mts. (Estimated / extrapolated growing stock) for Fir/Spruce Working Circle PB-I (Area = 1180.66)														
Sr. No.	Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	241	Deodar	Number	1968	0	0	7871	3936	3936	1968	1968	1968	1968	25581
			Volume in Cubic Mtrs	118.07	0	0	14482.76	11137.56	14482.76	9464.96	11983.7	13577.59	13577.59	88824.99
2	926	Kail	Number	66904	17710	0	0	0	0	0	0	0	0	84614
			Volume in Cubic Mtrs	4014.24	4958.77	0	0	0	0	0	0	0	0	8973.02
3	2	Fir	Number	7871	9839	13774	7871	13774	5903	5903	3936	0	1968	70840
			Volume in Cubic Mtrs	472.26	2754.87	13636.62	13380.81	38981.46	26741.95	38430.48	30106.83	0	19500.57	184005.86
4	921	Spruce	Number	3936	0	0	0	1968	0	1968	1968	3936	15742	29517
			Volume in Cubic Mtrs	236.13	0	0	0	5017.81	0	12259.19	15053.42	39001.14	156004.54	227572.22
5	1162	Taxus	Number	3936	0	0	0	1968	0	0	0	0	0	5903
			Volume in Cubic Mtrs	39.36	0	0	0	924.85	0	0	0	0	0	964.21
6	1006	Mohru	Number	0	0	0	0	0	0	0	1968	0	0	1968
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	7969.46	0	0	7969.46
7	19	Maple	Number	5903	0	0	0	0	0	0	0	0	0	5903
			Volume in Cubic Mtrs	59.03	0	0	0	0	0	0	0	0	0	59.03
8	38	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
9	47	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
10	1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
11	651	Walnut	Number	0	0	3936	9839	3936	1968	0	0	0	0	19678
			Volume in Cubic Mtrs	0	0	432.91	2262.93	1456.15	1121.63	0	0	0	0	5273.61
12	969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
13	965	Bird Cherry	Number	1968	0	1968	0	0	0	0	0	0	0	3936
			Volume in Cubic Mtrs	19.68	0	452.59	0	0	0	0	0	0	0	472.26

14	2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
			Number	92485	20465	19678	25581	25581	11807	9839	9839	5903	19678	247939
		G Total	Volume in Cubic Mtrs	4958.77	7713.65	14522.12	30126.51	57517.82	42346.34	60154.63	65113.4	52578.73	189082.7	524114.65

PB-II (Area = 1765.35)														
Sr. No.	Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	241	Deodar	Number	0	0	0	0	0	0	0	0	4413	0	4413
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	30452.29	0	30452.29
2	926	Kail	Number	0	8827	4413	8827	22067	22067	8827	0	0	0	75027
			Volume in Cubic Mtrs	0	2471.49	4369.24	17476.965	68627.98	93784.22	49959.405	0	0	0	236689.3
3	2	Fir	Number	30894	30894	22067	13240	22067	0	0	8827	8827	8827	145641
			Volume in Cubic Mtrs	1853.62	8650.22	21846.21	22508.21	62449.26	0	0	67524.64	87473.09	87473.09	359778.33
4	921	Spruce	Number	0	0	0	0	0	0	0	0	0	4413	4413
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	43736.55	43736.55
5	1162	Taxus	Number	0	22067	22067	13240	4413	0	0	0	0	0	61787
			Volume in Cubic Mtrs	0	1324.01	3530.7	3839.64	2074.29	0	0	0	0	0	10768.64
6	1006	Mohru	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
7	19	Maple	Number	0	4413	4413	0	0	0	0	4413	0	0	13240
			Volume in Cubic Mtrs	0	132.4	485.47	0	0	0	0	4987.11	0	0	5604.99
8	38	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
9	47	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
10	1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
11	651	Walnut	Number	0	0	0	0	0	0	4413	4413	0	0	8827

			Volume in Cubic Mtrs	0	0	0	0	0	0	3618.97	4987.11	0	0	8606.08
12	969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
13	965	Bird Cherry	Number	0	0	8827	4413	0	13240	0	0	0	0	26480
			Volume in Cubic Mtrs	0	0	2030.15	1941.89	0	14299.34	0	0	0	0	18271.37
14	2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
			Number	30894	66201	61787	39720	48547	35307	13240	17654	13240	13240	339830
		G Total	Volume in Cubic Mtrs	1853.62	12578.12	32261.77	45766.7	133151.52	108083.55	53578.37	77498.87	117925.38	131209.64	713907.54

PB-U (Area = 3577.14)														
Sr. No.	Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	241	Deodar	Number	53657	71543	89429	29810	59619	59619	11924	5962	0	0	381562
			Volume in Cubic Mtrs	3219.43	20031.984	76014.225	54849.48	168721.77	219397.92	57353.48	36307.97	0	0	635896.25
2	926	Kail	Number	5962	0	5962	0	0	0	0	0	0	0	11924
			Volume in Cubic Mtrs	357.71	0	5902.281	0	0	0	0	0	0	0	6260
3	2	Fir	Number	23848	11924	17886	0	5962	11924	5962	17886	0	17886	113276
			Volume in Cubic Mtrs	1430.86	3338.66	17706.84	0	16872.18	54014.81	38811.97	136825.61	0	177247.29	446248.22
4	921	Spruce	Number	5962	5962	5962	5962	0	0	17886	5962	0	23848	71543
			Volume in Cubic Mtrs	357.71	1669.332	4232.949	8465.898	0	0	111427.91	45608.54	0	236329.72	408092.06
5	1162	Taxus	Number	5962	35771	23848	5962	0	0	0	0	0	0	71543
			Volume in Cubic Mtrs	59.62	2146.284	3815.616	1728.951	0	0	0	0	0	0	7750.47
6	1006	Mohru	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
7	19	Maple	Number	29810	17886	0	5962	0	0	0	0	0	0	53657
			Volume in Cubic Mtrs	298.1	536.571	0	1371.237	0	0	0	0	0	0	2205.9
8	38	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0

9	61	Kunish	Number	0	0	0	35771	5962	0	11924	0	0	0	53657
			Volume in Cubic Mtrs	0	0	0	8227.422	2205.903	0	9777.516	0	0	0	20210.84
10	1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
			Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
11	651	Walnut	Number	0	17886	11924	11924	5962	0	0	0	0	0	47695
			Volume in Cubic Mtrs	0	536.571	1311.62	2742.47	2205.9	0	0	0	0	0	6796.57
12	992	Kainth	Number	0	0	0	5962	0	0	0	0	0	0	5962
			Volume in Cubic Mtrs	0	0	0	2623.236	0	0	0	0	0	0	2623.24
13	965	Bird Cherry	Number	0	0	0	0	5962	0	0	0	0	0	5962
			Volume in Cubic Mtrs	0	0	0	0	4232.949	0	0	0	0	0	4232.95
14	2000	Other B/L	Number	0	0	5962	0	0	17886	5962	5962	0	0	35771
			Volume in Cubic Mtrs	0	0	1371.237	0	0	19316.556	9181.326	12400.752	0	0	42269.87
			Number	125200	160971	160971	101352	83467	89429	53657	35771	0	41733	852552
		G Total	Volume in Cubic Mtrs	5723.42	28259.41	110354.77	80008.7	194238.7	292729.29	226552.2	231142.86	0	413577	1582586.4

Table- 4.4
General Abstract Growing Stock in all PBs

Species wise No. and Volume in cubic mtrs. (Estimated growing stock) for Fir Spruce Working Circle All PB's (Area = 6523.15)													
Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
241	Deodar	Number	55625	71543	89429	37681	63555	63555	13892	7930	6381	1968	411556
		Volume in Cubic Mtrs	3337.49	20031.98	76014.23	69332.24	179859.33	233880.68	66818.44	48291.67	44029.88	13577.59	755173.53
926	Kail	Number	72866	26537	10375	8827	22067	22067	8827	0	0	0	171565
		Volume in Cubic Mtrs	4371.96	7430.26	10271.52	17476.97	68627.98	93784.22	49959.41	0.00	0.00	0.00	251922.31
2	Fir	Number	62612	52656	53727	21111	41803	17827	11865	30648	8827	28680	329757
		Volume in Cubic Mtrs	3756.74	14743.75	53189.67	35889.03	118302.89	80756.76	77242.45	234457.07	87473.09	284220.95	990032.41
921	Spruce	Number	9897	5962	5962	5962	1968	0	19853	7930	3936	44003	105473
		Volume in Cubic Mtrs	593.85	1669.33	4232.95	8465.90	5017.81	0.00	123687.10	60661.95	39001.14	436070.80	679400.82
1162	Taxus	Number	9897	57838	45914	19202	6381	0	0	0	0	0	139233

		Volume in Cubic Mtrs	98.97	3470.30	7346.32	5568.59	2999.14	0.00	0.00	0.00	0.00	0.00	19483.31
1006	Mohru	Number	0	0	0	0	0	0	0	1968	0	0	1968
		Volume in Cubic Mtrs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7969.46	0.00	0.00	7969.46
0019	Maple	Number	35713	22299	4413	5962	0	0	0	4413	0	0	72801
		Volume in Cubic Mtrs	357.13	668.97	485.47	1371.24	0.00	0.00	0.00	4987.11	0.00	0.00	7869.92
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0651	Walnut	Number	0	17886	15859	21763	9897	1968	4413	4413	0	0	76200
		Volume in Cubic Mtrs	0.00	536.57	1744.53	5005.41	3662.05	1121.63	3618.97	4987.11	0.00	0.00	20676.26
0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0965	Bird Cherry	Number	1968	0	10795	4413	5962	13240	0	0	0	0	36378
		Volume in Cubic Mtrs	19.68	0.00	2482.74	1941.89	4232.95	14299.34	0.00	0.00	0.00	0.00	22976.59
0992	Kainth	Number	0	0	0	5962	0	0	0	0	0	0	5962
		Volume in Cubic Mtrs	0.00	0.00	0.00	2623.24	0.00	0.00	0.00	0.00	0.00	0.00	2623.24
0061	Kunish	Number	0	0	0	35771	5962	0	11924	0	0	0	53657
		Volume in Cubic Mtrs	0.00	0.00	0.00	8227.42	2205.90	0.00	9777.52	0.00	0.00	0.00	20210.84
2000	Other B/L	Number	0	0	5962	0	0	17886	5962	5962	0	0	35771
		Volume in Cubic Mtrs	0.00	0.00	1371.24	0.00	0.00	19316.56	9181.33	12400.75	0.00	0.00	42269.87
		Number	248579	254721	242436	166654	157595	136542	76736	63264	19143	74651	1440320
	G Total	Volume in Cubic Mtrs	12535.81	48551.17	157138.66	155901.90	384908.05	443159.18	340285.20	373755.13	170504.11	733869.34	2820608.55

4.7.6 Total growing stock per hac. works out as under:-

Table- 4.5

P.B.	Area in hac.	Vol. of conifers in cums	Vol. of B.L. in cums	Vol./ha of conifers in cums	Vol/ha of B.L. in cums	Total vol/ha in cums
I	1180.66	510340	3577.14	432.25	3.03	435.28
II	1765.35	681425	32482.4	386	18.4	404.4
U	3577.14	1504247	78339.4	420.52	21.9	442.42
Total	6523.15	2696012	114399	1238.77	43.33	1282.1

Range wise no. of sample taken

Table- 4.6

Sr. No.	Name of Range	PB-I	PB-II	PB-U	Total
1	Bhaba Nagar	3	0	1	4
2	Kalpa	0	0	0	0
3	Katgaon	0	0	1	1
4	Kilba	0	0	2	2
5	Moorang	0	0	0	0
6	Nichar	3	4	2	9
7	Pooh	0	0	0	0
8	Malling	0	0	0	0
	Total	6	4	6	16

4.8 Compartative Statement:- As discussed under para no 4.7 above, sampled enumerations has been carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The whole of the area of the Kinnaur Forest Division was divided into grids and total **150 Nos** of samples were taken. **Total 16 Nos.** sample plots pertaining to this working circle were enumerated down to 10cm d. b. h. and annalized. Thereafter, the growing stock has been assessed / extrapolated as given in the Table No 4.2, 4.3, and 4.4.

The Abstract showing the growing stock of PB-I PB-II and PB-III total for the working circle in Rajiv's working plan and in the Plan under revision is given is Table No. 4.7, 4.8, 4.9 and 4.10.

Table No. 4.7

Rajiv's Plan	PB-I (Area = 965.66)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Fir Spruce Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	5909	3464	2540	1156	605	432	317	270	278	14971	13783.65
	Kail	Number	1747	1078	955	764	714	595	319	211	159	6542	11672.96
	Fir	Number	16568	11772	11006	9693	9634	8250	6269	4059	5221	82472	219903.65
	Spruce	Number	6032	3398	2216	1483	1323	1110	886	1344	2009	19801	48794.30
	Total	30256	19712	16717	13096	12276	10387	7791	5884	7667	123786	217316.00	

Present Plan (Plan Under Revision)	PB-I (Area = 1180.66)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Fir Spruce Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	1968	0	0	7871	3936	3936	1968	1968	1968	1968	25583	88824.99
	Kail	Number	66904	17710	0	0	0	0	0	0	0	0	84614	8973.02
	Fir	Number	7871	9839	13774	7871	13774	5903	5903	3936	0	1968	70839	184005.86
	Spruce	Number	3936	0	0	0	1968	0	1968	1968	3936	15742	29518	227572.22
	Total	80679	27549	13774	15742	19678	9839	9839	7872	5904	19678	210554	509376.09	

Table No. 4.8

Rajiv.s Plan	PB-II (Area = 1415.35)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Fir Spruce Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	1804	1072	567	412	402	196	103	155	103	4814	5576.3
	Kail	Number	1917	1082	1144	1433	1000	825	309	175	186	8071	14951.18
	Fir	Number	10876	8701	8309	7113	4969	3567	2103	1186	1495	48319	91202.93
	Spruce	Number	9587	5680	4247	3608	2938	2732	2134	1722	6289	38937	118192.39
	Total		24184	16535	14267	12566	9309	7320	4649	3238	8073	100141	229922.8

Present Plan (Plan Under Revision)	PB-II (Area = 1765.35)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Fir Spruce Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	0	0	0	0	0	0	0	0	4413	0	4413	30452.29
	Kail	Number	0	8827	4413	8827	22067	22067	8827	0	0	0	75027	236689.3
	Fir	Number	30894	30894	22067	13240	22067	0	0	8827	8827	8827	145641	359778.33
	Spruce	Number	0	0	0	0	0	0	0	0	0	4413	4413	43736.55
	Total	30894	39721	26480	22067	44134	22067	8827	8827	13240	13240	229494	670656.47	

Table No. 4.9

Rajiv.s Plan	PB-U (Area = 2720.26)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Fir Spruce Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & Over	Total Number	Total Volume
	Deodar	Number	4516	3238	2692	2462	1878	1446	1152	1126	1382	19892	39481.26
	Kail	Number	3976	4049	4498	3421	2265	1636	882	221	102	21050	33531.51
	Fir	Number	56754	46740	55263	46521	34443	24878	16317	9678	11662	302256	656291.99
	Spruce	Number	11248	8594	8524	7508	6166	5314	3680	2669	4602	58305	147061.69
	Total		76494	62621	70977	59912	44752	33274	22031	13694	17748	401503	876366.45

Present Plan (Plan Under Revision)	PB-U (Area = 3577.14)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Fir Spruce Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	53657	71543	89429	29810	59619	59619	11924	5962	0	0	381563	635896.25
	Kail	Number	5962	0	5962	0	0	0	0	0	0	0	11924	6260.00
	Fir	Number	23848	11924	17886	0	5962	11924	5962	17886	0	17886	113278	446248.22
	Spruce	Number	5962	5962	5962	5962	0	0	17886	5962	0	23848	71544	408092.06
	Total	89429	89429	119239	35772	65581	71543	35772	29810	0	41734	578309	1496496.53	

Table No. 4.10
Estimated growing Stock of Fir Spruce Working Circle (Total for Circle, i.e all PBs)

Rajiv's Plan	All PB's (Area = 5101.27)												
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Fir Spruce Working Circle												
	No of trees in diameter in classes												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & over	Total Number	Total Volume
	Deodar	Number	12229	7774	5799	4030	2885	2074	1572	1551	1763	39677	58841.21
	Kail	Number	7640	6209	6597	5618	3979	3056	1510	607	447	35663	60155.65
	Fir	Number	84198	67213	74578	63327	49046	36695	24689	14923	18378	433047	967398.57
	Spruce	Number	26867	17672	14987	12599	10427	9156	6700	5735	12900	117043	314048.38
	Total		130934	98868	101961	85574	66337	50981	34471	22816	33488	625430	1400443.81

Present Plan (Plan Under Revision)	All PB's (Area = 6523.15)													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Fir Spruce Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number	55625	71543	89429	37681	63555	63555	13892	7930	6381	1968	411559	755173.53
	Kail	Number	72866	26537	10375	8827	22067	22067	8827	0	0	0	171566	251922.31
	Fir	Number	62612	52656	53727	21111	41803	17827	11865	30648	8827	28680	329756	990032.41
	Spruce	Number	9897	5962	5962	5962	1968	0	19853	7930	3936	44003	105473	679400.82
	Total		201000	156698	159493	73581	129393	103449	54437	46508	19144	74651	1018354	1835708

4.9 Silvicultural System:-The forest allotted to this Working Circle shall be managed under the Indian Irregular Shelter Wood System with the provision of retention of compact group of well grown poles as a part of future crop. The system is described in para 30 of the Punjab Forest leaflet No.11. Young crop upto 30 cm diameter and upto 0.1 hac. in extent of area shall be retained as part of future crop. In addition, all Fir trees 30 cm dbh will also be retained as part of future crop. No felling will be done on steep, precipitous and rocky patches. The intensity of opening of Fir is less than in case of Deodar, though, it should be remembered that at higher elevation, it will require a fair amount of opening to bring in reproduction. The Spruce requires heavier opening than Fir, almost equal to Deodar. Efforts will be made to regenerate the area naturally with effective closure. Artificial planting will only be resorted where natural regeneration fails to come up in a reasonable time.

4.10 Choice of Species:- Silver Fir and Spruce shall be given preference and planted on the ground ideally suited to each species in the mixture of Fir and Spruce, preference will be given to Fir, because as it occupies less space and consequently, the number of tree per hac will be more. On spurs / warm aspects Kail will be preferred. Broad leaved species like Walnut, Maple, Bird Cherry and Poplar etc. shall be planted in moist location, depressions and nallas, which are also important constituents and shall be favoured. The proportion of Deodar shall be increased on suitable ground between 2400 meters to 3000 meters on Northern aspects. The grazing frequency is responsible for absence of natural regeneration of Fir and Spruce. In addition, heavy weed growth and accumulation of deep humus are known to be the factors unsuitable to regeneration of Fir and makes the conditions for natural regeneration unfavorable. It is, therefore, necessary that the steps must be taken to regenerate these forests with existing two species on the ground suited to each other, while, broad leaved species should be planted in depressions. In the lower parts of some of these forests in tension belt considerable quantities of Kail are some time present and the Kail is not in frequently found invading into the Fir. Here, it should be possible to increase the proportion of this more valuable species and on the ridges in the tension belt it is also possible to introduce little Deodar in the mixture. Beyond this, it is mistake to try and force Deodar. Kail should not be sacrificed for Fir or Spruce. In short, the species best suited to the locality shall be preferred.

4.11 Regeneration Period:-The Silver Fir and Spruce are expected to attain a height of 3 to 4 mts. in 30 years when they can be considered as established and beyond the damage by cattle. Therefore, regeneration period is fixed at 30 years.

4.12 Rotation Period:-As in the Rajiv's plan the rotation is fixed at 150 years in this Working Circle. This period of 150 years is reasonable and economical for production of sizes of timber fit for all market demands. The major portion of the forest included in the working circle carry irregular crop and was managed under Wet Zone selection working circle under Tandon's working plan and under Fir Spruce working circle in the working plan under revision. Therefore, rotation of 150 years is adopted tentatively, during which Fir and Spruce crop are expected to attain average crop dia meter of 45 cm to 55 cm respectively. These diamensions are quite suitable for the use to which the species are put. Therefore, the rotation period 150 years is fixed in this working circle. The general quality class of the tract is II/III of the FRI quality classes.

4.13 Exploitable Diameter:-Exploitable diameter fixed at 45 to 55 cm dbh being the most suited to yield better out turn in the form of sleeper size, which fetches better price in the market. This is, however, a size to be aimed at, for the converted crop, whereas, the existing crop has such a large preponderance over mature stock that the exploitable size is only of academic interest.

4.14 Felling Cycle:- The felling cycle of 30 years corresponding to the regeneration period of the plan will be adopted, keeping in view the silvicultural requirements.

4.15 Division into Periodic Blocks:-Area of the whole Working Circle has been divided into three periodic Blocks as P.B.I, P.B.II and P.B.U. The allotment is discussed as under:-

4.15.1 PB-I (1180.66hac.):-Area allotted to this periodic block contain predominantly middle aged to mature crops that have been worked under Selection and Punjab Shelter Wood System, but are devoid of natural regeneration. In addition to this, the forests with preponderance of mature age classes is also allotted to PB-I and while all the forests having established pole crop with scattered matured trees has been allotted to PB-U. The forests with generally blanks are also allotted to PB-I. No fellings were done in the plan under revision in PB-I. All such areas where artificial regeneration have been carried out, have also been put in PB-I. No change is made in PB-I area of the plan under revision except for the areas transferred from Wild Life Division, Sarahan to Kinnaur Forest Division and the forest areas which were left the Rajiv's plan has been included. The distribution of number of trees and volume per hac. is tabulated in Table No. 4.11

Table- 4.11
Species wise distribution of number of trees and volume per hac.

PB-I (Area = 1180.66)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	2	0	0	7	3	3	2	2	2	2	22
		Volume in Cubic Mtrs	0.1	0	0	12.27	9.43	12.27	8.02	10.15	11.5	11.5	75.23
0926	Kail	Number	57	15	0	0	0	0	0	0	0	0	72
		Volume in Cubic Mtrs	3.4	4.2	0	0	0	0	0	0	0	0	7.6
0002	Fir	Number	7	8	12	7	12	5	5	3	0	2	60
		Volume in Cubic Mtrs	0.4	2.33	11.55	11.33	33.02	22.65	32.55	25.5	0	16.52	155.85
0921	Spruce	Number	3	0	0	0	2	0	2	2	3	13	25
		Volume in Cubic Mtrs	0.2	0	0	0	4.25	0	10.38	12.75	33.03	132.13	192.75
1162	Taxus	Number	3	0	0	0	2	0	0	0	0	0	5

		Volume in Cubic Mtrs	0.03	0	0	0	0.78	0	0	0	0	0	0.82
1006	Mohru	Number	0	0	0	0	0	0	0	2	0	0	2
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	6.75	0	0	6.75
0019	Maple	Number	5	0	0	0	0	0	0	0	0	0	5
		Volume in Cubic Mtrs	0.05	0	0	0	0	0	0	0	0	0	0.05
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	0	3	8	3	2	0	0	0	0	17
		Volume in Cubic Mtrs	0	0	0.37	1.92	1.23	0.95	0	0	0	0	4.47
0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0965	Bird Cherry	Number	2	0	2	0	0	0	0	0	0	0	3
		Volume in Cubic Mtrs	0.02	0	0.38	0	0	0	0	0	0	0	0.4
2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
		Number	78	23	17	22	22	10	8	8	5	17	210
	G Total	Volume in Cubic Mtrs	4.2	6.53	12.3	25.52	48.72	35.87	50.95	55.15	44.53	160.15	443.92

4.15.2 PB-II (1765.35 hac.): Forests, in which there is preponderance of maturing trees, have been allotted to this periodic block. No change is made in PB-II areas of the plan under revision except for the areas transferred from Wild Life Division Sarahan and the areas left over in the Rajiv's plan. The distribution of number of trees and volume per hac. is tabulated in Table No. 4.12

Table- 4.12

Species wise distribution of number of trees and volume per hac.

PB-II (Area = 1765.35)													
Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	0	0	0	0	0	0	0	0	3	0	3
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	17.25	0	17.25
0926	Kail	Number	0	5	3	5	13	13	5	0	0	0	43
		Volume in Cubic Mtrs	0	1.4	2.48	9.9	38.88	53.13	28.3	0	0	0	134.08
0002	Fir	Number	18	18	13	8	13	0	0	5	5	5	83
		Volume in Cubic Mtrs	1.05	4.9	12.38	12.75	35.38	0	0	38.25	49.55	49.55	203.8
0921	Spruce	Number	0	0	0	0	0	0	0	0	0	3	3
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	24.78	24.78
1162	Taxus	Number	0	13	13	8	3	0	0	0	0	0	35
		Volume in Cubic Mtrs	0	0.75	2	2.18	1.18	0	0	0	0	0	6.1
1006	Mohru	Number	0	0	0	0	0	0	0	0	0	0	0

		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0019	Maple	Number	0	3	3	0	0	0	0	3	0	0	8
		Volume in Cubic Mtrs	0	0.08	0.28	0	0	0	0	2.83	0	0	3.18
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0047	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	0	0	0	0	0	3	3	0	0	5
		Volume in Cubic Mtrs	0	0	0	0	0	0	2.05	2.83	0	0	4.88
0969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0965	Bird Cherry	Number	0	0	5	3	0	8	0	0	0	0	15
		Volume in Cubic Mtrs	0	0	1.15	1.1	0	8.1	0	0	0	0	10.35
02000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
		Number	18	38	35	23	28	20	8	10	8	8	193
	G Total	Volume in Cubic Mtrs	1.05	7.13	18.28	25.93	75.43	61.23	30.35	43.9	66.8	74.33	404.4

4.15.3 PB-U (3577.14 hac.): All the remaining compartments have been grouped under this periodic block. Few mature and over mature trees are out of place in this PB, as these are either deteriorating or frequently stand over or interfere with healthy young crops. Silviculturally, all such trees will, however, will not be available for felling as many of them stand on blank or rocky ground which must be spared. Even otherwise, it is unwise to remove all such trees with a view to safe guard the future yield. Young poles with scattered mother trees have also been allotted to PB-U as in the plan under revision. No change has been made therein except for the areas transferred from Wild Life Division, Sarahan and the areas left over in the Rajiv's plan. The species wise distribution in different classes per hac is tabulated in Table No.4.13.

Table- 4.13
Species wise distribution of number of trees and volume per hac.

PB-U (Area = 3577.14)													
Species code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	15	20	25	8	17	17	3	2	0	0	107
		Volume in Cubic Mtrs	0.9	5.6	21.25	15.33	47.17	61.33	16.03	10.15	0	0	177.77
0926	Kail	Number	2	0	2	0	0	0	0	0	0	0	3
		Volume in Cubic Mtrs	0.1	0	1.65	0	0	0	0	0	0	0	1.75
0002	Fir	Number	7	3	5	0	2	3	2	5	0	5	32
		Volume in Cubic Mtrs	0.4	0.93	4.95	0	4.72	15.1	10.85	38.25	0	49.55	124.75
0921	Spruce	Number	2	2	2	2	0	0	5	2	0	7	20
		Volume in Cubic Mtrs	0.1	0.47	1.18	2.37	0	0	31.15	12.75	0	66.07	114.08
1162	Taxus	Number	2	10	7	2	0	0	0	0	0	0	20

		Volume in Cubic Mtrs	0.02	0.6	1.07	0.48	0	0	0	0	0	0	2.17
1006	Mohru	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0019	Maple	Number	8	5	0	2	0	0	0	0	0	0	15
		Volume in Cubic Mtrs	0.08	0.15	0	0.38	0	0	0	0	0	0	0.62
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0061	Kunish	Number	0	0	0	10	2	0	3	0	0	0	15
		Volume in Cubic Mtrs	0	0	0	2.3	0.62	0	2.73	0	0	0	5.65
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
0651	Walnut	Number	0	5	3	3	2	0	0	0	0	0	13
		Volume in Cubic Mtrs	0	0.15	0.37	0.77	0.62	0	0	0	0	0	1.9
0992	Kainth	Number	0	0	0	2	0	0	0	0	0	0	2
		Volume in Cubic Mtrs	0	0	0	0.73	0	0	0	0	0	0	0.73
0965	Bird Cherry	Number	0	0	0	0	2	0	0	0	0	0	2
		Volume in Cubic Mtrs	0	0	0	0	1.18	0	0	0	0	0	1.18
2000	Other B/L	Number	0	0	2	0	0	5	2	2	0	0	10
		Volume in Cubic Mtrs	0	0	0.38	0	0	5.4	2.57	3.47	0	0	11.82
		Number	35	45	45	28	23	25	15	10	0	12	238
	G Total	Volume in Cubic Mtrs	1.6	7.9	30.85	22.37	54.3	81.83	63.33	64.62	0	115.62	442.42

4.15.4 General Abstract of Areas Allotted PB wise: The PB wise allotment of the areas to different Ranges is tabulated in table No.:- 4.14

Table- 4.14

Sr. No	Name of Range	Forest category	Fir - Spruce WC			
			PBI	PBII	PBU	
1	Bhaba Nagar	DPF	199.53	65.56	931.73	1196.82
		Listed UPF	15	550	1142	1707
		Total	214.53	615.56	2073.73	2903.82
2	Kalpa	DPF	0	97.93	114.96	212.89
		Listed UPF	0	0	0	0
		Total	0	97.93	114.96	212.89
3	Katgaon	DPF	0	0	242	242
		Listed UPF	200	350	420	970
		Total	200	350	662	1212
4	Kilba	DPF	0	0	209.23	209.23
		Listed UPF	0	0	0	0
		Total	0	0	209.23	209.23
5	Malling	DPF	0	0	0	0

		Listed UPF	0	0	0	0
		Total	0	0	0	0
6	Moorang	DPF	0	0	0	0
		Listed UPF	0	0	0	0
		Total	0	0	0	0
7	Nichar	DPF	766.13	701.86	517.22	1985.21
		Listed UPF	0	0	0	0
		Total	766.13	701.86	517.22	1985.21
8	Pooh	DPF	0	0	0	0
		Listed UPF	0	0	0	0
		Total	0	0	0	0
Total DPF			965.66	865.35	2015.14	3846.15
Total Listed UPF			215	900	1562	2677
G. Total			1180.66	1765.35	3577.14	6523.15

4.15.5 General Abstract of Areas and Growing Stock P.B. wise

The general abstract of areas and Growing Stock P.B. wise is tabulated in table No.:- 4.15

Table- 4.15

Particulars	P.B.I	P.B.II	P.B.U	Total
Area allotted (in hac.)	1180.66	1735.65	3577.14	6523.15
Growing Stock (M ³)	524114.65	713907.54	1582586.36	2820608.55

4.16 Calculation of Yield:- The yield has been calculated by volume for PB-I and PB-U. Increment has been ignored for the reasons safety against fire and natural calamities and to serve as emergency reserve. No yield has been prescribed from PB-II as a safe guard and to build up the growing stock to be treated in next PB-I.

4.16.1 For computation of the total yield from Deodar Kail (Wet Zone) working circle, the three methods was tried and out of which the one that gave minimum yield have been prescribed. These methods are as under :-

1. Von Mantel' Formula
2. Smythies Formula
3. Hufnagels Formula

4.16.2 Calculations from Von Mantel' formula:- The Von Mental's Formula based on the volume of the growing stock only. The Von Mental's Formula have been arrived from the relation that the volume of normal growing stock is equal to the MAI of the FS, multiplied by half the rotation that is $NGS = I \times r/2$ where I represents the volume of oldest age gradation (and also the total annual increment of the FS) and is a normal annual yield. I is, therefore, equal to $NSG/r/2 = 2 \times NSG/r$. Von Mantal's simple formula derived from the above relation is:-

$$\text{Annual yield} = \frac{\text{Actual volume of growing stock}}{\frac{1}{2} \text{ Rotation.}}$$

Therefore, the $AY = \frac{2(GS)}{R}$

Where AY = Annual Yield.

GS = Total Volume of Growing Stock (at lower confidence limit).

R = Rotation.

Yield from Total growing stock

Deodar

Total Growing Stock = 755173.53 M³

Rotation = 150 Years

Therefore, the $AY = \frac{2 \times 755173.53}{120} = 10068.98 \text{ or say } 10065 \text{ M}^3$

Kail

Total Growing Stock = 251922.31 M³

Rotation = 150 Years

Therefore, the $AY = \frac{2 \times 251922.31}{150} = 3358.96 \text{ or say } 3355 \text{ M}^3$

Fir

Total Growing Stock = 990032.41 M³

Rotation = 150 Years

Therefore, the $AY = \frac{2 \times 990032.41}{150} = 13200.43 \text{ or say } 13200 \text{ M}^3$

Spruce

Total Growing Stock = 679400.82 M³

Rotation = 150 Years

Therefore, the $AY = \frac{2 \times 679400.82}{150} = 9058.68 \text{ or say } 9055 \text{ M}^3$

Total Growing Stock	
Species	Volume (in Cum)
Deodar	10065
Kail	3355
Fir	13200
Spruce	9055
Total	36685

2.16.3 Calculations from Smythies formula:- This is also known as UP safe-guarding Formula. It was evolved by Smythies in the thirties, mainly for Sal Forests of UP; which were worked under selection system and where the chief objective of management was the production of trees of large size. Smythies found that in most of the plans there was tendency to regard everything above the selection limit as surplus stock. Therefore, this tendency had been responsible for decrease in the yield from the selection trees.

The yield from this formula is calculated by the number of selection trees calculated by this formula, which defines the yield available during the felling cycle as the number of trees of the next lower diameter class may be expected to grow up the exploitable size during the felling cycle, i.e.:-

$$X = \frac{f}{t} \quad (\text{II} - z\% \text{ of II})$$

Where X = Basic yield.

f = the felling cycle in years.

t = the period it take for the approach class into exploitable size.

II = the existing number of trees of approach class.

Z = the mortality percentage.

The value of 't' and 'z' for various species, as given in the chapter will be used for the yield calculations.

The annual yield will be expressed as the percentage of selection trees to be removed according to the following formula :-

$$Y = \frac{x}{I + \frac{x}{2}} \times 100 \pm A$$

Where Y = the annual yield expressed as a percentage.

X = the yield during the felling cycle

I = the number of I class trees, as enumerated.

A = an arbitrary value adopted for purposes of empirical adjustment etc.

After calculating 'x' the area of the working circle of the Felling Series, its further divided into 'f' annual coupes .

Since this formula is mainly to prescribe and area yield by divideing the forest into 'f' annual coupes and limiting the removal of I class trees to a percentage (p) there number per hectare 'N' in the coupes of the year at the time of the marking. This formula is basically when the yield is prescribed by area.

Perusal of the above paragraphs reveals that this formula is not applicable for calculating the yield in this division.

4.16.4 Calculation of Yield from Hufnagels Formula:-

4.16.4.1 Yield from PB-I Areas: The enumeration down to 10 cms dbh in 10 cms dia classes has been carried out in six numbers sample plots of size 0.1 Ha each forest of PB-I areas. The abstract of sample taken in PB-I areas are tabulated in Table No.:- 4.16

Table- 4.16

Sr. No.	Name of Range	Sample Taken
1.	Bhabanager	3
2.	Kalpa	0
3.	Katgaon	0
4	Kilba	0
5	Malling	0
6	Moorang	0
7	Nichar	3
8	Pooh	0
	Total	6

The abstract showing the growing stock of class wise and species wise PB-I areas the details are given in the ***Appendix No.-XVII.***

Table- 4.17

Species wise No. and Volume in cubic mts.(Estimated growing stock) for Fir/Spruce Working Circle PB-I (Area = 1180.66)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
241	Deodar	Number	1968	0	0	7871	3936	3936	1968	1968	1968	1968	25581
		Volume in Cubic Mtrs	118.07	0	0	14482.76	11137.56	14482.76	9464.96	11983.7	13577.59	13577.59	88824.99
926	Kail	Number	66904	17710	0	0	0	0	0	0	0	0	84614
		Volume in Cubic Mtrs	4014.24	4958.77	0	0	0	0	0	0	0	0	8973.02
2	Fir	Number	7871	9839	13774	7871	13774	5903	5903	3936	0	1968	70840
		Volume in Cubic Mtrs	472.26	2754.87	13636.62	13380.81	38981.46	26741.95	38430.48	30106.83	0	19500.57	184005.86
921	Spruce	Number	3936	0	0	0	1968	0	1968	1968	3936	15742	29517
		Volume in Cubic Mtrs	236.13	0	0	0	5017.81	0	12259.19	15053.42	39001.14	156004.54	227572.22
1162	Taxus	Number	3936	0	0	0	1968	0	0	0	0	0	5903
		Volume in Cubic Mtrs	39.36	0	0	0	924.85	0	0	0	0	0	964.21
1006	Mohru	Number	0	0	0	0	0	0	0	1968	0	0	1968
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	7969.46	0	0	7969.46
19	Maple	Number	5903	0	0	0	0	0	0	0	0	0	5903
		Volume in Cubic Mtrs	59.03	0	0	0	0	0	0	0	0	0	59.03
38	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
47	Ailanthus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
651	Walnut	Number	0	0	3936	9839	3936	1968	0	0	0	0	19678
		Volume in Cubic Mtrs	0	0	432.91	2262.93	1456.15	1121.63	0	0	0	0	5273.61
969	Prunus	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0

965	Bird Cherry	Number	1968	0	1968	0	0	0	0	0	0	0	3936
		Volume in Cubic Mtrs	19.68	0	452.59	0	0	0	0	0	0	0	472.26
2000	Other B/L	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0
		Number	92485	20465	19678	25581	25581	11807	9839	9839	5903	19678	247939
	G Total	Volume in Cubic Mtrs	4958.77	7713.65	14522.12	30126.51	57517.82	42346.34	60154.6 3	65113.4 3	52578.7 3	189082.7 3	524114.6 5

Calculation of the yield has been based on the volume of the trees of 40 cms dbh and over. Increment has been ignored. From the management point of view and theoretically, the entire growing stock except the mother trees above 40 cms diameter should be available during the plan period. Since a compact group of poles shall be retained as advance growth and some trees will be left on broken and steep grounds, only a part of II and III/IV class trees will be available. Similarly, the yield from I and II class trees will be further restricted as some trees have to be retained as emergency reserve and fire insurance trees. The trees standing on blanks or over patches where regeneration has not established shall also be not available. Therefore, the yield on the basis of silvicultural availability is calculated as under:-

$$Y = \frac{C1V1+C2V2+C3V3}{P}$$

Where V1, V2 and V3 are the volumes of I class, II class trees and III and IV class trees respectively.

P= Plan period i.e. 10 years.

C1, C2, C3 are the constants representing percentage of I class, II class and III class and IV class trees respectively estimated to be available for felling during the regeneration period. The values of constants of C1, C2, C3 have been fixed as under after detailed examination of forests during field inspections. These figures are arrived at after analysis number of stems per ha and emerged after considering field conditions is tabulated in Table No. 4.18

Table – 4.18

Species	C1	C2	C3	
Deodar	0.1	0.1	0.1	% is lower for Deodar and Spruce as these are to be retained as seed bearers as far as possible in preference to other Species
Kail	0.5	0.3	0.2	
Fir	0.3	0.2	0.1	
Spruce	0.1	0.1	0.2	

The above proportion is based on purely theoretical consideration. This combined with field observations gives well suiting proportions.

The yield is now calculated by Hufnagels formula as under:-

$$Y = \frac{C1V1+C2V2+C3V3}{P}$$

(Deodar) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.1.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.1.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.1.

(Deodar) V1= Volume of trees of I class trees of conifers = 63086.60 M³

V2= Volume of trees of II class trees of conifers = 25620.32 M³

V3= Volume of trees of IV and III class trees of conifers = 0.00 M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$Yield = \frac{C1V1+C2V2+C3V3}{P}$$

$$Y = \frac{0.1 \times 63086.60 + 0.1 \times 25620.32 + 0.1 \times 0.00}{10} = 887.06 \text{ or say } 850 \text{ M}^3$$

(Kail) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.5.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.3.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.2.

(Kail) V1= Volume of trees of I class trees of conifers = 0.00 M³

V2= Volume of trees of II class trees of conifers = 0.00 M³

V3= Volume of trees of IV and III class trees of conifers = 4958.77M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1 + C2V2 + C3V3}{P}$$

$$Y = \frac{0.5 \times 0.00 + 0.3 \times 0.00 + 0.2 \times 4958.77}{10} = 99.17 \text{ or say } 100 \text{ M}^3$$

(Fir) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.3.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.2.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C3 has been taken as 0.1.

(Fir) V1= Volume of trees of I class trees of conifers = 114779.80 M³

V2= Volume of trees of II class trees of conifers = 52362.27 M³

V3= Volume of trees of IV and III class trees of conifers = 16391.50M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1 + C2V2 + C3V3}{P}$$

$$Y = \frac{0.3 \times 114779.80 + 0.2 \times 52362.27 + 0.1 \times 16391.50}{10} = 4654.55 \text{ or say } 4650 \text{ M}^3$$

(Spruce) C1= Constant representing the fraction of volume of I class trees available for felling during the regeneration period. C1 has been taken as 0.1.

C2= Constant representing the fraction of volume of II class trees available for felling during period. C2 has been taken as 0.1.

C3= Constant representing the fraction of volume of IV and III class trees available for felling during period. C2 has been taken as 0.2.

(Spruce) V1= Volume of trees of I class trees of conifers = 222318.30 M³

V2= Volume of trees of II class trees of conifers = 5017.80 M³

V3= Volume of trees of IV and III class trees of conifers = 0.00M³

P= Period of the plan is 10 year i.e. Working Plan period.

$$\text{Yield} = \frac{C1V1 + C2V2 + C3V3}{P}$$

$$Y = \frac{0.1 \times 222318.30 + 0.1 \times 5017.80 + 0.2 \times 0.00}{10} = 2273.36 \text{ or say } 2250 \text{ M}^3$$

Therefore, the annual yield of different species is summarized as under for P.B.I:

Table – 4.19

Sr. No.	Species	Annual yield (in m ³)
1	Deodar	850
2	Kail	100
3	Fir	4650
4	Spruce	2250
Total		7850

4.16.4.2 Yield from PB-II:-Strictly speaking, there should be no felling from this PB as this PB constitutes the future PB-II. However, past experience has shown that due to snow damage and wind thrown, salvage removals occur which also have to be accounted for. These removals have to be counted for in order to safe guard the future yield, no major fellings are prescribed and therefore, no yield has been calculated for this periodic block. As given in the Chapter-VIII under paragraph 8.8, the enumeration down to 10 cms dbh in 10 cms dia classes has been carried out in Four numbers sample plots of size 0.1 Ha each forest of PB-II areas. The abstract of sample taken in PB-II areas is tabulated in Table No 4.16. All the trees in such units down to 10 cms dbh were enumerated in four numbers of PB-II areas.

Table- 4.20

Sr. No.	Name of Range	Sample Taken
1.	Bhaba Nagar	0
2.	Kalpa	0
3.	Katgaon	0
4	Kilba	0
5	Malling	0
6	Moorang	0
7	Nichar	4
8	Pooh	0
	Total	4

The detail of enumeration done in the sample areas are given in **Appendix-XII**.

4.16.4.3 Yield from PB-U Area:-Mature and over mature trees of 70 cm d.b.h. and over are out of place in this block. These are either deteriorating or frequently standing over or interfering with healthy young crops. Silviculturally all such trees will, however, not be available for felling as good many of them stand on blank or rocky ground which must be spared. Even otherwise, it is unwise to remove all such trees with a view to safe guard the future yield. As such, it is estimated that only 10% of trees 70 cm dbh and over shall be available for felling during the next 30 years period. The demand of right holders used to be invariably met from the forests of this periodic block before imposition of ban on green fellings. However, salvage markings of dead and uprooted trees will be done to clear these forests from fire hazards. The removals will, however, count toward the yield of PB-U. Sampled enumeration down to 10 cms dbh classes has been carried out in Six numbers sample plots of size 0.1 Ha each forest of PB-U areas and is tabulated in Table No. 4.21

Table- 4.21

Sr. No.	Name of Range	Sample Taken
1.	Bhaba Nagar	1
2.	Kalpa	0
3.	Katgaon	1
4	Kilba	2
5	Malling	0
6	Moorang	0
7	Nichar	2
8	Pooh	0
	Total	6

The abstract of growing stock is tabulated in Table No.4.22

Table- 4.22

Species code	PB-U (Area = 3577.14)												
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	53657	71543	89429	29810	59619	59619	11924	5962	0	0	381562
		Volume in Cubic Mtrs	3219.43	20031.984	76014.225	54849.48	168721.77	219397.92	57353.48	36307.97	0.00	0.00	635896.25
0926	Kail	Number	5962	0	5962	0	0	0	0	0	0	0	11924
		Volume in Cubic Mtrs	357.71	0.00	5902.281	0	0	0	0	0	0	0	6260.00
0002	Fir	Number	23848	11924	17886	0	5962	11924	5962	17886	0	17886	113276
		Volume in Cubic Mtrs	1430.86	3338.66	17706.84	0.00	16872.18	54014.81	38811.97	136825.61	0	177247.29	446248.22
0921	Spruce	Number	5962	5962	5962	5962	0	0	17886	5962	0	23848	71543
		Volume in Cubic Mtrs	357.71	1669.332	4232.949	8465.898	0.00	0	111427.91	45608.54	0.00	236329.72	408092.06
1162	Taxus	Number	5962	35771	23848	5962	0	0	0	0	0	0	71543
		Volume in Cubic Mtrs	59.62	2146.284	3815.616	1728.951	0.00	0	0	0	0	0	7750.47
1006	Mohru	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0.00	0	0	0.00
0019	Maple	Number	29810	17886	0	5962	0	0	0	0	0	0	53657
		Volume in Cubic Mtrs	298.10	536.571	0	1371.237	0	0	0	0	0	0	2205.90
0038	Aescules	Number	0	0	0	0	0	0	0	0	0	0	0
		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0.00
0061	Kunish	Number	0	0	0	35771	5962	0	11924	0	0	0	53657
		Volume in Cubic Mtrs	0	0	0	8227.422	2205.903	0	9777.516	0	0	0	20210.84
1038	Rhododendron	Number	0	0	0	0	0	0	0	0	0	0	0

		Volume in Cubic Mtrs	0	0	0	0	0	0	0	0	0	0	0.00
0651	Walnut	Number	0	17886	11924	11924	5962	0	0	0	0	0	47695
		Volume in Cubic Mtrs	0	536.571	1311.62	2742.47	2205.90	0.00	0	0	0	0	6796.57
0992	Kainth	Number	0	0	0	5962	0	0	0	0	0	0	5962
		Volume in Cubic Mtrs	0	0	0	2623.236	0	0	0	0	0	0	2623.24
0965	Bird Cherry	Number	0	0	0	0	5962	0	0	0	0	0	5962
		Volume in Cubic Mtrs	0.00	0	0.00	0	4232.949	0	0	0	0	0	4232.95
2000	Other B/L	Number	0	0	5962	0	0	17886	5962	5962	0	0	35771
		Volume in Cubic Mtrs	0	0	1371.237	0	0	19316.556	9181.326	12400.752	0	0	42269.87
		Number	125200	160971	160971	101352	83467	89429	53657	35771	0	41733	852552
	G Total	Volume in Cubic Mtrs	5723.42	28259.41	110354.77	80008.70	194238.70	292729.29	226552.20	231142.86	0.00	413577.00	1582586.36

That all the trees above 40 cms. in diameter are out of place in this PB, if the regeneration has established and can be removed during the period of plan. However, this is not possible due to silvicultural considerations. Trees standing on broken and precipitous ground can not be removed. Similarly, the trees standing on periphery of the blanks and along the boundary or in the nallas shall not be available for fellings. Beside this many of the II class trees standing amongst groups of pole retained as part of future crop will not be removed. Therefore, keeping in view the condition of forest and observation made during inspection of forests, it is estimated that not more than 10 % of the volume of I class trees shall be available for all species except in case of Deodar only 05 % of the volume of I class trees shall be available for felling during the period of regeneration. In addition to this, another 5% of the volume of IV and III class trees shall be available under thinning. The annual yield is therefore calculated:-

$$\text{Annual Yield (AY)} = \frac{V1 \times 10/100 + V2 \times 05/100}{R}$$

Where, V1, is volume of I class trees.

V2 is volume of III & IV class trees.

R is regeneration period which is 30 years.

The yield is, therefore, calculated as under:-

(i) **(Deodar)** $AY = \frac{V1 \times 05/100 + V2 \times 10/100}{30}$

$$V1 = 313059.40 \text{ M}^3$$

$$V2 = 96046.21 \text{ M}^3$$

$$\text{Therefore, AY} = \frac{313059.40 \times 05\% + 96046.21 \times 10\%}{30} = 841.91 \text{ M}^3 \text{ or say } 800 \text{ M}^3$$

(ii) **(Kail)** $AY = \frac{V1 \times 10/100 + V2 \times 05/100}{30}$

$$V1 = 0.00 \text{ M}^3$$

$$V2 = 5902.28 \text{ M}^3$$

$$\text{Therefore, AY} = \frac{0.00 \times 10\% + 5902.28 \times 05\%}{30} = 9.83 \text{ M}^3 \text{ or say } 10 \text{ M}^3$$

(iv) **(Fir)** $AY = \frac{V1 \times 10/100 + V2 \times 05/100}{30}$

$$V1 = 406899.70 \text{ M}^3$$

$$V2 = 21045.51 \text{ M}^3$$

$$\text{Therefore, AY} = \frac{406899.70 \times 10\% + 21045.51 \times 05\%}{30} = 1391.40 \text{ M}^3 \text{ or say } 1400 \text{ M}^3$$

(v) **(Spruce)** $AY = \frac{V1 \times 10/100 + V2 \times 05/100}{30}$

$$V1 = 393366.20 \text{ M}^3$$

$$V2 = 5902.28 \text{ M}^3$$

$$\text{Therefore, AY} = \frac{393366.20 \times 10\% + 5902.28 \times 05\%}{30} = 1321.05 \text{ M}^3 \text{ or say } 1300 \text{ M}^3$$

Therefore, the annual yield of different species is summarized as under for P.B.IV

Table- 4.23

Sr. No.	Species	Annual yield (M ³)
1	Deodar	800
2	Kail	10
3	Fir	1400
4	Spruce	1300
Total		3510

4.17 Total Prescribed Annual Yield:-The total Annual yield from the forests of this Working Circle is prescribed as under and is tabulated in table No. 4.24.

Table- 4.24

Species	PBI	PBU	Total (M ³)
Deodar	850	800	1650
Kail	100	10	110
Fir	4650	1400	6050
Spruce	2250	1300	3550
Total	7850	3510	11360

4.17.1 Comparative Statement:- The comparative Statement of Annual Yield obtain by using both the Methods is given below:-

Methodology		
Von Mantel's		Hufnagels Formula
Name of Species	Volume (in Cum)	Total Volume (in cum)
Deodar	10065	1650
Kail	3355	110
Fir	13200	6050
Spruce	9055	3550
Total	35675	11360

The yield calculated by adopting the Hafunagel's formula is only 31.84 percent of the yield obtained by using VM method and it is conservative.

Therefore, Hafnagel's formula is adopted in the current plan which is conservative.

4.18 Control of Yield:-All the removals of whatever nature down to 10 cms dbh shall count towards yield of this Working Circle. Deviation for a year, period of five year and plan period shall not exceed 10% of the annual prescribed yield. Removals will depend upon the pace of regeneration. Moreover, no commercial fellings will be undertaken until there is polythene raised stock in nursery of 3.5 to 4.5 years for Fir, 2.5 to 3.5 years for Spruce and for Deodar 2.5 years. The regeneration survey shall be carried out once in five year and if it indicates that the specification of regeneration has not been achieved, then fellings shall be deferred till such time as desired result of regeneration is achieved.

4.19 Method of Executing the Felling:-

4.19.1 In PB-I Areas:- The marking shall be carried out by Divisional Forest Officer or his ACF and invariably checked by the Conservator of Forests. The technique of carrying of regeneration marking is described in the Punjab Forest Leaflet No. 2 and must be carefully studied by the marking officer and complied. In addition the following broad guidelines are laid down for the marking Officer.

- (i) The Mother trees should be uniformly distributed all over the area and tall, well grown healthy trees with superior poles and well developed crown should be selected as mother trees. These should preferably of class II B and II-A.
- (ii) As far as practicable, mother trees selected should be of Fir and Spruce and uniformly spaced. In case of pure Fir crop, 40 to 50 trees per hac. and in case of pure Spruce 30 to 35 trees per hac. shall be retained as seed bearers. In the groups of Deodar and Kail occurring on warmer slopes and in lower belt, opening shall be created to same extent suitable for these species.
- (iii) In case of mixture of Fir and Spruce, 30 to 40 trees of both Fir and Spruce of 40 to 60 cms dia class per hac. shall be retained.
- (iv) As far as possible, seed bearers shall be retained on ridges and spurs in order to have better disposal of seed.
- (v) Well grown advance growth upto 30 cm d.b.h. covering an area not less than 0.1 hac. and density exceeding 0.5 shall be retained as part of future crop.
- (vi) Markings on steep and precipitous slopes shall conform to selection principles.
- (vii) Broad leaved trees found in mixture with Fir and spruce shall ordinarily be retained but where too dense, they shall be marked or lopped as warranted by the situation in order to remove the over head shade and to create a proper seed bed.
- (viii) Before undertaking any forest for seeding fellings, it shall be ensued that nursery stock is ready to replace the felled trees immediately, after the timber has been extracted from the forest. To achieve this objective, nurseries should be raised 2 to 3 years in advances in the vicinity of the area to be undertaken for felling. In case neither the nurseries have been raised nor the stock is available, no markings/fellings shall be done and the yield for that particular year should be considered as obtained.
- (ix) Regeneration survey shall be carried out in the felled areas and the success of regeneration will be reviewed every fifth year. In case the regeneration is not keeping pace with the fellings further fellings shall be stopped/deferred.
- (x) Final felling shall be carried out keeping in view the progress of regeneration.

4.19.2 In PB-II Areas:-This being sacred PB, no major felling of any kind and magnitude will be done in PB-II. However, only salvage marking of dead, uprooted trees will be done to clear these forests from fire hazards and improvement of the crop. The yield removed from these PBs shall be counted for yields towards the yield of the Working Circles.

4.19.3 Thinning:-Thinning will be carried out in accordance with the principles of thinning laid down in Punjab Forest Leaflets No. I and IA, with the additional numerical check of yield table figures.

4.19.4 In PB-U Areas:-The crop is irregular and growing stock is below normal. However to improve the condition of the crop, only hygienic removal are to be carried out in the form of removals of dead, dying, diseased, malformed and suppressed trees. No major fellings will be carried out in this PB but only removal of over-wood which suppress and stand over the young crop are to be removed and felled. The felling would correspond to final felling. However, salvage marking of dead and uprooted trees will be done to clear the forest from fire hazards. All removals shall count towards total yield of Working Circle. All over wood shall be removed in the areas where regeneration has been fully established. Besides this, thinnings in patches of advance growth are to be done. The following general principles are laid down for the guidance of marking officer:-

- (i) No attempt should be made to obtain or induce regeneration. The marking should aim at freeing the established regeneration by removing the over wood. Thus, I and II class trees standing over the established regeneration will be marked.
- (ii) All solitary trees standing amongst young crop which are likely to develop into wolf tree shall be marked.
- (iii) Thinnings in groups of poles and patches of advance growth shall be carried out, wherever, necessary.
- (iv) All marked trees likely to damage young crop underneath should be lopped before felling.
- (v) Broad leaved tree should not be marked unnecessarily on the pretext of improvement fellings. These should, however, be lopped where found suppressing the young crop.

4.20 Table of Felling: The following tabular statement gives the order of fellings in PB-I areas:-

Table 4.25
PB-I

Year	Range	Name of Forest	Comptt. No.		Area in Hac.	Allotment	Nature of felling
			Old	New			
1	2	3	4	5	6	7	8
2019-20	-	-	-	-	-	-	-
2020-21	-	-	-	-	-	-	-
2021-22	Bhaba Nagar	Ramni	130(a) I Part	36 (a) Part	40	PB-I	Seedling Felling
2022-23	Bhaba Nagar	Ramni	130(a) I Part	36 (a) Part	45.93	PB-I	Seedling Felling
2023-24	Nichar	Gutrang	79 (a) Part	12 (a) Part	50	PB-I	Seedling Felling
2024-25	Nichar	Gutrang	79 (a) Part	12 (a) Part	52.80	PB-I	Seedling Felling
2025-26	Bhaba Nagar	Kandlu-Chhonda (Chaura)	68 (b) II Part	1 (d) Part	30.6	PB-I	Seedling Felling
2026-27	Bhaba Nagar	Kandlu-Chhonda (Chaura)	68 (b) II Part	1 (d) Part	32	PB-I	Seedling Felling
2027-28	Nichar	Tranda Soldang (Kutangang)	71 (b) II Part	4 (d) Part	35.49	PB-I	Seedling Felling
2028-29	Nichar	Tranda Soldang (Kutangang)	71 (b) II Part	4 (d) Part	37	PB-I	Seedling Felling
	Bhaba Nagar	Rupi	UPF - 4	3	15	PB-I	Seedling Felling

4.21 Treatment of PB-U:- Since the crop is irregular and growing stock is below normal, therefore, to improve the condition of the crop, only hygienic removals are to be carried out in the form of removals of dead, dying diseased, malformed and suppressed trees. This operation will form the thinning sequence and is tabulated in Table no 4.26

Table No 4.26
PB-U

Year	Range	Name of Forest	Comptt. No.		Area in Hac.	Allotment	Nature of felling
			Old	New			
1	2	3	4	5	6	7	8
2019-20	-	-	-	-	-	-	-
2020-21	Kilba	Phinla-I	135	41	64.35	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
	Bhaba Nagar	Ramni	68(b) I Part	1 (c) Part	140	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
2021-22	Bhaba Nagar	Ramni	68(b) I Part	1 (c) Part	145.85	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
	Nichar	Ramni	73 Part	6 Part	180	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
2022-23	Nichar	Ramni	73 Part	6 Part	195.95	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
	Kalpa	Gutrang	NC-23	185	114.96	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
2023-24	Nichar	Bari (Kot Dharang)	77	10	129.5	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
	Bhaba Nagar	Janni	UPF-48 Part	30 Part	200	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
2024-25	Bhaba Nagar	Janni	UPF-48 Part	30 Part	200	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
	Nichar	Kandlu-Chhonda (Tikrang)	70 (a) II	3(b)	82.15	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
2025-26	Bhaba Nagar	Ramni	130 (b) Part	36 (d) Part	159	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
	Nichar	Morang Kanda	NC-14 Part	176	155.57	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
2026-27	Bhaba Nagar	Ramni	130 (b) Part	36 (d) Part	110.93	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
	Nichar	Morang Kanda	NC-14 Part	176	150	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
2027-28	Bhaba Nagar	Lishnam	UPF-46 Part	28 Part	200	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
	Bhaba Nagar	Lishnam	UPF-47 Part	29 Part	155	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
2028-29	Bhaba Nagar	Lishnam	UPF-46 Part	28 Part	187	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.
	Bhaba Nagar	Lishnam	UPF-47 Part	29 Part	150	PB-U	Removals of dead, dying diseased, malformed and suppressed trees.

4.22 Subsidiary Silvicultural Operations, Cleaning and Thinning:-

Following subsidiary silvicultural operations are prescribed:-

4.22.1 Subsidiary Silvicultural Operations in PB-I:-The techniques of slash disposal are laid down in the technical order No.6 of Punjab Forest Manual Volume III. In addition to this the following principles must be born in mind while carrying out the slash disposal.

- (a) Once the seeding fellings are completed, collection and disposal of felling refuse, cutting of bushes and racking of humus etc. are the most essential operations to be carried out in order to obtain the clean seed bed.
- (b) As the felling refuse is salable as fuel wood or as pulp wood and the obsolete method of burning the same should be avoided. Very rarely and in exceptional circumstances, the felling refuse should be disposed by burning in small heaps in depressions and nalas. Every care should be taken while disposing the debris by burning, as Spruce and Fir trees are extremely susceptible to fire and die with excessive drought. Therefore, these heaps should be small and away from trees. As the heaps burn away, additional chips, twigs and billets can be added gradually keeping thereby intensity of fire low.
- (c) The humus around the burning heaps must be completely removed to ensure that the fire does not become underground. The humus in these patches will automatically get burnt and elsewhere, it can be removed by scraping either in strips or patches to keep down the expenditure.
- (d) These operations shall be carried out in winter only and in the presence of Range Officer to avoid accidental fires.

4.22.2 Artificial Regeneration:-The natural regeneration in the Fir Spruce area has unfortunately been failed to fill the areas for many reasons and the reliance has to be placed on artificial regeneration. The technique of raising nurseries and artificial reproduction has been given in detail in the Chief Conservator of Forests Technical Order No. 3 &4 of Punjab Forest Manual-Volume III and also Himachal Pradesh Forest Manual-Volume IV.

Although, both Silver Fir and Spruce constitute the forest but both these species are silviculturally different. Silver Fir is a very slow growing species and natural distribution of Spruce and Fir clearly indicates that Spruce grows in lower parts and silver Fir occupies upper belt. Silver Fir prefers the cooler, moist and shady locations, whereas, Spruce occupies the raised ground and exposed spur. The depressions are filled up by broad leaved species. Therefore, only such locations should be chosen for planting of Silver Fir as are suitable for the species. Some retrogression does take place as consequence of operation proceeding artificially and often, it will be possible to introduce the faster grown and higher crowned Spruce in preference to Silver Fir. The Fir and Spruce seeds ripen in September, October and the seed should be collected from the middle aged healthy trees with well developed crown and clear bole. The Fir nurseries should be raised in the natural zone of its distribution. The healthy plants not less than 25 to 30 cms. (Silver Fir 3.5 to 4.5 years old and Spruce 2.5 to 3.5 years old) in height (only polythene raised) should be planted in the field. The planting should be carried out in July after 2 to 3 good showers and must be planned in such a manner so as to complete by the end of first week of August. In moist location, Broad leaved species like Ash, Walnut, Birdcherry and Maple shall be planted in winter (December) when the plants are dormant.

4.22.3 Planting Programme:-The yield prescribed from the forest area in this Working Circle is directly proportionate to area planted successfully. Any slackness in plantation is going to reduce

the forest area for obtaining the prescribed yield. To achieve this objective detail planting programme has been given in the Plantation (overlapping) Working Circle.

4.22.3 Closure and Fencing:-All the regeneration areas shall be fenced and closed for grazing. Action to notify these closures shall be taken immediately to avoid legal complications. Regeneration/successful planting depend upon the effective closure and good will of the local people and their cooperation in this regard.

4.22.4 Weeding:-For the healthy growth of the plants, timely weeding is of immense importance. The growing season of Fir is limited to the months of April, May and June and the plants must be kept free of weeds during this period. The growth starts with the onset of rain as the temperature falls down but still another weeding during July/August to keep the plant free of weed is essential and also beneficial. In a nut shell, the plants must always be kept free from weeds during the growing season. The weeding shall be continuing till the plants are free from the damage of the weeds.

4.23 Other Regulations:-

4.23.1 Fire Protection:- The whole Working Circle will be under strict vigil against fire hazard. Preventive measure should be taken in advance. Incendiary forest fires are very common and as such the forests are required to be strictly protected from these. The forests floor should be kept clean of inflammable material such as debris, unwanted bushes, weeds, needles and grass. The fire lines, inspection paths and bridle paths should be kept clean of needles especially during summer season. Fire watcher should be employed during dry months. Besides developing cordial relations with local people to protect the forests, they should be educated with regard to importance of forest conservation, rights and duties and social obligation as enshrined in Article 51 A(g) of the Constitution of India read with Section 79 of the Indian Forest Act, 1927. The detail description is given in Chapter No. IX of the Forest Protection (overlapping) Working Circle.

4.23.2 Grazing and grass cutting:-Outside the regeneration areas, there will be no restriction on grass cutting. In all the PB-I areas under regeneration, grass cutting will not be allowed till the plants are at least 1 meter in height. Grass cutting in closed areas shall be allowed under the supervision of forest guard so that no young, seedlings/sapling are cut. Grazing shall be strictly prohibited in the regeneration areas during the closure period under Section 30 (b) of Indian Forest Act, 1927.

4.23.3 Right Holder's Demand: Demand of right holder for timber will be met from the forest in which such rights has been recorded in Forest Settlement Report and as per revised Timber Distribution Policy 2016 (**Notification No. FFE-B-A (3) 4/2015 Dated: Shimla -2, the 26 February, 2016**) and right and concessions shall be exercised strictly in accordance with the silviculture principles. Thus, all rights can be exercised subject to silvicultural availability. No trees should be marked from PB-I area after the marking of seedling fellings have been done till the regeneration is fully established. Trees should be marked strictly in accordance with the silvicultural principles and not necessarily according to the convenience of right holders. No trees should be marked from the PB-I area. From other PBs, the trees to be marked to meet out the demand of right holder should be such as are required to be removed during the course of thinning and improvement fellings and final fellings. The trees can be removed/felled from forest irrespective of the prescribed year of fellings. All the trees marked to meet the demand of right holders shall count towards the prescribed yield. Dry and fallen trees should primarily be utilized to meet the right holders demand etc.

4.23.4 Closures: After the seedling fellings are over, all PB-I areas should be closed immediately till the regeneration is established. The area will have to be closed for grazing till the regeneration is established. Normally, this period is 30 years, Govt. notification for such closure should be got

issued under Section 30 (b) of Indian Forest Act, 1927 well in time after approval of felling programme by the competent authority to avoid any litigation.

4.23.5 Regeneration Survey: The regeneration survey of the felled areas shall be carried out every year as per standing instructions and corrective measures taken if the regeneration is not progressing satisfactorily. The regeneration survey of the felled PB-I areas shall be carried out to assess the progress of regeneration, and to plan operations for the next year. The reasons for failure should be detailed and corrective measures taken. The regeneration should be made to keep pace with the fellings and in case there are short falls on this account with reference to the prescription of the Working Plan, further fellings should not be carried out and deferred till the problem is resolved.

CHAPTER V

THE NEOZA WORKING CIRCLE

5.1 General Constitution:- This working circle comprises of all forest containing Neoza as principal species. The Neoza Pine (*Pinus gerardiana*) areas occurring in the altitudinal limit of 1500 mtrs to 3300 mtrs. in the Dry Zone, in the demarcated and un-demarcated Forest have been allotted to this working circle with the objective of inducing natural and artificial regeneration. The major attention is required for these important forest, which otherwise have been ignored in the past. The timber of this pine is of little importance, but the forests are subjected to the rights of user by the local inhabitants for the collection of Neoza seeds. The incidence of grazing is very high and natural regeneration is very deficient. There is no change in the areas from the earlier plan. *Pinus gerardiana* Neoza Pine is known for its high quality edible seeds and is confined to in the dry inner areas of Satluj catchment in Kinnaur district, that is, in the tract covered by this plan. It is the native of North-East Himalayas. This species is listed as lower risk and near threatened. Over cutting for extaction of chilgoza cones, and intensive grazing has resulted in poor regeneration of Chilgoza Pine. In the world, the Chilgoza Pine is found in India, Pakistan, Afganistan, and Tibet. In India, it is found in Himachal Pradesh and Jammu Kashmir. In Himachal, this species is confined to District Kinnaur and Chamba. Before independence, the bulk of the country's requirement of Neoza seeds was being met from Baluchistan. Then the market price of Neoza was low and the Neoza forests of Himachal Pradesh were not of much commercial importance because of their then interior location. But with the opening of tract with road network and also coming up of many HEP in district Kinnaur, the Neoza forests have now assumed increased importance. The local inhabitants have got the rights to collect Neoza seeds without any hindrance and these forests have lately been exploited rather even over exploited in this regard. The economic importance of this species, its place in ecological climax and problems experienced in its conservation led to the creation of Neoza working circle in the previous plan and the same is also being continued in the current plan. The demarcated forest having preponderance of Neoza Pine has been allotted to this circle with the object of inducing both natural and artificial regeration in these forests. The Neoza Pine does not produce the structural timber and the difficult terrain in which it grows prevents management of these forests under any conventional silvicultural system. Only rotational closures against grazing and plucking of cones for planting / sowing on for obtaining natural regeneration will be regulated. The latest research and technology as evolved in the recent years is also to be given due consideration. The total area of this Working Circle is **2844.53** hac, which is **8.02%** of the total area of the Kinnaur Forest Division.

5.2 General Character of Vegetation:- The vegetation of the area allotted to this working circle has been described in detail in **Para 2A.2.17 of chapter II**. It falls in the Group 13- Himalayan Dry Temperate Forests C2a according to "A revised survey of the forests types of India" by H. G. Champion and S. K. Seth. Neoza Pine grows mixed with Deodar in varying proportions in the region outside the influence of monsoons (i.e Dry zone region) in the demarcated and un-demarcated protected forest of Kalpa, Kilba, Moorang and Pooh Ranges. The annual precipitation which varies between about 250 to 670 mm is received mainly in the form of snow during winter. It endoures severe winter cold. This pine is capable of growing on shallow soils or rocky crevices and on hill sides. The Neoza Pine demands little fertility of the soil and the forests are open and deficient in natural regeneration. These forests are being depleted during the recent years due to many developmental activities going on in the tract. The following impediments are in the way of the natural regeneration of Chilgoza Pine.

- i) Unrestricted collection of Neoza seed by the local right holders. They hardly leave any cone on the trees for providing seed. Even they collect each and every accessible cone from the forest before it opens and no seed is left for natural regeneration.
- ii) There is unregulated and unrestricted grazing in the Pine forests, much beyond the carrying capacity. Whatever little regeneration appears is trampled upon or browsed.
- iii) Birds, rats, rodents and reptiles etc. also destroy / eat the seed.
- iv) The extremely inhospitable climatic and edaphic factors hamper the establishment of any seedlings that do come up in rather difficult and inaccessible situation.

5.3 Special Objects of Management:- Without prejudice to general objects of managements, the special objects of managements of the forest allotted to this Working Circle are:-

- (i) To protect the hill sides from further denudation and erosion by preserving and enhancing the forest cover and by undertaking the effective soil conservation works in a planned manner, wherever necessary.
- (ii) To regenerate the degraded and poorly stocked Neoza Pine forest.
- (iii) To protect the steep, precipitous and unstable mountains slopes by maintaining permanent forest cover and to ensure ecological security of the tract.
- (iv) To protect and preserve the valuable forest wealth from the indiscriminate fellings and lopping of trees.

5.4 Area Statement:- The total area of this working circle **2844.53ha**. which works out to be **8.78%** of the total area of the division. The distribution of these forests range wise and by legal status is tabulated in table No. 5.1.

Table 5.1

Name of Range	DPF	NDPF	UPF	Total in Ha
Bhaba Nagar	0	0	0	0
Kalpa	777.8	0	0	777.8
Katgaon	0	0	0	0
Kilba	0	0	0	0
Malling	0	0	0	0
Moorang	1435.83	0	0	1435.83
Nichar	0	0	0	0
Pooh	630.9	0	0	630.9
Total	2844.53	0	0	2844.53

The forest wise detail of specific allotment is given in **Appendix No.-IV**.

5.5 Blocks and Compartment:- No change has been made in the existing compartments and sub compartments. The compartments and sub compartments have been numbered systematically both for DPFs and UPFs which was necessitated due to creation of new DPFs and reorganization of Kinnaur Forest Division.

5.6 Analysis and Valuation of the Crop: Most of the demarcated and un-demarcated protected forests are rocky, steep, precipitous, and inaccessible. Their main value lies in being most important from the point of view of protection in preventing erosion and denudation of the hill slopes, besides their economic value. In view of the objects of management of forest allotted to this Working Circle, no detailed analysis and valuation of the crop is considered necessary.

5.6.1 Stock Map: The stock maps on 4"=1 Miles scale, have been prepared and digitized for all the forests separately.

5.6.2 Density: The crown density of each compartment has been estimated ocularly at the time of field inspection of the forests and has been recorded in respective compartments history files. The average density of the crop varies from 0.2 to 0.5

5.6.3 Site Quality: The site quality of the crop varies from place to place overall quality conform to II/III of the FRI quality classes. The site quality of individual compartments/ sub compartment has been indicated in the compartment history files.

5.6.4 Enumerations: As given in the Chapter-VIII under paragraph 8.8 sampled enumeration was carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The whole of the area of the Kinnaur Forest Division was divided into grids and total 12 Nos. Sample plots have been done by sampling in all PB's areas. The results have been analyzed / extrapolated. The results of enumerations are given in **Appendix No-XIII**. The growing stock has been assessed / extrapolated by sampling and is also given in **Appendix No-XVIII**.

Range wise no. of sample taken

Table- 5.2

Sr. No.	Name of Range	Samples	Total
1	Bhaba Nagar	0	0
2	Kalpa	3	3
3	Katgaon	0	0
4	Kilba	0	0
5	Moorang	5	5
6	Nichar	0	0
7	Pooh	4	4
8	Malling	0	0
	Total	12	12

5.7 Compartmentative Statement:- As discussed under para no 5.6 above, sampled enumerations has been carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The whole of the area of the Kinnaur Forest Division was divided into grids and total **150 Nos** of samples were taken. **Total 12 Nos.** sample plots pertaining to this working circle were enumerated down to 10cm d. b. h. and annalized. Thereafter, the growing stock has been assessed / extrapolated as given in **Appendix No-XVIII** of the current plan.

Abstract showing the growing stock of Neoza Working Circle and total for the working circle in the Plan under revision is given in **Appendix No-XVIII**. However, no enumeration has been carried out in this working circle under Rajiv's working plan. Therefore, the comparative statement is not given.

5.8 Silvicultural System:- Since the object of management is to conserve and improve the existing forests and to restock the mature and under stocked areas, hence, no commercial fellings are envisaged. Therefore, no silvicultural system is prescribed only the demand of local right holders will met with and that too, from the dead and dying trees. Under no circumstances the commercial fellings will be carried out for any purpose. Only salvage marking will be carried out as and when required.

5.9 Choice of Species:- Only Chilgoza Pine best suited to the area will be preferred.

5.10 Rotation Period:- The forest allotted to this Working Circle will have physical rotation only. No felling cycle is prescribed.

5.11 Calculation of Yield:- As no commercial fellings are proposed, therefore, no yield is prescribed. Only salvage marking will be carried out to extract the dead and uprooted trees. The legitimate requirement of right holders will also be met strictly on silvicultural availability. All these fellings will be recorded in the CH Files.

5.12 Sequence of Fellings:- No sequence of fellings is prescribed as the area is to be given rest and protection. However, the total growing stock is tabulated on the Table no:- 5.3

Table No: 5.3

Neoza Working Circle (Area = 2844.53)													
Species Code	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
0241	Deodar	Number	45038	23704	35557	28445	14223	14223	4741	9482	21334	14223	210969
		Volume in Cubic Mtrs	1351.15	5452.02	25245.20	48357.01	36267.76	48357.01	20148.75	45607.30	102616.42	68410.95	401813.57
0926	Kail	Number	4741	0	0	0	0	0	0	0	0	0	4741
		Volume in Cubic Mtrs	142.23	0	0	0	0	0	0	0	0	0	142.23
0927	Chilgoza	Number	47409	47409	18964	23704	21334	9482	11852	4741	2370	0	187265
		Volume in Cubic Mtrs	853.36	7111.33	7964.68	20622.84	26667.47	11852.21	14815.26	5926.10	2963.05	0.00	98776.30
	G Total	Number	97188	71113	54520	52150	35557	23704	16593	14223	23704	14223	402975
		Volume in Cubic Mtrs	2346.74	12563.34	33209.89	68979.85	62935.23	60209.22	34964.01	51533.40	105579.47	68410.95	500732.10

5.13 Methods of Treatment:- The chief value to these forests is in protection of hill sides against the denudation and soil erosion and hence, these forests will be strictly protected and preserved. The demand of right holders, will be met with strictly in accordance with the selection principles and as per recorded settlement rights.

5.14 Plantation Programme:- To achieve the objective, the detailed planting programme has been given in the Plantation (overlapping) Working Circle. Although, Neoza Pine plantation has been raised in the past, the efforts have been meager and sporadic, with no lasting and fruitfull result. In raising the Neoza Pine artificially, the cooperation of local inhabitants is foremost requirements and therefore, the **Joint Participatory Forest Management (JPFM)** programme in the villages shall be implimanted. With this JPFM programme in place, planting and natural regeneration can be expected to come up and restock the deficient areas. The planting programme to be followed during the plan period is given in the Table No:7.2 under the Plantation (overlapping) Working Circle.

5.14.1 Planting Technique:-The Chilgoza Pine is medium sized ever green tree. The flowering time is May and June and the maturation time of female cone is September and October. Generally,the Chilgoza tree starts bearing cones at the age of 15-20 years. The average yield of Chilgoza seeds is about 7 to 10 kgs per tree and the number of seeds per cone is about 140 to 150. The cones mature in 18 months after flowering. The cones are harvested during September – October, when the cone attains the full size having dark green colour. The harvesting is done by cutting the end of branches supporting the cones by sickle.

It has been observed that the patch sowing has not yielded good results in the past, therefore, only polythene raised plants should be planted in the field as per plantation schemes of the Forest Department. The plantation will be basically, a gap filling exercise or enrichment plantation. The endeavor will be to plant up the permanent gaps and also to introduce seedlings in an otherwise old and over- mature stock. Thus, while the net plantation area based on norm of 1100 plants to an hectare on of plants would be less, the gross area covered by plantation will be much more. In carrying out artificial planting, the following main points should be carefully observed:-

- (i) Site Selection: The area selected should be having good manageable soil.
- (ii) The area selected should be fenced properly. The area is to be closed both from grazing as well as plucking of cones in September. The area should remain closed to plucking of cones for at least five years and to grazing till the seedlings get established.
- (iii) In case the plantation is carried through Village Forest Development Committees, the area selected should also be closed.
- (iv) The soil in the plantation / closed area should be raked/worked up during October, so that it is ready for the seed.
- (v) The Plantation should be raised mainly through pit, pit / trench method. The patch-sowing method should invariably be discouraged and only 20 % of the area, wherever necessary, should patch sown, and the remaining 80% should be left for pits / trenches and pit planting.
- (vi) Patches prepared should be 60x60x60 cm Size and 10-15 seeds should be sown per patch during December after treating with poisonous material (to prevent being by birds or rodents.) The patches should then be covered with thorny bushes.
- (vii) The size of pits should be 60x60x60 cm to accommodate 18'' polythene – bag raised minimum 2½ years and 3½ yearsold seedlings.
- (viii) The plantable size recommended is 22.5 cm, which is achieved in 2 ½ years to 3½ yearsold of age and mostly winter planting just before the onset of snow be carried out. Pits should be made inward sloping to retain maximum moisture.
- (ix) The spacing should be 3m X 3m in case of pits and 5m x 5m in case of patches.
- (x) Two weeding and hoeing in the months of April and September should be given.
- (xi) The pits should be dug in June, so that adequate weathering of soil takes place by the time of planting.
- (xii) In case of trench planting, the double trench method should be used. Two trenches should be dug out. One filled and the other unfilled. The unfilled trench will be used for water /snow storage and is made on the upper side of the filled trench used for planting.
- (xiii) In case of planting by pit, the plantations should be irrigated once in a fortnight (wherever, there is availability of water) from May to November during the First two years and thereafter, once in a month for the next two years.
- (xiv) Continuous efforts are being made by different agencies and Himalayan Forest Research Institute to come out with improved plantation technique,

which will have better survival rates. It is, thus incumbent on the Divisional Forest Officer to keep abreast of developments in this regard and make use of improved plantation / nursery package, whenever, it is developed. The indicative cost model for raising one hectare of Chilgoza plantation under Enrichment scheme and also indicative cost model for raising Chilgoza Nursery is given in **Appendix No- XLI** and **Appendix No- XLII** respectively.

5.14.2 Raising of Neoza Pine Nursery:-After constant studies / experience the standrized technique of raising of Neoza pine in nursery is now well established and is in the knowledge of subordinate field staff. The following points should be followed scrupulously, while raising the Neoza Pine nursery and the same is summarized as under:-

- i) Soil brought from Neoza forests is mixed with FYM in 3:1 ratios and filled in polythene bags of 6"x18" (15cm X 45cm). After proper sieving and mixing in Aldrin dust.
- ii) The polythene bags are lined in rows each having 5 bags in width.
- iii) The filling of polythene bags is carried out in October – November.
- iv) The mycorrizal inoculation through Chilgoza Forest soil is found useful in the nursery and therefore, should also be added in the polythene bags.
- v) Clean, healthy Neoza seed is sown in the polythene bags at least 1-2 seeds per bag in the month of November and December and then covered with leaves/ twigs and wire net/ mesh.
- vi) Germination starts in the month of March- April and 70-75% germination takes place.
- vii) The Neoza plants have very much- elongated root system require great care in weeding and hoeing thereafter.
- viii) In case of polythene bags having two seedlings only one should remain by July, the other pricked out.
- ix) Leaf mould or soil-single superphosphate mixture should be added once in a month so that the ball of earth becomes compact.
- x) In the second year, the plants will have to be shifted twice to avoid roots striking and a constant regime of proper watering and hoeing is required.
- xi) In the second year, two small doses of NPK in May and September are given.
- xii) The Neoza plants should attain a height of approximately 22. 5cm. in the month of December (i.e. after two years) in nurseries located on sunny sites.
- xiii) Before taking to the field, the plants should be watered properly to saturation.
- xiv) The Polythene bags being of 18" length are bulky and therefore, utmost precaution is required while transporting them of planting site from nursery.
- xv) As the ball of earth might break when the polythene bag is cut open, it is therefore, recommended that the bags be cut open from the bottom only.

5.14.3Plantation Time Table:- The Time of carrying out important operations is given in the Table No. 5.4 for guidance of the staff.

Table No.5.4

Sr. No.	Operation	Time to carry out operation
i	Sowing in nursery or in patches in plantation area.	November/ December
ii	Demarcation and survey in plantation area.	April.
iii	Layout and digging of pits / trenches.	June.

iv	Fencing of area.	October.
v	Transplanting.	December before snowfall.
vi	Irrigation	May to November
vii	Beating up of failures	December in next year.

5.14.4 Closure and Fencing: All the plantation areas shall be fenced and closed for grazing. Action to notify these closures shall be taken immediately to avoid legal complications. Regeneration/successful planting depend upon the effective closure and good will of the local people and their cooperation in this regard.

5.14.5 Weeding:- For the healthy growth of the plants, timely weeding are of immense importance. In a nut shell, the plants must always be kept free from weeds during the growing season. The weeding shall be continuing till the plants are free from the damage of the weeds.

5.15 Other Regulations:-

5.15.1 Fire Protection:- The whole Working Circle will be under strict vigil against fire hazard, though, the areas are not fire prone, still stray incidences cannot be ruled out. Preventive measure should be taken in advance. The Village Forest Development Committees should also ensure that there is no Fire incidence. The fire lines, inspection paths and bridle paths should be kept clean of needles especially during summer season. Fire watcher should be employed during dry months. Besides developing cordial relations with local people to protect the forests, they should be educated with regard to importance of forest conservation, rights and duties and social obligation as enshrined in Article 51 A(g) of the Constitution of India read with Section 79 of the Indian Forest Act, 1927. The detail description is given in Chapter No. IX Forest Protection (overlapping) Working Circle.

5.15.2 Grazing and Grass Cutting:- Outside the regeneration areas, there will be no restriction on grass cutting. Grass cutting will not be allowed till the plants are at least 1 meter in height, during the closure period under Section 30 (b) of Indian Forest Act, 1927.

5.15.3 Right Holder's Demand:- Demand of right holder will be met from the forest in which such rights has been recorded in Forest Settlement Report and further the right and concessions shall be exercised strictly in accordance with the silviculture principles. All the trees marked to meet the demand of right holders shall be recorded in the concerned Compartment History Files. Dry and fallen trees should primarily be utilized to meet the right holder's demands.

5.15.3.1 Collection and Sale of Neoza Seed:- The Chilgoza seed collected and exported by the local right holders during the expired working plan given in the Table No 5.5

Table No: 5.5

Sr. no	Year	Quantity of Chilgoza collected / exported (In Qtl.)	Royalty	Remarks
1	1999-2000	---	---	Information from 1999 - 2000 to 2008-2009 not available
2	2000-2001	---	---	Information from 1999 - 2000 to 2008-2009 not available
3	2001-2002	---	---	Information from 1999 - 2000 to 2008-2009 not available
4	2002-2003	---	---	Information from 1999 - 2000 to 2008-2009 not available
5	2003-2004	---	---	Information from 1999 - 2000 to 2008-2009 not available
6	2004-2005	---	---	Information from 1999 - 2000 to 2008-2009 not available
7	2005-2006	---	---	Information from 1999 - 2000 to 2008-2009 not available
8	2006-2007	---	---	Information from 1999 - 2000 to 2008-2009 not available
9	2007-2008	---	---	Information from 1999 - 2000 to 2008-2009 not available

10	2008-2009	---	---	Information from 1999 - 2000 to 2008-2009 not available
11	2009-2010	454.5	Nil	No royalty rates notified by the forest department for collection of Neoza
12	2010-2011	152	Nil	No royalty rates notified by the forest department for collection of Neoza
13	2011-2012	127	Nil	No royalty rates notified by the forest department for collection of Neoza
14	2012-2013	74	Nil	No royalty rates notified by the forest department for collection of Neoza
15	2013-2014	86	Nil	No royalty rates notified by the forest department for collection of Neoza
16	2014-2015	6	6000	Royalty rates fixed by H. P. Government and charged accordingly
17	2015-2016	179	179000	Royalty rates fixed by H. P. Government and charged accordingly
18	2016-2017	3	3000	Royalty rates fixed by H. P. Government and charged accordingly
19	2017-2018	26.5	26500	Royalty rates fixed by H. P. Government and charged accordingly
20	2018-2019	22	22000	Royalty rates fixed by H. P. Government and charged accordingly
	Total	1130	236500	

(Source:-Record of Kinnaur Forest Division)

It is laid down that the Divisional Forest Officer should ensure to maintain complete proper record for extraction of Chilgoza seeds.

5.15.4 Closures: The Village Forest Development Committees (VFDC) should be constituted and notified. The committee should frame its bye laws which shall be approved by the Divisional Forest Officer. The local inhabitant has to be convinced about closures and regeneration. The area will have to be closed for grazing till the regeneration is established. Normally, the period of 15 years, Govt. Notification for such closure should be got issued under Section 30 (b) of Indian Forest Act, 1927 well in time before the closure of the area by the competent authority to avoid any litigation.

5.15.5 Lopping: The people have got exclusive rights to collect the seed without any let or hindrance. The Neoza Pine continues to be heavily lopped, both for plucking the cones and also for the fuel wood with resultant heavy injuries to the crop. This practice is also affecting the natural regeneration of Chilgoza to a greater extent. The Village Forest Development Committees (VFDC) should exercise a check on heavy lopping and fine must be imposed on the defaulters.

5.15.6 Assessment of Annual Production of Neoza Seed: It is suggested that the data should be collected annually about the collection and sale of Neoza Pine seeds from the village auctions. etc. This will give insight in to the level of production of Neoza seeds and tract about its availability.

CHAPTER VI

THE REHABILITATION WORKING CIRCLE

6.1 General Constitution:- This working circle comprises of all the conifers and Broad leaved forests which are inaccessible and are situated on the steep and precipitous grounds where commercial working is not possible and the removal of which will create soil erosion problems and will encourage landslides. In short, this circle contains all the demarcated/un-demarcated protected forests which has not been included in any of the working circle, being either inaccessible due to steep and difficult precipitous terrain or poor stocking (both quantitatively and qualitatively) and also those forest which were under the Protection Cum Rehabilitation working circle of Rajiv's Plan. Their chief value has been in being most important from the point of view of the protection in preventing denudation and maintaining an equitable flow of water in the streams and rivers, which have their sources in the hills. Hence, the compartments allotted to this working circle are also to preserve the pristine ecosystem of the area. The forest allotted to this working circle render intangible benefits than the tangible ones. It includes all the areas allotted to Protection Cum Rehabilitation working circle in the previous plan and also newly created DPFs. The total area of this Working Circle is **21966.20** hectare, which is **61.92%** of the total area of the Kinnaur Forest Division.

6.2 General Character of Vegetation:- Because of the varied types of areas included in this working circle and their scattered distribution throughout the tract, almost every type of vegetation typical to this area is encountered in the forests allotted to this working circle and has been described in detail in Chapter II of part I of this working plan. However, the principal forest types found in this working circle are as under:-

- 9 C1 (b) Upper or Himalayan Chil pine forest
- 12 C1 (a) Ban oak forest (*Quercus incana*)
- 12C1(d) Western mixed coniferous forest (*Spruce* Blue pine and Silver fir)
- 12C1(e) Moist temperate deciduous forest
- 12C II (a) Kharsu Oak forest (*Quercus semecarpifolia*)
- 13CII(a) Neoza pine forest (*Pinus gerardiana*)
- 14C1(b) Western Himalayan sub alpine birch/Fir forest
- 15CIII Alpine pasture

It is also worthwhile to mention here that while these are forest of Chil, Deodar, Kail, Fir, Spruce in wet zone and in dry zone it is replaced by a mixture of Deodar, Kail and further in the interior by the mixture of Deodar and Neoza. Further, in Pooh Range, the Deodar is stunted, malformed and branchy with extremely poor stock both quantitatively and qualitatively.

6.3 Special Objects of Management:- Without prejudice to general objects of managements, the special objects of managements of the forest allotted to this Working Circle are:-

- i) To protect the hill sides from further denudation and erosion by preserving and enhancing the forest cover and by undertaking the effective soil conservation works in a planned manner, where ever necessary.
- ii) To conserve moisture and streamline the flow of water in streams and nallas by protecting and enhancing vegetation cover in the watershed.
- iii) Consistent with above, to provide for grazing requirements of local people of sheep goats and buffaloes and migratory grazers who come to these areas with their flocks for summer grazing and also to meet the demand of right holders for timber and fuel wood in accordance with notification no FFE-B-A (3) 4/2015 dated Shimla -2, 26-Feb-2016 (copy of the notification given in **Appendix No.-XXX.**)

- iv) To protect and preserve the valuable forest wealth from the indiscriminate felling and lopping of trees.
- v) To protect the forest, no felling of trees will be allowed from precipitous slopes, nallas and banks of rivers to ensure ecological security of the tract
- vi) To preserve and improve the biodiversity of the area.

6.4 Area Statement:- The total area of this working circle **21966.20 hectare**, which works out to be **61.92%** of the total area of the division. The distribution of these forests range wise and by legal status is tabulated in Table No. 6.1.

Table 6.1

Name of Range	DPF	NDPF	UPF	Total in Ha
Bhaba Nagar	575.03	0	595	1170.03
Kalpa	3694.76	0	445	4139.76
Katgaon	981.62	0	770	1751.62
Kilba	2149.15	971.45	2408	5528.6
Malling	0	0	0	0
Moorang	2530.59	0	0	2530.59
Nichar	2351.64	0	3737	6088.64
Pooh	756.96	0	0	756.96
Total	13039.75	971.45	7955	21966.2

The forest wise detail of specific allotment is given in **Appendix No.-IV**.

6.5 Blocks and Compartment:-No change has been made in the existing compartments and sub compartments. New compartments have been formed in case of newly created DPFs. Compartments and sub compartments have been numbered systematically both for DPFs and UPFs, which was necessitated due to creation of new DPFs and transfer of forest areas from Wild Life Division, Sarahan to Kinnaur Forest Division.

6.6 Analysis and Valuation of the Crop:-Most of the demarcated and un-demarcated protected forests are rocky, steep, precipitous, inaccessible and unworkable or high lying alpine pastures. Their main value lies in being most important from the point of view of protection in preventing erosion and denudation of the hill slopes and in maintaining and equitable flow of water in the river and streams. Unless these hills are protected, mountain falls shall start eroding and flood will play the havoc. They will silt up the reservoirs, break dams and embankments ruin the roads, bridges and over run the field, villages and town in the foot hill and plains bringing misery to the thousands of people. In view of the objects of management of forest allotted to this Working Circle, no detailed analysis and valuation of the crop is considered necessary.

6.6.1 Stock Map:-The stock maps on 4"=1 Miles scale, have been prepared and digitized for all the forests separately.

6.6.2 Density:-The crown density of each compartment has been estimated ocularly at the time of field inspection of the forests and has been recorded in respective compartments history files. The average density of the crop varies from 0.3 to 0.5

6.6.3 Site Quality:- The site quality of the crop varies from place to place, overall, quality conform to II/III of the FRI quality classes. The average site quality of Deodar and Kail II in the forest of wet zone and low quality III in the forest of dry zone. The Deodar forest of dry zone largely consist of stunted malformed and multiforked stem and while, Kail is severely attacked by

Arceuthobium. The site quality of individual compartments/ sub compartment has been indicated in the compartment history files.

6.6.4 Enumerations:-As given in the Chapter VIII under paragraph 8.8 sampled enumerations has been carried out. The enumeration was carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. Total 79 Nos. sample plots pertaining to this working circle were enumerated. The detailed forest wise enumeration results are given in **Appendix No-XIV**. The results have been analyzed statistically and growing stock has been assessed / extrapolated in **Appendix No-XIX**.

Range wise no. of sample taken

Table- 6.2

Rehabilitation Working Circle			
Sr. No	Name of Range		Total
1	Bhaba Nager	9	9
2	Kalpa	24	24
3	Katgaon	4	4
4	Kilba	15	15
5	Malling	0	0
6	Moorang	12	12
7	Nichar	5	5
8	Pooh	10	10
	Total	79	79

Table No.:-6.3
Species wise No. and Volume in cubic mts. (Estimated / extrapolated growing stock) for Protection Working Circle

Area 21966.20 ha.															
Sr. No.	Species Code	Botanical Name	Common / Local Names		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total
1	0241	<i>Cedrus deodara</i>	Deodar	Number (WZ)	8449	30978	39427	50691	45059	53507	16897	5632	0	0	250640
				Volume in Cubic Mtrs	506.91	8673.83	33512.54	93271.86	127516.61	196907.27	81274.94	34301.07	0.00	0.00	575965.03
				Number (DZ)	118280	183052	298515	236559	154890	90118	78853	50691	22529	36610	1270097
				Volume in Cubic Mtrs	3548.39	42101.88	211945.67	402150.43	394969.17	306400.33	335125.36	243824.82	108366.59	176095.70	2224528.34
2	0926	<i>Pinus wallichiana</i>	Kail	Number (WZ)	11265	11265	5632	2816	2816	5632	0	5632	0	0	45059
				Volume in Cubic Mtrs	675.88	3154.12	5576.04	5576.04	8758.32	23937.53	0.00	34301.07	0.00	0.00	81978.98
				Number (DZ)	45058	84485	70404	36610	56323	14081	5632	5632	0	0	318225
				Volume in Cubic Mtrs	1351.77	19431.64	49987.19	62237.57	127291.31	51817.70	28725.03	28725.03	0.00	0.00	369567.23
3	0002	<i>Abies pindrow</i>	Fir	Number	30978	28162	22529	25346	14081	11265	22529	11265	8449	28162	202765
				Volume in Cubic Mtrs	1858.68	7885.30	22304.14	43087.55	39848.94	51029.17	146666.63	86175.09	83725.02	279083.39	761663.90
4	0921	<i>Picea smithiana</i>	Spruce	Number	2816	16897	16897	8449	2816	0	8449	0	0	8449	64772
				Volume in Cubic Mtrs	168.97	4731.18	11996.92	11996.92	7181.26	0.00	52634.39	0.00	0.00	83725.02	172434.67
5	0929	<i>Pinus roxburghii</i>	Chil	Number	14081	28162	28162	36610	8449	16897	22529	5632	0	0	160522
				Volume in Cubic Mtrs	1253.20	9237.07	21825.39	54110.07	20867.89	64023.02	123145.90	42417.30	0.00	0.00	336879.84
6	0927	<i>Pinus gerardiana</i>	Chilgoza	Number	90118	84485	101382	81669	25346	22529	8449	8449	11265	0	433692
				Volume in Cubic Mtrs	1622.12	12672.81	42580.63	71052.21	31682.02	28161.79	10560.67	10560.67	14080.90	0.00	222973.83
7	1162	<i>Taxus baccata</i>	Taxus	Number	19713	0	2816	0	0	0	0	0	0	0	22529
				Volume in Cubic Mtrs	197.13	0.00	450.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	647.72
8	0153	<i>Betula alnoides</i>	Betula	Number	2816	2816	2816	5632	0	0	0	0	0	0	14081
				Volume in Cubic Mtrs	28.16	168.97	450.59	1633.38	0.00	0.00	0.00	0.00	0.00	0.00	2281.11
8	1010	<i>Quercus incana</i>	Ban oak	Number	50691	22529	2816	0	0	8449	8449	0	0	5632	98566
				Volume in Cubic Mtrs	22304.14	15995.90	3041.47	0.00	0.00	22388.63	27795.69	0.00	0.00	27767.53	119293.36
9	1006	<i>Quercus dilatata / floribunda</i>	Mohru Oak	Number	0	11265	0	0	2816	0	0	0	0	0	14081
				Volume in Cubic Mtrs	0.00	7997.95	0.00	0.00	5857.65	0.00	0.00	0.00	0.00	0.00	13855.60
10	1017	<i>Quercus semecarpifolia</i>	Kharshu Oak	Number	11265	0	0	0	0	0	0	0	0	0	11265

				Volume in Cubic Mtrs	4956.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4956.48
11	0652	<i>Juniperus macropoda</i>	Juniper	Number	0	2816	2816	0	0	0	0	0	0	0	5632
				Volume in Cubic Mtrs	0.00	197.13	647.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	844.85
12	0651	<i>Juglans regia</i>	Walnut	Number	0	2816	8449	0	11265	2816	2816	2816	0	8449	39427
				Volume in Cubic Mtrs	0.00	84.49	929.34	0.00	4167.95	1605.22	2309.27	3182.28	0.00	16052.22	28330.77
13	0038	<i>Aesculus indica</i>	HC Nut	Number	2816	2816	2816	0	2816	0	0	0	0	0	11265
				Volume in Cubic Mtrs	28.16	168.97	450.59	0.00	1295.44	0.00	0.00	0.00	0.00	0.00	1943.16
14	0061	<i>Alnus nitida</i>	Alnus	Number	0	0	0	0	5632	0	5632	0	0	0	11265
				Volume in Cubic Mtrs	0.00	0.00	0.00	0.00	2083.97	0.00	4618.53	0.00	0.00	0.00	6702.51
15	0630	<i>Ilex dipyrena</i>	Bray	Number	76037	47875	39427	16897	8449	0	0	0	0	0	188684
				Volume in Cubic Mtrs	33456.21	33991.29	42580.63	26021.50	17572.96	0.00	0.00	0.00	0.00	0.00	153622.59
16	1038	<i>Rhododendron aeboreum</i>	Rhododendron	Number	0	2816	0	0	0	0	0	0	0	0	2816
				Volume in Cubic Mtrs	0.00	197.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	197.13
17	0019	<i>Acer acuminatum</i>	Maple	Number	30978	42243	25346	5632	25346	0	0	0	0	0	129544
				Volume in Cubic Mtrs	309.78	1267.28	2788.02	1295.44	9377.88	0.00	0.00	0.00	0.00	0.00	15038.40
18	0965	<i>Prunus cornata</i>	Bird cherry	Number	2816	2816	2816	2816	0	0	0	0	0	0	11265
				Volume in Cubic Mtrs	28.16	197.13	647.72	1239.12	0.00	0.00	0.00	0.00	0.00	0.00	2112.13
19	0500	<i>Fraxinus Species</i>	Fraxinus	Number	8449	8449	2816	2816	0	0	0	0	0	0	22529
				Volume in Cubic Mtrs	84.49	591.40	647.72	1239.12	0.00	0.00	0.00	0.00	0.00	0.00	2562.72
20	2000	<i>Identified and Uncoded Tree</i>	Other B/L	Number	5632	11265	14081	8449	2816	0	0	0	0	0	42243
				Volume in Cubic Mtrs	56.32	788.53	3238.61	3717.36	1999.49	0.00	0.00	0.00	0.00	0.00	9800.30
			G Total	Number	532258	628007	689963	520993	368919	225294	180235	95750	42243	87302	3370964
				Volume in Cubic Mtrs	72434.95	169534.01	455601.52	778628.57	800470.86	746270.67	812856.41	483487.33	206172.50	582723.86	5108180.67

6.7 Age Classes:- In the dry zone, there is marked paucity of younger age classes and the standing stock is mostly mature to more mature. In the wet zone, the younger classes are much less except in a few compartments, where all the age classes are represented.

6.8 Compartmentative Statement:- As discussed under para no 5.6 above, sampled enumerations has been carried out on the grid system bases in the Sample IDs (Plots) of size 0.1 Ha each. The whole of the area of the Kinnaur Forest Division was divided into grids and total **150 Nos** of samples were taken. **Total 79 Nos.** sample plots pertaining to this working circle were enumerated down to 10cm d. b. h. and annalized. Thereafter, the growing stock has been assessed / extrapolated as given in **Appendix No-XVIII** of the current plan.

The Abstract showing the growing stock of Rehabilitation Working Circle and total for the Protection Cum Rehabilitation working circle in Rajiv's working plan and in the Plan under revision (Now named as Rehabilitation Working Circle) is given is **Table no 6.3.**

Table no 6.3.

Estimated growing Stock of Rehabilitation Working Circle and total for the circle.

Rajiv's Plan	Area 13518.63 ha.											
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Protection Cum Rehabilitation Working Circle											
	No of trees in diameter in classes											
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90 & over	Total Number
	Deodar	Number (WZ)	14884	10565	8423	6300	4082	2988	1984	2045	2368	53639
		Number (DZ)	143283	95916	72004	48777	25106	14743	8483	5499	7874	421685
	Kail	Number (WZ)	4015	2960	2597	1898	1141	671	359	169	93	13903
		Number (DZ)	43646	36103	27709	23442	13880	9829	6820	5460	5962	172851
	Fir	Number	70573	52343	50138	41672	31227	22064	15008	8728	7617	299370
	Spruce	Number	38530	23985	18183	11109	7926	4168	2588	2746	4184	113419
			314931	221872	179054	133198	83362	54463	35242	24647	28098	1074867

Present Plan (Plan Under Revision)	Area 21966.20 ha.													
	Species wise No. and Volume in cubic mtrs. (Estimated / Extrapolated growing stock) for Protection Cum Rehabilitation Working Circle													
	No of trees in diameter in classes													
	Species		10-20 V	20-30 IV	30-40 III	40-50 IIA	50-60 IIB	60-70 IA	70-80 IB	80-90 IC	90-100 ID	100 over IE	Total Number	Total Volume
	Deodar	Number (WZ)	8449	30978	39427	50691	45059	53507	16897	5632	0	0	250640	575965.03
		Number (DZ)	118280	183052	298515	236559	154890	90118	78853	50691	22529	36610	1270097	2224528.34
	Kail	Number (WZ)	11265	11265	5632	2816	2816	5632	0	5632	0	0	45059	81978.98
		Number (DZ)	45058	84485	70404	36610	56323	14081	5632	5632	0	0	318225	369567.23
	Fir	Number	30978	28162	22529	25346	14081	11265	22529	11265	8449	28162	202765	761663.9
	Spruce	Number	2816	16897	16897	8449	2816	0	8449	0	0	8449	64772	172434.67
			216846	354839	453404	360471	275985	174603	132360	78852	30978	73221	2151558	4186138.15

6.9 Silvicultural System:- Since the object of management is to conserve the existing forests and no commercial fellings are envisaged. Therefore, no silvicultural system is prescribed only the demand of local right holders will met with that too, from the dead and dying trees as per Himachal Pradesh Forest (Timber Distribution to the Right holders) Amendment Rules, 2016. Under no circumstances, the commercial felling will be carried out for any purpose. Only salvage marking will be carried out as and when required.

6.10 Choice of Species:- Species best suited to the area will be preferred.

6.11 Rotation Period:- The forest allotted to this Working Circle will have physical rotation only.

6.12 Calculation of Yield:- As no commercial fellings are proposed, therefore, no yield is prescribed. Only salvage marking will be carried out to extract the dead and uprooted trees. All these fellings will be recorded in the CH Files.

6.13 Sequence of Fellings:- No sequence of fellings is prescribed as the area is to be given rest and protection.

6.14 Methods of Treatment:- The chief value to these forests is in protection of hill sides against the denudation and soil erosion and hence, these forests will be strictly protected and preserved. The demand of right holders, where, there is no other forests in the vicinity will be met with strictly in accordance with the selection principles and as per recorded settlement rights and as per amended Timber Distribution Rules, 2016.

6.15 Plantation Programme:- The chief value to these forests lies in their protective cover against the denudation and soil erosion of hills. Demands of the right holders will be met only on silvicultural consideration and should conform to selection marking. All the sizable cultural blanks will be planted with suitable species. The area which requires closure, soil conservation work and afforestation, etc. the detail has been given in the Plantation (overlapping) Working Circle. The plantation areas will remain closed for minimum period of 10 years or more and the area so closed shall be got notified well in time. The inspection path in the plantation area, which is normally constructed 60 cms wide should be constructed at least one meter wide which will act as fire line and also to protect the plantation. The path should be constructed in such a way, that it divides the whole plantation in four or five equal parts. The plantations and closures of the past have suffered on account of poor people's participation, but that concept must now change with the advent Joint Participatory Forest Management. Only those areas should be taken up where the people readily agree participate and protect. In these areas, motivational and organizational skills are of great importance, which is also a pre-requisite before taking an area for the plantation activities.

6.16 Other Miscellaneous Regulations:-

6.16.1 Fire Protection:- The whole Working Circle will be under strict vigil against fire hazard. All the old and new plantations area will be strictly fire protected from fire. All the fire lines should be cleared and fire watcher should be engaged in the fire prone areas. Besides this, maintaining cordial relations with the local people and educating them properly, with regard to, importance of forest conservation, rights and duties and social obligation as enshrined in Article 51 A(g) of the Constitution of India read with Section 79 of the Indian Forest Act, 1927.

6.16.2 Closures: All areas taken up for planting should be closed to grazing, lopping, grass cutting etc. and shall duly notified for closure under Section 30 (b) of IFA, 1927, for a period of 10-15 years.

6.16.3 Grazing: All plantations areas shall remain closed for grazing for 10 to 15 years period depending upon the progress or success of plantation. The closure should be effective and for the minimum possible time, so that least hardships is experienced by right holders. However, depending upon the progress of the young crop, particular area may be thrown open to grazing even before the period of closure notification is expired. Most of the areas of this working circle are over grazed and following suggestions are made to control and regulate grazing in the forests of this working circle.

- i) All the alpine pastures are required to be surveyed for determining their carrying capacity.
- ii) No increase should be allowed in the number of migratory sheep and goats which visit these areas during summer.
- iii) The check on the number of cattle which the local people should be provided and number of cattle allowed to graze free of charge should be fixed for different sizes of holdings.
- iv) The people should be encouraged to keep stall fed cattle of good breed.

- v) The areas, which are seriously suffering from over grazing, should be closed to grazing under the scheme of rotational closure.
- vi) Grass cutting should be allowed from these areas in the month of October, when the seed has been shed.
- vii) Suitable legumes should be introduced in the pasture land.

The following rules should be enforced for lopping:-

- a) The conifers and valuable broad leaved species like Maple, Walnut, Ash etc. should not allowed to be lopped.
- b) The trees below three meters in height will not be lopped.
- c) The lopping will be restricted only to the lower 2/3rd portion of its total height.
- d) The branches more than 8 cm. in dia meter will not be cut.

6.16.4 Grass cutting: No grass cutting shall be allowed except under strict supervision of the forest guard under MGNREGA Scheme, etc. It will also be better, if Panchayats are associated for the purpose. Removal of grass reduces competition and also mortality due to overhead shade.

6.16.5 Lopping: Trees standing in the plantation areas shall remain prohibited for lopping during the closure period and necessary notification shall be got issued under Section 30 (b) of the Indian Forest Act, 1927 to avoid any litigation.

6.16.6 Right Holder's Demand: The requirements of right holders will be met from the forests in which such right has been recorded in settlement. But, it should be bare minimum, so that, the forest crop is not damaged and soil conservation problem is not created. The marking of trees to the right holders, if permitted, should be in accordance with the silvicultural principle

MANDATORY WORKING CIRCLES

CHAPTER VII

THE PLANTATION (OVERLAPPING) WORKING CIRCLE

7.1 General Constitution:- This Working Circle comprises of such demarcated and un-demarcated protected forests including Culturable Govt. waste land, which are understock or devoid of tree growth or blank areas or have young plantation or crop, which still need protection and are suitable for planting of ecologically and economically important species. The main objectives of forest management is no more managing the forests for economical timber harvests, but has been changed to environmental and social factors. The forests of Himalayas, in general, and this region in particular have very high watershed value owing to its strategic location, altitude and source of perennial water supply. Therefore, keeping importance of this area in mind, forest policy advocates at least 60 % area should be under forest cover. To achieve this target, a massive plantation drive was launched in the state which has yielded satisfactory results, particularly, in the presence of very heavy population and livestock pressure and huge infrastructure needs. Only such areas will be taken which have site factor favourable for raising plantations, closure is possible, in view of the fact that not more than one third area of a forest can be closed at a time under the permission of settlement of rights and *section 29 (b) of Indian Forest Act, 1927*. Human population has increased manifold and is further increasing day by day. Their requirements for fuel-wood, fodder, timber, NTFP and water has also increased manifold, thereby, putting pressure on natural forest resources. Therefore, the areas adjacent to village habitations where the species of local requirement of fodder and fuel can be raised in sustainable manner through JFM (participatory practices). The depleted scrub forests are also included in this Working Circle. Focus will be on restoring the species composition from timber centric to other useful species for fuel, fodder and NTFP, etc.

7.2 General Character of Vegetation:- This Working Circle extends over several types of forests starting from Sub Tropical Pine Forests to Sub Alpine Forests, extending upto Moist and Dry Alpine Scrub Forests. The general description of the crop has been described in Chapter II of Part I of the Working Plan under revision. The detail descriptions are also given in the respective compartment history files also. The forests of this Working Circle are located in different altitudinal zones and therefore, there is marked variation in the vegetation. No specific forests are allotted to this working circle, but the areas which are devoid of or have very scanty vegetation, areas which are infested by weeds, all areas along road side where strip plantation can be done to enhance the aesthetic beauty of the area are included to constitute this working circle. The typical landscape of these areas have a few scattered trees of conifer/BL with local shrubs like *Prinscepea utilis*, *Berberis* Spp, *Rubus* Spp, *Indigofera* Spp, *Desmodium* Spp, *Duetzia* Spp, *Rhus* Spp, *Sarcococca* Spp, *Spiraea* Spp etc infesting the area. Unrestricted grazing, browsing, lopping and repeated fires have reduced these areas to the present deplorable state.

7.3 Special Objects of Management:- The special objects of managements of the forest allotted to this Working Circle are:-

- (i) To rehabilitate the degraded treeless area and poorly stocked areas, with economic and ecological tree species to meet the demand of the local people for fodder, fuel and timber etc. in the vicinity of these forests.
- (ii) To manage the degraded, sparsely stocked and blank forests on scientific basis to increase the area under forest cover, thereby, reducing the pressure on natural forests.
- (iii) To relocate the barren areas to preserve the soil in situ and conserve the soil moisture in the watershed/catchment areas.
- (iv) To rehabilitate degraded areas by planting fodder trees and high yielding varieties of grasses through participatory management practices and to involve local people in planning,

execution and management of plantation areas near habitation so as to have better survival rate and to develop sense of ownership and belongingness amongst the villagers.

- (v) To develop and augment forest resources of area in order to meet the demand of the locals for firewood, fodder and timber & NTFPs.
- (vi) To replace gradually the inferior weed infested forests with more valuable commercial as well as species most suited to local people.
- (vii) To restock the blanks of roadside strips with species of aesthetic importance.
- (viii) To protect and nurse the existing plantations and natural young growth under a systematic regime of cleaning and thinning etc.

7.4 Area Statement:- No specific forest area has been allotted to this working circle. However, the Forest areas allotted to other working circle of the plan under revision, which requires afforestation is tabulated in Table no 7.1 under the plantation programme.

The forest wise detail of specific allotment is given in **Appendix No.-IV**.

7.5 Blocks and Compartment:- No change in the existing compartments and sub compartments has been made except for the areas transferred from Wild Life Division, Sarahan and the forest areas not included in the previous plan. The compartments and sub compartments have been numbered systematically both for DPFs and UPFs, which was necessitated due to creation of new DPFs and revision of the present plan.

7.6 Plantation Series:- There will be only one plantation series, conforming to the territorial jurisdiction of Kinnaur forest Division.

7.7 Analysis and Valuation of the Crop:- In order to cover the entire plantable area of this division during the plan period, annual plantation program has been laid down in this Working Circle. Emphasis, however, should be on proper selection of suitable species of the area, combination of species, reduction of mortality etc.

7.7.1 Stock Map:- The stock maps on 4"=1 Miles scale, have been prepared and digitized for all the forests separately and placed in the respective compartment history files of the forests.

7.7.2 Density:- The areas being bare grassy land or with scattered and stunted tree growth, working out of density is not feasible. However, the crown density of each compartment wherever necessary, has been estimated ocularly and has been recorded in respective compartment history files.

7.7.3 Site Quality:- Working out of the site quality is not feasible since the area being bare grassy land or with scattered and stunted tree growth. However, the site quality of the crop varies from place to place, but overall quality conforms to II/III of the FRI quality classes. The site quality of individual compartment/ sub compartment has been indicated in the compartment history files.

7.7.4 Enumerations:- No enumerations have been carried out as it was not required in these areas. However, the description has been written up for each area showing the present state of the areas.

7.8 Silvicultural System:- The new plantations will be raised artificially. The choice of silvicultural system, therefore, at the stage does not arise. As the main object is to raise plantations of suitable species, therefore, no silvicultural system is prescribed. The plantation will be raised by artificial planting or sowing. However, as and when plantations are established, areas as per crop composition will be allotted to respective Working Circles in next Working Plans.

7.9 Choice of Species

The choice of species for raising plantation will mostly be governed by the site factors. The choice of species depends on various factors such as climatic, edaphic, topographic and biotic, but surviving indigenous species give a clear indication of most suitable species. The correct choice of species would give productive and praise worthy results where as wrong choice of species always

brings adverse publicity for the forester. In short, adequate care must be taken while selecting the species to be planted, keeping in view the ecological land capability, terrain and the demands of the local people. The species to be planted altitude-wise are suggested as under. However, Divisional Forest Officer is at liberty to change or new species suitable to a particular site.

Table-7.1
Suggested list of species to be planted

Altitude	Species suggested for plantation
1	2
Up to 1000 metres	Toon, Beuhl, Siris, Khirk, Ficus species etc.
1000 to 1500 meters	Robinia, Chulli, Chil, Ailanthus, Bihul, Toon, Willow, Leucaenia, Khirk, Kikker, Poplar, Mulberry
1500 to 2500 metres	Chilgoza, Deodar, Kail, Walnut, Poplar, Willow, Robinia, Ban Oak, Horse Chestnut.
2500 to 3000 metres	Chilgoza, Silver Fir, Spruce, Maple, Walnut, Moru/Kharsu Oak, Bird Cherry, Ash, Poplar

7.10 Rotation Period:- There is no need for prescribing rotation at this stage. However, the different species will naturally be worked out under different rotations.

7.11 Exploitable Diameter:- No exploitable diameter is fixed at this stage.

7.12 Calculation of Yield:- Since blank grassy land, degraded forest and under stock areas have been prescribed for afforestation, and therefore, no felling has been prescribed in this Working Circle at this stage. Therefore, no yield has been prescribed.

7.13 Table of Planting:- The table below gives the plantation programme in these areas and is tabulated in Table No. 7.2

Table no 7.2												
Year	Name of Range	Name of Forest	Comptt No.	New Comptt No	Area of Comptt. (ha)	Working Circle wise area to be planted (in hac.)						Total
						DK WZ WC	D/ K DZ WC	F/ SWC	NWC	REH. WC	Other Forest land	
1	2	3	4	5	6	7	8	9	10	11	12	13
2020-21	Bhaba Nagar	Kandlu chaunda	68(a)-I	1 (a)	43.7	6	0	0	0	0	0	6
		Kandlu-Chhonda (Chaura)	68(c)	1 (f)	167.13	4	0	0	0	0	0	4
		Thach	NC-5	167	51.86	0	0	0	0	4	0	4
		Jani	C-131	37	113.3	6	0	0	0	0	0	6
		Lisnam	C-132 (a)	38 (a)	93.5	5	0	0	0	0	0	5
		Total				21	0	0	0	4	0	25
	Kalpa	Chini	C- 243 (a)	147 (a)	16.2	0	5	0	0	0	0	5
		Boktu	C- 238	142	66.37	0	6	0	0	0	0	6
		Duni	C-241	145	89.03	0	0	0	5	0	0	5
		Tangling	C-178	82	112.1	0	0	0	8	0	0	8
		Telang	C-239	143	192.63	0	0	0	0	6	0	6
		Barang	C-171(a)	75 (a)	21.85	0	5	0	0	0	0	5
		Tangling	C-176	80	131.5	0	0	0	0	8	0	8
		Purbani	C-183(a)	87 (a)	77.7	0	6	0	0	0	0	6
		Purbani	C-183(b)	87 (b)	12.55	0	0	0	0	5	0	5
		Rang Runang	NC-21	183	97.57	0	0	0	0	6	0	6
		Gunshanang	NC-26	188	141.76	0	0	0	0	7	0	7
		Rangley	NC-27	189	81.68	0	0	0	0	8	0	8
		Total				0	22	0	13	40	0	75
	Katgaon	Rushnang	C-87	20	196.27	0	0	0	0	10	0	10
		Rusnang	C-88	21	242	0	0	10	0	0	0	10
		Total				0	0	10	0	10	0	20
	Kilba	Phinla-II	C-136 a	42 (a)	37.25	5	0	0	0	0	0	5
		Seringche	C-162 (a)	66 (a)	42.49	0	0	0	0	5	0	5

		Pawanang I1	C-165	69	78.1	0	0	0	0	8	0	8
		Chansu	C-152 (a)	58 (a)	97.5	0	0	0	0	5	0	5
		Sapni	C-143	49	55.45	0	7	0	0	0	0	7
		Baturi	C-146	52	36	0	0	0	0	0	0	0
		Punang	C-134 a	40 (a)	66.75	5	0	0	0	0	0	5
		Total				10	7	0	0	18	0	35
	Moorang	Korti-Akpa	C-227	131	467.82	0	0	0	5	0	0	5
		Rispa	C-191	95	172.4	0	0	0	9	0	0	9
		Holdaring	C-186	90	265.07	0	0	0	0	5	0	5
		Tidong-I	C-193	97	271.15	0	0	0	0	5	0	5
		Chakra	C-216	120	31.16	0	0	0	0	5	0	5
		Total				0	0	0	14	15	0	29
	Malling					Nil						
	Nichar	Tranda Soldang (Kutangang)	C 71 (b) III	4 (e)	41.27	10	0	0	0	0	0	10
		Chhachi Dhar	C-84	17	109.66	8	0	0	0	0	0	8
		Total				18	0	0	0	0	0	18
	Pooh	Rishi	C-198	102	34.4	0	0	0	0	4	0	4
		Giaboung-I	C-208	112	168.65	0	0	0	0	5	0	5
		Sunam	C-210	114	106.84	0	0	0	0	5	0	5
		Total				0	0	0	0	14	0	14
		G Total 2020-21				49	29	10	27	101	0	216
2021-22	Bhaba Nagar	Kandlu-Chhonda (Chaura)	68(a)-II	1 (b)	65.56	0	0	5	0	0	0	5
		Kandlu-Chhonda (Chaura)	68(b)-I	1 (c)	285.85	0	0	3	0	0	0	3
		Kandlu-Chhonda (Chaura)	68(c)	1 (f)	167.13	4	0	0	0	0	0	4
		Bundo Kutang	C- 73	6	375.95	0	0	7	0	0	0	7
		Thach	NC-5	167	51.86	0	0	0	0	3	0	3
		Ramni	C-130 (a) i	36 (a)	85.93	0	0	2	0	0	0	2
		Jani	C-131	37	113.3	5	0	0	0	0	0	5
		Lisnam	C-132 (a)	38 (a)	93.5	5	0	0	0	0	0	5

		Total				14	0	12	0	3	0	29
	Kalpa	Tangling	C-178	82	112.1	0	0	0	8	0	0	8
		Kashang-I	C-234 ©	138 (c)	26.71	0	0	0	4	0	0	4
		Telangi	C-240 (b)	144 (b)	37.23	0	0	0	8	0	0	8
		Telangi	C-239	143	192.63	0	0	0	0	8	0	8
		Chini	C-2 43 (b)	147 (b)	18.6	0	3	0	0	0	0	3
		Barang	C-171(a)	75 (a)	21.85	0	7	0	0	0	0	7
		Tangling	C-176	80	131.5	0	0	0	0	9	0	9
		Purbani	C-183(a)	87 (a)	77.7	0	6	0	0	0	0	6
		Purbani	C-184(a)	88 (a)	102.4	0	0	0	0	8	0	8
		Purbani	C-184(b)	88 (b)	63.13	0	0	0	0	7	0	7
		Purbani	C-184(c)	88 (c)	69.2	0	0	0	0	8	0	8
		Rang Runang	NC-21	183	97.57	0	0	0	0	7	0	7
		Gunshanang	NC-26	188	141.76	0	0	0	0	8	0	8
		Uchaden	NC-30	192	31.87	0	0	0	0	9	0	9
		Total				0	16	0	20	64	0	100
	Katgaon	Rushnang	C-87	20	196.27	0	0	0	0	5	0	5
		Yeti	C-91	24	510.7	0	0	0	0	10	0	10
		Total				0	0	0	0	15	0	15
	Kilba	Limsanhang	C-154 (a)	60 (a)	39.65	0	4	0	0	0	0	4
		Seringche	C-162 (b)	66 (b)	50.6	0	0	0	0	4	0	4
		Pawanang I1	C-165	69	78.1	0	0	0	0	6	0	6
		Chansu	C-152 (b)	58 (b)	75.7	0	0	0	0	5	0	5
		Baturi	C-147	53	50.2	0	6	0	0	0	0	6
		Junpan	C-137 (a)	43 (a)	34.4	0	0	0	0	5	0	5
		UF Kamru				0	0	0	0	0	5	5
		Total				0	10	0	0	20	5	35
	Moorang	Korti-Akpa	C-227	131	467.82	0	0	0	5	0	0	5
		Holdaring	C-186	90	265.07	0	0	0	0	4	0	4

		Ribba West	C-187	91	169.67	0	0	0	0	6	0	6
		Ralda	C-190(b)	94 (b)	108.45	0	0	0	0	5	0	5
		Tidong-I	C-194	98	124.65	0	0	0	0	6	0	6
		Lirang	C-217	121	82.15	0	0	0	0	5	0	5
		Total				0	0	0	5	26	0	31
	Malling					Nil						
	Nichar	Kaksthal	NC-15	177	117.43	0	0	0	0	8	0	8
		Rango	NC-8	170	72.37	0	0	0	0	7	0	7
		Total				0	0	0	0	15	0	15
	Pooh	Rishi	C-198	102	34.4	0	0	0	0	3	0	3
		Giaboung-I	C-208	112	168.65	0	0	0	0	3	0	3
		Sunam	C-210	114	106.84	0	0	0	0	4	0	4
		Total				0	0	0	0	10	0	10
		G Total 2021-22				14	26	12	25	153	5	235
2022-23	Bhaba Nagar	Kandlu-Chhonda (Chaura)	68(a)-II	1 (b)	65.56	0	0	5		0	0	5
		Kandlu-Chhonda (Chaura)	68(b)-I	1 (c)	285.85	0	0	3		0	0	3
		Kandlu-Chhonda (Chaura)	68(c)	1 (f)	167.13	5	0	0		0	0	5
		Bundo Kutang	C- 73	6	375.95	0	0	10		0	0	10
		Ramni	C-130 (a) i	36 (a)	85.93	0	0	3		0	0	3
		Jani	C-131	37	113.3	4	0	0		0	0	4
			C-74 (c)			0	0	5		0	0	5
		Total				9	0	26	0	0	0	35
	Kalpa	Duni	C-241	145	89.03	0	0	0	5	0	0	5
		Telangi	C-239	143	192.63	0	0	0	0	10	0	10
		Kashang-II	C-233	137	23.88	0	0	0	0	5	0	5
		Kashang-I	C-234(a)	138 (a)	87	0	0	0	0	5	0	5
		Chini	C- 243 (b)	147 (b)	79.72	0	5	0	0	0	0	5
		Kashang-I	C-234 ©	138 (c)	26.71	0	0	0	6	0	0	6
		Barang	C-171(b)	75 (b)	29.14	0	4	0	0	0	0	4

		Barang	C-175 (b)	79 (b)	53.42	0	5	0	0	0	0	5
		Tangling	C-176	80	131.5	0	0	0	0	5	0	5
		Purbani	C-183(a)	87 (a)	77.7	0	0	0	0	8	0	8
		Purbani	C-184(a)	88 (a)	102.4	0	0	0	0	7	0	7
		Purbani	C-184(b)	88 (b)	63.13	0	0	0	0	5	0	5
		Purbani	C-184(c)	88 (c)	69.2	0	0	0	0	7	0	7
		Pangi-I	C-235	139	48.56	0	0	0	0	6	0	6
		Rushanang	NC-34	196	220.59	0	0	0	0	5	0	5
		Runang	C-248 (b)	152 (b)	63.53	0	5	0	0	0	0	5
		Gunshanang	NC-26	188	141.76	0	0	0	0	5	0	5
		Uravaning	NC-33	195	43.93	0	0	0	0	7	0	7
		Total				0	19	0	11	75	0	105
	Katgaon	Rushnang	C-87	20	196.27	0	0	0	0	5	0	5
		Rusnang	C-88	21	242	0	0	10	0	0	0	10
		Kampunang	C-90	23	9.3	4	0	0	0	0	0	4
		Total				4	0	10	0	5	0	19
	Kilba	Rukti Hurba	C-155	61	177.25	0	0	0	0	9	0	9
		Rakcham	C-160	64	2.43	0	0	0	0	2	0	2
		Seringche	C-162 (c)	66 (c)		0	0	0	0	4	0	4
		Chidu	C-153	59	144.88	0	0	10	0	0	0	10
		Baturi	C-148	54	39.65	0	5	0	0	0	0	5
		Shoang	C-151 (b)	57 (b)	147.3	0	0	0	0	5	0	5
		Phinla-I	C-135	41	64.35	0	0	5	0	0	0	5
		Total				0	5	15	0	20	0	40
	Moorang	Rispa	C-191	95	172.4	0	0	0	9	0	0	9
		Rarang-I	C-229	133	221.36	0	0	0	6	0	0	6
		Ribba West	C-187	91	169.67	0	0	0	0	5	0	5
		Shalmati -II	C-219(b)	123 (b)	22.26	0	0	0	0	5	0	5
		Total				0	0	0	15	10	0	25

	Malling					Nil						
	Nichar	Kaksthal	NC-15	177	117.43	0	0	0	0	10	0	10
		Rango	NC-8	170	72.37	0	0	0	0	7	0	7
		Total				0	0	0	0	17	0	17
	Pooh	Ropa-I	C-205	109	163.49	0	0	0	0	2	0	2
		Giaboung-I	C-208	112	168.65	0	0	0	0	2	0	2
		Sunam	C-210	114	106.84	0	0	0	0	3	0	3
		Shiasoo	15/89			0	0	0	0	0	4	4
		Total				0	0	0	0	7	4	11
		G Total 2022-23				13	24	51	26	134	4	252
2023-24	Bhaba Nagar	Lisnam	C-132 (a)	38 (a)	93.5	5	0	0	0	0	0	5
		Bundo Kutang	C- 73	6	375.95	0	0	4	0	0	0	4
		Thach	NC-5	167	51.86	0	0	0	0	3	0	3
		Ramni	C-130 (a) i	36 (a)	85.93	0	0	4	0	0	0	4
		Jani	C-131	37	113.3	2	0	0	0	0	0	2
		Total				7	0	8	0	3	0	18
	Kalpa	Chini	C242	146	162.68	0	0	0	7	0	0	7
		Kashang-I	C-234 ©	138 (c)	26.71	0	0	0	2	0	0	2
		Telangi	C-240 (b)	144 (b)	37.23	0	0	0	5	0	0	5
		Chini	C- 243 (b)	147 (b)	18.6	0	3	0	0	0	0	3
		Boktu	C- 238	142	66.37	0	4	0	0	0	0	4
		Barang	C-171(b)	75 (b)	29.14	0	4	0	0	0	0	4
		Tangling	C-177	81	232.3	0	0	0	0	8	0	8
		Tangling	C-178	82	112.1	0	0	0	5	0	0	5
		Purbani	C-183(a)	87 (a)	77.7	0	0	0	0	8	0	8
		Purbani	C-184(a)	88 (a)	102.4	0	0	0	0	7	0	7
		Purbani	C-184(c)	88 (c)	69.2	0	0	0	0	5	0	5
		Purbani	C-185	89	123.83	0	0	0	0	7	0	7
		Runang	C-248 (a)	152 (a)	74.46	0	0	0	0	5	0	5

		Runang	C-248 (b)	152 (b)	63.53	0	5	0	0	0	0	5
		Rangley	NC-27	189	81.68	0	0	0	0	7	0	7
		Tharu	NC-28	190	286.38	0	0	0	0	6	0	6
		Kashti	NC-29	191	121.98	0	0	0	0	6	0	6
		Total				0	16	0	19	59	0	94
	Katgaon	Rushnang	C-87	20	196.27	0	0	0	0	8	0	8
		Yeti	C-91	24	510.7	0	0	0	0	7	0	7
		Total				0	0	0	0	15	0	15
	Kilba	Limsanhang	C-154 (c)	60 (c)	40.87	0	5	0	0	0	0	5
		Rukti Hurba	C-156	62	177.25	0	0	0	0	7	0	7
		Seringche	C-163	67	8.5	0	0	0	0	3	0	3
		Ralli	C-167	71	260.6	0	7	0	0	0	0	7
		Mebar	C-168	72	212.05	0	0	0	0	8	0	8
		Kumkumi	C-142	48	68.4	0	4	0	0	0	0	4
		Shoang	C-151 (b)	57 (b)	147.3	0	0	0	0	6	0	6
		Tikru - Wasankan	C-138 b	44 (b)	50.6	5	0	0	0	0	0	5
		UF Kamru				0	0	0	0	0	5	5
		Total				5	16	0	0	24	5	50
	Moorang	Rirang	C-223(a)	127 (a)	36.83	0	0	0	0	3	0	3
		Rarang-I	C-229	133	221.36	0	0	0	2	0	0	2
		Rispa	C-192	96	70.82	0	0	0	5	0	0	5
		Ribba West	C-187	91	169.67	0	0	0	0	3	0	3
		Tidong-II	C-195	99	3.23	0	0	0	0	2	0	2
		Shalmati -III	C-220	124	17.81	0	0	0	0	3	0	3
		UF Ramgsangthan				0	0	0	0	0	4	4
		Total				0	0	0	7	11	4	22
	Malling					Nil						
	Nichar	Kaksthal	NC-15	177	117.43	0	0	0	0	4	0	4
		Rango	NC-8	170	72.37	0	0	0	0	5	0	5

		Total				0	0	0	0	9	0	9
	Pooh	Ropa-I	C-205	109	163.49	0	0	0	0	3	0	3
		Giaboung-I	C-208	112	168.65	0	0	0	0	2	0	2
		Sunam	C-210	114	106.84	0	0	0	0	2	0	2
		Total				0	0	0	0	7	0	7
		G Total 2023-24				12	32	8	26	128	9	215
2024-25	Bhaba Nagar	Lisnam	C-132 (a)	38 (a)	93.5	6	0	0	0	0	0	6
		Kandlu-Chhonda (Chaura)	68(c)	1 (f)	167.13	5	0	0	0	0	0	5
		Bundo Kutang	C- 73	6	375.95	0	0	7	0	0	0	7
		Thach	NC-5	167	51.86	0	0	0	0	5	0	5
		Ramni	C-130 (a) i	36 (a)	85.93	0	0	3	0	0	0	3
		Total				11	0	10	0	5	0	26
	Kalpa	Tangling	C-178	82	112.1	0	0	0	5	0	0	5
		Chini	C242	146	162.68	0	0	0	8	0	0	8
		Chini	C- 243 (b)	147 (b)	18.6	0	3	0	0	0	0	3
		Kashang-I	C-234(a)	138 (a)	87	0	0	0	0	5	0	5
		Chini	C- 243 (b)	147 (b)	18.6	0	5	0	0	0	0	5
		Telangi	C- 240 (a)	144 (a)	74.46	0	8	0	0	0	0	8
		Barang	C-172 (a)	76 (a)	38.45	0	0	0	0	8	0	8
		Tangling	C-179	83	117.75	0	0	0	7	0	0	7
		Tangling	C-180	84	232.3	0	0	0	10	0	0	10
		Purbani	C-181(c)	85 (c)	105.6	0	0	0	0	10	0	10
		Purbani	C-182(b)	86 (b)	21.85	0	0	0	0	7	0	7
		Purbani	C-184(a)	88 (a)	102.4	0	0	0	0	8	0	8
		Purbani	C-184(b)	88 (b)	63.13	0	0	0	0	7	0	7
		Purbani	C-185	89	123.83	0	0	0	0	8	0	8
		Rushanang	NC-34	196	220.59	0	0	0	0	5	0	5
		Runang	C-248 (a)	152 (a)	74.46	0	0	0	0	7	0	7
		Runang	C-248 (b)	152 (b)	63.53	0	7	0	0	0	0	7

		Chagaon III	C-257	161	17.4	0	0	0	0	5	0	5
		Tharu	NC-28	190	286.38	0	0	0	0	7	0	7
		Kashti	NC-29	191	121.98	0	0	0	0	8	0	8
		Total				0	23	0	30	85	0	138
	Katgaon	Rushanang	C-87	20	196.27	0	0	0	0	8	0	8
		Yeti	C-91	24	510.7	0	0	0	0	5	0	5
		Total				0	0	0	0	13	0	13
	Kilba	Kilba	C-140	46	98.75	0	0	0	0	7	0	7
		Limsanhang	C-154 (b)	60 (b)	35.6	0	5	0	0	0	0	5
		Seringche	C-162 (a)	66 (a)	42.49	0	0	0	0	5	0	5
		Pawanang I1	C-165	69	78.1	0	0	0	0	5	0	5
		Chansu	C-152 (a)	58 (a)	97.5	0	0	0	0	8	0	8
		UF Palingcha				0	0	0	0	0	5	5
		UF Ramgsangthan				0	0	0	0	0	5	5
		Total				0	5	0	0	25	10	40
	Moorang	Kirarng	C-224	128	106.43	0	0	0	0	3	0	3
		Rarang-I	C-229	133	221.36	0	0	0	3	0	0	3
		Holdaring	C-186	90	265.07	0	0	0	0	2	0	2
		Ribba Eest	C-188(a)	92 (a)	55.85	0	0	0	0	3	0	3
		Tidong-III	C-196	100	57.05	0	0	0	0	4	0	4
		Total				0	0	0	3	12	0	15
	Malling					Nil						
	Nichar	Somo	NC-9	171	95.67	0	0	8	0	0	0	8
		Chott Kanda	NC-10	172	379.49	0	0	0	0	7	0	7
		Total				0	0	8	0	7	0	15
	Pooh	Labrang	C-213	117	101.17	0	0	0	2	0	0	2
		Ropa-I	C-205	109	163.49	0	0	0	0	3	0	3
		Shiasoo	15/89			0	0	0	0	0	7	7
		Total				0	0	0	2	3	7	12

		G Total 2024-25				11	28	18	35	150	17	259
2025-26	Bhaba Nagar	Lisnam	C-132 (a)	38 (a)	93.5	3	0	0	0	0	0	3
		Bundo Kutang	C- 73	6	375.95	0	0	8	0	0	0	8
		Thach	NC-5	167	51.86	0	0	0	0	5	0	5
		Kandlu-Chhonda (Chaura)	C-68(b)-II	1 (d)	62.6	0	0	5	0	0	0	5
		Kandlu-Chhonda (Khuni)	C-69(b)	2 (b)	51	0	0	7	0	0	0	7
		Total				3	0	20	0	5	0	28
	Kalpa	Duni	C-241	145	89.03	0	0	0	7	0	0	7
		Barang	C-174 (b)	78 (b)	67.99	0	0	0	0	8	0	8
		Tangling	C-179	83	117.75	0	0	0	8	0	0	8
		Kashang-I	C-234(a)	138 (a)	87	0	0	0	0	5	0	5
		Chini	C- 243 (b)	147 (b)	18.6	0	0	0	0	5	0	5
		Telangi	C- 240 (a)	144 (a)	74.46	0	5	0	0	0	0	5
		Rogi I	C- 244	148	17	0	4	0	0	0	0	4
		Barang	C-172 (a)	76 (a)	38.45	0	0	0	0	7	0	7
		Tangling	C-179	83	117.75	0	0	0	7	0	0	7
		Tangling	C-180	84	232.3	0	0	0	10	0	0	10
		Purbani	C-182(a)	86 (a)	26.7	0	5	0	0	0	0	5
		Purbani	C-184(a)	88 (a)	102.4	0	0	0	0	8	0	8
		Purbani	C-185	89	123.83	0	0	0	0	7	0	7
		Runang	C-248 (a)	152 (a)	74.46	0	0	0	0	5	0	5
		Chagaon IV	C-256	160	35.61	0	0	0	0	10	0	10
		Chagaon II	C-258 (a)	162 (a)	69.2	0	4	0	0	0	0	4
		Goli	NC-24	186	113.18	0	0	0	0	10	0	10
		Rangley	NC-27	189	81.68	0	0	0	0	8	0	8
		Total				0	18	0	32	73	0	123
	Katgaon	Dutrang	C-89	22	124.65	0	0	0	0	10	0	10
		Yeti	C-91	24	510.7	0	0	0	0	7	0	7
		Total				0	0	0	0	17	0	17

	Kilba	Rukti Hurba	C-156	62	177.25	0	0	0	0	3	0	3
		Seringche	C-162 (c)	66 (c)		0	0	0	0	5	0	5
		Mebar	C-168	72	212.05	0	0	0	0	6	0	6
		Chansu	C-152 (b)	58 (b)	75.7	0	0	0	0	5	0	5
		Baturi	C-145	51	37.65	0	8	0	0	0	0	8
		Shushang	UF 160			0	0	0	0	0	3	3
		Total				0	8	0	0	19	3	30
	Moorang	Korti-Akpa	C-227	131	467.82	0	0	0	4	0	0	4
		Rispa	C-192	96	70.82	0	0	0	3	0	0	3
		Ribba Eest	C-188(a)	92 (a)	55.85	0	0	0	0	3	0	3
		Rirang	C-221	125	83.36	0	0	0	0	2	0	2
		Rirang	C-222(a)	126 (a)	78.1	0	0	0	0	3	0	3
		Rirang	C-222 (b)	126 (b)	80.94	0	0	0	0	2	0	2
		Total				0	0	0	7	10	0	17
	Malling					Nil						
	Nichar	Somo	NC-9	171	95.67	0	0	7	0	0	0	7
		Chott Kanda	NC-10	172	379.49	0	0	0	0	10	0	10
		Tranda Soldang (Kutangang)	C- 71 (b) II	4 (d)	72.49	0	0	8	0	0	0	8
		Total				0	0	15	0	10	0	25
	Pooh	Labrang	C-213	117	101.17	0	0	0	3	0	0	3
		Kirmang	C-215	119	237.15	0	0	0	5	0	0	5
		Shiasoo	15/89			0	0	0	0	0	6	6
		Total				0	0	0	8	0	6	14
		G Total 2025-26				3	26	35	47	134	9	254
2026-27	Bhaba Nagar	Kandlu chaunda	68(a)-I	1 (a)	43.7	6	0	0	0	0	0	6
		Kandlu-Chhonda (Chaura)	68(c)	1 (f)	167.13	3	0	0	0	0	0	3
		Kandlu-Chhonda (Khuni)	69 (c)	2 (c)	69.6	5	0	0	0	0	0	5
		Lisnam	C-132 (a)	38 (a)	93.5	2	0	0	0	0	0	2

		Thach	NC-5	167	51.86	0	0	0	0	4	0	4
		Ramni	C-130 (a) i	36 (a)	85.93	0	0	5	0	0	0	5
		Jani	C-131	37	113.3	5	0	0	0	0	0	5
		Total				21	0	5	0	4	0	30
	Kalpa	Chini	C242	146	162.68	0	0	0	8	0	0	8
		Tangling	C-179	83	117.75	0	0	0	3	0	0	3
		Boktu	C-237	141	91.86	0	0	0	0	6	0	6
		Telangi	C-239	143	192.63	0	0	0	0	8	0	8
		Boktu	C- 238	142	66.37	0	4	0	0	0	0	4
		Putka	NC-23	185	114.96	0	0	4	0	0	0	4
		Roghi II	C-245 (a)	149 (a)	25.5	0	0	0	0	5	0	5
		Barang	C-171(b)	75 (b)	29.14	0	6	0	0	0	0	6
		Tangling	C-179	83	117.75	0	0	0	7	0	0	7
		Tangling	C-180	84	232.3	0	0	0	8	0	0	8
		Purbani	C-184(a)	88 (a)	102.4	0	0	0	0	7	0	7
		Purbani	C-185	89	123.83	0	0	0	0	8	0	8
		Runang	C-248 (b)	152 (b)	63.53	0	5	0	0	0	0	5
		Eula Miru I	C-249	153	23.07	0	0	0	0	5	0	5
		Eula Miru II	C-250	154	3.24	0	0	0	0	2	0	2
		Yulla-Miru-IV	C-252	156	38.04	0	0	0	0	5	0	5
		Telgancho	NC-25	187	58.61	0	0	0	0	10	0	10
		Total				0	15	4	26	56	0	101
	Katgaon	Dutrang	C-89	22	124.65	0	0	0	0	7	0	7
		Yeti	C-91	24	510.7	0	0	0	0	8	0	8
		Total				0	0	0	0	15	0	15
	Kilba	Punang	C-134 b	40 (b)	48.95	5	0	0	0	0	0	5
		Sapni	C-144	50	17.8	0	5	0	0	0	0	5
		Bassarang	C-157	63	234.72	0	7	0	0	0	0	7
		Wadang	C-166	70	119.38	0	0	0	0	5	0	5

		Mebar	C-168	72	212.05	0	0	0	0	4	0	4
		Shoang	C-151 (b)	57 (b)	147.3	0	0	0	0	6	0	6
		Brua	C-150	56	65.95	0	0	0	0	5	0	5
		Khayarma	UF 160			0	0	0	0	0	2	2
		Total				5	12	0	0	20	2	39
	Moorang	Rarang-I	C-229	133	221.36	0	0	0	2	0	0	2
		Ribba East	C-188(b)	92 (b)	69.6	0	0	0	0	2	0	2
		Rispa	C-192	96	70.82	0	0	0	3	0	0	3
		Shalmati -I	C-218	122	28.33	0	0	0	0	3	0	3
		Shalmati -II	C-219(a)	123 (a)	72.03	0	0	0	0	2	0	2
		Kirarng	C-223 (b)	127 (b)	147.71	0	0	0	0	3	0	3
		Total				0	0	0	5	10	0	15
	Malling					Nil						
	Nichar	Somo	NC-9	171	95.67	0	0	5	0	0	0	5
		Chott Kanda	NC-10	172	379.49	0	0	0	0	10	0	10
		Total				0	0	5	0	10	0	15
	Pooh	Labrang	C-213	117	101.17	0	0	0	3	0	0	3
		Kirmang	C-215	119	237.15	0	0	0	4	0	0	4
		Koila-pilu	C-214	118	178.87	0	0	0	4	0	0	4
		Total				0	0	0	11	0	0	11
		G Total 2026-27				26	27	14	42	115	2	226
2027-28	Bhaba Nagar	Kandlu-Chhonda (Chaura)	68(a)-II	1 (b)	65.56	0	0	5	0	0	0	5
		Kandlu-Chhonda (Chaura)	68(b)-I	1 (c)	285.85	0	0	4	0	0	0	4
		Bundo Kutang	C- 73	6	375.95	0	0	5	0	0	0	5
		Ramni	C-130 (a) i	36 (a)	85.93	0	0	6	0	0	0	6
		Jani	C-131	37	113.3	4	0	0	0	0	0	4
		Total				4	0	20	0	0	0	24
	Kalpa	Chini	C-242	146	162.68	0	0	0	6	0	0	6
		Tangling	C-179	83	117.75	0	0	0	5	0	0	5

		Kashang-I	C-234(a)	138 (a)	87	0	0	0	0	5	0	5
		Chini	C- 243 (b)	147 (b)	18.6	0	0	0	0	5	0	5
		Putka	NC-23	185	114.96	0	0	4	0	0	0	4
		Kastiarang	C-246	150	32.37	0	6	0	0	0	0	6
		Kastiarang	C-247	151	206.39	0	0	0	0	10	0	10
		Barang	C-173	77	13.76	0	5	0	0	0	0	5
		Tangling	C-179	83	117.75	0	0	0	10	0	0	10
		Tangling	C-180	84	232.3	0	0	0	10	0	0	10
		Purbani	C-184(a)	88 (a)	102.4	0	0	0	0	7	0	7
		Purbani	C-185	89	123.83	0	0	0	0	8	0	8
		Yulla-Miru-III	C-251	155	7.28	0	0	0	0	3	0	3
		Yulla-Miru-IV	C-252	156	38.04	0	0	0	0	7	0	7
		Chagaon I	C-258 (b)	162 (b)	144.07	0	0	0	0	6	0	6
		Tharu	NC-28	190	286.38	0	0	0	0	8	0	8
		Kashti	NC-29	191	121.98	0	0	0	0	7	0	7
		Bragdo	NC-31	193	36.99	0	0	0	0	5	0	5
		Pangi-II	C-236	140	42.08	0	0	0	0	5	0	5
		Total				0	11	4	31	76	0	122
	Katgaon	Dutrang	C-89	22	124.65	0	0	0	0	5	0	5
		Saknathpa	C-92	25	150	0	0	0	0	7	0	7
		Total				0	0	0	0	12	0	12
	Kilba	Rukti Hurba	C-156	62	177.25	0	0	0	0	5	0	5
		Mebar	C-168	72	212.05	0	0	0	0	4	0	4
		Meber	C-169 b	73 (b)	24.68	0	6	0	0	0	0	6
		Chidu	C-153	59	144.88	0	0	4	0	0	0	4
		Tiuden	C-139 b	45 (b)	75.7	5	0	0	0	0	0	5
		Brua	C-150	56	65.95	0	0	0	0	5	0	5
		Wadang	C-166	70	119.38	0	0	0	0	6	0	6
		UF Ralli				0	0	0	0	0	5	5
		UF Kilba				0	0	0	0	0	5	5

		Total				5	6	4	0	20	10	45
	Moorang	Korti-Akpa	C-227	131	467.82	0	0	0	3	0	0	3
		Ribba East	C-188(b)	92 (b)	69.6	0	0	0	0	3	0	3
		Ralda	C-190(a)	94 (a)	68.4	0	0	0	3	0	0	3
		Rispa	C-192	96	70.82	0	0	0	2	0	0	2
		Total				0	0	0	8	3	0	11
	Malling					Nil						
	Nichar	Chott Kanda	NC-10	172	379.49	0	0	0	0	7	0	7
		Tranda Soldang	C-71 (a) I	4 (a)	125.45	0	0	0	0	8	0	8
		Bari(Raida)	C-74(a)	7 (a)	52.6	5	0	0	0	0	0	5
		Tranda	C 72 (b)	5 (b)	63.95	0	0	7	0	0	0	7
		Total				5	0	7	0	15	0	27
	Pooh	Ropa-I	C-205	109	163.49	0	0	0	0	2	0	2
		Kanam	C-211	115	82.96	0	0	0	3	0	0	3
		Koila-pilu	C-214	118	178.87	0	0	0	2	0	0	2
		Total				0	0	0	5	2	0	7
		G Total 2027-28				14	17	35	44	128	10	248
2028-29	Bhaba Nagar	Kandlu-Chhonda (Chaura)	68(a)-II	1 (b)	65.56	0	0	5	0	0	0	5
		Kandlu-Chhonda (Chaura)	68(b)-I	1 (c)	285.85	0	0	3	0	0	0	3
		Kandlu-Chhonda (Chaura)	68(c)	1 (f)	167.13	5	0	0	0	0	0	5
		Bundo Kutang	C- 73	6	375.95	0	0	4	0	0	0	4
		Total				5	0	12	0	0	0	17
	Kalpa	Tangling	C-180	84	232.3	0	0	0	4	0	0	4
		Purbani	C-181(a)	85 (a)	69.2	0	0	0	0	7	0	7
		Tangling	C-179	83	117.75	0	0	0	3	0	0	3
		Chini	UF 33	15	225	0	0	0	0	8	0	8
		Boktu	C-237	141	91.86	0	0	0	0	6	0	6
		Kastiarang	C-246	150	32.37	0	4	0	0	0	0	4
		Barang	C-174(a)	78 (a)	28.33	0	8	0	0	0	0	8

		Tangling	C-179	83	117.75	0	0	0	7	0	0	7
		Purbani	C-181(a)	85 (a)	69.2	0	0	0	0	6	0	6
		Purbani	C-181(b)	85 (b)	69.2	0	0	0	0	5	0	5
		Purbani	C-181(c)	85 (c)	105.6	0	0	0	0	7	0	7
		Urni II	C-255 (a)	159 (a)	30.75	0	5	0	0	0	0	5
		Urni II	C-255 (b)	159 (b)	76.08	0	6	0	0	0	0	6
		Yulla-Miru-IV	C-252	156	38.04	0	0	0	0	6	0	6
		Shakamo	NC-32	194	30.53	0	0	0	0	7	0	7
		Total				0	23	0	14	52	0	89
	Katgaon	Yeti	C-91	24	510.7	0	0	0	0	4	0	4
		Saknathpa	C-92	25	150	0	0	0	0	6	0	6
		Total				0	0	0	0	10	0	10
	Kilba	Bassaring	C-157	63	234.72	0	4	0	0	0	0	4
		Seringche	C-162 (c)	66 (c)		0	0	0	0	4	0	4
		Wadang	C-166	70	119.38	0	0	0	0	6	0	6
		Punang	C-133	39	231.9	0	0	0	0	8	0	8
		Barang	C-170 a	74 (a)	55.04	0	6	0	0	0	0	6
		UF Meber Dakho				0	0	0	0	0	8	8
		UF Ralli				0	0	0	0	0	7	7
		Total				0	10	0	0	18	15	43
	Moorang	Jangi	C-226	130	209.22	0	0	0	5	0	0	5
		Ralda	C-189(a)	93 (a)	54.63	0	0	0	4	0	0	4
		Ralda	C-189(b)	93 (b)	72.84	0	0	0	4	0	0	4
		Tidong-IV	C-197	101	41.68	0	0	0	5	0	0	5
		Rirang	C-221	125	83.36	0	0	0	0	3	0	3
		Korti-Akpa	C-228	132	294.21	0	0	0	6	0	0	6
		Rarang-II	C-230	134	33.99	0	0	0	0	2	0	2
		Khorangi	C-231	135	92.27	0	0	0	0	5	0	5
		Khorangi	C-232(a)	136 (a)	126.67	0	0	0	0	4	0	4
		Total				0	0	0	24	14	0	38

	Malling					Nil						
	Nichar	Chott Kanda	NC-10	172	379.49	0	0	0	0	8	0	8
		Tranda	C 72 (b)	5 (b)	63.95	0	0	10	0	0	0	10
		Bari(Raida)	C-74(a)	7 (a)	52.6	5	0	0	0	0	0	5
		Total				5	0	10	0	8	0	23
	Pooh	Kanam	C-211	115	82.96	0	0	0	4	0	0	4
		Tabang	C-212	116	30.75	0	0	0	2	0	0	2
		Total				0	0	0	6	0	0	6
		G Total 2028-29				10	33	22	44	102	15	226
		G Total				152	242	205	316	1145	71	2131
Range Wise General Abstract												
	Bhaba nagar				95	0	113	0	24	0	232	
	Kalpa				0	163	8	196	580	0	947	
	Katgaon				4	0	20	0	112	0	136	
	Kilba				25	79	19	0	184	50	357	
	Malling				0	0	0	0	0	0	0	
	Moorang				0	0	0	88	111	4	203	
	Nichar				28	0	45	0	91	0	164	
	Pooh				0	0	0	32	43	17	92	
	G. Total				152	242	205	316	1145	71	2131	

General Abstract								
Name of Range	Category of Forest	Name of Working Circle						
		DKWZ WC	D/KDZ WC	F/S WC	NWC	REH. WC	Other forest land	Total
Bhaba Nagar	Old	95	0	113	0	24	0	232
	New	0	0	0	0	0	0	0
	Listed UPF	0	0	0	0	0	0	0
	Other Forest Land	0	0	0	0	0	0	0
	Total	95	0	113	0	24	0	232
Kalpa	Old	0	163	8	196	572	0	939
	New	0	0	0	0	0	0	0
	Listed UPF	0	0	0	0	8	0	8
	Other Forest Land	0	0	0	0	0	0	0
	Total	0	163	8	196	580	0	947
Katgaon	Old	4	0	20	0	112	0	136
	New	0	0	0	0	0	0	0
	Listed UPF	0	0	0	0	0	0	0
	Other Forest Land	0	0	0	0	0	0	0
	Total	4	0	20	0	112	0	136
Kilba	Old	25	79	19	0	184	0	307
	New	0	0	0	0	0	0	0
	Listed UPF	0	0	0	0	0	0	0
	Other Forest Land	0	0	0	0	0	50	50
	Total	25	79	19	0	184	50	357
Moorang	Old	0	0	0	88	111	0	199
	New	0	0	0	0	0	0	0
	Listed UPF	0	0	0	0	0	0	0
	Other Forest Land	0	0	0	0	0	4	4
	Total	0	0	0	88	111	4	203
Malling	Old	0	0	0	0	0	0	0
	New	0	0	0	0	0	0	0
	Listed UPF	0	0	0	0	0	0	0
	Other Forest Land	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0
Nichar	Old	28	0	45	0	91	0	164
	New	0	0	0	0	0	0	0
	Listed UPF	0	0	0	0	0	0	0
	Other Forest Land	0	0	0	0	0	0	0
	Total	28	0	45	0	91	0	164
Pooh	Old	0	0	0	32	43	0	75

	New	0	0	0	0	0	0	0
	Listed UPF	0	0	0	0	0	0	0
	Other Forest Land	0	0	0	0	0	17	17
	Total	0	0	0	32	43	17	92
	G Total	152	242	205	316	1145	71	2131

The plantation shall be carried out only after issuance of closure notification under 30(b) of IFA, 1927. It has been observed that large chunk of forest land consisting of listed UPFs, other forest land i.e. Charagah Darktan, Bila Darktan were covered in the working plan for raising plantation over these land, but these areas does not come under the preview of IFA, 1927 in absence of notification under Section 29 to 32 of the Act. Thus, in the event of grazing, fire, felling/removal, lopping of young plants/pole crops and breaking of land through encroachment by local people, the offender cannot be prosecuted under Section 33 of IFA, 1927 in absence of notification under section 29 to 32 of the Act. Therefore, it needs to be done prior to plantation over these lands. It must be ensured that sufficient nursery stock should be available, before taking the areas for afforestation under different schemes. Only plantable size and healthy plant should be planted in the plantation area.

7.14 Control and Deviation:-The areas prescribed annually for planting will be shown in the control forms and any excess or deficit carried forward in the control form and deviation statement. The successful planted areas only are to be counted against the prescribed planting programme. Any excess planting will not constitute a deviation. However, the short fall of any one year must be made good in the subsequent years.

7.15 Subsidiary Silvicultural Operations:-

7.15.1 Treatment/Beating up of Failure of Existing Plantation:- With proper care, precautions and devotion, it should be possible to fill up the whole area successfully within the prescribed period. In case of the any failure, the same must be replaced in the years immediately following sowing and planting.

All existing young plantations should be strictly protected and tended properly. Maintenance operations such as fence repair, weeding, bush cutting, beating up of failures etc. should be carried out for a period of at least 5 years after the planting.

7.15.2 Weeding:-Bush cutting and weeding of plants shall be done in accordance with the practice for each species, preferable in the rainy season. For Deodar, two weeding in the month of July and August shall be done.

7.15.3 Seed Collection:-“As you sow so shall you reap” goes the saying, the seed should, therefore, be of good quality. It should be collected from healthy, well grown, vigorous and genetically superior trees. It may be noted that most of the morphological and physiological characters are inherited. The seed trees should preferably be middle aged as the seed collected from too young or too old trees is not good. The seed trees of each species should be selected by the Divisional Forest Officer or Range Officer and should be marked with a distinctive band. Instead of dispersing the seed collection work in the entire area, it will be better to select good forests of each species from where the seed is to be collected. This will concentrate the work and will facilitate supervision. Such seed stands should be properly thinned to weed out inferior trees and to allow sufficient light for each tree to induce more cone formation. It will be desirable to depute some special staff for seed collection at the time when the seed of different species ripens because the experience has been that the beat guards are not able to give due attention for seed collection work. Mechanical appliances such as light aluminum ladders, tree climbing aides, sickles, secateurs etc. should also

be provided. The seed should be collected at the right time. The cones should be spread in sun to open and the seed should be separated and cleaned of cone scales, wings, unsound seeds and foreign matter. Sufficient quantity of seed should be collected so that some extra seed is used in the following year, if it is expected to be a very lean seed year. This extra seed should be stored in cool places in suitable containers. The practice of purchasing the seed from the villagers should be discontinued because in that case the quality of the seed is not guaranteed. To ensure collection of good quality seed, it is prescribed that the seed will be collected departmentally from the seed trees selected for the purpose and no seed will be purchased from the villagers.

7.16 Nurseries:- It is, universal truth that the degree of survival of plantations is directly linked to the quality of nursery stock raised in nurseries. More so, when we are faced with increasing swings in seasonal fluctuations, both in terms of erratic rainfall and rising temperatures. These recent changes in weather patterns exacerbate our historical woes of compacted soil, damage by fire and cattle and general lack of interest (and therefore concern) of local communities in our plantations. Vastly improved nursery stock can, in a major way, to address most of these impediments coming in the way of establishing successful plantations in and outside forests. Few important qualities of any good nurseries would include:-



- (a) It should be large in size (at least 0.5 to 1 hac.) so that it is cost effective and also proper infrastructure including water supply, germination chamber (poly-house), Mali-hut, soil mixing yard, vermin-compost etc can be developed.
 - (b) Adequately trained, dedicated staff should be available in each nursery. Mali and laboureres should be trained and guided from time to time about raising of quality stock.
 - (c) Each nursery should specialize in 5-6 species suited to the area and have large stock of each species, which is graded from time to time so that only quality stock goes for planting.
 - (d) Soil mixture is most vital component for raising quality stock. Thus, care must be taken not to compromise with quality of soil mixture (ideally 1:1:1 of soil: sand: vermin-compost)
- There are **32** nurseries in Kinnaur Forest Division (as on 31st May, 2019) having a stock of **887201** plants. Thus, average number of plants per nursery is **27725** which is quite meager

and should further be increased (and the average plant cost reduced) with development of infrastructure in more nurseries.

7.17 New Plantations:-

7.17.1 Plantation Technique:-The technique of raising each species should be as per standard techniques, instructions and guidelines issued from time to time and in conformity with the experience. The technique of “Forest Nursery work” and “Artificial Reproduction” in hills has been dealt with in the Technical Orders No. 3 & 4 contained in the Punjab Forest Manual, Vol-III. and the techniques for plantations on type of land including choice of species for different localities have been given in the book titled as “Plantation Forestry in India by Sh. R.K. Luna”. However, the following points deserve the special consideration:

(i) Selection of Plantation Site/Area:- The area selected should be personally inspected by the Range Officers concerned keeping in view the suitability of the area, ease of closure and type of fencing etc. These should also be approved by the DFO/Conservator of forests. The requirement of grazing and grass-cutting of the right holders should also be given due consideration. The following points may be kept in view while selecting the site for plantation.

- (a) Migratory Grazier:-** No plantation above and below the road should be carried out and the corridor should be maintained to avoid conflict between the department and migratory graziers. However, in suitable sites the tall planting may be carried out in the areas.
- (b) Rotational Grazing:-** In the halting places of the grazier, no plantation should be carried out. Beside this emphasis on rotational grazing should be laid.
- (c) Refractory Areas:-** No sites should be taken up for afforestation which is refractory in nature and only well soil deposited sites should be taken.
- (d) Community Wood Lot:** The community wood lot should be established in between DPFs and adjoining habitation in order to reduce the pressure and avoid encroachments. Only fuel and fodder species should be planted outside the regular forests i.e. DPFs and listed UPFs.
- (e) Grazing land:** No attempt should be made for re-afforestation of grazing land.
- (f) Water Harvesting Structures:** Emphasis should be made to established water harvesting structures near the plantation areas to increase the water regime.
- (g) Fire line:** A wide strips of preferably 5-7 mtrs. should be kept which will act as fire lines in the plantation areas and reduce the fire hazards.

(ii) Fencing:- The plantation area should be efficiently/effectively closed by barbed wire fencing or social fencing. Fencing needs to be done around plantation sites only, where it is necessary. Fencing along their steep slopes cliffs, should be avoided, where it serves no purpose. However, it is advisable to plant bio-engineering species suitable for the area along three / four strand barbed wire fencing especially in areas where grazing incidence is high. Fencing work should be taken up during the rainy season along with live fence support even for area which is to be planted in the ensuing winter. Where economical, and especially along roads, RCC fence posts should be used for fencing. Tall plants of broad leaved species (6-8 ft high), wherever, available can also be planted along the fence provided the area is adjacent to motorable road.

(iii) Site Preparation:- Proper preparation of planting site requires special attention. Sites of pits should be marked in the field and on plantation map. The pits should be prepared/dug at least 2-3 months ahead of plantation work, so as to allow proper weathering of soil and to enable maximum possible work done within the prime time of planting season. Proper inspection path should also be prepared to facilitate inspection and planting work. Pits of the standard size (30 cm

x 30 cm x 30 cm for Conifers species, 60 cm x 60 cm x 60 cm for Chilgoza and 45cm x45cm x 45cm for broad leaves) should be dug about 3-4 months in advance and the soil be heaped on the lower side of the pit. This helps in weathering and improvement of the soil.

The practice to cut and remove all bushes & shrubs from the plantation area is to be discontinued as shrubs and bushes help/prevent soil erosion and add in moisture retention. However, if the area has weeds species, then these are to be removed when the area is fenced.

(iv) Sowing and Planting:- The indigenous, well grown sturdy nursery plants of fast growing hardy species should be preferred and planted which can survive under the adverse conditions. The nursery should be preferably raised near to the plantation area or on road side, from where the plants could be transported with ease and facility to planting sites in minimum possible time.

(v) Pure or Mixed Species:- As far as possible, pure crops should be raised over large blocks to avoid management difficulties.

(vi) Plantation Practices:- It is suggested that 30% medicinal trees suitable for the area, 20% wild fruit trees suitable for the area and the remainder to be the main species of the forest type either conifers or broad leaved should be planted in the plantation area. It is, therefore, to be ensured that for plantation programmes sufficient diversity of tree species is grown and available in the nurseries. It is also prescribed that wherever Fir, Deodar, and Chilgoza is being planted, the plants should be at least 3 and half years to 4 and half years old, 2 and half years old and 2 and half years to 3 and half years old respectively. Similarly, broad leaved species should be at least 1 year to one and half years old. Deciduous broad leaved species are to be planted during winter, while conifers are to be planted during the rainy season.

7.18 Tall Planting:- As per instructions of PCCF HP, from time to time that tall plants should be planted in the field and technique for raising the same in the nurseries is also given and must be followed because one of the main reasons for failure of plantations is grazing or trampling by cattle. Also drought, fire hazards contribute to failure. Thus, to overcome pressure of grazing and drought, planting of tall plants (above grazing height) with well developed root system and good collar girth is desirable. Such plants will be able to cope with droughts owing to their well developed spread out root system, will be above grazing height and thus, will survive grazing pressure and their good collar girth will help them withstand trampling. Such plants can be raised in nurseries for which month-wise operation activity is tabulated in Table No. 7.5 & 7.6.

Table 7.5
Raising of Deodar in Nurseries

Month	Activities for Raising Deodar
Nov-Dec	1. Sow seeds in trays filled with only Vermi compost. Keep the trays in poly house. (1 kg deodar seed contains 8000-10000 seeds approximately)
March (1 st Year)	1. Prick in 6"x4" bags or in root trainers with potting mixture of 1:1:1 of sand, soil, vermin-compost
July (1 st Year)	1. Transfer to 9"x5" bag along with ball of earth, add some more soil at bottom and sides.
July (2 nd Year)	Transfer to 15"x7" bag along with ball of earth, add some more soil at bottom and sides
July (3 rd Year)	1. Plant 90% of the good quality plants 2. Retain 10% best plants from among the quality plants for production of ' Tall Plants ' and shift them in bags of size 20" x 12"
July (4 th Year)	Shift these plants to cement bags or such other alternatives
July (5 th Year)	Plant out these plants in pits of size 60x60x60cm

Table 7.6
Raising of Chilgoza in Nurseries

Month	Activities for Raising Chilgoza & Deodar
1	2
Nov	1. Sow seeds in fresh cow dung immediately after collection as oak seeds are viable only for 7-14 days
Jan (1 st Year)	1. Prick the germinated seedlings in 9"x5" bags with potting mixture of 1:1:1 of sand, soil, vermin compost
July (1 st Year)	1. Transfer to 15"x7" bag along with ball of earth, add some more soil at bottom and sides.
July (2 nd Year)	Transfer to 20"x12" bag along with ball of earth, add some more soil at bottom and sides
1	2
July (3 rd Year)	1. Plant 90% of the good quality plants 2. Retain 10% best plants from among the quality plants for production of ' Tall Plants ' and shift them in cement bags
July (4 th Year)	Plant out these plants in pits of size 60x60x60cm

Tall plants of other deciduous species will also be raised in a similar way as that of Oak. But sowing time and technique will be as per species requirement. For deciduous tall plants, root-shoot cuttings will be raised in production nurseries, while sowing will be done in mother nurseries. Nurseries with small area between 0.25 hac. to 0.5 hac. can be used as **Mother Nursery** for production of root-shoot cuttings of deciduous broad leaved species. Thus, all deciduous broad leaved species will not be grown from seed in production nurseries, but their root-shoot cutting will be made in Mother Nurseries.

7.18.1 Notification of Closures:- Every area to be taken up for plantation should be notified for closure one year in advance. The period of closure may be 15-30 years.

7.18.2 Plantation Journals:- It is essential that, whenever, a site is selected for plantation a proper hard bound plantation journal is prepared for that site. The plantation journal must have a large sketch of the area showing boundaries and other details like nallas, rocks, existing patches of trees etc. It is important that GPS coordinates of at least 6 to 8 points around plantations are also recorded and entered in the plantation journal along with the altitude of the area. Details of all works carried out must be entered in the plantation journals and signed by the concerned officials showing date of signature. All inspecting officers are to record their visits and comments/observations in the plantation journals. Once a plantation journal is complete i.e. in the fourth and fifth year of the plantation, it should be transferred to the division office and kept properly in record there.

7.19 Land Bank:- The Compensatory Afforestation is one of the most important conditions stipulated by the Central Government while approving proposals for diversion of forest land for non-forestry purpose under Section 2 of the Forest (Conservation) Act, 1980. Para 3-4 of the Govt. of India's guidelines under which creation of a Land Bank for carrying out Compensatory Afforestation (CA) against different proposals in a compact area has been mandated and stipulates that the non-forest land identified for the purpose of CA is to be transferred to the ownership of the State Forest Department and declared as Protected Forest or Reserved Forest under the provision of Indian Forest Act, 1927. This transfer is required to take place prior to the commencement of the proposal.

In pursuance to the GOI guidelines, it has been decided that each forest Division in the State shall earmark 10 to 15 hac. area as a Land Bank for carrying CA of all the projects approved in the

Division. The land so identified shall be surveyed, demarcated and declared as Protected Forest under the provision of Chapter-IV of the Indian Forest Act, 1927. For declaration of areas as Protected Forest (PF), such procedure/methodology defined in the Indian Forest Act, 1927 shall be followed and necessary revenue entries made in the Revenue record under the provision of H.P Land Revenue Act, 1954.

In case of non-availability of degraded forest land or other Govt. land in a compact patch of 10-15 hac. in a particular Forest Division, CA against smaller projects can be done in the Land Bank identified in another Division of the Circle or within the State. Similarly, the MOEF, GOI vide D.O. No 25-217/2013-ROC dated 16th January, 2013 directed that non forest land identified for CA in lieu of the forest land diverted for non forestry purposes, has to be transferred to the ownership of the Forest Department and declared 'Protected Forest' and after that the declared protected forest will be added to the total recorded forest area of the State.

The detail of Land Bank area identified in Kinnaur Forest Division is tabulated in Table No.7.7

Table No. 7.7

Detail of Land Bank in respect of Kinnaur Forest Division							
S.No	Year	Name of Range	Name of Block	Name of Beat	Name of Area	Area in Hac	Plantation Done to be done
1	2017-18	Kilba	Sangla	Chansu	UF Palingcha	5	5
2		Kilba	Sangla	Sangla	UF Hurba	5	5
3		Kilba	Karchham	Sapni	C-141	5	5
4		Kalpa	Kalpa	Pangi	C-240	10	10
5		Kalpa	Kalpa	Pangi	C-240	5	5
6		Kalpa	Kalpa	Kalpa	C-239	5	5
7		Katgaon	Katgaon	Kafnoo	Rang Thach	5	5
8		Katgaon	Katgaon	Nathpa	UPF-26 Nathpa	5	5
9		Katgaon	Katgaon	Musrang	UPF-Darch	5	5
10		Nichar	Nichar	Nichar	UF Wangtoo	15	15
11		B/Nagar	B/Nagar	Chaura	NC-1	5	5
12		Kilba	Rakchham	Rakchham	UF-160	5	5
13		B/Nagar	Sholtu	Jani- Ramni	UF Ramni	5	5
14		B/Nagar	B/Nagar	C/Kamba	UF Garshoo	5	5
15		Moorang	Ribba	Ribba	C-186	5	5
16		Moorang	Ribba	Ribba	C-189	5	5
	Total					95	95
1	2018-19	Moorang	Jangi	Rarang	UF Korti	15	15
2		Moorang	Jangi	Jangi	UF Jangi	5	5
3		Moorang	Ribba	Moorang	UF Nesang _I	5	5
4		Moorang	Ribba	Moorang	UF Nesang _II	5	5

5		Moorang	Ribba	Moorang	C-195	5	5
6		Kilba	Sangla	Rakchham	C-160	5	5
7		Kilba	Sangla	Seringcha	C-162b	5	5
8		Kilba	Karchham	Ralli	UF Ralli	5	5
9		Kilba	Karchham	Shong	C-148	5	5
10		B/Nagar	B/Nagar	Chaura	C-68 C	5	5
11		B/Nagar	B/Nagar	Chaura	NC-5	5	5
12		Katgaon	Katgaon	Kafnoo	UF-31	5	5
13		Katgaon	Katgaon	Musrang	C-29	5	5
14		Kalpa	Kalpa	Kalpa	C-239	5	5
15		Kalpa	Kalpa	Pangi	C-238	5	5
16		Kalpa	Urni	Urni	Nc-33	5	5
17		Kalpa	Urni	Tapri	UF Kaksthal	5	5
18		Kalpa	Urni	Runang	UF Cholling	5	5
19		Nichar	Sungra	Sungra	C-82	5	5
20		Nichar	Nichar	Kaksthal	NC-14	5	5
G.Total						110	110

It has been observed that in spite of instruction issued from time to time by the GOI, due care has not been taken regarding declaration of Protected Forests. Therefore, Divisional Forest Officer Kinnaur is required to take up necessary steps in this regard and all the identified Land Bank shall be declared as Protected Forest (PF) under Section 29 of Indian Forest Act, 1927 and necessary revenue entries made in the revenue record under the provision of H.P Land Revenue Act, 1954.

7.20 Other Regulation:-

7.20.1 Closure:-All the plantation areas will remain closed for grazing. The areas should be duly notified for closure under Section 30 (b) of Indian Forest Act, 1927 for a period of 15-20 years and the notification for closure should, therefore, be published well in time in advance of actual planting. Old plantation may be thrown open, if these are beyond grazing damages. Effective closure is a must in order to reduce the total closure period of each plantation depending upon the progress of the new crops.

7.20.2 Grass Cutting: No grass cutting shall be allowed till the plants grow above the level of the grass or shall be allowed except under strict supervision of the forest guard under MGNREGA of the scheme and it should be ensured that no plants are cut along with grass. Removal of grass reduces competition and also mortality due to fire hazard and overhead shade. Or it is better, if Panchayats, are associated for the purpose. The ghasni should be put to open auction and amount from the auction can be suitably distributed amongst all the right holders or to generate income for the Panchayats.

7.20.3 Lopping:-Tree standing in the plantation areas shall remain prohibited for lopping during the closure period and it should be got notified under Section 30 (b) of the Indian Forest Act, 1927. Therefore, notification for prohibition should be published well in time under Section 31 of Indian Forest Act, 1927.

7.20.4 Fire Protection:-All the plantation area will be strictly fire protected. The measures suggested for different species in the respective Working Circle will apply. Legal measures as suggested in different Working Circles and Protection Working Circle shall be followed. No deviation is allowed.

7.20.5 Grazing:- All plantations areas shall remain closed for grazing for 15 to 30 years period depending upon the progress success of plantation. The closure should be effective and for the minimum possible time, so that least hardships is experienced by right holders. However, depending upon the progress of the young crop, particular area may be thrown open to grazing even before the period of closure expires.

7.21 Plantation Records:-

- (i) Plantation journal will be maintained in accordance with the standing orders/instructions for each plantation area on the standard form prescribed for the purpose. A location map on 1:50,000 scales should also be prepared and prefixed to the journal.
- (ii) Plantation boards should be put at prominent places, and written in Hindi, giving name of plantation, area, year of commencement, and other details of work. A simple small wooden/tin board; written in Hindi by staff will be sufficient instead of commercial type of high priced one.
- (iii) Notes on germination, establishment, casualties' etc. are given regularly by the Range Officer, and inspection notes of visiting Officers are incorporated in the journal.
- (iv) A detailed map showing various species and its extent should be prepared on 1:15,000 scales and placed in plantation journal.

7.22 Monitoring and Evaluation:-Monitoring and evaluation of plantation activities have not received due attention in the past. It is, therefore, prescribed that regular review of the plantation area with respect to success percentage and suitability of species planted should be done till establishment. Various reports will also put before the revision committee of the Government of India/ State at the time of inspection for midterm reviews (if any).

CHAPTER VIII

THE NON TIMBER FOREST PRODUCE (OVERLAPING) WORKING CIRCLE

8.1 General Constitution:- This Working Circle overlaps with other Working Circle and is constituted to ensure systematic development and exploitation of non timber forest produce species that occurs in this division. The area is very rich in medicinal plants, but, so far not much scientific efforts has been made to preserve and propagate the minor forest produce.

With the thrust of forest management shifting from being “tree centered to people centered”, forests are now been viewed as a source of not only commercial timber but also of valuable non timber forest products as well. There is the need to emphasize on the study, exploitation and marketing of valuable medicinal plants found in this division. The main non timber forest produce found/extracted in the Division are Medicinal plants like Dhup (*Jurinea macrocephala*), Karu (*Picrorhiza kurrooa*), (*Podophyllum emodi*), Chukkri, (*Aconitum violaceum*) (Tilla), (*Dioscorea deltoidea*) and Kuth (*Saussurea lappa*) etc. The main emphasis/focus would be on medicinal plants.

8.2 General Character of Vegetation:- This Working Circle overlaps and extends over several types of forests. Earlier, the management of forests was based on production of timber and earning of revenue rather than conservation of bio diversity. The non timber forest produce were considered to be much lesser importance. After 1980, the earning of revenue from forests and their management for commercial production of timber has been discouraged from the policy framework and objects of management. The 1988 National Forest Policy emphasizes on in situ conservation of natural environment. Conservation and propagation of non-timber forest produce and their contribution towards local/tribal economy has also given importance in the policy. The forest areas of this Working Circle are located in different altitudinal zones and therefore, there is marked variation in the non timber forest produce. The Non Timber Forest Produce found in this division along with their altitudinal zonation and brief description is tabulated in the Table No.8.1.

Table No-8.1
Non Timber Forest Produce in Kinnaur Forest Division

Sr. No.	Botanical name of the Minor Forest Produce	Local name of the Item	Altitudinal zonation	Remarks
1	<i>Ainslaea aptera</i>	Sath jalori	2500-4500 mts.	Biennial herb
2	<i>Acotinum chasmanthum</i>	Karvi patish	3000-5000 mts.	Biennial herb
3	<i>Picrorhiza Kurrooa</i>	Karoo	3000-4000 mts.	Perennial herb
4	<i>Jurinea macrocephala</i>	Dhoop	3500-4500 mts.	Perennial herb
5	<i>Podophyllum hexandrum</i>	Ban Kakri	2600-4500 mts.	Perennial herb
6	<i>Angelica glauca</i>	Chora	2700-3000 mts.	Perennial herb
7	<i>Viola serpens</i>	Banafsha	upto 2000 mts.	Perennial herb
8	<i>Valeriana wallichii</i>	Mushbala	1600-3600 mts.	Common in forest under growth.
9	<i>Rheum emodi</i>	Rewand chini	3300-5200 mts.	Common as forest under growth.
10	<i>Dioscorea deltoidea</i>	Shingli Mingli	1500-2800 mts.	The species is dwindling due to over exploitation.
11	<i>Artimisia brevifolia</i>	Siski	800-4000 mts.	Perennial herb
12	<i>Thymus serpyllum</i>	Banajwain	1500-4500 mts.	Evergreen Prennial herb
13	<i>Atropa acuminata</i>	Balladuna Jhraka)	2500-3000 mts.	Perennial herb
14	<i>Morchella esculenta</i>	Guchhi	2200-3200 mts.	Ascomycetes fungi (perishable)
15	<i>Potentilla nepalensis</i>	Dori	2000-3000 mts.	Perennial herb

16	<i>Pistacia integerrima</i>	Kakarsinghi	350-2400 mts.	Moderate size deciduous tree.
17	<i>Polygonatum vaticilatum</i>	Salam Mishri	2000-2800 mts.	Perennial herb
18	<i>Aconitum heterophyllum</i>	Patish (Mithi)	3000-5000 mts.	Biennial herb
19	<i>Salvia moorcroftiana</i>	Thuth	upto 1800 mts.	Perennial herb
20	<i>Selinum vaginatum</i>	Butkesh	1800-3800 mts.	Perennial herb
21	<i>Taxus baccata</i>	Brimi	1800-3300 mts.	Evergreen tree.
22	<i>Rhododendron campanulatum</i>	Kashmiri patta	2400-5200 mts.	Evergreen shrub.
23	<i>Dactylorhiza hatagirea</i>	Salam Panja	2800-4200 mts.	Terristrial orchid.
24	<i>Valeriana hardwickii</i>	Nihani	1500-4000 mts.	Biennial herb
25	<i>Acorus calamus</i>	Barian/Bach	upto 2600 mts.	Perennial herb
26	<i>Pinus wallichina</i>	Kail cones	2000-3500 mts.	Evergreen tree.
27	<i>Berberis aristata</i>	Rasaunt	1650-3400 mts.	Deciduous shrub.
28	<i>Adiantum lunulatum</i>	Dusgtuli	upto 2800 mts.	Perennial herb
29	<i>Lichens</i>	Chalora	600-3500 mts.	Perennial lichen.
30	<i>Abies spectabilis</i>	Talis patra	3600-4200 mts.	Evergreen tree.
31	<i>Saussurea lappa</i>	Kuth	2600-4000 mts.	Perennial herb
32	<i>Gerardiana heterophylla</i>	Bichhu buti	800-6000 mts.	Perennial herb
33	<i>Pyrus pashia</i>	Kainth	upto 3000 mts.	Deciduous tree.
34	<i>Rhododendron app</i>	Brass phool	1200-4000 mts.	Evergreen tree.
35	<i>Ephedra gerardiana</i>	Somlata	2500 -5000 mtrs	Tufted shrub
36	<i>Hippophae rhamnoides</i>	Sea-buckthorn	2650 and 3700 m	Spiny deciduous shrub
37	<i>Carum bulbostanum</i>	Kala zira	2500-2700 mtrs.	Herb
38	<i>Aesculus indica</i>	Khanor	1800 to 3000 mtrs.	Tree

8.3 Special Objects of Management:- The State has formulated Himachal Pradesh Forestry Sector Medicinal Plants Policy, 2006 which is aimed at conserving and strengthening medicinal plant resource base in forest areas as well as outside for use towards enhancing health and livelihood security of the people of the State on sustainable basis. The special objects of management are:-

- (i) To identify economical NTFP and useful species of herbs, shrubs and fungi for exploitation.
- (ii) To preserve and improve the quantity and quality of NTFPs in this division and manage them on sustainable basis.
- (iii) To conserve and augment existing non timber forest produce including medicinal plants resource in its natural habitat.
- (iv) To encourage cultivation of commercially important species of medicinal plants on private lands.
- (v) To provide sustained employment and supplementary income to the local population by popularizing the conservation of natural resources.
- (vi) To develop a system of pricing the wild harvest so as to reflect both the conservation costs and the community benefits.
- (vii) To encourage public-private-community partnership for building capacity for cultivation, value addition and processing of raw material before exporting the forest produce from the state.

- (viii) To maximize yield of medicinal plants through sustainable natural and artificial regeneration and scientific exploitation of forest produce by enforcing legal control mechanism on exploitation etc.

8.4 Area Statement:-The Working Circle is overlapping, no area statement is required.

8.5 Blocks and Compartment:-The entire tract of the division will be covered by taking beat as a unit.

8.6 Analysis and Valuation of the Crop:-

8.6.1 Non timber forest produce are an important source of livelihood for forest based poor people in State of H.P. Non timber forest products include fodder and grasses, herbal medicinal plants, leaves, and resins and many forms of food including nuts, wild fruits, Chilgoza, roots and honey etc. Gathering these from the forest for subsistence and sale forms an integral part of the livelihood strategies of the poor.

8.6.2 As far as, medicinal plants are concerned, Himachal Pradesh is one among the major suppliers in Indian market. More than forty species, enlisted by the State Forest Department are exported from the State. But the actual list of produce could well be much. Collection and selling of medicinal plants occupy an important place in the household economy in some parts of rural Himachal Pradesh. It is difficult to estimate the extent of employment generated by this sector for rural people in the State, since most of the activities under this sector is considered to be unorganized. It is not even easy to identify the linkages, whereby, it has with organized sector. In other words, the intersection of informal and formal linkages in this sector is another important issue of concern. In economic literature the phrase informal sector refers to the economy in which the employed persons do not enjoy the advantages of unionization, social security and other associated benefits, or any assurance of regular employment.

8.6.3 The entire tract is rich in many useful shrubs, herbs, fungi which have been exploited from time to time. The area produces large quantities of Banafsha, Karu, Dhup, Salam Panja, Chukkri, Shingli mingli, Guchhi, Rakhal, Lichens, Berberis roots etc. A list of commonly used or economically extracted medicinal herbs, plants occurring naturally in the Kinnaur Forest Division is tabulated in Table No. 8.2

Table 8.2
Medicinal Plants found in Kinnaur Forest Division

Sr. No.	Botanical Name	Common Name	Habit	Occurrence Zone	Parts Used
1	2	3	4	5	6
1.	<i>Aconitum heterophyllum</i>	Mithi Patish	Herb	Sub alpine	Root
2.	<i>Aconatum chasmanthom</i>	Patish, Atish	Herb	Sub alpine	Root
3.	<i>Acorus calamus</i>	Barian/Bach	Herb	900 to 2000m	Rhizome
4.	<i>Angelica glauca</i>	Chora	Herb	Above 2200m	Whole plant
5.	<i>Artimisia nilagirica</i>	Siski	Herb	1500-2500m	-do-
6.	<i>Asparagus adscendens</i>	Sufed Musli	Shurb	Upto 1800m	Root

7.	<i>Berberis spp.</i>	Rasaunt(Kash mal)	Shurb	1800-3200m	Root
8.	<i>Ainslaea aptera</i>	Sathjalori			
9.	<i>Cannabis sativa</i>	Bhang	Herb	Up to 1600m	Leaves
10.	<i>Cinnamomum tamala</i>	Tej patta	Shurb/tree	Up to 2200m	Leaves
11.	<i>Dioscorea detoidea</i>	Shingli Mingli	Climber	Up to 2200m	Tuber
12.	<i>Ephedra spp.</i>	Bhutshur		Above 2200m	Root
13.	<i>Heracleum candicans</i>	Patlain	Herb	2000-2500m	Root
14.	<i>Lichens</i>	Chalora	Herb	2000-2500m	Whole parts
15.	<i>Morchella esculenta</i>	Guchhi	Fungus	1500-2500m	Fruiting body
16.	<i>Myrica nagi</i>	Kaphal	Tree	1000-2100m	Fruit
17.	<i>Dactylorhiza hatagirea</i>	Salam Panja	Herb	Above 3000m	Roots
18.	<i>Picrorhiza Kurrooa</i>	Karoo	Herb	Above 3000m	Roots
19.	<i>Pistacia integerrima</i>	Kakarsinghi	Herb	Upto 1500m	Fruit
20.	<i>Podophyllum emodii/hexandrum</i>	Bankakri	Herb	Above 2200m	Rhizome
21.	<i>Polygonatum vaticilatum</i>	Salam Mishri	Herb	2300-3000m	Leaves
22.	<i>Potentilla fulges</i>	Bajardanti	Herb	1500-3000m	Roots
23.	<i>Pinus wallichina</i>	Kail cons	Tree	1500-3000m	cones
24.	<i>Rhododendron arboreum</i>	Cheo (Brass)	Tree	1200-2400m	Leaves
25.	<i>Rhododendron companulatum</i>	Saranger	Tree	Sub alpine	Flower
26.	<i>Rheum emodi</i>	Rewandchini			
27.	<i>Bergenia ligulata</i>	Pathar Tor	Shrub	1800m & above	Whole plant
28.	<i>Swertia charata</i>	Chiryata	Herb	Sub alpine	Flower
29.	<i>Salvia moorcrotiana</i>	Thuth	Herb	Sub alpine	Flower
30.	<i>Sassuria lappa</i>	Kuth	Herb	Sub alpine	Roots
31.	<i>Gerardiana heterophylla</i>	Bichhu buti	Herb	Sub alpine	Leaves
32.	<i>Taxus wallichiana</i>	Rakhal	Herb	2400-3000m	Leaves

33.	<i>Thumus surphyllum</i>	Banajwain	Herb	1200-1800m	Seeds, leaves
34.	<i>Tinospora cardifolia</i>	Gloe	Herb	1500-2200 m	Leaves
35.	<i>Viola serpens</i>	Banafsha	Herb	1000-3000m	Flower
36.	<i>Valeriana wallichii</i>	Mushbala	Herb	2100-3000m	Root stock
37.	<i>Valeriana hardwickii</i>	Nihani	Herb	1200-3600m	-do-
38.	<i>Hippophae</i>	Seabuck thorn	Shrub	2400-3000m	Seeds / Cuttings
39.	<i>Centella asiatica</i>	Brahmi	Herb	Sub-temprate/ temprate	Leaves
40.	<i>Pinus gerardiana</i>	Chilgoza / Neoza	Tree	1500 mtrs to 3300 mtrs. Himalayan Dry Temperate	Seed

8.6.4 The existing method of collection, extraction and marketing are as per the provision on the Forest Settlement Report, 1921. The people use to exercise these rights and have been collecting medicinal herbs and plants for the preparation of medicine for local use and consumption. With the establishment of new pharmaceutical units, the demand of these medicinal plants has increase many folds. With the increased demand coupled with lucrative prices of these herbs and plants has seen a sudden spurt, in extraction of these plants in all the forest areas. The local right holders are now using all sorts of unscrupulous method in order to extract/collect more and more quantities of these NTFP species.

8.6.5 A wide variety of wild medicinal and aromatic plants and other genetic resources are found in the high hills of wet temperate zone. The gathering and sale of high value medicinalplants from the surrounding forests as well as pasture lands above/ human settlements has traditionally been an important source of cash income in these areas. The collection of the herbs from the alpine pastures and distant forests is considered to be as specialized task undertaken by physically stronger and young members. The men live in groups with bags stocked with food and bedding for long journey. The grazing of cattle is usually combined with the extraction activities the collector gathers and dries the herbs on the alpine pastures and brings to home for marketing. Along with herbs for marketing these men also brings home other plants with either medicinal or religious use in the house hold. The seasonal pattern of collection varies considerably with the bulk of collection concentrated between March and November and conceeding and interspersed with agricultural and live stocks activities. Time of extraction described as scientific for some of the medicinal plants is tabulated in Table No. 8.3

Table 8.3

Sr. No.	Species		Month of extraction
	(Common name	Scientific name	
1	2	3	4
1	Singli-mingli	<i>Dioscorea deltoidis</i>	July-October
2	Bach	<i>Acorus calamus</i>	March-May
3	Banfasha	<i>Viola serpens</i>	April-July
4	Brahmi	<i>Centella asiatica</i>	April-June,

			September-December
5	Harar, Behra, Amla	<i>Terminalia chebula</i> , <i>Tbelerica</i> , <i>Embelica officinalis</i>	January, October-December
6	Kakarsinghi	<i>Pistacia integerrima</i>	September-November
7	Neelkanthi	<i>Ajuga bracteosa</i>	August-September
8	Tejpatta	<i>Cinnamomum tamala</i>	Jan-March, December
9	Dhoop	<i>Jurienia macrocephale</i>	August-October
10	Guchhi	<i>Morchella esculanta</i>	April –July
11	Salam panja	<i>Dactylorhiza hatagirea</i>	August-October
12	Karoo	<i>Picrorrhiza kurrooa</i>	August-October
13	Patish	<i>Aconatumchasmanthom</i>	August-October
14	Kuth	<i>Sassuria lappa</i>	August-October
15	Thuth	<i>Salvia moorscotiana</i>	August-October
16	Salam Mishri	<i>Polygenatum verticillatum</i>	July-October
17	Rakhal	<i>Taxus baccata</i>	September – November
18	Mushkbala	<i>Valerian wallichii</i>	June – September
19	Sapdotri	<i>Berginia species</i>	July-October
20	Mehandi	<i>Lichens</i>	July-August
21	Chora	<i>Angelica glauca</i>	August-October
22	Bankakri	<i>Podophyllum emodi</i>	July – October

Source:- (ISST survey 1998 and Navrachna)

Pre mature and destructive extraction also takes place due to the open access to all collecting villagers as also a competition for resources within the collectors of a village.

8.6.6 The local people sell the medicinal herbs and plants collected seasonally and few people extract/collect these medicinal plants on whole time basis and spend several months in high reaches for collection of these plants to the local contractors. The contractors in turn sell/export these produce to the market situated outside the state. These contractors pay the prices to the local people much below the prevailing market rates. The collection and export permits are issued by the forest department on payment of nominal fees. Since, the medicinal herbs and plants fall under the category of forest produce, the movement and export of these NTFP is regulated under the H.P. Forest Produce Transit Land Routes/ Rule, 1978.

8.6.7 The continuous extraction of herbs and its parts has posed a great threat for the natural use which are being extracted continuously unscientifically and through faulty means by the local people or the labourers engaged in extraction of NTFP. Alarmed with the serious state of affairs, the State Government, by its notification has increased the export fee of the medicinal plants in order to rationalize the export of medicinal herbs. Further, the HP Forest Department has also issued many regulatory instructions for the exploitation of the medicinal wealth.

8.6.8 Stock Map:- As the medicinal plants are mostly herbs and shrubs found on annual or perennial basis, stock mapping is not possible.

8.7 Silvicultural System:- As no silvicultural system is prescribed, no specific operations are proposed. However, when the medicinal plants are raised in the nurseries or plantations, the regular operations like closure, weeding, bush cutting, protection from fire, grazing etc. are to be carried as in case of tree species.

8.8 Calculation of Yield:- No yield can be prescribed as the most NTFPs are extracted through right holders. However, proper record of all the NTFPs exported, should be maintained annually and entered in respective compartment history files. The detail of various NTFPs exported outside from Kinnair Forest Division since 1990-2000 to 2018- is tabulated in Table No. 3.7 of Chapter-III of Part-I.

8.9 Method of Treatment:-No data or information is available for laying down the method of propagation, management, conservation, extraction or fixing any rotation for obtaining maximum yield of the medicinal plants without damage to its multiplication in the settlement Reports, 1921 and previous Working Plan. To put a stop of excessive extraction year after year or degradation of environment and ecosystem, it is felt necessary, to give rest for the area at least once in the three years for regeneration of resources and to avoid further degradation. Therefore, four year extraction cycle of medicinal plants has been regulated by the State Government.

8.9.1 Rotational Extraction:-The unscientific and unsystematic extractions of medicinal plants are likely to reduce the yield and quality of plants and may even lead to disappearance of the species. In order to avoid the chances of over exploitation of the NTFP by the right holders or the traders has regulated the extraction of various medicinal plants, herbs and shrubs by laying 4 years collection cycle as per instruction contained in the Pr. CCF H.P letter No. Ft. 12-306/57 (M) dated 8-2-1994. Regeneration operations include raising of nursery stock, planting, weeding and the maintenance etc. No species are allowed to extraction from the prescribed area which has not been approved in extraction cycle by the competent authority. The extraction shall be done in a sustainable manner and has not to be caused any ecological or environmental damages.

Therefore, a four year extraction cycle of medicinal plants is already enforcing in this division. This cycle will continue and is extended further during the plan period as given in Table No. 8.4.

Table 8.4
Four year extraction cycle of medicinal of plants

Name of Range	Year when extraction will be allowed			
Bhaba Nagar	2019	2023	2027	2031
Kalpa	2022	2026	2030	2034
Katgaon	2021	2025	2029	2033
Kilba	2021	2025	2029	2033
Malling	2022	2026	2030	2034
Moorang	2020	2024	2028	2032
Nichar	2020	2024	2028	2032
Pooh	2019	2023	2027	2031

(Source:- Record of Kinnair Fprest Division)

8.10 Artificial Propagation and Conservation:- Keeping in view the economic importance and demand of medicinal herbs, it is desirable to encourage naturally occurring medicinal plants in suitable localities. The demand of medicinal plants has picked up with setting up of pharmaceutical industries in the state. The existing germplasm of different herbs needs to be conserved. Following measures are suggested for the conservation, protection and propagation of medicinal plants:-

- i) Systematic rotational collection as per approved four year cycle should be followed strictly.
- ii) Heavy gazing and destruction of medicinal herbs should be checked as these species do not produce sufficient seeds/vegetative form of regeneration.

- iii) The raising of nurseries/herbal gardens, drug farms should be developed through various research institutes like HFRI, UHF, Nauni, HPKVV Palampur, CSIR Palampur, Ayurveda department who are engaged in medicinal and aromatic plants.
- iv) Medicinal plant collectors should be educated and provided proper information or guidelines so that there is continuous regeneration of medicinal herbs.
- v) The community based organizations like Mahila Mandals, Yuvak Mandals, VFDCs and other rural co-operatives should be involved in the development, protection, propagation and conservation of medicinal plants through Gram Panchayat.
- vi) The local organizations should also be encouraged to propagate the indigenous medicinal plants through the centrally sponsored schemes like State Medicinal Plant Board/National Medicinal Plant Board etc.

8.11 Community Versus Official Efforts in Conservation of Medicinal Plants:- The growing demand for rare Indian herbs in the Ayurvedic and cosmetic industries inside and outside the country is a cause for concerned to environmentalists, who fear this burgeoning demand might soon lead to the total extinction of wild plants from their natural habitat. Unfortunately, there is little or next to no statistical data available on many of these slow growing wild species. Several of these cannot be grown artificially without leading to a loss of their medicinal properties, according to experts in the field. Himachal has witnessed one of the oldest initiatives in involving local communities in natural resource management in the form of forest co-operatives in Kangra. In the past independence era community involvement was first envisaged under the social forestry programme in the form of protection of fuel wood plantations on community lands.

In 1993, the State Government issued an order regarding the involvement of local communities in rehabilitating degraded forests in a programme widely known as joint forest management.

Traditional efforts in conservation had received a big blow in areas where they have come to a direct conflict with the interest of the collected or the traders, as a possible source of higher income. Forest department has taken steps to stop and reduce extraction of few medicinal plants. Department is controlling the extraction of some species by allowing its collection on rational basis.

Every year only a single Range will be open for collection in one division. In this way, the closed areas will get some time for regeneration of that particular species. The forest department claims that the extraction of *Taxus baccata* has been closed in the area for couple of years.

8.11.1 Demand from Outside Markets and Impact on State Market:- From the talks with traders in Himachal Pradesh, it seems that entire market in the state is operating on the demand from outside the state. There is no report of government purchase of medicinal plants from the villagers, neither any report of helping them directly or indirectly to sell out the herbs. It has to be noted down at this point that, there are 14 Ayurveda hospitals in the state and over 200 Ayurveda dispensaries spread all over the State.

Probably, they procure raw herbal medicines, but information on it is yet to be gathered. As far as, processing of herbal medicines in the state is concerned, there are not many processing unit in the state. The entire market in the State runs on the basis of personal and oral contract.

A change in market structure has been noticed during recent years. Earlier, Rampur used to hold a very important position in the trading of medicines plants for entire Kinnaur district and western part of Shimla district. The importance of the Rampur as nodal market has declined in last few years. The main reason is emergence of a number of valley level traders in the region. The valley traders either directly purchase from the right holders / collectors or they recruit Gorkha labours to extract medicinal plants directly from the forest before exporting them directly to

Amritsar or Delhi. As a result, huge volumes of medicinal plants are going out of the State, bypassing the nodal markets like Rampur. Secondly, the improvement of transport facilities also has influenced the market structure to some extent. Previously, the medicinal herbs / produce used to come to the nodal markets on foot from the distant inaccessible area. Now a day's transport facilities have made it easier for the trader to send the materials by trucks from many of those areas which were inaccessible earlier.

8.11.2 Income and Employment Generation:- Extraction of medicinal plants by the villagers for sale is an age old practice, in various parts of Himachal Pradesh extraction is undertaken largely by the family members of different age and sex groups. Presently the estimation of income generated by villagers is not known, but is undoubtedly, a fact that some of the villagers are earning handsome amounts by selling medicinal plants legally as well as illegally. The ups and downs in the annual earnings are corresponding to the intensity of collections during the peak extraction period and the season happened to a peak or trough year for collection.

8.12 Propagation Techniques:- Whereas method of propagation and harvesting of important plants be standardized after research in puts, the technique of propagation and harvesting of some important plants is described in the Table No 8.5

Table 8.5
Method of Propagation of Medicinal Plant

Name	Method of Propagation	Harvesting/ Collection	Uses
<i>Artemisia nilagirica</i>	The seeds are minute. The sowing is done in Feb./March. Seedlings are transplanted in June-July in pits at a spacing of 0.5m x 0.5m.	The crop is harvested in October when the plants flower.	The flowers are used in extraction of drug used as wormicide.
<i>Acorus calamus</i>	The species is propagated by sowing as well as planting rhizomes at 15m deep at 30cm x 30cm spacing during Feb.-March. If direct sowing is decided, then the soil is worked up to a depth of 15 cm. Sowing is done in patches which may be spaced at 30cm x 30cm.	Harvesting is done after one year during Nov.-Dec.	The dried rhizome is generally used in the form of infusion. It produces best results in case of dyspepsia and chronic diarrhea.
<i>Aconitum heterophyllum</i>	The species is propagated by direct sowing in patches at 30cm x 30cm during Feb.-March.	Roots are dug out in the month of Oct.-Nov.	Roots are used as astringent, tonic and in diarrhea, cough.
<i>Angelia glauca</i>	The species is easily propagated by sowing in patches at spacing of 3' x 3'. Sowing is carried out in Feb.-March.	Collection/harvesting is done in Sep.-Oct.	Roots, fruits used for flavouring. Used in medicines for digestion, heart burn, flatulence.
<i>Dioscorea deltoidea</i>	It is propagated by planting rhizomes in 15cm deep pit at the spacing of 60cm x 45cm during March. About 15-18 Qtls. of rhizomes are required for one hectare area.	Tubers are dug out in Nov.-Dec.	Tubers yield steroidal sapogenin which is a source for manufacture of oral contraceptive.
<i>Heracleum candicans</i>	The species is propagated by seeds and root cuttings. Seeds @ 10-15 Kg/ha are required. The root cuttings 2.5cm to 4 cm long should be planted in 30cm deep pits at a spacing of 75cm x 50cm in March-Apr.	After one year, the roots/tubers are dug out in Oct.-Nov.	Roots are source of xanthotoxin, a furocoumarin which is used in treatment of leucoderma, fruits as aphrodisiac and nervetonic

<i>Podophyllum emodi</i>	The rhizomes are planted in 15cm deep pits in the zone of natural occurrence. The seeds germinate in about 3 years but if sowing is done in bores at low altitudes, it can germinate in 6 months, then the seedlings can be taken to sub alpine region and transplanted.	The rhizomes are collected when fully developed.	Roots and rhizomes are considered hepatic, stimulant, cholagogue, purgative alternative and bitter tonic. The resin or podophyllin is a drastic purgative and produces copious watery stool and is given with Belladuna and Hyscyamus to avoid griping.
<i>Picrorhiza kurroa</i>	It is easily propagated by planting rhizomes in 15 cm deep pits at a spacing of 60cmx60cm during Nov.-Dec.	Collection is done after 3-5 years when rhizomes are fully developed.	Roots are used as stomachic, tonic, improve appetite and stimulate gastric secretion
<i>Swertia chirayita</i>	It is propagated by sowing of seeds in patches at a spacing of 30cmx30cm during Feb.-March.	Harvesting is done in following November-December.	The dried plant yields drug used as tonic, stomachic, bronchial asthma and liver disorders.
<i>Valerina wallichii</i>	The species is propagated by direct sowing or planting rhizomes in 15cm deep pits at espacement of 30cmx30cm during Feb.-March. About 25-40 Qtls. of root stock is sufficient for one hectare.	Rhizomes are dug out after 3-5 years when fully developed.	Dried rhizomes are employed for hair and perfumes, as incense and in drugs for hysteria and nervous problems.
<i>Viola serpens</i>	The species is propagated by sowing or planting root suckers at a spacing of 15cmx15cm during June-July.	Flowers are collected in Feb.-March in low lying area and in April-May in higher reaches.	Used for lung trouble, eye and ear diseases. Also used as blood purifier
<i>Jurinea macrocephala</i> (Dhoop)	The species is propagated by sowing seeds and divisions of root stock at colaor level.	It occurs in the alpine pastures	Decoction of roots is given in colic and puerperal fever and bruised root is applied to eruptions
<i>Ephedra gerardiana</i> (Som lata)	Propagation is through seed, sukers and layers. It is desirable for plantation in dry rocky slopes and sandy banks of the temperate region.	It occur in dry region of temperate and alpine Himalayas	Decoction of stems and roots are used as remedy for rheumatism and syphilis. Tincture of <i>Ephedra</i> is also used as a cardiac and circulatory stimulant.

The distribution, description, marketing, uses and propagation techniques of various medicinal and aromatic plants are well defined in the book “Medicinal and Aromatic plants of Himachal Pradesh” by Dr. N.S. Chauhan Prof. Department of Forest Products, University of Horticulture and Forestry Nauni, Solan.

The best time of collection is generally during dormancy.

8.13 Other Non Timber Forest Produce:-

8.13.1 Gucchi: Gucchi is a highly valued morel mushroom that grows over wide swathes of the country side under Deodar or mixed coniferous forests. It grows in March or early April (depending upon the altitude) and is collected by local people (men, women and children) as soon as one is spotted. This has led to extensive free riding and consequently, gucchi collections are said to be dwindling all over the state. Another reason for the decline is the manner in which the morel is collected. It is wrenched off the ground, possibly also yanking out the substrate mycelium as well.

There is neither time nor patience to allow the mushroom to shed its spores. So the next crops are getting less and less.

If locals can be organized and trained to do two simple things, *gucchhi* might have a chance to bounce back. One, the species needs to be collected after it has shed its spores. This might vary according to weather and altitude, but the local people know when. Secondly, a simple training to get the collectors to use a blade to cut the mushroom stem (instead of yanking it out) is all that is needed to help the species recover. Of course, to do this is apparently simple job, there is a need to find out some good NGO or trainers who can take up this with the collectors (who are numerous) and sort of organize them into monitoring collection methods as well.

The royalty or export permit fee rate on *gucchi* is high: Rs 10,000 per quintal. While a quintal of *gucchhi* is a lot and given the current market rates (between Rs 6500 to 8500/kg), they might seem reasonable; but people are not tuned to paying such taxes on forest produce (agriculture income is tax free). This high rate is a reason why much of the *gucchhi* trade seems to have gone underground. There is, therefore, a need to review these export permit rates for *gucchhi* and bring about a more transparent system in its trade.

8.13.2 *Dioscorea Deltoides*:-It is propagated both through rhizomes and stem cuttings. In case of rhizomes it is propagated by putting the sprouting buds of the rhizomes in prepared soil, (March-April) in the rainy season (July- August). The plant prefers light sandy loam soils and a warm temperate climate, which permits a long growing season. The soil should be manure with old rotted leaf mould before planting. The plants are planted at a distance of 0.3 meter in rows spaces 0.6 meters apart and are provided with supports or dry branch stubs on which the vines can climb. The plants raised in spring and rainy season come up very nicely. Similarly, the plant can be propagated through stem cutting. In this case, the new wood, which will not wilt, is divided into single node cuttings, consisting of a leaf with the auxiliary bud and a short portion of the stem. The cuttings are placed in coarse sand and watered immediately. They are shaded and protected from the direct sun. In about three week's time, the rooted cuttings are produced, which are then planted in the field.

8.14 Campaign for Conservation and Preservation of Endangered Species:- For conservation of medicinal plant wealth, sequential field surveys should be launched so as to assess the conservation status from time to time. Extraction of such species should be banned for such period as may be necessary to restock them. Further, following action is recommended for the endangered species:-

- i) Propagation of endangered species both in ex-situ and in-situ.
- ii) Exploration of substitutes to save the endangered species from over exploitation.
- iii) Compensation to the right holders and particularly to the people actually affected where the species are growing.
- iv) To create public awareness amongst the local people to save the endangered plant species.
- v) Such NTFPs should be given the due thrust and species yielding them should be included in the plantation programme.

8.14.1 Threats to *Taxus* and *Berberis*

- i) Lack of inventorisation. We know next to nothing about the approximate number of trees of *Taxus wallichiana*, their regeneration status and their pockets of occurrence across the appropriate altitudinal zone in the division.
- ii) This tree, though on the List of THREATENED TREES (IUCN, RED LISTING FOR HP), is not enumerated as part of the enumeration done in forests. There appears to be

no nursery stock grown nor are there any efforts for planting this species in appropriate location.

- iii) Though collection and export of *Taxus* leaves has been banned since 1994 and still continues, but there are reports of its illegal collection and export, either as it is or in the name of *Talis patra* (*Abies pindrow* leaves), which is permitted under present regulations export of which can be allowed by the Panchyat Pradhan.
- iv) *Taxus wallichiana* is a very slow growing tree and unless successful plantations of it, are raised annually, in the long term, this tree will eventually disappear.
- v) *Berberis* as one can see is being extracted in huge quantity. It is not clear how this is done, but there must be implications for soil conservation.

8.14.2 Urgent Action on *Taxus wallichiana*:-

- i) There is an urgent need to locate pockets/distribution of this tree in the forests of Kinnaur Forest Division, map these sites by using GPS and inventory the trees class wise.
- ii) A suitable nursery to be identified and stock of *Taxus wallichiana* raised from cuttings (done in February using rooting hormones). One and half lakh such cuttings to be raised in polybags every year for the next 5 to 6 years. The nursery stock has to be retained for two and half to three and a half years in the nursery before planting out. Since, this is a long term, cyclic affair with a long nursery period, it is important that cuttings are raised on the recommended scale annually. A planting schedule for *Taxus* can be developed after 3 to 4 years. But this must continue every year for a long time to come; across the next many future management plans.
- iii) If we have sufficient well grown stock of *Taxus*, it is feasible to grow the live hedges with the species around our closed areas and also to encourage farmers to use this as a live hedge. Such practices that can be incentivized in suitable areas through payment for environmental services.

8.14.3 Action on *Berberis* Conservation:-

- i) A study to answer the question raised must be commissioned soonest possible.
- ii) A PAR (Participatory Action Research) study be undertaken to evolve and adopt and monitor non destructive ways of harvesting this species.
- iii) *Berberis* should be raised in large numbers in nurseries, as it is a very versatile species for use in Bio-engineering.

8.14.4 Policy on Introduction of Medicinal Trees in Forests:-It is now the state policy that in different plantations of the forest department about 30% of the trees being planted need to be of medicinal value and also native to the tract where plantation is being done. Planting of medicinal and aromatic plant will increase the biological/ecological value of the forest in undergrowth level as well as it will also help in breaking of monoculture. Beside this, it will also help in controlling the soil erosion in the plantation areas. There is thus a need to identify and grow suitable medicinal trees for different altitude zones in a particular forest division. While most trees may be technically “medicinal”, it is important that species like Deodar, Kail, and Chilgoza etc. which are normally grown in forest plantations are not reckoned as medicinal trees. It is important that the species like Walnut, Bird cherry, Hazelnut, Horse Chest Nut etc, need to be grown in nurseries.

8.15 Other regulations:-

8.15.1 Legal Measures:- The export of NTFP is regulated under the Himachal Pradesh Forest Produce Transit (Land Routes) Rules, 1978. The season for extraction and collection of NTFP is from the mid of September till snowfall and export is generally completed by the end of the December in each calendar year. The transit rules framed by the State Govt. under Section 41/42

of India Forest Act, 1927 shows that the rules are intended for regulating the movement of forest produce by land routes into “from and within the territorial limits of the Himachal Pradesh”.

Rules 5 provides for registration of property marks and its use with regard to forest produce, whenever, a person wants to transport or cause to transport such forest produce.

Rule 6 deals with registration of property and its use. Rule 8 provides for issue of certificate of registration. Rule 9 fixes the validity period of registration certificate. Rule 10 deals with issue of pass for export or transport of forest produce. It provides that no pass shall be issued for any unmarked timber or for such timber as bears the marks not registered as provided therein.

Rule 11 deals with prohibition on transport of forest produce. Rule 14 provides for production of pass challan for examination. Rule 16 provides for seizure of forest produce and other articles etc. Rule 17 provides for exemption to right holders from obtaining a pass. Rule 18 imposes a ban on booking of forest produce by rail.

Thus, the transit rules framed under Section 41 of Indian Forest Act, 1927 applies to the private forests as well as forests grown by private individuals also and as such any transit of such forest produce requires transit pass for movement. It merely provides for a license for removals of timber or other forest produce from or within the state and also for setting up or establishing a trading depot within the state.

Section 42 deals only with penalty for breach of rules made under Section 41 of the Act.

Local people/right holders have recorded rights to collect fruits, edible seeds, medicinal roots and leaves, roots for the preparation of dyes and honey for their own use and for sale of forest product free of cost as per the recorded rights given in Forest Settlement Report, 1921. This means that right holders can avail the facilities only from the forest in which they have recorded right subject to condition that forest produce can be used for domestic purpose free of cost and forest product can be sale in open market only not forest produce collected from the forest as per recorded rights in Forest Settlement Report, 1921. Therefore, Divisional Forest Officer may take up the matter with the Government to notify for fixing of quantity of forest produce to be collected by right holders for domestic use so that malpractices or over-exploitation of NTFP could be checked and controlled.

In practice the traders purchase the medicinal herbs and shrubs from the rights holders and transport the same to the Amritsar, Chandigarh and Delhi & other markets of demand after obtaining export permits from the concerned Divisional Forest Officer under the H.P. Forest Produce Transit (Land Routes) Rules, 1978 by payment of rates as prescribed by the State Govt. from time to time.

8.15.2 Fire Protection:- The whole working cycle will be under strict vigil against fire hazard. The floor should be kept clean of inflammable material such as debris, unwanted bushes, weeds and grass etc. and adequate fire watchers should be employed.

8.15.3 Right Holder's Demand:- Demand of right holders for medicinal plants, herbs and shrubs will be met from the forest in which they have recorded rights. These rights shall be exercised by the right holders to meet the demand of domestic purpose free of cost whereas for commercial purpose, the species shall be extracted from the prescribed area only in the approved extraction cycle by the competent authority and that the extraction shall be done in sustainable manner and has not to be caused any ecological or environmental damages under the supervision of Forest Guard concerned. Non-adherence to the above condition shall debar the collection and extraction of NTFP from forest by DFO after giving prior show cause notice to the right holders/traders under the principle of natural justice read with the provision of Indian Forest Act, 1927 besides criminal proceeding under the provisions of Indian Forest Act read with Indian Penal Code.

8.16 Issues and Challenges:-

8.16.1 High Exploitation and Poor Regeneration:- Due to unrestricted collection, over use of products and unscientific collection, and also rapid deforestation for non- forest use, the natural availability of NTFP producing trees are less in number, and their regeneration in many forest areas has gone down. Number of productive trees is less in the forest which is how the overall production of NTFP has decreased whereas the demands have gone very high.

8.16.2 Inadequate NTFP Baseline Data and Mapping, Unclear Demand Supply Scenario:- For national level planning and management a reliable data base on NTFP is required which however is not available properly to determine the quantity available, collected, self- consumed, value added and traded, mature trees available and their production potential, per hectore number of trees, etc.. Since NTFP collections are seasonal and may vary from year to year (though the average size of the dependent population may remain more or less the same for quite some time) it is difficult to provide demand and specific forest types, mapping/ inventorization through GIS system is to be developed.

8.16.3 Poor Attention to NTFP Conservation- In situ and ex situ conservation, identification of genotype and gene bank, application of biotechnology and genetic engineering are either paid less attention or totally absent in NTFP sector.

8.16.4 Absence of Sustainable Harvesting Protocols:- Sustainable harvest means, “the level of harvest at which a species composition at natural or near- natural levels and the harvest will not change the species composition of the community’ Understanding of sustainable harvesting is not an easy task, and suitable robust thumb rules are to be followed for different plant parts- roots, leaf, bark, flowers, gums & resin, whole plant etc. sustainable harvesting protocols have not been developed for most NTFPs and whatever protocols are available remain unpracticed in many cases. Participatory ecological monitoring is required, so that local people may understand how much resource is available and how is to be harvested sustainably.

8.16.5 Unorganized Sector:- Traditionally the whole NTFP sector, particularly its collection, trade and local value addition are managed in an unsystematic and unorganized manner. Gram sabhas and Panchayats were given some responsibilities for NTFP management but are still not in a position to independently & successfully handle the overall management of NTFP. Ownership has not been defined in the concerned law. What the Haque Committee (MoPR) quoted can’t be applicable to common property resources where the right to disposal has to be exercised in a manner justifiable to the society. State regimes widely vary. Same item may be free in one state and restricted in the other.

8.16.6 Policy-level Inconsistencies:- As stated earlier various states have got different management processes, procedures and control mechanisms for NTFPs, and that’s because forest is a concurrent subject; but the concurrency has resulted in a kind of highly incompatible regime across the country thereby hampering the development of the NTFP sector. It is high time to develop a national policy, which can address the need of 275 million people related with this sector. There are many grey areas like ownership of Gram sabha in PESA areas over produce cultivated privately on trees on private land or community land, or rights of the Forest Department over NTFPs that are not traditionally collected by communities entitled under FRA outside PESA areas, which are to be addressed for clarity in a national policy.

8.16.7 Inadequate Infrastructure, and Post-Harvesting Facilities/ Skills- In most places in India neither the Forest Department or the procurement agencies nor the Gram sabha/ Panchayat nor the institutions of primary collectors have proper storage facilities, most NTFPs are biological and seasonal products; and several products being perishable require immediate disposal in absence

of appropriate storage facility. This means that the primary collector is vulnerable to distress sale or sale at a low price due to lack of adequate storage facility. Further, lack of value addition deprives the gatherer of better gain. Some products like lac, tassar, medicinal plant, several gums and kalmegh fail to provide the potential return without value addition.

8.16.8 Volatile Market:- NTFP market is highly diverse, and fluctuates quite frequently; hence intervention based on assumptions of market stability or expectations of stable/ growing market often become non- viable commercially. This discourages private entrepreneurship in the sector so far commercial farming is concerned. Primary collectors and producers get least share from their hard earned product, so there is a need of Minimum Support Price (MSP) from the government side.

8.16.9 Adapting to Climate Change- Climate change is a global phenomenon that is affecting the phenology and the reproductive biology of various trees, shrubs and herbaceous plant species. Various research data suggest change in temperature and rainfall pattern affecting the NTFP production- both qualitatively and quantitatively (for example, lac), and which will in turn affect the dependent economy of the local people. Suitable strategies require understanding the level of vulnerability and adaptation measure in future. Mapping of vulnerability to NTFP management and livelihood- change monitoring, bio- geographic region specific adaptation model require further understanding.

8.16.10 Incompatible Tax Structure:- The present tax structure for many NTFP is incompatible across the country which needs to be restructured. VAT has been a matter of major concern for public sector procurement & trading agencies in NTFP who advocate for exemption of the same. In some cases imposition of both central sales tax and state sales tax even led to litigations.

8.16.11 Inadequate Capacity and Knowledge in NTFP Management:- Previously, forestry trainings were mostly oriented towards timber, even community forestry was also timber- centric. As a result these conventional forest management systems are unable to meet the requirement of much broader, finer, integrated and complex challenge of the present era like biodiversity conservation and climate adaptation.

8.16.12 Minimum Support Price (MSP) for NTFPs:- Procurement of collected products providing an uniform minimum assured price will immensely help the gatherers who are often exploited by the local level trader. Although NTFPs are not same as agricultural products, some of them (particularly medicinal plants) are cultivated too while others are vital to the poor forest dwellers, which is why MSP for NTFPs has been advocated for since long. It is also true that similar attempt has been made in the past in few cases/ areas often with drastic financial results, but the experiences have also suggested that without the government guarantee for compensation for the losses to be accrued (if any) and without a compatible policy regime (including tax structure) in the country MSP can't be successful or sustainable in the long run. The Ministry of Panchayati Raj had constituted a Committee on ownership, price fixing, value addition and marketing of minor forest produce under the Chairmanship of Dr. T. Haque, member, Planning Commission. The Committee has submitted its report in May, 2011. Just to start, the Committee has recommended for MSP for 14 (actually 16 to include all three myrobalans, vide note under annexure-3) minor forest produce initially. However, the mechanism for successfully implementing this recommendation is yet to be assessed and ensured properly.

8.16.13 Absence of Complementary Mechanism for NTFP Crop Failures:- MSP can't help the primary collector in case there is a crop failure. Periodic crop failure is a natural phenomenon for many NTFP, but climate change has increased the frequency. NTFP crop failure or bad crop severely affects primitive tribal groups and hunter gatherers, but there is no policy or mechanism to provide some support in such cases to the critically dependents.

8.16.14 Underperformance of Public Sector Procurement & Trade Agencies:- TRIFED and state- level procurement & trade agencies have often underperformed in meeting their objectives partly because their structure is not much professionally and/ or commercially viable, partly because they suffer from policy level setbacks, and partly because they have to face unwanted and informal political and other interventions.

8.16.15 Primary Collectors Losing Interest in NTFP Collection: Uncertain market and reduced production followed by availability of more secured options like MGNREGS has reduced the interest of primary collectors (particularly males) in NTFP collection in many areas. This is similar to the labour crisis in agriculture, and is one of the reasons of under harnessing of the vast potential of the sector.

8.17 Assessment of major NTFP Species:- Kinnaur Forest Division has a very rich floral and faunal diversity due to its topographical, climatic and edaphic variation. As discussed, large quantity of NTFP are extracted and exported by the local inhabitants of the tract of this division on account of their recorded rights in the Forest settlement. Due to increasing subsistence as well as commercial expectation from Non Timber Forest Produce, it has become necessary for the forest department to assess the carrying capacity of the important medicinal herbs, shrubs and other NTFP species for its sustainable harvesting.

In Kinnaur Division the NTFP is being increasingly recognized for their crucial roles in rural livelihood, biodiversity conservation and export earnings. In order to cater to increasing level of subsistence as well as commercial needs of major species involved in the NTFP sector, more intensive management and extraction of NTFP has become mandatory. This necessitates more careful assessment of carrying capacity of major NTFP species like Chilgoza seed, Gucchi, Kala Zeera, Ephedra Grass etc. as well as devising sustainable harvesting system besides the four years extraction cycle which is in vogue in this division. The local stakeholders have also started to respond to this concern at various levels. Several initiatives to ensure sustainable management of NTFP have already been started within the framework of community forestry.

8.17.1 Resource Assessment and Harvesting :- Pursual of the information of Kinnaur Forest Division with regard to collection and export of NTFP for the last 21 years as given in the table no. 3.7 of part – I of the current plan, reveals that large quantity of NTFP are being extracted and exported from this region. The major species like Chilgoza Seed which is confined only in this division is being extracted in crude method and exported through the contractors. The local people lop the branches of the Chilgoza tree, without leaving even a single cone in the tree which could help in natural regeneration of the Chilgoza Pine. The Chilgoza Pine trees are mostly under the control of forest department. But by virtue of recorded rights of the local communities, they extract the seed year after year without leaving a single cone in the tree. This has resulted in degradation / extinction of the species in this division. No proper assessment of the species has been carried out in the past which is required to be developed for proper management of the species. The local communities are also required to be educated with regard to sustainable harvesting techniques, methods and tools to be utilized for extraction of major medicinal NTFP.

The assessment process to be followed is given below:

- **Preliminary mapping**
- **Boundary surveying**
- **Sampling and measurement**

8.17.1.1 Estimation of Sustainable Harvest Level:- Using the data from inventory and available secondary sources (on growth rate etc.), sustainable yield is required to be ascertained. During the

course of field survey the assessment and carrying capacity etc. of following major species were carried out for the last 21 years as give in the Table No.:- 8.6

Table No.:- 8.6

Sr. No.	Name of Species	Scientific Name	Total Quantity exported (in Qtl.) w.e.f. 1999-2000 to 2019-20	Average per year (in qtls)
1	Chilgoza	<i>Pinus gerardiana</i>	7711.67	367.22
2	Somlata	<i>Ephedra grass</i>	2478.53	118.03
3	Dhoop	<i>Jurinea macrocephala</i>	382	18.19
4	Guchhi	<i>Morchela esculentum</i>	355.72	16.94
5	Karoo	<i>Saussurea costus</i>	248.48	11.83
6	Nag Chhatri	<i>Trillidium govanianum</i>	12.71	0.61

Persual of the above table reveals that the Chilgoza is the major species being exported from this division and average per year is about 367 Qtls. followed by Somlata. The results of the major NTFP species were analyzed to assess the effect of harvest interval in the division. It was concluded that the four year cycle does't hold good for all the medicinal plants. The yield will increase in the fifth year but that is also not significant. Based on this, harvest interval of five years is recommended for extraction of medicinal herbs, shrubs and other NTFP species. The Divisional Forest Officer Kinnaur is to carry out the detail study about the extraction of Chilgoza and Somlata during the plan period.

In addition to this rapid assessment, five year monitoring studies is also suggested for optimal harvesting session, harvest interval and the harvesting method for rhizomes, roots, leaves and seed of Chilgoza.

8.17.1.2 Available Carrying Capacity:- The approximate carrying capacity of the major NTFP species found in this division is given in the Table below:-

Sr. No.	Name of Species	Scientific Name	Approximate area in which the species found (in hactare)
1	Chilgoza	<i>Pinus gerardiana</i>	1700
2	Somlata	<i>Ephedra grass</i>	450
3	Dhoop	<i>Jurinea macrocephala</i>	1100
4	Guchhi	<i>Morchela esculentum</i>	1600
5	Karoo	<i>Saussurea costus</i>	2100
6	Nag Chhatri	<i>Trillidium govanianum</i>	650

8.18 Strategy:-The NTFP management on sustainable basis has remained a complex process for the last several decades but in the present scenario, there is a need to adopt multipronged strategy,as under, to build up an environment to strengthen community based management and trade of NTFPs which in turn would strengthen the livelihood of poor forest dependant population:-

- i) **Resource Augmentation Plan / Incentives for Growing NTFP Crops in Private Land:-**Due to unrestricted & unscientific and over-use of products the NTFP resources have greatly been depleted in past years while their regeneration many forest areas has gone down. Special effort is required for reducing the pressure on forest by cultivating

- selected species outside forest areas and undertaking intensive conservation of existing forests supported by ANR and other conservation activities. The increased production thereby would not only reduce the gaps between demand and supply but also shall become the ground for sustainable NTFP development.
- ii) **Detailed Inventory and Prioritization of Zone-Wise Species:-** India has got very rich biodiversity. Hundreds of NTFP species are of Medicinal value, and are in active trade. While the Knowledge and data base on all species are needed, a gradual process of understanding and developing management programme would be appropriate and therefore, there would be a high need of zone wise inventory and prioritization of the various NTFPs.
 - iii) **Forward and Backward Linkages/Organization of Exiting Trade:-** There is a need to involve financial institutions to promote community based micro-enterprises with clear benefit sharing mechanisms. Involve financial institutions like NABARD and other public sector banks in NTFP enterprise development. Just as they have a target for Small and Medium Enterprises in the Industry sector, similarly, this approach can be customized towards Small Forestry Enterprises. In such effort PPP model must be developed which may help achieve the objectives of private sector involvement for bringing technology and capacity in the remote areas.
 - iv) **Capacity Development Training, Awareness Building Exposure:-** Skill / capacity development is very important for the foresters (particularly the sub-ordinate field staff) to successfully face the emerging challenges of accommodating community rights in forest conservation, ensuring biodiversity conservation, and managing climate change. At the same time, complimentary facilitation should be made for forests protecting/forest managing communities too in the form of NTFP management protocols. Trainings to primary collectors, processors, and traders, and also to be front line staff require basis and advance training to build their confidence.
 - v) **Food Security and Income Generation for Poverty Alleviation:-** For empowerment of community and sustainable forests a symbiotic relationship between forests and forests dwellers must be maintained in order to provide food security for forests dwellers and income generation for the poor population. Women are mostly dependent on NTFPs due to the nature of its production.
 - vi) **Quantity, Collection Procedure, Processing and Local Selling:-** In order to improve upon the subsistence level, programmes supporting to ensure food security would be required with specific concern for the landless, hunter gatherers and primitive tribes.
 - vii) **Research and Development:-** More revolutions in the NTFP sector are possible through successful R&D initiatives like that of Sal seed in 1950s. Special R&D drive is required to develop marketability for low value and high volume items, and also for alternate marketability for presently single market items. R&D focus is also necessary to develop NTFP silviculture, sustainable harvesting protocols, low cost and user-friendly (preferably women-friendly) value addition techniques and processing machines, eco-friendly (preferably women-friendly) value addition techniques and processing machines, eco-friendly and safe storage methods, and methods for using otherwise waste biomass in forest.
 - viii) **Establishment of an apex body for NTFP development:-** The overall development of NTFP sector, despite its vast potential, has not been a priority in the past. To develop the NTFP sector, despite its vast potential, has not been a priority in the past. To develop

the NTFP sector in a holistic way by coordinating/guiding various government sponsored activities/programmes on the same along with managing the Knowledge, developing package and practice, ensuring capacity development of stakeholders and providing overall guidance over the NTFP sector, an apex & autonomous agency like the Rubber Board or Spice Board would be very much required. This agency may be called the NTFP Development Board, and can have its state offices/branches.

CHAPTER IX

THE FOREST PROTECTION (OVERLAPPING) WORKING CIRCLE

9.1 General Constitution:- This Working Circle includes all forests which overlaps with other Working Circles and is constituted to address the forest protection problems like Fire, Illicit felling, Encroachment, Boundary pillars, Illegal mining and Poaching etc. The forest areas which are vulnerable to encroachments, status of damage reports, progress in prosecution/ compounding, disposal of seized timber and illicit felling etc. along with their future strategies are also discussed in detail under this Working Circle. This Working Circle is overlapping Working Circle which includes other land as defined by the Supreme Court of India also.

9.2 General Character of Vegetation:- The forests allotted to this Working Circle have their scattered distribution throughout the tract; hence, they represent almost all the forest types starting from scrub in lower elevations and high lying forests which extends up to higher elevation. These types are described in detail in Chapter-II of Part-I and briefly under the different Working Circles constituted under this plan.

9.3 Special objects of Management:- The special objects of management of the forest allotted to this Working Circle are:-

- i) To protect all the forests and other valuable broad leaved forests from all types of forest offences, including indiscriminate exploitation and to preserve eco-systems of the region.
- ii) To protect and conserve all forest land to ensure no illegal mining, encroachment and non forestry activities on forest land under the provision of Indian Forest Act, 1927, HP Mines & Mineral (Concession) Revised Rules, 1971, Mines & Minerals (Development & Regulation) Act, 1957, Forest (Conservation) Act, 1980, HP Land Revenue Act, 1954 and HP Public Premises & Land (Eviction & Rent Recovery) Act, 1971 etc.
- iii) To address the problem of forest fire to the best possible extent by adopting the legal measures and other preventive measures under the provision of Law i.e. IFA, 1927, IPC and Prevention of Damage to Public Property Act, 1984.
- iv) To provide protection of Wild life against poaching/hunting under the Wild Life (Protection) Act, 1972 to ensuring the ecological and environment security of the tract.

9.4 Illicit Felling:-

9.4.1 General:- Though organized and large scale illicit felling in this division is very few and that too, has been halted by various administrative and legislative measures, but major cases of illicit felling occasionally still do occur in Katgaon, Bhaba Nagar, Moorang, Nichar and Kilba Ranges. Open forest wealth is easily accessible to every person in the upper hill region especially nearby road side, as boundaries between private and Govt. forests are not well defined and destroyed the forest wealth to the large extent despite of steps taken by the forest field functionaries. Illicit felling of trees by some unscrupulous persons is another factor responsible for damaging the forest property. The details of cases of illicit felling of trees detected for the period 1999 to 2018-19 is tabulated in Table No. 9.1

Table No. -9.1

Year wise detail of illicit felling cases in respect of Kinnaur Forest Division for the period 1999 to 2018-19																	
Year	Opening balance at the beginning of the year		Cases detected during the year			Total cases			Cases compounded during the year		No. Of cases registered with police	Cases challaned in the court	Cases decided by the court	Balance cases at the end of the year			No. Of cases convicted by the court
	No. Of cases	Timber involved (In m³)	No. Of cases	Timber involved (In m³)	Value of trees involved (In Rs.)	No. Of cases	Timber involved (In m³)	Value of trees involved (In Rs.)	No. Of cases	Amount realized (In Rs.)				No. Of cases	Timber involved (In m³)	Value of trees involved (In Rs.)	
1999-2000	18	32.054	88	40.632	1,65,444	106	72.686	7,18,513	93	2,13,987	.....	.....	.....	13	27.58	5,04,526	.....
2000-01	13	27.58	108	13.474	2,88,718	121	40.99	7,93,244	94	2,30,197	.....	.....	.....	27	30.156	5,59,060	.....
2001-02	27	30.156	64	27.472	4,53,330	91	57.608	10,12,390	73	4,48,053	.....	.....	.....	16	37.286	6,22,331	.....
2002-03	16	37.286	84	18.05	4,03,473	100	55.336	10,25,804	89	6,36,231	.....	.....	.....	11	24.54	3,89,573	.....
2003-04	11	24.54	71	9.785	1,24,369	82	34.325	5,13,942	79	4,38,155	.....	.....	.....	3	.....	75,787	...
2004-05	3	.....	61	6.496	2,81,826	64	6.496	3,57,613	59	2,76,923	.....	.....	.....	5	0.91	80,690	.....
2005-06	5	0.91	84	8.761	2,47,202	89	9.671	3,27,892	85	2,49,938	.....	.....	.....	4	0.06	77,954	.....
2006-07	4	0.06	86	27.788	8,93,144	90	27.848	9,71,098	85	8,61,910	1	.....	.....	4	0.42	1,09,188	.....
2007-08	4	0.42	38	12.492	1,55,055	42	54.912	2,64,243	38	1,55,055	.....	.....	.....	4	0.42	1,09,188	.....
2008-09	4	0.42	86	40.233	6,76,444	90	40.653	7,85,632	82	6,78,411	.....	.....	.....	8	2.018	1,07,221	.....
2009-10	8	2.018	70	329.54	17,44,266	78	331.158	18,51,487	75	17,55,913	.....	.....	.....	3	.....	95,574	.....
2010-11	3	.....	47	42.757	5,93,359	50	42.757	6,88,933	44	5,59,797	.....	.....	.....	6	0.70	1,29,136	.....
2011-12	6	0.70	88	170.843	1,27,94,985	94	171.543	1,29,24,121	74	1,15,94,266	.....	.....	.....	20	20.37	13,29,855	.....
2012-13	20	20.37	36	43.015	21,85,040	56	63.385	35,14,895	35	33,13,191	.....	.....	.....	21	4.38	2,01,704	.....
2013-14	21	4.38	91	9.716	4,53,329	112	18.096	6,55,033	45	1,78,704	.....	.....	.....	67	16.247	4,76,329	.....
2014-15	67	16.247	40	4.996	3,58,011	107	21,237	8,34,340	79	3,67,855	.....	.....	.....	28	13.422	4,66,485	.....
2015-16	28	13.422	94	53.614	10,08,913	122	67.036	14,75,398	105	10,10,691	.....	.....	.....	17	7.79	4,64,707	.....
2016-17	17	7.79	62	18.298	3,95,472	79	26.088	8,60,179	73	6,47,776	.....	1	.....	5	3.75	2,12,403	.....
2017-18	5	3.75	47	13.19	2,37,827	52	16.94	4,50,230	48	2,67,861	.....	.....	.....	4	0.23	1,82,369	.....
2018-19	4	0.23	16	1.85	1,26,913	20	2.08	3,09,282	16	1,26,913	.....	.....	.....	4	0.23	1,82,369	.....

As per Indian Forest Act, 1927, any act causing damage by negligence or deliberately felling of a tree or breaking of land or clearing of land for cultivation or any other purpose in 'Protected Forest' etc., is an offence and punishable with imprisonment for a term may extend to two years or with fine up to five thousand rupees, or both.

Sub section (3) of Section 2 of Indian Forest Act, 1927 defines the term "Forest Offences" to mean an offence punishable under the Indian Forest Act or rules made there under. Nature of forest offence is varied. There may be serious aggravation of offences perspective of money value involved and similarly, criminal intent behind the offence may not be that serious as compared to the damage caused for forest ecology and environment. There are two types of forest offenders that one comes across. A section of the poor people and forest dwellers i.e. right holders who break the law and rules to keep up their livelihood and to meet their basic needs. The other class of forest offenders belongs to a chain of criminal's e.g. forest mafia, encroachers or Company or Corporate bodies or Contractors who knowingly break the law and rules and commit forest offences to meet their illegal ends through innocent people, tribals, Nepali mazdoor and villagers etc.

9.4.2 Causes of Illicit Fellings:-

These are briefly enumerated as under:-

- i) With ever increasing human population and urbanization of tract of Kinnaur Forest Division, the demand for constructional timber, fuelwood, and agricultural implements have increased manifolds. That is why some people indulge in illicit felling to satisfy their needs if their demands are not met with judiciously.
- ii) Poor economic conditions of forest dwellers have compelled them to resort to illicit felling of trees who further sell timber to wood smugglers and other persons or building contractors to earn their livelihood.
- iii) Installation of imported timber depot, Saw Mills, furniture Industry and failure of the department to fulfill their requirement, sometimes, leads to illicit fellings in the forests.
- iv) Tremendous increase in market price of timber of various species, has brought the element of greed in the minds of unscrupulous persons to become millionaire over night. As such illegal timber traders do not spare any pains in felling of trees illegally through innocent villagers.
- v) Due to unemployment, youths are also indulging this illegal timber trade and to make their source of income with the help of forest mafia etc.
- vi) Local inhabitants resort to such illegal activities to increase their land holdings by way of encroachments and raising apple orchard and cultivation by potatoes and vegetables.
- vii) Deodar is the most important species occurring in this tract from economic point of view. It fetches the highest prices in the market of all the species that occur in this area.

9.4.3 Modus Operandi of Illicit Fellings:- Trees are usually cut flush to ground. Axe and Hand Saws are generally used for fellings and conversion of trees. Sometimes, habitual offenders do this malice act in well planned manners, they either remove or burn the illicitly felled stumps and felling refuses to destroy spot evidences. They occasionally cover the stumps with earth or burn the stumps to deceive the forest officials.

They generally fell class-III, IIA & IIB trees and rarely 1st class and above trees and convert them into non-standard sizes to facilitates the manual carriage of timber to vantage points within minimum possible time. Timber is sold to various contractors, wood based industries or local people who need more timber to house construction and hotels and rarely exported illegally outside the district, Kinnaur.

9.4.4 Forests area Prone to Illicit Fellings:- Based on the field observation and record of illicit felling, following forests area are prone to illegal felling/cutting of trees which need effective protection and measures is tabulated in Table No.-9.2

Table No.-9.2
List of Forest areas Prone to Illicit Felling

Sr. No	Name of Range	Name of sensitive Forests	Compartment No. (Old)	Compartment No. (New)	Area in Hac.
1	Bhaba Nagar	Nil			
2	Kalpa	Telangi	C-239	143	192.63
		Putka	NC-23	185	114.96
		Chini	UF 33	15	225
		Kashang-I	C-234(a)	138 (a)	87.00
		Kashang-I	C-234(b)	138 (b)	79.72
		Kashang-I	C-234 ©	138 (c)	26.71
		Telangi	C- 240 (a)	144 (a)	74.46
		Chini	C242	146	162.68
		Runang	C-248 (a)	152 (a)	74.46
		Runang	C-248 (b)	152 (b)	63.53
		Eula Miru II	C-250	154	3.24
		Yulla-Miru-III	C-251	155	7.28
		Yulla-Miru-IV	C-252	156	38.04
		Gunshanang	NC-26	188	141.76
		Tharu	NC-28	190	286.38
		Kashti	NC-29	191	121.98
3	Katgaon	Nil			
4	Kilba	Limsanthang	C-154 (b)	60 (b)	35.60
		Rukti Hurba	C-156	62	177.25
		Chansu	C-152 (b)	58 (b)	75.7
		Chidu	C-153	59	144.88
		Bassaring	C-157	63	234.72
		Seringche	C-162 (a)	66 (a)	42.49
		UF-160			4007.74
		Barang	C-170 a	74 (a)	55.04
		Barang	C-170 b	74 (b)	23.88
		Ralli	C-167	71	260.60
		Sapni	C-143	49	55.45
		Sapni	C-144	50	17.80
		Baturi	C-146	52	36.00
		Shoang	C-151 (b)	57 (b)	147.3
		Baturi	C-148	54	39.65

		Tikru - Wasankan	C-138 a	44 (a)	75.70
		--do--	C-138 b	44 (b)	50.60
		Punang	C-134 a	40 (a)	66.75
		Punang	C-134 b	40 (b)	48.95
		Junpan	C-137 (a)	43 (a)	34.4
		Junpn	C-137 b	43 (b)	60.30
5	Malling	Nil			
6	Moorang	Kirarang	C-225	129	62.32
		Rirang	C-223(a)	127 (a)	36.83
		Kirarang	C-223 (b)	127 (b)	147.71
		Jangi	C-226	130	209.22
		Rirang	C-222(a)	126 (a)	78.10
		Rirang	C-222 (b)	126 (b)	80.94
7	Nichar	Nil			
8	Pooh	Nil			

9.4.5 Preventive/Remedial Measures:-

- i) **Requirement of Right Holder's:-** Genuine demand of local right holders for timber, fuelwood etc. should be met with without any unreasonable delay so that they may not resort to illicit fellings.
- ii) **Plantation of Fuel/ Fodder Species:-** Sincere efforts should be made to raise fuel and fodder species near the habitation, so as to reduce pressure on valuable forests.
- iii) In-charge of sensitive beats may be assisted by forest worker, while patrolling the various forests.
- iv) **Intensive Patrolling/Inspection of Forests:-** All Forest Guards must patrol the forests falling in jurisdiction of their respective beats regularly to avoid any chance of illicit fellings. Range Officer & Block Officer is equally responsible to prevent large scale illicit fellings in their respective jurisdiction and they should check all the sensitive forests periodically. Similarly, ACF should check all sensitive forests at least once in a year to plug any loopholes left by subordinate staff. Divisional Forest Officer himself should review the progress of detection of forest offences regularly and inspect the forest area prone to illicit felling once in a year.
- v) State Vigilance or police officer is required to be exercised on various developmental agencies working in the vicinity of forests, especially, when building and road construction is involved.
- vi) Frequent checking of saw mills and wood based industries are indispensable to prevent illegal trade of timber.
- vii) DFO/ACF/R.O. must conduct night raids/Nakas to check illicit export of timber or their forest produce outside the division.
- viii) To check the illegal trade of timber within the division, three more check posts, at Siasoo, Powari and Wangtooon National Highway must be created through NPV budget or through Tribal Sub Plan budget during the first two years of Working Plan period.
- ix) To check the illegal trade of timber and poaching, patrolling staff/R.O must be provided vehicle, mobile phone and gun etc.

- x) Whenever, a complaint is received by the staff by any means whether orally, telephonically or in writing, whether by name or anonymously or pseudonymously, the preliminary enquiry shall be initiated immediately and completed within two weeks if a forest offence is found to have been committed. Damage report shall be issued immediately and action shall be taken by following the rules and procedure. Major cases of illicit felling should invariably be registered with police immediately.

9.4.6 Prosecution of Forest Offences:- The cases of petty nature may be compounded or challaned in the court of law under the provision of Indian Forest Act, 1927, but the case involving large scale felling aggravate with Criminal offence under the provision of Indian Penal Code be registered with the Police. The first information report under Section 154 of Cr. PC is that information which is given to the police first in point of time, on the basis of which, investigation commences and relates to a cognizable offence. Non cognizable offences cannot be investigated by the police without the special order from a competent Magistrate, when a police officer receives information of a non-cognizable offence committed within the limits of his police station, he enters the substance in a prescribed book i.e. “Roj Namcha” daily diary report and refers the information to the Magistrate. When the Police Officer receives the order from the Magistrate to investigate the case, he may exercise the same power in respect of investigation as in cognizable offence.

For the purpose of the Criminal Procedure Code, all the offences have been classified into different categories but the code has not given any guidelines to determine, whether, a particular offence belong to one category or the other. It all depends upon, whether, it is shown as cognizable or non cognizable in the 1st schedule of the code. That schedule refers to all the offences under the Indian Penal Code and puts them into the cognizable and non-cognizable categories. The offences under the laws other than the Indian Penal Code which are punishable with imprisonment for three years or more have been in the 1st schedule as cognizable and those punishable with less than three years have been shown as non cognizable. This rule is of course subject to any rule to the contrary provided in that law. In case of a cognizable offence, a police officer can arrest the accused person without any warrant or authority issued by a Magistrate and can investigate into such a case without any order or direction from a Magistrate under Section 156 (I) and 157 of Cr. P.C.

In the case of forest offences under the Indian Forest Act, 1927 or any other special law all those that are punishable with imprisonment of less than three years or with fine only, are bail-able/non-cognizable offence unless there is a provision to the contrary. Hence, all forest offences are non-cognizable-bail-able offence as at present.

Proceeding in a non-cognizable offences start by means of a complaint addressed to a Magistrate, whereas, no complaint needs to be made in the case of cognizable offences. In cognizable offence Police begins the investigation on getting information of the crime under Section 154 read with Section 156 of Cr. P.C. Section 2 (d) of Cr. P.C ‘Complaint’ means any allegation made orally or in writing to a Magistrate, with a view to his taking action under the code, that some person, whether, known or unknown has committed an offence but does not include a police report.

Therefore, the position with regard to forest offences under Indian Forest Act is that they are non-compoundable under the Criminal Procedure Code and treated as complaint cases under chapter XV of Cr. P.C; and under Section 68 of Indian Forest Act, all offences except those falling under Section 62/63 are declared as compoundable offence. Composition of forest offences is on a different footing and it is clearly distinguishable footing from the compounding of offences punishable under the Indian Penal Code as mentioned in Section 320 of Cr. P.C.

As per State Govt. instruction, it is the duty of every beat Guard to take cognizance of a forest offence committed to issue the damage report (DR) under Section 33 of Indian Forest Act,

1927, get the damage accepted by the offender also to seize the forest produce and the implements used in committing the offence. The forest offence cases can either be compounded by the forest officer himself or if, he is not competent to compound the cases, be registered with the police or prepare challan and put in court for prosecution under the provision of Indian Forest Act, 1927. If the offence is committed on non-forest land i.e. Govt. land other than Demarcated Protected Forests, Damage report shall not be issued under Section 33 of Indian Forest Act, 1927 and FIR shall be registered with the police by involving the provision of Indian Penal Code only and to take cognizance of offence which has been committed.

The Indian Forest Act is not self sufficient for dealing with all legal problems relating to forest protection and conservation of forests. So, it becomes quite often necessary to invoke the provision of the Indian Penal Code along with Indian Forest Act, 1927. Any Forest or Police Officer may without orders from a Magistrate and without a warrant, arrest any person in any forest offence punishable with imprisonment for one month or upwards under Section 64 of the Act, provided that nothing in this section shall be deemed to authorize such arrest for any act which is an offence under Chapter-IV, unless such act has been prohibited under clause (C) of Section 30 of the Act. Meaning thereby arrest of offender cannot be made for the offences committed in protected forests in absence of notification under clause (C) of Section 30 of the Act.

Every officer making an arrest under sub section 2 of Section 64 shall, without unnecessary delay and subject to the provision of this Act as to release on bond take or send the person arrested before the Magistrate having jurisdiction in the case or to the office in-charge of the nearest Police Station. If there is reason to believe that such person comes under the provisions of Section 41 of Cr. P.C, a Police officer shall re-arrest him under Section 43 of Cr. P.C, but no police officer or forest officer shall detain in custody a person arrested without warrant for exceeding twenty four hours exclusive of the time necessary for the journey from the place of arrest to the Magistrate's court under Section 57 of Cr. P.C. No person who has been arrested by a police officer shall be discharged except on his own bond, or on bail or under the special order of a Magistrate.

9.4.7 Compounding of Forest Offences:- Under Section 68 of the Indian Forest Act, 1927, the Conservator of Forests are empowered to fixed the rates of compensation for compounding of various forests offences vide H.P. Govt. notification dated 5-5-2010. The Forest field staff should act immediately as per instructions issued from Pr CCF H.P. in this regard and within the time frame.

9.4.8 Disposal of Forest Offences:- It has been observed that in spite of instruction issued from time to time by the Govt. due care is not taken regarding prompt and timely disposal of forest offence cases. The cases are not being challaned in the court of Law within the limitation period under Section 468 of Cr. P.C with the result that the accused even in serious forest offence cases involving property worth lac of rupees are being acquitted simply on the technical ground of limitation and non production of certified copies of notification under Section 29, 30/31 of Indian Forest Act, 1927 as required under Section 78 of the Evidence Act, 1972, which is not desirable.

In order to avoid any such recurrence in future, it is hereby laid down that the following procedure will be followed for disposal of the forest offence cases:-

- i) It is the duty of every forest guard in beat to take cognizance of a forest offence which has been committed or is suspected to have been committed or is about to be committed. A report to the effect should be issued damage report immediately giving the date of occurrence, time of offence, name and compartment of forest, detail of damage, name, age and address of offender and name and address of witnesses, if any.

- ii) In case, repeated offence in the same year, reference to previous damage reports should be given.
- iii) The report should be prepared in triplicate. In case a witness is not available on the spot, circumstantial evidence to be collected through photograph or video film in presence of the offender and the offender must be taken to the nearest village Lambardar or Panchayat authority or any influential person or reliable person of village in whose presence the arresting officer will make a report of the offence committed and got the report witnessed.
- iv) The implements and the forest produce may be seized immediately at the time of arrest and will be placed in the custody of the Lambardar or any other reliable person near the place of offence under a proper receipt in the form of a *sapurad nama* or seizure memo etc.
- v) If the offender admits the commission of the offence and express his willingness to compound the offence without being challaned in a court of law, he should be required to put signature or thumb impression on the '*Iqbal nama*' printed on the back of the damage report, which should be got witnessed by two independent witnesses.
- vi) Thumb impression or signature on the '*Iqbal nama*' should be taken, even if the offender merely admits the commission of the offence and yet is not willing to compound the offences under Section 68 of the Act in the presence of witnesses.
- vii) In case, where the identity of an offender is not known to the Forest Officer, it is his duty to arrest him, seize implements or tools used in the commission of offence including mobile phone etc. as well as forest produce and take him to the village Lambardar or Panchayat authority or in his absence any respectable or reliable person with a view to establishing his identity. After ascertaining his full particulars the normal procedure prescribed above should be followed.
- viii) In a case, where the offender has escaped arrest on the spot an immediate report will be made and got signed by the nearest Lambardar or an influential person or reliable person. The implements or tools or the forest produce seized will be entrusted to "*Sapurdar*" and efforts will be made to trace the offender. If the offender admits commission of the offence in his '*Iqbal nama*' or restrain to discharge his duty should be taken in the manner described above. In case, an offender refuses to sign the '*Iqbal nama*' he must be prosecuted through the Police and complete details of such case should be furnished to the police officer concerned for investigation. Wherever possible, the Range Officer will release the offender on bond to appear, if and when, so required, before the Magistrate or before the officer incharge of the nearest Police Station under Section 65 of Indian Forest Act.
- ix) Where an offender resists arrest, the nearest police officer or right holders may be called upon to render necessary assistance under Section 79 of Indian Forest Act, 1927.
- x) The Police help may also be sought in case of aggravate of criminal offence or serious offences under the Indian Forest Act involving prolonged investigation. All cases of assault on departmental forest official or officers in the course of discharge of their official duties, voluntary causing of hurt to commit a forest offence, abetment of forest offence, criminal trespass, mischief by fire and injury to public property, giving false evidence, concealing offenders and forest produce, counterfeiting trade or property marks, selling goods marked with counterfeit trade mark or property mark and tempering with property mark with intent to cause injury or damage, theft of timber through organized fellings and damage to public property through setting fire etc or arrested person should be reported to the police for action under the Indian Penal Code read with IFA, 1927 or any other law applicable to the case. It

- is also emphasized that no premises can be searched without a search warrant either from the Conservator of Forests or DFO or from the Magistrate having jurisdiction.
- xi) Any damage report issued by a forest guard should be reported to the concerned Deputy Ranger within 48 hours and reported to Range Officer concerned within 3 days and thereafter, within 4 days to the DFO concerned. If the matter is reported, it is the responsibility of the Forest Range Officer/ACF/DFO to take further action or otherwise in case of failure for the same field functionaries are responsible for lapses under H.P. Preservation of Specific Corrupt Practice Act, 1983 and CCS (CCA) Conduct Rules, 1965.
 - xii) Forest Guards and other concerned staff shall maintain a daily diary report on the lines of the “Roj namcha” maintained by the Police department, where they should record the events of the day, the forest/village visited and observation made or reports received. This daily diary should be inspected and maintained by the Block Officer and sent a fortnightly report to Range Officer concerned and Range Officer/ACF/DFO should inspect the daily diary of the forest guard and Van Thana staff when the jurisdiction of the respective forest guard.
 - xiii) On receipt of the damage report, the Range Officer will enter them in the Damage Report Register. In entering them he will ensure that the continuity of serial number of a damage report of beat is maintained and no damage report is missed or tempered. On the damage report itself the serial number of the ‘Damage Report Register’ will be filled. One copy of the damage report will be retained in the Range office and field by beats for record.
 - xiv) The Range Officer is responsible to see that the damage reports are either compounded or taken to court and filed (with Divisional Forest Officers sanction) within six months of the commission of the offence.
 - xv) The register of cases compounded with the Range Forest Officer will show the disposal of each case. The disposal of each case will either be compounded or prosecuted or filed. In each case of the DFO sanction will be quoted. In the case of prosecution, a cross reference to the prosecution report will be given.
 - xvi) In complete or defective damage reports or tempered D.R. which can neither be compounded nor can be taken to court will be filed or written off by the DFO with prior concurrence of Conservator of Forests provided that he is satisfied about error of judgment on the part of the beat guard and Deputy Ranger etc.
 - xvii) At the close of the financial year, all undecided damage reports will be brought forward in red ink in the register of offences compounded with the Range Officer and dealt with in a normal way.
 - xviii) The compounding of offences under Section-68, the compensation in all such cases must be realized within a period of 3 months of the commission of offences. In cases the offenders is/are not willing to compound the cases for which his/their statements must be recorded in presence of two independent witnesses. The cases should then be challaned in the court of law before the 6 months or expiry of limitation period under Section 468 of the Cr. P.C. However, all challan must be submitted by the Range Office to DFO for according sanction for the commission of offence.
 - xix) The ACF will scrutinize the cases with the help of ADA (Assistant District Attorney) and enter the same in the Divisional prosecution register before these are put to DFO for his sanction. Thereafter, these cases will be challaned in the court of law under the signature of the RO/DFO concerned.
 - xx) The cases must be put in court before the expiry of 6 months period positively or before the expiry of limitation period under Section 468 of Cr. P.C, failing which the responsibility for

delay will rest with concerned Range Officer (whatsoever delays the prosecution of cases) who will be personally responsible to make good the loss of Government.

- xxi) All FIR of forest offences under Section 154 of Cr. P.C issued by the Police officer may be sent to DFO within 3 days from the date of issuance of the FIR and should immediately entered in the damage register maintained in the Range Office.

The Public Prosecutors have been entrusted the job of prosecuting the forest offence cases. However, Dy. Ranger or Range Officer should assist the Public Prosecutor in conducting the forest offence case in CJM court and ACF should assist the Deputy District Attorney or District Attorney in District and Session Judge Court. They will also keep the DFO and R.O's concerned and submits monthly progress report of the cases duly verified by the ADA/Dy. DA or DA concerned.

9.4.9 Indian Forest (HP 2nd Amendment) Act, 1991:- Vide Indian Forest (HP 2nd Amendment) Act, 1991 certain changes have been made in the Chapter-IX of the Indian Forest Act, 1927 in order to check the large scale illicit felling and smuggling of forest produce particularly by engaging vehicle by certain unscrupulous person. The State Legislative in their wisdom amended the Indian Forest Act in many States in the country, creating another forum, namely the 'Authorized Officer' to order confiscation of property which is instrumental in the commission of forest offences. There was no provisions in the Act enabling the forest officer's to confiscate such timber or forest produce and implements or tools or vehicle etc. used for committing forest offences even in a case where he was satisfied that a forest offence had been committed. In view of this, the State Govt. necessary amendments have been made in Section 52 and after Section 52, inserted the provision of Section 52 A and 52 B, 58 and 59 A in the Act.

Under Section 52(3) Authorized Office can passed order for confiscation of property on being satisfied that forest offence has been committed in respect thereof. It is true, as pointed out by Learned Counsel that the standard of proof required for confiscation proceedings in one case and that required for conviction of offender in the other case is not the same. But for that reason, these provisions cannot be regarded as confiscating or repugnant to each other. Conviction may result in sentence of imprisonment involving deprivation of right to life and liberty and other serious consequences, while order of confiscation of property under Section 52A does not such grave or serious consequences except to remove the vehicle out of circulation and as deterrent. The intention of the legislative is to ensure that the vehicle used in the transaction is no longer available for such misuse and to act as deterrent for the offender and others. These objects can be well served by confiscating the vehicle. Thus, the scheme of the Act providing for a separate confiscation procedure has a substantial public purpose to serve and is in tune with Articles 14, 48A and 51A(g) of the Constitution of India.

It is further provided under the provision to Section 52 B that no order confiscating the motor vehicle shall be made except after giving notice in writing to the registered owner of the vehicle and further after considering his objection, if any, it is so found that the vehicle was being used or used for carrying the timber without knowledge or connivance of the owner confiscation order shall not be passed. The burden of the proof, is generally, on the parties seeking relief or having the affirmative of an issue. The burden then shift to the respondent to establish the contrary provision of the Act. In other words, in quasi-judicial proceedings, there is no burden caste on any party, similarly, to the one in criminal proceeding. The law does not ordinarily recognize the principle of criminal proceeding and giving the benefit of doubt to a party or whom the burden of proof lies.

The details of cases admitted and decided in the Authorize Officer, Kinnaur Forest Division is tabulated in Table No.-9.3

Table No. -9.3

The details of illicit felling cases admitted and decided in the Authorize Officer, Kinnaur Forest Division is tabulated in table No. 9.3

Table No-9.3								
	Year	Balance cases of previous year	No. of cases admitted	Total	No. of cases decided	Property confiscated to the Govt.	Cases pending in Appellate Court/High Court	Balance cases for disposal
	2002-03	3	1	4	3	0	0	1
	2003-04	1	0	1	0	0	0	1
	2004-05	1	1	2	0	0	0	2
	2005-06	2	0	2	1	0	0	1
	2006-07	1	0	1	1	0	0	0
	2007-08	0	0	0	0	0	0	0
	2008-09	0	0	0	0	0	0	0
	2009-10	0	2	2	0	0	0	2
	2010-11	2	1	3	0	0	0	3
	2011-12	3	0	3	0	0	0	3
	2012-13	3	0	3	0	0	0	3
	2013-14	3	0	3	0	0	0	3
	2014-15	3	0	3	0	0	0	3
	2015-16	3	1	4	0	0	0	4
	2016-17	4	0	4	0	0	0	4
	2017-18	4	0	4	0	0	0	4
	2018-19	4	1	5	1	0	0	4

9.5 Fire Protection:-

9.5.1 General:- The incidence of forest fire in the State is increasing and more area is burnt each year. Fire is a major factor that causes considerable damage to the forests of this division. The fires both accidental and incendiary are very common in this tract due to the reason that majority of forests are easily approachable by roads/paths and the local inhabitants of the tract of this Division have cultivated landed property which is commonly known as **Kandas** etc. Also some of the forests lie in dry/higher reaches of steep and precipitous slopes. As most of the forests are either Kail or scrub forests, any incident of server fire have a considerable adverse effect not only on the incident of severe fire has a considerable adverse effect not only on the vegetation but it also deteriorates the habitat.

In State of Himachal Pradesh, in 2012 more than 20,000 hectare of forests has been destroyed in wild fires which are more than 10 times compared to the loss of 1758 hectare during the year 2011. The loss to the forest wealth in 2012 was estimated at Rs. 2.44 crore, whereas, it was just Rs. 43 lac. in 2011.

According to forest survey of India report of 2009, Himachal Pradesh has 37033 Sq. Kms. of forest area out of which 3224 Sq. Kms. is very dense forests which need to be safeguarded by putting all efforts.

The total forest loss in 2010 was 7654 hectares in the state, while it was 24849 hectare in 2009. Records of the H.P. Forest Department say 22% or 8267 Sq. Kms. of the total forest area in the state is fire prone.

Fire has an adverse effect on soil, water and ecological balance of the affected area. Soil becomes vulnerable to soil erosion and its structure gets affected, thereby retarding plant growth. The soil building micro-organisms are destroyed and the area is ultimately rendered susceptible to erosion and decreasing productivity. The young regeneration is wiped out, growth of surviving vegetation is adversely affected, the yield of forest produce is immensely reduced and the vegetation damaged by the fire becomes vulnerable to insect and fungal attack. The high salvage removals are attributed to this. In the fire burnt forests, change in crop pattern takes place, resulting in mixed crop in the forests. A mention of fire as a factor causes injury to the forest crop has already been made in Chapter-II “Flora and Fauna” of Part-I of this plan.

The forests in this division particularly Kail and Spruce are highly susceptible and are subjected to frequent fire in the month of April to June and September to November or even in December, whenever, there is no snowfall. If fires are not controlled in time, these cause serious damage. Year wise detail of fire incidences occurred during the plan period is tabulated in Table No. 9.4

Table No. 9.4

Fire incidences in Kinnaur Forest Division					
Sr. No	Year	No. of fire incident	Area damaged by fire (in ha.)	Approximate Loss(rs)	Remarks
1	1999-00	10	451	352000	
2	2000-01	6	77.5	176400	
3	2001-02	2	56	43500	
4	2002-03	4	48	1700	
5	2003-04	0	0	0	
6	2004-05	5	40	525000	
7	2005-06	0	0	0	
8	2006-07	2	4	49040	
9	2007-08	1	1	0	Ground Fire
10	2008-09	3	1.5	10312	
11	2009-10	3	31	512770	
12	2010-11	1	2	38000	
13	2011-12	1	13	28000	
14	2012-13	5	123.5	681536	
15	2013-14	1	100	70000	
16	2014-15	6	55	1684676	
17	2015-16	6	57.5	2004410	
18	2016-17	22	425.5	8684710	
19	2017-18	7	98	874118	
20	2018-19	6	127	0	
	Total	91	1711.5	15736172	

(Source:- Record of Kinnaur Forest Division)

As per detail given above, between the years 1999-2000 to 2018-19, there were **20** numbers of fire incidences and total **1711.5** hac. forest area was damaged by fire. The approximate total loss occurred was Rs. **1,57,36,172**. Fire incidents occurred every year, except in the year 2003-04, 2005-06. Maximum annual forest area recorded as burnt, has been 451 hac. in the year 1999-2000. After field observations, it is also apparent that some fire incidents are not reflected in the records of the division. In reality, wild fires do occur frequently in at least some of the areas, in the division.

Because of all these reasons prevention and control of forest fire assumes great importance in Kinnaur Forest Division and there is an urgent need to take effective steps to counter the menace of forest fires, with the aim of:-

- a) Protecting forests from damaging fires by taking up all preventive measures like administrative, technical, social, legal etc.
- b) Preparing adequately and taking appropriate action for controlling, suppressing and extinguishing forest fires, in order minimize the loss caused by them;
- c) Educating local people about fire damage and eliciting their cooperation in preventing, controlling and extinguishing fires.

9.5.2 Causes of Forest Fires:- The main causes attributable for the outbreak of forest are various and can be summarized as under:-

- i. **Natural:-** This caused due to lightening, friction between quartzite stones and dry grasses. However, such natural incidents of forest fires in the tract are not met with so far.
- ii. **Accidental:** Such fires are more common and are caused due to:-
 - a) Throwing of burning cigarette/Bidi pieces in forest areas by the passing and the local people visiting to Kandas, without visualizing possibility of causing forest fire therefrom.
 - b) Burning fire left behind in forests by hunters, workers, fuelwood collectors and grazers-again without contemplating possibility of incidence of fire there from.
 - c) The scintilla's fallen from wooden torches, used as source of light during dark nights also cause forest fires.
 - d) Honey from honey-comb of wild bees in the forests is extracted by villagers during night hours, by burning wooden torches. The ember of burning torches fall on dry grasses and leaves and become cause of forest fires.
 - e) Sometimes, fires spreads to forests, from adjoining private fields/land where local inhabitants set fire to burn useless bushy growth, or to get new flush or grass shoots in Ghasanis.
 - f) The forest fires are also sometimes caused from the spread of embers/scintilla's from charcoal kiln, if proper supervision precaution is not exercised/taken during burning of charcoal kilns in forest areas.
- iii. **Incendiarism:-** The outbreak of fire may be due to incendiarism. The general motives behind the cause of incendiarism in forest are given below:-
 - a) In case of illicit fellings, the defaulters maliciously burn such forests to conceal their illegal actions.
 - b) Hunters/Poachers burn forests to facilitate killings.
 - c) Local people burn forests, plantations if their genuine requirement of timber, fuel are not catered judiciously by the department.
 - d) Local inhabitants set fire in the forests deliberately to get new flush of grass for their cattle and collector of Minor Forest Produce like *Gucchhi*, from the Forest.

- e) Sometimes encroachers intentionally burn forest area, adjacent to their cultivated lands, orchards to extend their holdings illegally in Government land.

9.5.3 Factors Contributing to Fire Damage:- Fire is the product of fire environment, which has mainly following components:-

- i) High temperature/ Dry conditions.
- ii) Low humidity.
- iii) Inflammable material.

i) High Temperature / Dry conditions:-With the increase in temperature during summer season and due to prolonged dry spell, the possibility of fire increases. In this area 25° to 30° is considered the critical temperature, above which the cases of fires keep on increasing with increasing temperature. The detection of fire danger day can be assessed with the help of thermometer.

ii) Low Humidity:-This factor also contributes towards spread of fire. The areas which are more humid are less prone to fire, than the areas, which have low humidity in summers. This is the reason that the casual rain fall reduces the fire risk for a few days.

iii) Inflammable Material:-In most of the forests, grasses, needles, fallen trees, and bushes etc., make ample inflammable material. The possibility of forest fire depends upon the quantity of inflammable material on forest floor. To reduce the inflammable material in forests, control burnings should be done.

9.5.4 Fire Season:- The greatest danger of fire occurrence is during summer months from April to early July, up to the commencement of monsoon rains. During autumn, and winter season, normally, the danger of forest fire is less but occasionally the fires do occur in this period also due to long spell of dry season and late snowfall.

9.5.5 Special Fire Risk Zones:- The areas burnt during previous years indicate that the following blocks of forests are especially prone to fire is given in table No.9.4

Table No.-9.4
List of Fire Prone Areas

Sr. No.	Name of Range	Name of Forest Block
1.	Bhaba Nagar	Bhaba Nagar & Sholtu
2.	Kalpa	Kalpa, Shongthong, & Urni.
3.	Katgaon	Katgaon
4.	Kilba	Sangla, Rakchham, Karchham and Kilba
5.	Malling	Nil
6.	Moorang	Jangi & Ribba
7.	Nichar	Nichar, Sungra & Tranda
8.	Pooh	Nil

Special attention is required for the above forest zones during the fire season.

9.5.6 Management of Fire Protection

The following steps will prove effective in fire management:-

- a) Fire prevention measures.
- b) Timely detection of forest fires and information to concerned staff.
- c) Process of fire control and fire fighting.
- d) Penal provisions and a system of rewards.

a) **Fire Preventive Measures:-** “Prevention is better than cure”, and this holds good in case of forest fires too. Prevention of fire is more beneficial and cost effective than fighting the fire. For this effective steps should be taken well in time, such as summarized below:-

- i. **Earning Good Will of Local People:-** The forests cannot be protected against fire without winning the good will and co-operation of the local people. This can be done by making regular contact with local villagers and meeting the reasonable bonafide demands of right holders, well in time. Also the closures made should be affected for the minimum required period.
- ii. **Education and Publicity:-** Wide publicity especially in villages nearby forests should be given against the harms caused by forest fires. For this, timely action should be taken for distribution of pamphlets and other educative material during the fire season, well in advance, so as to acquaint the villagers/local people through Panchayats. The staff should hold regular meetings with local villagers in their areas to create awareness. Also, hoardings, notice boards and banners should be displayed at prominent points to make aware the tourists and local public regarding the damage caused by fires.
- iii. **Restriction on Tarring of Roads:-** During fire season, tarring of roads in forest areas should be banned, as PWD staff/labour burns fire underneath drums of bitumen leading to wild fires.
- iv. **Concept of Joint Forest Management:-** Joint Forest Management may help in preventing and controlling fires. For this active participation of local villagers should be sought by involving people in forestry activities and reasonable power should be given to the VFDS.
- v. **Removal of Pine Needles:-** Local villagers should be allowed and encouraged to collect and remove the fire needles, before hand, for domestic purposes. We need comprehensive Policy or Plan to deal with fires and to make use of the inflammable needles for making packing cases etc. This will definitely reduce the fire hazard and increase the livelihood of poor people to a great extent.
- vi. **Cleaning and Thinning in Regeneration Areas:-** All regeneration areas should be isolated by cleaning a strip of 1 meter width, all around, from all inflammable material, leaves, bushes etc. Early cleanings and thinning in young regeneration should be done, to give an escapement of 1 meter. The pruning of trees, which have attained a height of 1.5 meters, should be done upto 1/3rd of their height and debris should be collected at suitable Nallah/place and control burnt.

b. **Fire Protection Staff:-** Divisional Forest Officer will engage sufficient number of fire watchers in consultation with the Chief Conservator of Forests Rampur, during the fire season. Fire watchers (preferably the local villagers), will patrol the areas extensively for detection and protection against fires and will ensure all preventive measures with the local forest field staff. During fire season, fire fighting squad be formed out of the daily waged who have been regularized. This squad should always be ready at every Range H.Q and as soon as any information of fire occurrence is received, they be rushed on “Fire Pick up Van”, to that spot.

A latest guideline in respect of prevention and control of Forest fires are laid down by Govt. of India vide No. 9-6/99-FFD dated 22-6-2001 which should be followed properly.

c. **Fire Protection Equipments:-** The field staff (near the fire prone forests) should be provided with sufficient fire equipments such as brooms, shovels, slashes, axes, hatches, forks, buckets, gunny bags etc., so as to meet any emergency and for facilitating the speedy extinguishing of fire. Field staff should be imparted training for effectively controlling forest fires.

9.5.7 Fire Lines:- The existing fire lines be properly maintained and kept clear of all bushes, needles etc. to avoid any chance of fire. It is laid down that all such roads/paths and fire lines should be kept clear of all inflammable material especially during the fire season, so as to act as fire lines. The detail of fire lines existing and the fire lines which are proposed are tabulated and given in Table No.-9.5 & 9.6

**Table No.-9.5
List of Existing Fire Lines**

Sr. No	Name of Range	Name of Beat	Particular of Fire Lines	Apprx. Length (In Km)
1.	Bhaba Nagar	Chaura	Maneotidhar to Satluj River	5 Km Length X Width 10 Mtr.
2.	Kalpa		Nil	
3.	Katgaon		Nil	
4.	Kilba	Kilba	C-46	2.5 Km
5.	Malling		Nil	
6.	Moorang		Nil	
7.	Nichar	Tranda	Along Tranda Ridge in between C-5 (b) and C-6 commencing from near old H.T Road	Length 4 Km X Width 10 m
		Nichar	Along Upper Inspection path and cantour line of Chhanang Dogri through C-174 C-17, and C-175	Length 6 Km X Width 10 m
		Kaksthal	Along inspecton path through C-33, C-34 (a&b)	Length 3 Km X Width 10 m
8.	Pooh		Nil	

**Table No.-9.6
List of Proposed Fire Lines**

Sr. No	Name of Range	Name of Beat	Particular of Fire Lines	Apprx. Length (In Km)
1	Bhabanagar		Nil	
2	Kalpa	Roghi	C-151	4 Km
		Urni	C-159 (a)	2 Km
			C-159 (b)	4 Km
			C-193	3 km
			C-194	3 Km
			C-195	4 Km
		Tapri	Along khole Nalla to Kaksthal	6 Km
			Kaksthal to C-162 (a)	8 Km
		Runang	C-152 (a)	6 Km
			Yulla Miru – I	5 Km
			Yulla Miru – II	4 Km
			C-188	5 Km
			C-189	6 Km
			C-190	7 Km
			C-191	8 Km

3	Katgaon	Nil		
4	Kilba	Sangla	C-60 (b)	2 Km
			C-62	3 km
		Chansu	C-59	2 Km
			C-58 (a)	1 Km
			UF Regsangthag	2 Km
		Seringche	C-63	3 Km
			C-66 (b)	2 Km
		Rakchham	UF 160	5 Km
		Ralli	C-71	4 Km
		Sapni	C-47	2.5 Km
			C-50	3 Km
			C-70	2 Km
		Shong	C-69	2 Km
		Kilba	C-46	1 Km
		Punang	C-41	2.5 Km
5	Malling	Nil		
6	Moorang	Jangi	Along Tithri Dhar {Jangi to C-126 (a)}	7 Km
		Rarang	Along near old H.T. road in between C-136 (b)	14 Km
		Ribba	Along the old Inspection Path (Ribba Holdo to C-92 (a))	10 Km
7	Nichar	Nil		
8	Pooh	Nil		

9.5.8 Construction of Watch Towers:- A network of watch towers, at suitable commanding locations, should be developed. These should be permanently manned by fire watchers/Forest Workers during the fire season. The fire watcher will immediately come to know and report to the beat guard, any outbreak of fire that may occur. The beat guard will take further necessary action for fire fighting.

9.5.9 Control Burning:- The conifer needles and all other inflammable material lying on the floor of forest needs to be control burnt. The burning should be thoroughly planned and organized and should be carried out under the supervision of competent officials.

All the forests must be isolated by clearing a strip of 1 meter width, of all inflammable material, leaves, bushes etc. to act as fire barrier during the fire season. Grazing by cattle, should be permitted, in order to reduce inflammable material in the forests.

It is most essential, that the fire prone forests are adequately protected against fire. The control burning is the most important operation and should never be neglected. The triennial programme for control burning is the most important operation and should never be neglected. The triennial programme for control burning is chalked out and is given in Table No.-9.7

Table No. -9.7
Proposal of triennial Programme for Control Burning

Sr. No	Name of Range	Name of Beat	Name of Forest	Compartment No. (Old)	Compartment No. (New)	Area in Hac.
1	Bhaba Nagar	Nil				
2	Kalpa	Roghi	Kastiarang	C-247	151	206.39
		Barang	Barang	C-171(a)	75 (a)	21.85
			Barang	C-171(b)	75 (b)	29.14
			Barang	C-172 (a)	76 (a)	38.45
			Barang	C-173	77	13.76
			Barang	C-174(a)	78 (a)	28.33
		Tangling	Tangling	C-176	80	131.5
			Tangling	C-177	81	232.3
			Tangling	C-178	82	112.1
			Tangling	C-179	83	117.75
			Tangling	C-180	84	232.30
			Purbani	C-181(a)	85 (a)	69.20
			Purbani	C-181(b)	85 (b)	69.20
			Purbani	C-181(c)	85 (c)	105.60
			Purbani	C-182(a)	86 (a)	26.70
			Purbani	C-182(b)	86 (b)	21.85
			Purbani	C-183(a)	87 (a)	77.70
			Purbani	C-183(b)	87 (b)	12.55
			Purbani	C-184(a)	88 (a)	102.40
			Purbani	C-184(b)	88 (b)	63.13
			Purbani	C-184(c)	88 (c)	69.20
		Runang	Runang	C-248 (a)	152 (a)	74.46
			Runang	C-248 (b)	152 (b)	63.53
			Eula Miru I	C-249	153	23.07
			Eula Miru II	C-250	154	3.24
			Gunshanang	NC-26	188	141.76
			Rangley	NC-27	189	81.68
			Kashti	NC-29	191	121.98
3	Katgaon	Nil				
4	Kilba	Sangla	Limsanthang	C-154 (b)	60 (b)	35.60
			Rukti Hurba	C-156	62	177.25
		Chansu	Chidu	C-153	59	144.88
		Seringche	Seringche	C-162 (a)	66 (a)	42.49
		Rakchham		UF 160		4007.74
		Ralli	Ralli	C-167	71	260.60
		Kilba	Kilba	C-140	46	98.75
		Punag	Junpan	C-137 (a)	43 (a)	34.4
5	Malling	Nil				
6	Moorang	Nil				
7	Nichar	Nil				

The forest areas have been prescribed in full, however, it is laid down that all the forest areas planted therein should not be controlled burnt, until the plants attain a height of 1.5 meter.

The detailed instructions on control burning are contained in the H.P. Forest Manual Vol. IV and are summarized as below:-

- i) The control burning should be done during winters in February-March.
- ii) Burning should progress from uphill to downhill in calm weather and special care should be taken, to keep the line of fire as straight as possible and under control.
- iii) The fire should start along the ridge, a cleared path or specially cleared lines.
- iv) The needles and other inflammable material should be fully raked to ensure through burning.
- v) Cleanings and early thinning in young regeneration areas must be completed before the control burning.
- vi) Burning shall be done always under strict supervision and control of the executive staff and shall never be left to the engaged labour.
- viii) The existing fire lines should be properly maintained and kept clear. The roads, bridle and inspection path etc. must be kept clear of all inflammable material, so as to act as fire lines.
- ix) Sufficient number of trained fire watchers should be employed during the fire season to help the field staff and provided with necessary equipments. No felling operations, even to the right holders, should be allowed during the fire season.

It is, however, to be noted that areas under regeneration should not be control burnt, until the regeneration reaches a height of about 2.5 m. In such areas, however, the grass cutting/needle collection by right holders be encouraged.

9.5.10 Fire Fighting:- When a fire is observed, Forest Guard or the fire watcher should at once inform the Block Officer (Dy. Ranger) and the Range Forest Officer. He should also inform the president of the local panchayats immediately, as well as, the staff of the Government Offices or institutions situated in the vicinity and seek their help in the fire fighting operations. In case of alarming situations, immediate help of organizations, like I.T.B.P.Reckong Peo, Home Guard various Army Cantonment Head Quarters, Fire Brigade, N.C.C., N.S.S., situated near the vicinity of each range, the services of such institution can be availed. District Administration may be requested for immediate help, as and when, required. The fire is normally controlled by beating with a broom of green bushes.

Fire fighting methods have been given in the Punjab leaf let No.-8 and practical Forest Management by Trevor and Smithies. For guidance of field staff, the method is given in brief here. The Senior Officer present will immediately, take command of the operations. He should know the local geography and have some idea of labour force. The labour force should be organized in sections of suitable strength each under the order of one man and given definite task. A couple of men should be kept in waiting to take messages and instructions to the various sections. In case the fire goes beyond control, it is necessary to localize it by counter firing. Counter firing should only be done under order of a senior officer in-charge of operations and attempted from a defined line such as road or ridge or fire line. A line is formed along the ridge by clearing the forest floor and cutting bushes and from this fire is started, so as to consume the fuel in advance of the oncoming fire. Wind direction and gradient should always be kept in mind, while counter firing. Roads/paths are useful, provided, enough man power is present. After the fire has been brought under control, the smoldering stumps should be extinguished by putting the dug earth on them and strict vigilance be kept till all dangers of fire spreading are taken care of. Arrangement for the transport of food,

water and adequate fire fighting tools are essential. The rolls of right holders, who helped to fight the fire, should be kept in record, so that the rights of defaulting right holders can be suspended.

9.5.11 Preparation of Annual Plan:- Preparation of an exhaustive annual plan for the fire protection is also, recommended.

9.5.12 Administrative Measures:- Administrative aspects are also very important in connection with fire protection efforts. Encouragement should be given to good staff, while negligent staff should be punished appropriately, so that, the officials remain vigilant and cautious in their work. The concerned Conservator of Forests can give suitable reward, in case of exemplary work done by any official or any other person. So that temptation is more towards the fire fighting operations.

9.5.13 Legal Measures:- All cases of incendiarism should be properly investigated and punitive measures should be taken against the culprits. Legal provisions regarding forest fires are available under Indian Forest Act, 1927. Setting fire to Protected Forest is punishable under Section 33 of the Act with imprisonment up to two years or fine up to Rs. Five thousand or both. Similarly, under Section 33 (2) whenever, fire is caused willfully or by gross negligence in a protected forest, the State Government may, notwithstanding, that any penalty has been inflicted under this section, direct that in such forest or any portion thereof the exercise of any right of pasture or to forest produce shall be suspended for such period as it thinks fit.

Section 79 (1) of the Indian Forest Act, 1927 makes obligatory on every person, who exercises any right in a reserved or protected forest or who is permitted to take any forest produce from forest or Govt. employee shall be bound to furnish without un-necessary delay to the nearest Forest Officer or Police Officer any information with respect to any commission of forest offence, and shall forthwith take steps, whether so required by Forest Officer or Police Officer or not:-

- a) To extinguish any forest fire in such forest of which he has knowledge or information.
- b) To prevent by any lawful means in his power any fire in the vicinity of such forest of which he has knowledge or information from spreading to such forest, and shall assist any Forest Officer or Police Officer demanding his aid.
- c) In preventing the commission in such forest of any forest offence.
- d) When there is reason to believe that any such offence has been committed in such forest in discovering and arresting the offender.

And any violation of the provision of this Section is punishable under Section 79(2) with imprisonment for term which may extend to one month, or with fine which may extend to two hundred rupees or with both.

Therefore, field functionaries/staffs must take action accordingly so that the object of fundamental duty could be achieved.

Further, the H.P. Govt. has framed rules regarding fire protection known as Himachal Pradesh Forest (Protection from Fires) Rules, 1999 vide H.P. Govt. Notification No. FFE-A(C)7-1/96 dated 7-11-1999. The field functionaries should follow the Rules and instructions as contained in the given notification.

Vide this notification setting of fire to a protected forest is prohibited under Section 32 of the Act as under:-

- i) Kindling of fire within one hundred meters from a forest without permission of the Divisional Forest Officer, or his authorized representative shall be prohibited.
- ii) Any person lighting a fire even beyond one hundred meter from the boundary of a forest shall take precautions, by clearing a fire path, not less than 10 meters in width between such place and such boundary, or by employing watchers or otherwise, to prevent the fire from spreading.

- iii) Precautions to be taken in burning agriculture residue bushes or “Ghasnies” near forest. No person shall ignite agriculture residue or set fire to “Ghasnies”, clear by fire any land, within a distance of one hundred meter from the boundary of the forest, unless.
 - (a) He gives notice of his intention to burn or clear the land by fire, at least one week before doing so, to the nearest Forest Range Officer under whose jurisdiction such land lies; and
 - (b) There is between such boundary, and the spot on which such materials are ignited, a space at least ten meters in width which is clear of all vegetation capable of carrying fire from such spot to the forest.
- iv) Restrictions on collection and stacking of inflammable forest produce of inflammable material outside the boundary of or in the forest. Any person collecting such inflammable material, that is to say, forest produce such as grass, dried leaves and pine needles, firewood, timber, bamboo and resin, on a land adjoining a forest, or a holder of a pass or permit issued by a Forest Officer, or a person exercising his privilege or right to collect such forest produce from a forest, shall stack it at, as the case may be, in an open space in the forest as the Division Forest Officer may, by general or special order, specify, and shall isolate such stacks in such manner that, if it catches fire, the fire shall not spread to the surrounding area to endanger the forests.

Fire cases may also be registered with Police under Section 435 of IPC or Prevention of Damage to Public Property Act, 1984 to punish unscrupulous persons who set the fire to forests willfully, and with ulterior motives. Therefore, all cases of fires are to be registered with the Police against the offender or un-known offender or Jumaladaran for investigation and bringing the culprits to book soon after the outbreak or cause of fire.

9.5.14 Assessment of Loss Caused by Fire:- Fire causes tangible and intangible damages to the forests & wild life. Loss of timber, resins etc. are tangible, whereas loss of soil fertility and soil constituent are intangible. Fire causes adverse effect on regeneration and destroys under growth leading to invasion by weeds. Being afraid of disciplinary action, the loss caused by forest fire is often not actually recorded by field staff and is also under estimated because of which calculation of exact magnitude of loss is hardly possible. The methodology for assessment of fire loss developed by the CCF, Forest Protection, Bilaspur shall be followed as under:-

Sr. No.	Type of loss	Loss/hac.	Remarks
1	2	3	4
Conifer Forests			
1.	Plantation areas 1 st year	Area in hac.(No. of plants planted/hac.)x (Survival %)x (Current planting cost/plant)	
2.	Plantation areas 2 nd to 10 th year	(Total expenditure on plantation including maintenance upto date x No. of plants burnt) / (No. of plants as per norms) 10% increase on fire loss for each year upto 10 years.	
3.	Area under Natural Regeneration (Seedling loss)	Can be assessed for fully stocked area as in case of plantation.	Loss of natural regenerated seedlings due to fire burning.
4.	Area consisting pole stage crop, middle age crop and mature crop	.....	The loss sustained due to forest fire can be assessed after rainy season and 50% value of the dried or salvage trees (due to fire) can be applied for calculating loss. (with salvage, the royalty is taken as 50% of the total market value of tree)

5.	Resin blazes	.....	As per royalty rate fixed by the Govt. of H.P. from time to time.
6.	Fodder & Grasses	.....	No fodder is available in the Chil forests. However, grasses are usually cut by the right holder before fire season. Hence no, loss sustained in conifer forests.
7.	Beneficial Herbs, Shrubs & Wild fruits.	.....	Beneficial Herbs, Shrubs & Wild fruits which are collected by the right holder and food for the wildlife is a indirect loss and can be assessed keeping in view of the availability in particular forests and loss can be calculated on average annual yield which be can ascertained from the permit issued in the past or local subsistence usage.
8.	Other Environmental and Wildlife loss.	.....	Difficult to assess in term of money due to lack of requisite methodology.
9.	Domestic losses	Should not be considered as it is assessed by revenue department.	The loss caused due to fire to the domestic property in habitants like houses, cattle sheds, domestic animals, human life can be assessed separately per each individual case.
10.	Costs in anticipation (Pre dominantly cost for protection and preventive measures under taken by Forest Department and also for potential victims of Fire)	The actual expenditure incurred for prevention purposes like control burning etc.	The cost is based on average expenditure incurred for such activities in previous years. The focus of these activities is generally on the pine forests to save the pine forests from fire during summer season the funds are required to be further increased.
Miscellaneous Broad Leaved Forests			
1.	Plantation areas.	$(\text{Area in hac.}) \times (\text{No. of plants per hac.}) \times (\text{Survival}\%) \times (\text{Current planting cost/plant})$	
2.	Regeneration areas/coppice	Can be assessed in case of fully stocked areas as is in the case of applications.	Loss caused due to forest fire by burning of seedlings/coppice shoots.
3.	Areas consisting young crop	.....	No loss sustained to young crop of B/L trees due to forest fire in these forests. If some trees are dried up after rains the value of same can be assessed @ 50% of the market rate.
4.	Beneficial herbs, shrubs & wild fruits.	.....	Beneficial herbs, shrubs & wild fruits which are collected by the right holders and food for the wildlife is a indirect loss and can be assessed keeping in view of the availability in particular, forests and loss can be calculated on average annual yield which we can ascertained from the permit issued in the past or subsistence usage by locals.
5.	Fodder & Grasses	Since these resources are renewable the loss should not be considered	Loss caused due to burning of leaves of fodder trees and grass. Availability of fodder and grasses is more in broadleaved forests as compared to conifers.
6.	Other environmental and wildlife loss.	.....	Difficult to assess in term of money due to lack of requisite tools/methodology. However, the loss sustained to environment and wildlife is long term loss and cannot compensated easily.

7.	Domestic losses	Should not be considered, as it is assessed by revenue department.	The loss caused due to fire to the domestic property in habitants like houses, cattle sheds, domestic animals, human life can be assessed separately per each individual case.
Scrub Forests			
1.	Plantation areas.	(Area in hac.)x(No. of plants per hac.)x(Survival%)x(Current planting cost/plant)	
2.	Areas consisting young crop	.....	No loss sustained to young crop of B/L trees because of forest fire in these forests. If some trees are dried up after rains the value of same can be assessed @ 50% of the market rate.
3.	Beneficial herbs, shrubs & wild fruits.	.....	Beneficial herbs, shrubs & wild fruits which are collected by the right holders and food for the wildlife is a indirect loss and can be assessed, keeping in view, of the availability in particular forests and loss can be calculated on average annual yield which we can ascertained from the permit issued in the past or subsistence usage by locals.
4.	Fodder & Grasses	It is renewable resource, hence, should not be considered	Loss caused due to burning of leaves of fodder trees.
5.	Other environmental and wildlife loss.	.....	Difficult to assess in term of money due to lack of requisite tools/methodology. However, the loss sustained to environment and wildlife is long term loss and cannot compensated easily.
6.	Domestic losses	Should not be considered, as it is assessed by revenue department.	The loss caused due to fire to the domestic property in habitants like houses, cattle sheds, domestic animals, human life can be assessed separately per each individual case.

9.5.15 Fire Record:- A complete record of fires will be maintained, both in Range, as well as Divisional office. Maps of the forests showing the area burnt by fire will be maintained along with other relevant details regarding fire. The fire reports should contain a map of the area burnt. All the fire reports are sent to higher authorities on the prescribed performa along with inspection report of R.O/ACF and DFO and follow up action taken accordingly.

9.6 Encroachment:- The problem of encroachment is seriously persistent in forested region of Himachal Pradesh especially in Shimla, Kullu, Mandi, Chamba & Kinnaur Districts at large. There can be no denying fact that during the past three decades forest areas have been shaved off extensively for non-forestry purpose. Year by year, more and more land under forest cover is being brought under the plough even by way of large scale encroachments. The land grabbers have evolved a strangely novel method to eliminate the forest growth.

Under the Forest (Conservation) Act, 1980, diverting of forest lands for non-forestry purpose without the prior approval of Govt. of India is not permissible. As such, even the settlement staff of the revenue department cannot divert forest land for non-forestry purposes without the permission of the Govt. of India. The provision of Indian Forest Act, 1927 are only punitive. For eviction of the encroachers, simultaneous action is to be taken to file a challan before the Assistant Collector Grade-I concerned for taking up proceeding under Section 163 of H.P. Land Revenue Act, 1954 for ejectment of the encroachers on the Govt. land i.e. other than forest land and whereas in respect of the encroachment on forest land eviction proceedings by the DFO-cum-Collector shall be commenced under the Himachal Pradesh Public Premises and Land (Eviction & Rent Recovery) Act, 1971, unless the proceedings are initiated under the Act, eviction of the encroachers will not

be possible under the Indian Forest Act, 1927. The latest position of encroachment cases in Kinnaur Forest Division has been given in Table No.-1.9 paragraph No. 1.18 of Chapter-I.

9.6.1 Causes of Encroachment:- The main causes of encroachment can be summarized as under:-

- i) Due to increase in population, the greed for having more and more land for fulfilling their basic needs amongst the local people has increased.
- ii) The grant of Nautor land inside the forests and in the garb of Nautor in Kinnaur District is also responsible for encroachment on the forest land.
- iii) Coming up of Forest Rights Act, 2006 {Scheduled Tribes & other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006} is also responsible for large scale of encroachments in Kinnaur Forest Division.
- iv) The forest boundaries are not properly demarcated either on the ground or in the record etc.
- v) In a very large number of cases the notified forest areas have not been recorded properly in the land records, maintained by the revenue department and continue to be shown as non-forest areas i.e Charagah Bila Darakhtan and Charagah Darakhtan etc. Secondly, the department of forest has failed to proof or place on the record the notification declaring the forest in question 'Protected Forest' under the provision of Indian Forest Act, 1927. In the absence of evidence (under Section 58 of Evidence Act, 1872) of Circulation of the notification under Section 29 read with Section 30/31 of Indian Forest Act, 1927, the conviction under Section 33 of the Act would be bad in the eyes of law. Many cases are lost in the courts on this account alone.
- vi) There is no provision or mechanism to book and punish the abettors of encroachments. This encourages the highly organized land mafia, politicians and influential section of society to actively support and encourage large scale encroachments as they derive financial, political and social benefit from such benefits.
- vii) Influential persons with political affiliations not only promote encroachments, but also abet the entire process.
- viii) The punishment meted out to the offenders is insignificant compared to the gravity of the offence committed.
- ix) The existing provisions for removal of encroachments are time consuming and grossly ineffective. In respect of UPFs or Un-classed forest areas recorded as Govt. land in revenue records, which are not legally notified and constituted forests under Section 29, 30, 31 and 32 of the Act, the provision under which an offence can be booked are not clear except Section 447 of IPC only.
- x) There is no special provision provided in the Indian Forest Act, 1927 for eviction of encroachment as like provision provided in the Wild Life (Protection) Act, 1972. Similarly, there is no provision for recovering environmental losses from the encroachers caused due to the damage to flora and fauna and for the loss of productivity of the forest land. This emboldens them to encroach more forest land.
- xi) Demarcation of disputed land as given by the Patwari/Kanungo who under the law is not competent to demarcate the same. In the absence of proper demarcation under Section 107 of the H.P. Land Revenue Act, 1954 by the competent Revenue Authority, the proceeding initiated against encroachers cannot be held to be legal and valid.
- xii) Large scale encroachment removals result in serious law and order problem requiring a strong political will, contingent of police force and presence of a magistrate. These are not

available to the forest department, whenever needed, which results abandoning such drives or eviction on spot in the past.

9.6.2 Preventive Measures:-

- i) Forest officials must be well conversant with boundaries of the forests falling in their respective jurisdictions. Range Officer, Block Officers and Forest Guards must check the boundary pillars frequently and if anything is found wrong, immediate step should be taken for maintenance of boundary pillars and booked the wrongdoer under the Act.
- ii) Forest Guard must issue the damage report under the provision of Indian Forest Act, 1927 and information in this regard be sent to his superior within 3 days. On the report of incharge beat guard, Block Officer/Range Officer, should get the area encroached upon demarcated under Section 107 of the H.P. Land Revenue Act, 1954 and challan the case before the DFO-cum-Collector court for initiating eviction proceedings under the H.P. Public Premises and Land (Eviction & rent Recovery) Act, 1971, unless under this Act, eviction of the encroacher will not be possible under Section 33 of the Indian Forest Act, 1927. It is further pertinent to mention here that there is no bar for registering the FIR against the encroacher under Section 447 of IPC read with Section 32/33 of IFA, 1927. Limitation period for challaning the forest offence under Section 468 of Cr. P.C is 3 years but challans should not be delayed unreasonably.
- iii) Periodic checking of all forest offence cases and review of progress etc. by ACF/DFO and CF is, therefore, necessary.

9.6.3 Steps Taken for Eviction on Forest Land:- All Divisional Forest Officer have been delegated with the powers of Collector under H.P. Public Premises and Land (Eviction & Rent Recovery) Act, 1971 within their respective jurisdiction vide H.P. Govt. Notification No. 1-21/71-SLG dated 8-6-1994 besides taking punitive action against the encroachers under Section 447 of IPC read with Section 32/33 of Indian Forest Act, 1927. Now the H.P. Govt. delegated the powers of Collector to the Assistant Conservator of Forests (ACFs) to function of the collector within their respective jurisdiction of Forest Division vide H.P. Govt. notification dated 9-11-2012.

Powers of carrying out demarcation of disputed land in question are vested with Revenue Authority under Section 107 of the H.P. Land Revenue Act, 1954

The forest and revenue officers/officials are responsible and liable for detection/removal of encroachment cases ***under the provision of H.P. Prevention of Specific Corrupt Practice Act, 1983.***

Therefore, revenue officers/official are responsible for initiating eviction proceeding under Section 163 of the H.P. Land Revenue Act, 1954 against the encroacher who have encroached upon the Govt. land i.e. other than forest land which is not a notified forest land under the provision of Indian Forest Act, 1927.

In compliance of the Hon'ble High Court order dated 28-8-2009, Pr. Secretary Forests issued notification on dated 5-5-2010 has directed that, *when encroachment is detected on forest land, action for removal of such encroachment shall be initiated under the Himachal Pradesh Public Premises and Land (Eviction and Rent Recovery) Act, 1971 and also action for committing forest offence by the encroacher shall be initiated under the Indian Forest Act, 1927. FIR under various provisions of Indian Penal Code shall be registered with Police in case:-*

- i) *Boundary pillars have been tempered with;*
- ii) *Permanent structure has been made;*
- iii) *Area encroached more than 10 bighas;*

- iv) *There is encroachment within the Protected Area Network (PAN) i.e. in a Wild Life Sanctuary or National Park.*
- v) *The cases involving avoidable damages exceeding rupees 10 lacs caused by the Companies or Corporate Bodies.*

Thus, it should be made clear to the field executive staff that encroachments on DPFs are their direct responsibility. If any encroachments are allowed, the Forest Guard concerned shall be personally responsible for allowing such encroachment. In case the Forest Guard issue a damage reports and submit the cases to the B.O. and the Block Officers/Range Officer do not take further action under the provision of law, they shall be responsible for the encroachment. The Range Officer and the Divisional Forest Officer shall also be held responsible for such cases, if these are kept pending in their respective office without taking further action in compliance of the Hon'ble H.P. High Court order. Therefore, the Range Officer has to ensure that no encroachments take place in DPFs and wherever such encroachments have already taken place or to be taken, the case should be detected and challan be prepared for eviction and punishment after following the due process of law.

The field staff is required to carry out preliminary survey for detection of encroachment on forest land with the help of forest Patwari/Kanungo before getting demarcation from the revenue authority by the field functionary authorities.

9.7 Mining

9.7.1 General:- The Western Himalayas and its foothills is a treasure house of the minerals being exploited by human being since time immemorial with the advent of society. The methods of extraction of the minerals became more and more mechanized which resulted in extraction of the minerals at a pace much faster than the pace at which the nature could meet itself with such a situation is recover from the onslaughts of human beings. The production of aggregate in a particular area is a function of the availability of resources, the size of population, the economy of the area and various development and infrastructural works being undertaken in the area i.e. road construction and Hydro power projects etc. It brought into sharp focus the conflict between development and conservation of natural resources, which served to emphasize need for reconciling the twin objectives into the large interest of the society.

9.7.2 Supreme Court on Mining:- Mining in forest area is an another cause of forest degradation and environmental pollution but in State of Himachal Pradesh there is few number of cases of mining in protected forest. Mining operation is being carried out in this tract on Govt. waste land i.e. River/streambed such as Gair Mumkin Khad/Nallah, Na-Kabil Charand and private land under the administrative Control of Himachal Pradesh Industries Department and State Environment Protection and Pollution Control Board. The State Geologist in the Director of Industries designated as Authority on behalf of the State Govt. to supervise and control of such work w.e.f. 19-12-1998. Thus the forest department has major role only under Section 2 of the Forest (Conservation) Act, 1980 for granting or renewal of mining lease in forest area in compliance of the Hon'ble Supreme Court order dated 12-12-1996. The area applied for lease on non forest land shall be inspected by a committee constituted as per River/Stream Bed Mining Policy guidelines for the State of Himachal Pradesh, 2004 dated 28-2-2004. Based on the approval of the sites for setting up of the Stone Crusher unit & grant of mining lease after obtaining consent to operate from the State Pollution Control Board, Forest Department and Mining Department etc. The permanent registration shall be issued to the owner of the Stone Crusher by the Geological Wing, Department of Industries is under the provisions of the Himachal Pradesh Minor Minerals (Concession) Revised Rules, 1971.

Thus, it clears that no mining operation is allowed on forest land without prior permission of Central Govt. under Section 2 of the Forest (Conservation) Act, 1980. In series of orders in the ***T.N. Godavarman case, the Supreme Court*** dealt at length and at times in minute details about instances of mining taking place in forest area. The Supreme Court, however, made it clear that it was not against mining per-se but against mining which is in violation of the Forest (Conservation) Act, 1980 and also mining in National Park and Sanctuaries in compliance of the court order dated 14-2-2000.

The Supreme Court kept a strict watch on the implementation of the order. Not only was it concerned about the fact that no illegal mining activities should take place in forest areas, but it also kept a vigil against any leniency shown to those involved in illegal mining. The court made it amply clear that it has to be informed about all development, which relate to illegal mining.

It is also pertinent of point out that as per directions given by the Hon'ble Supreme Court of India, in mining matters, the mining of any mineral is a non forest purpose and is therefore, not permissible without prior approval of the Central Government.

The meaning of Forest shall be understood strictly in accordance with the law laid down by the Hon'ble Supreme Court of India in the case ***T.N. Godavarman Thirumulkpad etc. versus Union of India and others (AIR 1997 SC 1228)***. The word 'Forest' must be understood according to its dictionary meaning. This description covers all statutorily recognized forests, whether designated as reserved protected or otherwise for the purpose of Section 2(1) of the Forest (Conservation) Act, 1980.

For the purpose of application of Forest (Conservation) Act, 1980, the expression 'Forest' land would mean a tract of land covered with trees, shrubs, vegetation and undergrowth under mingled with trees with pastures, be it of natural growth or manmade forestation. The Gair Mumkin area i.e. river beds, nallas, khalas/dhank/junglejhari, such areas falls within the ambit of expression forest land.

In compliance to directions of Hon'ble Supreme Court, all the cases of mining lease, are required to be processed, under Forest (Conservation) Act, 1980 and further mining operation may be allowed subject to the following conditions:-

- i) No mining operation shall be allowed in forest land unless or until permission for its non forestry purpose is obtained from Central Government under the provisions of Forest (Conservation) Act, 1980.
- ii) Mining operation in private land may be allowed, only if, it does not cause any damage to the adjoining forests that too after obtaining prior permission from the competent authority.
- iii) The mining shall be started from top to bottom by making benches 6mx6m keeping general angle of repose as 45°.
- iv) Dumping sites for mine works and top of soil shall be provided in such a way so that there is no damage to the adjoining land; the same does not roll down the slope. Top soil shall be used for afforestation purpose in the barren/exhausted paths.
- v) The lessee shall erect check dams of undressed stones at different suitable sites along the slope of the area and also along nalla to avert the flow of debris rolling down the slope and to check soil erosion.
- vi) The lessee shall take all necessary precaution while carrying out blasting operations, if needs.
- vii) Adequate measures shall be taken to check the air pollution.

- viii) Sufficient funds should be provided to Forest Department to carryout afforestation and soil conservation works after the lease is over apart from minor works carried out as mentioned above during the mining operations.
- ix) No extraction of sand, gravels, and stone shall be allowed along the roads and river bank to check the menace of erosion.
- x) Trees of suitable species shall be planted to develop a green belt within and along the boundary of the premises.

The Hon'ble Supreme Court further directed that before any mining operations commence, the lease holders shall obtain all statutory clearances including environmental clearance in term of MOEF notification dated 14-9-2006 and also the approval under the Forest (Conservation) Act, 1980 read with the Environment Protection Act, 1986. However, no stone crusher unit and mining lease area are granted in RF and DPF except in un-demarcated protected forests in Kinnaur Forest Division, the details of stone crusher units is tabulated in Table No.-9.8

Table No.-9.8
Detail of Stone crusher and mining lease areas

Detail of Stone Crusher and Mining lease areas						
S.No	Name of Stone Crusher	Govt/Pvt Land	Kharsa No	Location with area (Maujza)	Approval accorded by GoI/State Govt	Remarks permitted up to)
1	Diversion of 0.475 hec of forest land for the installation of crusher, Hot mix plant & wet mixing plant near Akpa in favour of M/s Amit Singla, Chandigarh under Kinnaur Forest Division.	Govt land	1016	Up-Mohal Jangi Khas	GoI	Lease period elapsed
2	Diversion of 1.3918 hac. (Instead of 1.3819) of forest land in favour of Shri Daulat Ram Negi VPO Kilba extraction of river bed minerals i.e. sand, stone & bazari etc. within the jurisdiction of Kilba Range Kinnaur Forest Division.	Govt land	10/1/1,232/1 /1,232/2/1	Up-Mohal Kilba	GoI	Final approval still awaited

The mining activities in the Govt. land i.e. River beds/waste land falls under the provisions of forest department notification dated 25-12-1952. According to this notification every Govt. waste land over which the State Govt. has the proprietary right or the property of the Govt. is a forest land for the application of Forest (Conservation) Act, 1980 in compliance of the Hon'ble Supreme Court order dated 12-12-1996. Thus, River beds/waste lands of the tract in this division attract the provisions of Forest (Conservation) Act, 1980. Therefore, it is the duty of the forest department to keep watch and ward over their properties primarily as nodal officer under the Forest (Conservation) Act, 1980. And after registration of stone crusher unit and mining lease area by the Geological Wing, Department of Industries under the provisions of H.P. Minor Minerals (Concessions) Revised rules, 1971, the Sub-Divisional Level Flying Squad or Committee under the chairmanship of the Sub-Divisional Magistrate constituted by the Govt. of H.P. vide notification No. Udyog-II(F) 6-20/2005 dated 30-4-2001 is responsible for all un-authorized or illegal and unscientific mining and stone crushing operation without realizing the proper compounding fee in terms of the law laid down by the Hon'ble High Court.

Vide H.P. Govt. Notification No. Rev. B.A (4)8/2004-loose dated 21-4-2006 notified that notification issued in the year 1952 by the Govt. of Himachal Pradesh, Forest Department, the provision of Indian Forest Act, 1927 and Forest (Conservation) Act, 1980 will not apply to the lands vested in the State Govt. under the provision of the H.P. Ceiling on Land Holding Act, 1972 and H.P. Village Common Lands Vesting and Utilization Act, 1974 unless any land which vested in the State Govt. under the aforesaid enactments was recorded as forest land in the revenue record before vestment etc.

9.7.3 Mining Lease Mandatory for Running a Stone Crusher Unit:- In order to ensure legal and regular supply of minor minerals, every owner of stone crusher, shall have a valid mining lease for this purpose.

No person shall install or run any stone crusher in any area within the State of Himachal Pradesh unless he obtains a provisional registration from the Geological Wing, Department of Industries. For this an application Form “A” shall be submitted and it shall be accompanied by fee of Rs. 2500/- only. Permanent registration shall be issued to the owner of the stone crusher by the Geological Wing, Department of Industries after obtaining consent to operate from the Pollution Control Board on Form-‘B’. in case of renewal of the registration, the owner of stone crusher shall apply for the renewal at least six months prior to the expiry of the registration in Form-“A”.

9.7.4 Other Condition for Running of Stone Crusher:- The owner of the stone crusher shall observe the provisions of:-

- i) The Forest (Conservation) Act, 1980 and rules framed thereunder.
- ii) The Air (Prevention and Control of Pollution) Act, 1981 and rules framed thereunder.
- iii) The Water (Prevention & Control of Pollution) Act, 1974 and rules framed thereunder.
- iv) The Environment (Protection) Act, 1986 and rules framed thereunder.
- v) The Noise Pollution (Regulation and Control) Rules, 2000.

9.7.5 Condition for Mining Lease:- As per strategy No. 9.6 of River/Stream Bed Mining Policy guidelines and Rule 21 (4) (i) of the H.P. Minor Mineral (Concession) Revised Rules, 1971 (as amended on 10-6-2004) every applicant shall submit Working-cum-Environment Management Plan for carrying out systematic and scientific mining.

9.7.6 Mining in Hill Slopes shall be Subject to Following General Conditions

I. Environment Considerations

- i) No mining shall be allowed within 100 meters of thickly forested area.
- ii) No mining shall be allowed in areas, which may cause aesthetic/visual degradation near any known tourist spot.
- iii) No mining shall be allowed where it is likely to disrupt the existing water regime IPH schemes, roads, bridges etc.
- iv) No mining shall be allowed where danger to site of culture, religions, historical, archeological or scenic importance is likely.
- v) No mining shall be allowed near habitation, where it is likely to cause noise and vibration problems, due to blasting or operation of machinery.
- vi) No mining shall be allowed where proper disposal of mine waste cannot be arranged, i.e. Dumping Yard etc.
- vii) Conditions shall be imposed that the lease holder will take adequate steps to control and check soil erosion, debris flow etc. by raising various engineering structures.

II. Geological and Geomorphological Considerations

- i) No mining shall be allowed where the slope angles are more than 45° from horizontal and in case of mid slope mining, the foot wall should be of hard strata.

- ii) No mining lease shall be granted where the ore to overburden ratio is not economical i.e. 1:0.2, that is, the waste generation should not be more than 20%.
- iii) Proper appraisal of the deposit for its qualitative and quantitative assessment shall be made in the form of Geological and topographical plans.

III. Technical Consideration

- i) The area should not be highly jointed, fractured or consisting of weak planes.
- ii) Relation of slope angle to angle of repose should be within mining parameters where 6x6 meter benches by keeping overall angle of repose as 45° can be made.
- iii) No mining shall be allowed where subsidence of rocks is likely due to steep angle of slope.
- iv) No overhangs shall be allowed to be formed during the course of mining.
- v) The gradient of approach roads shall be gentle with side drains and parapet walls. Adequate number of waiting and crossing points shall be provided for safe plying of vehicles.
- vi) No blasting shall be resorted to without taking proper licence under Explosive Act.

IV. General Conditions

- i) Mining site shall only be handed over to the lease holder after it is duly demarcated by permanent boundary pillars and certified by concerned Mining Officer.
- ii) Junction at take off point of approach road with main road shall be developed with proper width and geometric required for safe movement of traffic by crusher owner at his own cost and in consultation with Executive Engineer, HPPWD.
- iii) No lease holder shall store/stack any material in the acquired width of PWD road without the specific permission of the competent authority.
- iv) In addition to above, the mining operation shall be subject to provisions of various Acts and Rules in force.
- v) Dumping of waste shall be done in earmarked places as per the approved Working Plans.

9.7.7 Delegation of Powers:- All Deputy Commissioners/ CFs, Divisional Forest Officers/ACF's and Range Forest Officers have been delegated with the powers under Sub Section (2) of Section 26 read with Section 21 (4) of the Mines & Minerals (Development & Regulation) Act, 1957 to empower to seize any minerals raised or transported or caused to be raised or transported by any person without any lawful authority, any mineral from any land for that purpose use any tool/equipment, vehicle or any other thing for this purpose

All forest guards have been delegated with powers under Section 22 of the Mines & Minerals (Development & Regulation) Act, 1957 to make complaint in written in the court of competent jurisdiction in respect of any offence punishable under the said Act or any rules made thereunder. Similarly, Assistant Conservator of Forests and Range Officers have also been delegated with powers under the Act to make complaints in courts in writing in respect of any offence punishable under the Act or any rules made there under in their respective jurisdiction

The powers also have already been delegated to all Deputy Commissioner/Executive Magistrates and SP in HP within their jurisdiction to seize any material raised by any person without any lawful or any tool, equipment, vehicle or any other thing brought on the land for the purpose, under Section 21 of Mines & Minerals (Development & Regulation) Act, 1957. Similarly all Directors, State Geologist, Deputy Commissioners, Executive Magistrate and Police Officers have also been delegated with powers under the act to make complaint in writing in the court of competent jurisdiction in respect on any offense punishable under the Mines & Minerals (Development & Regulation) Act, 1957.

Following Sub-Divisional Level Flying Squad has been constituted vide Notification No. Udyog (Chh) 7-3/90 dated 11-3-1993 and revised vide notification No. Udyog (Chh) 7-3/90 dated 20-11-1993.

1.	Sub Divisional Magistrate	-	Chairman
2.	Assistant Conservator of Forests	-	Member
3.	DSP or his representative having local jurisdiction	-	Member

The above committee is authorized to requisition the relevant record from the office of Mining Officer and the Services of Mining Officers and his staff for the purpose of carrying out such inspections.

Taking into consideration the hill topography, availability of less land and requirement to maintain the fragile ecology of the hills, the units shall be setup keeping in view the following criteria namely:-

Sr. No.	Criteria	Distance
1.	Minimum distance from National highway/nearest State highway.	100 Mtrs.
2.	Minimum distance from the District Headquarter.	1.5 Kms.
3.	Minimum distance from any Town/Notified Area Committee.	1.00 Kms.
4.	Minimum distance from village Abadi deh.	250 Mtrs.
5.	Minimum distance from Hospital or Educational Institute.	1.00 Kms.
6.	Minimum distance from Springs, Canals, reservoirs and functional water supply schemes.	100 Mtrs.
7.	Minimum distance from notified lakes and wetlands.	500 Mtrs.
8.	Minimum distance from Link roads/Other Distt. roads	75 mtrs
9.	Minimum distance from Natural water springs	500 mtrs.
10.	Minimum distance from Notified parks	2 Kms.
11.	Minimum distance from Bridge sites	200 mtrs up stream 300 mtrs. Downstream.

9.7.8 Illegal Mining:- Under Sub Rule (I) of rule 53 of the H.P. Minor Minerals (Concession) Revised Rules, 1971, no person shall undertake any operations in any area, except under and in accordance with the terms and conditions of the mining lease, contract or permit granted under these rules.

Under Sub Rule (2) of rule 53, any contravention of sub-rule (1) shall be punishable with imprisonment for a term which may extend to one year or with fine which may extend to five thousand rupees, or with both and in case of a continuing contravention, with an additional fine which may extended to five hundred rupees for every day during which the contravention continues after conviction for the first such contravention.

9.7.9 Cognizance of Offences:- Under Rule 54, no court shall take cognizance of any punishable under these rules except upon a complaint in writing made by the Director or any other officer authorized by him in this behalf within six months of the date on which said offence is alleged to have been committed.

9.7.10 Restrictions on Transport of the Minerals Under Rule 57:-

- i) The holder of a mining lease or mining permit or a person authorized by him in this behalf shall issue a pass in Form 'M' duly countersigned by the concerned Mining Officer/General Manager, District Industries centre or any officer authorized in this behalf

to every person carrying a consignment of minor mineral by a vehicle, animal or any other mode of transport.

- ii) No person shall carry within Himachal Pradesh a minor mineral by a vehicle, animal or any other mode of transport, excepting railway, without carrying a pass in Form 'M' issued under sub-rule (1)
- iii) Every person carrying any minor mineral shall on demand by any officer of the State Government authorized in this behalf, show the said pass to such officer and allow him to verify the correctness of the particulars of the pass with reference to the quantity of the minor mineral.
- iv) The State Government may establish a check post for any area included in any mining lease or permit, and when a check post is so established, public notice shall be given of this fact, by publication in the Gazette and in such other manner as may be considered suitable by the State Government.
- v) No person shall transport a minor mineral to which these rules apply from such area without first presenting the mineral at the check post fixed for that area for purposes of verification of the weightment or measurement of the quantity of the mineral.
- vi) Any person found to have contravened any provision of sub-rule (2), (3) or (5) above shall, on conviction, be punishable with imprisonment of either description for a term which may extend upto six months or with fine which may extend to one thousand rupees or both.

Besides this the Himachal Pradesh Minerals (Prevention of illegal Mining Transportation & Storage) Rules, where stringent provision have been made in case of violation have been notified by the Govt. vide notification No. Ind. II (F) 11-3/2000 dated 11-8-2004. To curtail illegal mining, instructions have also been issued to all the Mining Officers that no case of illegal extraction of mineral shall be compounded for less than five thousand rupees. If the offence is repeated, the case shall not be compounded and shall be lodged in the court of law.

9.7.11 Compounding of Offences Under the Mines & Minerals (Development & Regulation) Act, 1957:-

Rule 23 A (1) any offence punishable under this Act or any rule made thereunder may, either before or after the institution of the prosecution be compounded by the person authorized under Section 22 to make a complaint to the court with respect to that offence, on payment to that person, for credit to the Government, of such sum as that person may specify:

Provided that in the case of an offence punishable with fine only, no such sum shall exceed the maximum amount of fine which may be imposed for that offence.

(2) Where an offence is compounded under sub Section (1) no proceeding or further proceeding, as the case may be, shall be taken against the offender in respect of the offence so compounded, and the offender, if in custody, shall be released forthwith.

9.7.12 Rule 23 B Power of Search:-

If any gazetted officer of the Central or a State Government authorized by the Central Government or a State Government, as the case may be, in this behalf, by general or special order has reason to believe that any mineral has been raised in contravention of the provisions of this Act or rules made thereunder or any document or thing in relation to such mineral is secreted in any place or vehicle, he may search for such mineral, document or thing and the provisions of Section 100 of the Code of Criminal Procedure, 1973 shall apply to every such search.

Rule 23C (1) the State Government may, by notification in the Official Gazette, make rules for preventing illegal mining, transportation and storage of minerals and for the purposes connected therewith.

(2) In particular and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:-

- a) Establishment of check-posts for checking of minerals under transit.
- b) Establishment of weigh-bridges to measure the quantity of mineral being transported.
- c) Regulation of mineral being transported from the area granted under a prospecting license or a mining lease or a quarrying license or a permit, in whatever name, the permission to excavate minerals, has been given.
- d) Inspection, checking and search of minerals at the place of excavation or storage or during transit.
- e) Maintenance of registers and forms for the purposes of these rules.
- f) the period within which and the authority to which applications for revision of any order passed by any authority be preferred under any rule made under this section and the fees to be paid therefore and powers of such authority for disposing of such applications.
- g) Any other matter which is required to be or may be prescribed for the purpose of prevention of illegal mining, transportation and storage of minerals.

(3) Notwithstanding anything contained in Section 30, the Central Government shall have no power to revise any order passed by a State Government or any of its authorized officers or any authority under the rules made under sub-Sections (1) and (2).

9.7.13 Power of Entry and Inspection:-

Rule 24 (1) for the purpose of ascertaining the position of the working, actual or prospective, of any mine or abandoned mine or for any other purpose connected with this Act or the rules made thereunder, any person authorized by the Central Government or a State Government in this behalf, by general order, may-

- a) Enter and inspect any mine.
- b) Survey and take measurements in any such mine.
- c) Weigh, measure or take measurements of the stocks of minerals lying at any mine.
- d) Examine any document, book, register or record in the possession or power of any person having the control of, or connected with, any mine and place marks of identification thereon, and take extracts from or make copies of such document, book, register or record.
- e) Order the production of any such document, book, register, record, as is referred to in clause.
- f) Examine any person having the control of, or connected with, any mine.

(2) Every person authorized by the Central Government or a State Government under sub-Section (1) shall be deemed to be a public servant within the meaning of section 21 of the Indian Penal Code, and every person to whom an order or summons is issued by virtue of the power conferred by clause (c) or clause (f) of that sub-section shall be legally bound to comply with such order or summons, as the case may be.

9.7.14 Penalties:-

Rule 21 (1) Whoever contravenes the provisions of sub-Section (1) or sub-Section (IA) of Section 4 shall be punished with imprisonment for a term which may extend to two years, or with fine which may extend to twenty five thousand rupees, or with both.

(2) Any rule made under any provision of this Act any provide that any contravention thereof shall be punishable with imprisonment for a term which may extend to one year or with fine which may extend to five thousand rupees, or with both and in the case of continuing contravention, with an additional fine which may extend to five hundred rupees for every day during which such contravention continues after conviction for the first such contravention.

(3) Where, any person, trespasses into any land in contravention of the provisions of sub-Section (1) of Section 4, such trespasser may be served with an order of eviction by the State Government or any authority authorized in this behalf, by that Government and the State Government or such authorized authority may, if necessary, obtain the help of the police to evict the trespasser from the land.

(4) Whenever, any person raises, transports or causes to be raised or transported, without any lawful authority, any mineral from any land, and for that purpose, uses any tool, equipment, vehicle or any other thing, such mineral, tool, equipment, vehicle or any other thing shall be liable to be seized by an officer or authority specially empowered in this behalf.

(4A) Any mineral, tool, equipment, vehicle or any other thing seized under sub-section (4) shall be liable to be confiscated by an order of the court competent to take cognizance of the offence under sub-section (1) and shall be disposed of in accordance with the directions of such court.

(5) Whenever, any person raises, without any lawful authority, any mineral from any land, the State Government may recover from such person the mineral so raised, or where such minerals has

already been disposed of the price thereof, and may also recover from such person, rent, royalty or tax, as the case may be, for the period during which the land was occupied by such person without any lawful authority.

(6) Notwithstanding, anything contained in the Code of Criminal Procedure, 1973, an offence under sub-section (1) shall be cognizable.

9.7.15 Preventive/Remedial Measures:- The provision given in Rule 53 and 57 of H.P. Minor Minerals (Concession) Revised Rules, 1971 is not sufficient to deal the cases and offenders are coming forward for compounding the offences or prefers to contest cases in the court of law. Therefore, forest field functionaries must ensure that cases may not be compounded in case of violation of the provision of Forest (Conservation) Act, 1980 and the Hon'ble Supreme Court order dated 12-12-1996 and 4-3-1997. After taking cognizance, the matter may be taken up with MoEF, Govt. of India under Section 3A/3B of the Forest (Conservation) Act, 1980 read with rule 9 of the Forest (Conservation) Rules, 2003. Thus, no mining operation is allowed on forest land in compliance of the Hon'ble Supreme Court order dated 12-12-1996 without prior permission of the Central Govt. under Section 2 of the Forest (Conservation) Act, 1980. Therefore, violation of mining cases or breaking of forest land under the provision of Indian Forest Act, 1927 may not be booked or detected until and unless sufficient material evidences are available and mandatory provisions are fulfilled under Section 30 to 32 of the Act against the offender.

That the field functionaries are advised to take action against the mining mafia or offender under the Mines and Minerals (Development and Regulation) Act, 1957 read with Forest (Conservation) Act, 1980, so that illegal mining could be halted/checked on the forest land including Charagah Billa Darakhatan, Gair Mumkin Khad, Nallah, River Bed/Stream etc. in compliance of the Hon'ble Supreme Court order dated 12-12-1996. All vehicle carrying stone, sand, bajri etc. are required to carry with them "M" Form duly signed by the Mining Officer or authorized officer. Action need to be taken against vehicle not accompanied by 'M' Form signed by authorized signatory, as it shall be presumed that the mineral has been brought from forest if the vehicle

incharge or owner of the vehicle failed to proof the legal source of material with satisfaction of the forest officer, police officer or mining officer etc. under the provisions of the Mines & Minerals (Development & Regulation) Act, 1957. Similarly, incharge check post Chaura should also check all vehicle carrying minerals i.e. Sand, Bajri and Stone etc. for 'M' Form and a record of all such vehicle checked should be maintained at check post's register and fortnightly report may be submitted to Range Officer, Bhaba Nagar. With regard to control of mining activities in private areas the forest department has no role to regulate mining on such lands in order to ensure availability of stone/minerals for various department activities except transportation of forest produce under Section 41/42 of Indian Forest Act, 1927. However, in order to control soil erosion and conservation of forests, notification issued by the Land Preservation Act, 1978 for felling of trees regulation must be followed. The cutting/felling of trees in private land could be done in accordance with the rules after approval from the Govt. in compliance of the Hon'ble Supreme Court's order dated 12-12-1996 and H.P. High Court order dated 28-5-2008.

9.7.16 Monitoring and Review of the Mining Lease Area:- Monitoring and review of the mining lease area shall be conducted by Geologist/Mining Officer.

It shall be ensured by the concerned Mining Officer that possession of land or area is handed over to the lessee only after permanent boundary pillars are raised. In fact, this condition is being now incorporated in the grant order by Geologist, Department of Industries, H.P.

The renewal of the mining lease shall be based on monitoring and review reports of the officers of Geological Wing, Department of Industries, and H.P.

9.8 Poaching:-

9.8.1 General:- Poaching of animals for meat and sometimes as trophy in the division is not very common. The H.P. Wild Life (Protection) Rules, 1975 provides shooting and Hunting Rules which are applicable to the RF and DPF in the State vide Notification No. 6-9/73-SF dated 24-2-1975. Now hunting and shooting in schedule I, II, III & IV is prohibited under the Wild Life (Protection) Act, 1972. Hence, there is a complete ban on hunting in the State since 1983 vide H.P. Govt. Notification No. 6-2/73-SF-II dated 24-5-1983. In certain cases, where the wild animals becomes a man eater, dangerous to human life or is so disabled or diseased as to be beyond recovery then it can be killed any wild animal specified in schedule after seeking permission from the Chief Wild Life Warden to this effect under Section 11 (1)(a) of the Wild Life (Protection) Act, 1972 that such animal cannot be captured, tranquilized or translocated. And under Section II(1) (b) a person having obtained a permit, therefore, would hunt any wild animal specified in scheduled II, III & IV, when it has become dangerous not only to human life, but also to property including standing crops on any land or is so disabled or diseased as to be beyond recovery. It is true so far as wild animal specified in schedule-I, is concerned a person cannot obtain permission to hunt it, even if, it becomes dangerous to property including standing crops on any land from that it is not possible to say that it has abridged the right to protect one's property from wild animal specified in schedule-I under the Wild Life (Protection) Act, 1972.

9.8.2 Detection of Offences:- Section 50 of the Wild Life (Protection) Act, 1972 makes it clear those police officer or forest officers are empowered to investigate the offence and search and seize the offending articles. Section 51 provides for penalties which would indicate that certain offences are cognizable offences meaning thereby police officer can arrest without warrant. Sub Section (5) of Section 51 provides that nothing contained in Section 360 of the Cr. P.C or the Probation of Offender Act, 1958 shall apply to a person convicted of an offence with respect to hunting in a Sanctuary or a National Park or of an offence against any provision of chapter-5A, unless such

person is under 18 years of age. The aforesaid specific provisions are contrary to the provisions contained in Cr. P.C and that would prevail during the trial court. However, from this, it cannot be said that operation of the rest of the provisions of the Cr. P.C are excluded. The power to compound offences is also conferred under Section 54 of the Act provided that no offence, for which a minimum period of imprisonment has been prescribed in Section 51, shall be compounded.

9.8.3 Preventive/Remedial Measures:- The cases pertaining to poaching of wild animals are dealt with promptly under the Wild Life (Protection) Act, 1972. The Wild Life (Protection) Act, is not self sufficient for dealing with all legal problems relating to poaching & trading of trophy etc. so, it becomes quite often necessary to invoke the provision of Indian Penal Code also. This open nation forest wealth including wild life can be saved by adopting various following measures:-

- i) To check the illegal poaching or trade of illegal timber or smuggling within the division, three more check posts one at Siasoo, Kafnoo and other at Sangla near Rutrang Bridge must be created through NPV budget or Tribal Sub Plan budget during the 1st two years of Working Plan period.
- ii) To check the illegal trade of timber and poaching, R.O and Patrolling staff must be provided vehicle, mobile phone and gun etc. and also immunity under Section 197 of Cr. P.C. By an order of the Supreme Court dated 22-8-1997, it was directed that in order to effectively control the growing menace of poaching in the Sanctuaries/National Parks or forests, the Central Govt. as well as the State Govt. should ensure that the forest guards in Protected Areas are provided modern arms. Communication facilities viz, wireless sets and other necessary equipments in that regard within six months from the date of order.
- iii) DFO/ACF/RO must conduct night raids/Nakas to check illegal trading & poaching in a planned manner regularly, especially on Nepali Majdoor, Hydro power projects employee and labour and also any suspected person in forest.

9.8.4 Penalties, Bail and Cognizance of Offences:- Any person who contravenes any provision of this Act or any rule or order made thereunder or who commits a breach of any of the conditions of any license or permit granted under the Act, shall be guilty of an offence against this Act, and shall, on conviction, be punished with imprisonment for a term which may extend to three years or with fine which may extend to twenty five thousand rupees or with both order Section 51 of the Act.

Provided that where the offence committed is in relation to any animal specified in schedule I or Part-II of schedule-II or meat of any such animal or animal article, trophy or uncured trophy derived from such animal or where the offence relates to hunting in a Sanctuary or a National Park or altering the boundaries of Protected Areas, such offence, shall be punishable with imprisonment for a term which shall not be less than three years but may extend to seven years and also with fine which shall not be less than ten thousand rupees.

Provided, further, that when any person accused of the commission of any offence relating to schedule-I or Part-II of schedule-II or offences relating to hunting inside the boundaries of the Protected Areas, is arrested under the provisions of the Act, then notwithstanding anything contained in the Cr. P.C, 1973, no such person who had been previously convicted of an offence under Section 51-A of the Act shall be released on bail unless:-

- (a) The Public Prosecutor has been given an opportunity of opposing their release on bail.
- (b) Where the Public Prosecutor opposes the application, the court is satisfied that there are reasonable grounds for believing that he is not guilty of such offence and that he is not likely to commit any offence while on bail.

The Act is intended only for the protection of the wild animals. Thus, there is no major differences in respect of such offence in “Protected Area and Non Protected Areas” except bail granting procedure etc. under the Wild Life (Protection) Act, 1972. Cognizance of offence order Section 55 of the Act should be taken only a complaint filed by an officer not below the rank of Deputy Conservator of Forests or DFO or any other officer authorized in this behalf by the State and Central Government otherwise, no court shall take cognizance of any offence against the Act.

CHAPTER X

THE PFM (OVERLAPPING) WORKING CIRCLE

10.1 General Constitution:- This Working Circle includes all DPFs, UPFs and other forest areas or forest land near to the habitations, where active participation of local people has been taken in the past along with potential new areas. It is an overlapping Working Circle and fulfils the objectives of the National Forest Policy, 1988 by involving the rural communities living close to forests ecosystem. This Working Circle also lays emphasis on man-forest interface and channelizing human resources for conservation of forests and vice versa. The National Forest Policy, 1988 emphasis on participatory management of forests and wild life. It also specifically mentions that to achieve the objectives of the Policy, a massive people's movement should be created, especially involving women. In pursuance of National Forest Policy, the Govt. of India, on 1st June 1990, issued policy instruction to all State Governments supporting greater participation of village communities, in regeneration, management, protection of forests and conservation of natural resources. This led to the initiation of Joint Forest Management (JFM) programme and importance of the programme is evident from the fact that the Government of India has constituted a "JFM Network" with the Inspector General of Forests, Govt. of India as the Chairman. The objectives of the network are:-

- i) To act as a regular mechanism of consultation between various agencies engaged in JFM work in the country, and
- ii) To obtain constant feedback from various stakeholders on the JFM programme for proper policy formulation and suitable direction to States.

In keeping with the above notification, the GOHP has formulated policy vide its No. Forest (C) 3-4/80-V dated 12-5-1993 on the involvement of people for participatory forest management. Ever since, the village communities are being involved by the forest department to further the aim of protection and management of forests and continuation of forest cover. The recognition of the link between socio economic incentives and forest development has been singularly responsible in eliciting the community participation. A new resolution of the Ministry of Environment and Forests, Govt. of India, dated February 21, 2000 has further strengthened the JFM programme are:-

- i) Legal backup to the JFM committees
- ii) 50% members of the General Body should be women.
- iii) Extension of JFM in good forest areas, with sharper focus on activities concentrating on NTFP management.

Though, no separate and exclusive Working Circle has been proposed in this Plan under which the JFM activities are to be confined but this Working Circle overlaps with other Working Circles of this Working Plan. It is suggested that all the activities, as far as possible, should be carried out after involving local people, but the general prescriptions of Working Plan will be adhered to. The species of local importance should be preferred in afforestation activities which should have meet out the basic needs of local people and their livelihood issues.

10.2 Emergence of Joint Forest Management:- In the colonial India, the princely rulers proclaimed the power of eminent domain over the territories they ruled and specified hunting rights for themselves in the forests. Traditional customary rights of local people living in and around forest were respected and this enabled them to utilize the produce of the forests for their livelihoods. During the 19th and the early part of the 20th century these rights were modified, reduced and in some cases eliminated at the state to cover control of forest resources. This was finally consolidated in 1927 with the enactment of the Indian Forest Act, which is still in force today.

A related development was the emergence of "Scientific" forest management by the state, which had the primary objectives of production forestry. Local people's needs were provided

through rights. The use of forest resources has also been influenced by the rapid increase in population in recent decades. With the explosion of population as well as expansion of industry, demand of timber and fuel wood increased dramatically, resulting in uncontrolled exploitation of forests at an ever increasing pace. By the seventies, it was understood that treating forests products as a national resources for industrial development without proper concern for local demand would result in total destruction of forests, which, in turn would endanger environmental security of the country. So, a modified approach to forestry on the international scene, which in India was labeled Social Forestry, was adopted in the 1970's. This attempted to address the forest based needs of local people more directly but did this within the existing framework of State control through the forest departments. The forestry sector was dominated by this approach to forestry which can be rather starkly characterizes as forestry for the people by the State on the People's land. Although, not as successful as anticipated, many valuable lessons were learnt and this Social Forestry legacy is being transformed into a more meaningful partnership between local communities and the forest departments as Joint Forest Management.

As pressure on the forest resource mounted in the 1960's and 1970's, foresters in different parts of India realized that conditions had changed to such an extent that the forest protection model they had inherited would not work. Rather than protecting the forests from the depredations of the local people (as the model described things) this minority of forward looking foresters realized that the local communities had to be directly involved in and benefit from forest protection and management.

The lead in experimenting with this was taken during the 1970's in West Bengal, Haryana and Gujarat where forests protection communities were formed and given the responsibility of protecting degraded forests, department land from illegal cuttings, fires, over grazing, and encroachments. In return, they were granted access to a range of non timber forests products and in West Bengal to 25% share of the returns from the coppice fuel-wood harvest in regenerated Sal forests. Other protection movements also developed at the same time in Uttar Pradesh, and many tribal forest protection communities emerged spontaneously in part of Bihar, Orissa and M.P.

The successes that these "experiments" generated gradually begin to influence opinion throughout in India and the forestry debated reached substantial proportions in the 1980's. This culminated in the issue of a new commercial value and concentrated on ensuring environmental stability, maintenance of ecological balance and specified that the domestic requirement of tribal and the poor living within the vicinity of the forests should have the first charge on the forest produce.

In 1990's, this was complemented by another Govt. order directing all states to undertake participatory forest management on degraded forest land based on the experiences of states such as West Bengal, Gujarat and Haryana. This order also encouraged forest departments to involve NGO's as intermediaries and facilitators.

This was the first time that the rapidly developing Joint Forest Management had been given official sanctions and marked a watershed in India's forestry development. Since that time 15 states have issued Govt. orders for the implementation of JFPM programme. These JFPM initiatives have many of the following characteristics in common:-

- i) The formation of local community based institution to participate with the forest department in forest management decision making.
- ii) Rules and regulations about responsibilities and sharing decision making.
- iii) Involvement of NGOs particularly in documentation, training, research and community level organizing and facilitation.

- iv) Reorientation and training of forest department staff and local communities.
- v) The joint preparation of micro-plan for forest management which often on the basis of formal agreements between the forest department and the local institution.
- vi) The formation of state level working groups to co-ordinate their Joint Forest management.

10.3 The Concept of Joint Participatory Forest Management:- The concept of Joint Participatory Forest Management is an intervention to evolve organised and collective thinking on the issues of forest management, keeping in view, the fact that the forest resources are limited and the claim over these are varied. No single solution can satisfy the needs of all. The philosophy aims at involving all the stakeholders in resource generation activities through motivation, active involvement in the process of management and sharing of benefits through adequate institutional arrangement.

Efforts were made under the Social Forestry project in the late eighties to raise rural fuel wood plantations to cater to the requirement of people, but in this scheme only limited success was achieved in Apple belt areas of Himachal Pradesh. But in the lower areas this Social Forestry scheme has achieved better results. In pursuance of this project of “Van Lagao Rozi Kamao” scheme launched by Forest Department during the early nineties also could not take off very well in apple belt area as compared to low lying areas of H.P.

10.4 Joint Forest Management in H.P.:- The concept of people’s participation in forests of H.P. started long back with formulation of Forest Settlement Reports (FSRs) deriving powers from Indian Forest Act. These reports entrusted rights in villages, adjoining to forests such as Timber Distribution (TD), collection of fuel wood, from dead and fallen trees or by lopping of branches, fodder from leaves and grass, NTFPs etc. Almost all villages in the State have been entrusted with rights and concessions. This was accomplished much before enactment of National Forest Policy, 1988 and Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Rights) Act, 2006 (in brief known as FRA, 2006). There is, however, a stipulation for getting rights in that people will perform certain duties to conserve and protect forests otherwise their rights can be suspended. This was simplest and best way of soliciting participation and co-operation of communities in forest management.

The actual implementation of concept of JFM in H.P. was initiated under World aided Integrated Watershed Development Project, share (Kandi Project). German aided Indo German Changer Project and schemes through village level institutions known by various names such as Village Development Committees (VDCs). Village Forest Development Committees (VFDCs) / Village Eco – development Committees. VFDCs also known as JFMCs (as per MoEF, GOI guidelines have also been involved in executing of various centrally sponsored schemes (CSS) including National Medicinal Plant Board (NMPB) supported projects in Kullu, Kangra, Chamba and Sirmaur districts.

The implementation of JFM through Panchayat level institutions under H.P. PFM Regulations, 2001 was first initiated under DFID funded H.P. Forestry Reforms Project through constitution of Village Forest Development Societies (VFDSs) at Panchayat wards level. Another State sponsored scheme based on these regulations with the name Sanjhi VanYojna, 2001 was also initiated for sustainable management of forest resources.

In H.P. World Bank aided social Forestry projects known as umbrella project was launched in the year 1985. Under this project a new scheme “Van Lagao Roji Kamao” was launched in the year 1992 as participatory mode of management in which Van Sewaks were selected from amongst poor families and a plot of 2 ha were allotted to them for afforestation on forest Govt. land. Besides

these pressure cookers & chullah were distributed or subsidized rates to the local people as fuel saving devices. This scheme could not take off very well in apple belt area of HP, but in the lower areas this scheme has received good results.

The Sanjhi Van Yozna as a community based afforestation scheme was launched by the HP Govt. on 25th December, 1998. Under this scheme the communities as well as the NGOs are to be involved in the protection of the existing forest wealth and also to participate in holistic rural development. The main objectives of this scheme were:-

- a) Involvement of grass-root level institutions e.g. Gram Panchayats, Mahila Mandals, Yuvak Mandals, VFDCs, NGOs etc. in eco-restoration.
- b) Regeneration of degraded forest areas through community involvement.
- c) Creation of social assets for the benefit of the communities.
- d) Increasing the productivity of the forest areas by improvement of nursery stock through adoption of modern nursery techniques.
- e) Re-orientation of forest staff for facilitating community participation.
- f) Generation of employment opportunities in rural areas.
- g) To bring more area under tree cones by encouraging rehabilitation/plantations of private waste lands on cost/benefit sharing basis.

In support of the participatory management the State Govt. had issued a notification vide No. Fts.II (B) 15-10/87 dated 23rd August, 2001, called the Himachal Pradesh Participatory Forest Management Regulations, 2001, these rules were applicable to such government land and forests, including common lands, where participatory management was envisaged.

10.5 Formation of Forest Development Agency (FDA):- The Ministry of Environment and Forests, Govt. of India has launched new scheme called Samanvit Gram Vanikaran Samridhi Yojna (SGVSY) under the overall supervision of the FDA (Forest Development Agency). Under this new scheme committee will form a federation and a proposal in the form of project for:-

- i) Integrated Afforestation and Eco-Development Project.
- ii) The Area Oriented Fuelwood and Fodder Project Scheme.
- iii) The scheme for Development on Non Timber Forest Produce including Medicinal plants.
- iv) Scheme for Associate of Scheduled Tribe and Rural Poor in regeneration of degraded forests.
- v) Eco-Development in and around National Parks and Sanctuaries.
- vi) Plantation programme through Ecological Task Forces will get discontinued.

10.5.1 Objectives of FDA:- The main objectives of the scheme are:-

- i) Arrest and reverse the trend of forest degradation due to the unsustainable removal of forest products by communities living in and around the forest by making the community responsible for management and monitoring of the forest.
- ii) Provide sustainable and assured employment opportunities to the tribal and other weaker sections of the rural populations in such areas all around the year.
- iii) Create permanent community assets for each population, which would contribute to overall eco-development in the target areas.
- iv) To involve the village community for execution of the scheme and make them to exercise fully participatory management.
- v) Create an effective mechanism in order to ensure that the medium of the FDA is used to reach the beneficiaries by other government departments also.

10.5.2 Silent Features of FDA:-

- i) The scheme will aim at providing employment to the local village community through the afforestation programme, thereby, creating valuable forest assets for the village community and other permanent community assets for overall eco-development of the target communities/villages.
- ii) “Federation of Forest Committees (F.D.Sc.)” is proposed to be constituted at the Territorial Forest/wildlife Division level. Each of these Divisions will constitute the planning unit or the project area for the Forest Development Agency (FDA). On an average, about 25-30 villages would be covered under the SGVSY within the jurisdiction of each FDA and all households needing income augmentation will be targeted. In selecting the village, the criteria will be:-
 - a) Preponderance of SC/ST population.
 - b) Willingness of people to participate in forest conservation efforts.
 - c) Existence of FPCs/EDCs
 - d) Extent of degraded forestland.
 - e) Degree of dependence on biomass resource, etc.
- iii) SGVSY will be a demand driven scheme with no fixed earmarking of funds for any particular State of FDA. The requirements of funds would emerge through the micro-planning and Participatory Rural Appraisal (PRA) exercise to be undertaken by each FDA for preparation of an integrated project. The project would seek to establish a link between the level of dependence of the village on forests, the absence of sustainable livelihood opportunities, the need for creation of community assets and requirement of ecological regeneration to be undertaken in and around the forest areas.
- iv) The creation of FDA and adoption of JFM Resolution will be a pre-requisite for the introduction of this scheme. Each FDA would be headed by the respective Territorial/Wildlife Conservator of Forests with the respective Territorial/Wildlife DFO as its Member-Secretary-Cum-Chief Executive Officer. The other members will include representatives of the village forest committees (VFDs/Eco-development committees (EDCs)). The FDA will be registered as Federation of Village Forest Committees/Eco-Development Committees under the Registration of Society Act, 1860. Each village within the jurisdiction of village forest committee (VFC/Eco-Development Committee (EDC)) will be constituted in each village following bodies. The local forest block officer/Forester will be ex-officio member Secretary of the VFC/EDC.

Executive body member of the FDA shall be ex-officio member of the General Body of FDA, which would be headed by the respective Conservator of Forests. The SGVSY will be implemented under the overall supervision of the FDA at Division Level and in the State Level for implementation, monitoring and evaluation State Forest Development Agency is constituted by the State Govt., the VFDs/EDCs will be responsible for actual implantation of various activities in the field. The FDA at Division level will co-ordinate the project and provides technical and administrative guidance throughout its implementation of programme.

Periodical evaluation studies on the implementation of SGVSY should be got done by the NAEB, Govt. of India through reputed institution, organization and NGOs and the issues which emergence from such evaluation and monitoring, should be used for taking remedial action for improving the implementation of the project.

10.6 Special Objective of JFM:- The basic objects of Joint Forest Management are given below:-

- i) To evolve consensus on the basic issues to conservation of soil, water and forest resources.
- ii) To provide effective and immediate treatment for barren, wastelands, or degraded protected forests situated near villages through protection, afforestation, pasture development, soil conservation by active participation of local people.
- iii) To maintain the environmental stability through preservation and wherever necessary, restoration of the ecological balance that has been adversely destroyed by depletion of the forests through involvement of local people in resource management.
- iv) To augment fuel wood, fodder and small timber production for use by local people.
- v) To convert a hostile population living in the fringes of forests areas into friends and ultimately into resource managers and resource users.
- vi) To evolve policy and law, this will help in the continuity in the planning and implementation.
- vii) To make environment conducive for the adoption and implementation of the JFM in the State and area.

10.7 H.P. Forest Eco-system Climate Proofing Project:- With assistance from German Development Bank was launched in 2016 with objective of minimizing and mitigating the negative impacts of climate change, to work in increase of bio-diversity and sustained income in rural areas through sustainable management forest resource. It is being implemented through selection of cluster of villages at ward level from about 600 Panchayats as per. H.P. PFM Regulations, 2001 in Chamba and Kangra districts of the state. Recently, in 2018 another EAP 'Improvement of HP Forests Ecosystem Management and Livelihood Project' funded by JBIC-Japan has been launched with aim for conservation of bio-diversity and sustainable socio-economic development of people of the State. The implementation of the project in Kullu, Lahaul and Spti, Mandi, Bilaspur, Shimla and Kinnaur districts would be done through 460 Rural Forest Development Societies and Bio-diversity Management Committees following in cluster of villages at ward level following H.P. PFM Regulations, 2001.

10.7.1 The World Bank aided Mid – Himalayan Watershed Development Project:- was launched in the State in 2005 and ended on 31.03.2017. It was implemented under the leadership of HPFD. It has been implemented through community driven approach through Gram Panchayat (GP) by devolution of powers to these constitutional bodies. It was decided to strengthen their capacity to yield sustainable impact rather than building village level committees which could disappear after project conclude. The components of the project were implemented by preparing GP Watershed Development and Livelihood Plans (GPWDLPs) after these were approved by the Gram Sabha (GS) and agreement signed between GP and Watershed Development officer (WDO), to have flexibility in improving the GPWDLP, these could be revised after every 6 months. The institution within the GS included SHGs,UGs, CEGs etc. that provide platform for managing natural resource and promoted these for livelihood improvement. The communities were further empowered through capacity building, partnerships and accountability mechanisms. The performance was evaluated (PME), through traditional implementation focused systems emphasizing project outcomes. Thus, it can be seen that peoples participation was ensured not only at the planning level but in implementation and evaluation through constitutional bodies of GP.

10.7.2 Similarly, **Swan River integrated Watershed Management Project** funded by JBIC in Una district which ended on March 2017, was implemented under the leadership of HPFD through 95 Panchayat Development Committees (PDC) registered under Societies Registration Act, 1860, wherein, general house of the PDC approved consolidated ward level and Panchayat level plans. PDC and Watershed Development Committees (WDC) also monitored the implementation of these plans. SHGs, UGs were formed for livelihood generation for increased income of farmers through utilization of agricultural, horticultural, animal husbandry and forestry resources in raw form or through, their value addition and marketing. these two projects were implemented with GP as nodal to implementation, had forestry component, but were based on natural resources with watershed management approach unlike above referred to forestry based projects mostly implemented on the basis of cluster of village approach at ward level through HP PFM Resolution, 2001.

10.7.3 To further ensure peoples participation and empowerment of Gram Panchayat (GP) in forest management in HP, powers to issue transit permit of important forest resources of 37 medicinal plants and NTFPs were given to Pradhan of GP under Rule 11 of HP Land Transit Rules, 1978 deriving powers from section 41 and 42 of IFA, 1927. These powers were given not only in scheduled areas but whole of the State. The powers so given did not work due to misuse, non-maintenance of data base and time consumed for issuing permits. This empowerment was consequently withdrawn through another notification issued in 2013. Although, it is a per-requisite under PRA, 1992 and PESA, 1996 to have NTFP management with GP the issue remains to be further analyzed and thrashed to come at some workable solution as per statute in force.

10.7.4 H.P. is one of developed States with high per capita income dependence and association of people on forests has decreased with improved economic status and literacy especially of women. Educated women don't want to go to forests to collect fuel wood, fodder. They are compelling the family heads for going in for gas connection, readymade fodder and other easy modes of living that does not involve travelling to forest areas. There are alternatives to rights in forests available now in the form of imported timber, medicines, fodder etc. Availability of easy labour has led people to further drift away from forests. This brings in new challenges for the Govt. and the FD for involvement of people in protection and conservation of forests. One of the way, to tackle this is to bring in incentive based forest management. An illustration in this respect is conservation of catchment forests by VFDC of Bohal Panchayat in Palampur Forest Division in Kangra district for supply of water to Municipal Council of Palampur through sustained payment of ecosystem service in view of agreement signed between the Council and communities through VFDC. This approach of payment for eco-system services helps in protection and conservation of forests for sustainable supply of services (i.e, water) and people though not dependent directly on forests get monetary benefits. This approach is required to be carried to other areas of the State by utilizing other eco-services as forests would be conserved would provide goods and services, for which these have been created and with that improve the economic condition of people instigating them to conserve forests.

10.8 Strategic Approach of Participatory Forest Management (PFM) in Himachal Pradesh (H.P.):- Forest government under JFM resolution and guidelines of MoEF, GOI and those of State governments have been carried out through top down approach with uniform models of implementation, leaving little scope for integrating specific local needs and land use wise adjustments. JFM in present shape lacks legal sanctity, is incompatible with forest laws, lack clarity on benefit sharing arrangements has inadequate linkage with decentralized framework of local self-governance brought about through Panchayati Raj Act, 1992 and PESA, 1996. Non-conformity

with FRA, 2006 and rules made therein so also the results that were expected through three decades of its implementation are not forthcoming.

There is, thus, need to bring in new integrated model of implementation involving participation of all stakeholders. Taking care of above mentioned lacunae in operations and implementation, such an approach can be called Participatory Forest Management. PFM is a better approach than JFM, wherein, peoples participation can be ensured in every domain of forest policy and law to achieve sustainable forest management. FAO (2006) defines “Participatory Forestry to processes and mechanisms that enable people who have a direct stake in forest resources to be part of decision making in all aspects of forest resources, to be part of decision making in all aspects of forest management, from managing resources. To formulating and implementing institutional framework. JFM orders issued by MoEF & CC, GOI, at later stage, contained more proactive people participation, but these along with those of Govt. of H.P are still short of what is contained in above definition of PFM. We have, therefore, to shift to PFM approach for better result by integrating following measure:-

10.9 Implementation of PFM in Kinnaur Forest Division:- The PFM approach has been implemented in this division under different projects viz social forestry umbrella project, Sanjhi Van Yojna, and FDA etc. The micro plans were prepared in accordance with the project philosophy and works executed through VFDC/VFDS, JFMC etc.



The activities like soil conservation, afforestation, village development activities, fire protection, grazing etc. have been under taken in the past but almost in all case the participation of local remained up to fund flow only. Most of the committees are totally inactive but some committees are active and play vital role in protection and management of forest. There is a need to revive, activate and involve this rural community in forest management activities.

The Sanjhi Van Yojna and FDA Project were also implemented in this division. The List of old VFDC under Sanjhi Van Yojna and new proposed VFDS under JICA Project is tabulated in Table No.10.1

Table No.10.1

List of VFDC, JFMC, VFDS					
Name of Range	Name of VFDC / JFMC	Old	New Proposed VFDC	New Proposed VFDS under JICA	Registration and Year of Constitution
Bhaba Nager	Jani	1	0	1	NCR-12/2019 dated 29/07/2019
	Ramni	1	0	1	NCR-09/2019 dated 11/07/2019
	Chaura	1	0	1	NCR-08/2019 dated 02/07/2019
	Bara Kamba	0	0	1	NCR-07/2019 dated 02/07/2019
	Chota Kamba	0	0	1	
Kalpa	Garshu	0	0	0	
	Pangi	1	0	0	
	Then Pangi	1	0	0	09/2000 dt.17-4-2000
	Khonta	1	0	0	
Katgaon	Hen Pangi	1	0	0	
	Shango	1	0	0	
Kilba		0	0	0	
Malling		0	0	0	
Moorang	Rispa	1	0	0	SDP(SDK)32/2018 Dated 11-12-2018
Nihar	Nigani	1	0	1	Under Process
	Kashpo	1		0	04/2014 dt.13-3-2014
	Grange	1	0	1	NCR-03/2019 dated 13/03/2019
	Panvi	1	0	0	Awaited Nihar
	Sungra	1	0	0	2/2006 dt 21-1-2006
	Thanang	1	0	0	03/2006 dt.21-1-2006
	Thusaring	1	0	0	04/2006 dt. 21-1-2006
	Yusaring	1	0	0	05/2006 dt.21-1-2006
	Shangliba	1	0	0	06/2006 dt. 21-1-2006
	Rajya	1	0	0	07/2006 dt.21-1-2006
	Khangshito	1	0	0	08/2006 dt. 21-1-2006
	Bari	1	0	0	
Pooh	G.P. Pooh	1	0	0	
	G.P. Sunnam	1	0	0	
	Ward No.- 1 Asrang	1	0	0	06/2006 dt. 15-6-2006
	Ward No.- 2 Asrang	1	0	0	07/2006 dt. 15-6-2006
	Ward No.- 3 Asrang	1	0	0	08/2006 dt. 15-6-2006
	Ward No.- 4 Asrang	1	0	0	09/2006 dt. 15-6-2006
	Ward No.- 5 Asrang	1	0	0	10/2006 dt. 15-6-2006

Under Sanji Van Yojna 3 numbers of VFDC and under FDA 18 numbers of JFMCs were constituted and registered as per instructions. The works were executed as per micro plan and MOU. Out of total 18 numbers JFMC committees, 15 numbers JFMCs are totally inactive. At present only 3 numbers JFMCs are active and the funds are being provided to carry out the works as per approved micro plans. There is a need to revive and activate the JFMCs which have become inactive for the past quite some time. Efforts may be made to identify the potential areas where more JFMCs can be constituted for adopting JFM / PFM approach for the protection and management of the forests after taking confidence of Panchayat concerned. The list of JFMCs under

FDA Kinnaur Forest Division and total expenditure incurred for the year 2017-18 and 2018-19 is tabulated in Table No.-10.2 and 10.3 respectively.

Table No.-10.2

LIST OF JFMCs UNDER FDA KINNAUR FOREST DIVISION

S No.	Name of FDA Society	Registration No/ date	Development
1	FDA Society Kashpo Tehsil Nichar Distt. Kinnaur H.P.	04/2014 dt.13-3-2014	Nichar
2	FDA Society Nigani Tehsil Nichar Distt. Kinnaur H.P.	18/2013 dt. 4-9-2013	--do--
3	FDA Society Thhen Pangi Tehsil Kalpa Distt. Kinnaur H.P.	09/2000 dt.17-4-2000	Kalpa
4	WDC. (Ward Development Committee) Dharorang G.P Sungra ward No.- 1 Tehsil Nichar Distt. Kinnaur	2/2006 dt 21-1-2006	Nichar
5	WDC. Ward No. 2 (Thanang)G.P. Sungra Tehsil Nichar Distt.Kinnaur	03/2006 dt.21-1-2006	Nichar
6	WDC. Ward No.- 3 (Thusaring)G.P. Sungra Tehsil Nichar Distt. Kinnaur	04/2006 dt. 21-1-2006	Nichar
7	WDC. Ward No.-4 (yusaring) G.P. Sungra Tehsil Nichar Distt. Kinnaur	05/2006 dt.21-1-2006	Nichar
8	WDC Ward No-5 (Shangliba) G.P Sungra Tehsil Nichar	06/2006 dt. 21-1-2006	Nichar
9	WDC Ward No-6 (Rajya)G.P. Sungra Tehsil Nichar Distt. Kinnaur	07/2006 dt.21-1-2006	Nichar
10	WDC Ward No-7 (Khangshito) G.P. Sungra Tehsil Nichar Distt. Kinnaur	08/2006dt. 21-1-2006	Nichar
11	FDA Society G.P. Jani Tehsil Nichar Distt. Kinnaur H.P.	Awaited B/N	Nichar
12	FDA. Society G.P, Ramni Tehsil Nichar Distt. Kinnaur H.P.	-----B/N	Nichar
13	FDA. Society G.P.Panvi Tehsil Nichar Distt. Kinnaur H.P.	-----Nichar	Nichar
14	WDC. Ward No.-1 (Asrang) G.P. Asrang Tehsil Pooh Distt. Kinnaur	06/2006 dt. 15-6-2006	Pooh
15	WDC Ward No.-2(Asrang) G.P. Asrang Tehsil Pooh Distt. Kinnaur	07/2006 dt. 15-6-2006	Pooh
16	WDC Ward No-3 (Asrang G.P. Asrang Tehsil Pooh Distt. Kinnaur	08/2006 dt. 15-6-2006	Pooh
17	WDC. Ward No-4(Asrang G.P. Asrang Tehsil Pooh Distt. Kinnaur	09/2006 dt. 15-6-2006	Pooh
18	WDC. Ward No-5(Asrang G.P. Asrang Tehsil Pooh Distt. Kinnaur	10/2006 dt. 15-6-2006	Pooh

Table No.-10.3

Detail of expenditure incurred under FDA in Kinnaur Forest Division

Years	Added Natural Regeneration		Artificial Regeneration		Pasture/ Silvo-pasture Development		Regeneration of herbs & shrubs of medicinal value		Other expenditure	G. Total	
	Area in hac	Expenditure (Rs lac)	Area in hac	Expenditure (Rs lac)	Area in hac	Expenditure (Rs lac)	Area in hac	Expenditure (Rs lac)	Expenditure (Rs lac)	Area in hac	Expenditure (Rs lac)
2017-18	30	327600	7	134064	15	186480	7	159936	143712	0	951792
2018-19	30	307125	7	125685	15	174825	7	149940	178005	0	935580

Similarly under the JICA (The Japan International Cooperation Agency) project VFDS will be constituted and registered in Five Ranges viz Bhaba Nagar, Katgaon, Malling, Nichar and Pooh. In the first phase only five nos. of VFDS are to be constituted in Kinnaur Forest Division. But the process of constitution of VFDS in seven numbers has been started as per detail given in the Table no.10.1.

10.10 Constraints to Participatory Management:- There is a general lack of enthusiasm in embracing the idea of shared management in the forestry sector by the people and though some inroads have been made with the communities, a lot more thrust needs to be given to popularize the concept among the masses. The causes for this lack of encouraging response among people are:-

- a) There is a general apathy of the youth to participatory programmes related to rural sector because with acquiring college education, all youth strive for white collared jobs and anything that keeps them back in villages does not enthuse them.
- b) Lack of proper education of the government programmes and insufficient extension activities of the forest department.
- c) Long gestation period of forestry activities.
- d) Too much dependence of the public on government and subsidy, cost sharing in such activities is generally not accepted.
- e) Reluctance of government functionaries to hand over control of resources to people or even partially share their “power” with the people.
- f) Lack of proper legislation on participatory management and usufruct sharing.
- g) Need to promote income generating activities under JFM programmes.
- h) Frequent changes in schemes and discontinuation of old schemes which leads to mistrust of people in government,
- i) JFMCs members found difficulties in organizing and maintaining the paper works like opening accounts in banks, audit work, submission of progress report to FDA and similar other activities as the formats provided to them were very time taking and clumsy.
- j) Political rivalry at village level among communities created hurdles in smooth implementation of the projects.
- k) Flow of fund was not smooth. This resulted in late payment of wages to workers. This created unnecessary hassles and embarrassment to the project implementing authority. On the other hand it was difficult to hire village labourers on the prescribed wage rate of the government. Majority of labour community demanded increase in wage rate.
- l) Official bottleneck at both ends namely, State level as well as NAEB level created unwarranted delay in paper work and fund release.

10.11 Scope of PFM:-

10.11.1 There is tremendous scope for the PFM activities in the division. All the forests allotted to the Plantation, NTFP and Forest Protection Working Circles are suitable/potential sites for afforestation, soil conservation, grassland improvement, NTFP development besides other forestry operations.

10.11.2 Identification of PFM Areas:-The degraded forest areas as well as community land located in the vicinity of the villages are potential sites for PFM implementation. The deficiencies and strengths of these with regard to soil condition, water availability, grazing pressure, fuel wood production and requirements need to be understood. The Divisional Forest Officer can include or exclude any areas while implementing the PFM approach with the consultation of Panchayat concerned. The following broad guidelines have been devised for selection of potential (pilot) area:

- i) Re-orientation of front line staff for facilitating community participation in forest protection & management
- ii) Interest of local people in involvement in joint forest planning, management and decision making.

- iii) Existence of ongoing ‘successful’ collective land management systems;
- iv) Resource poor areas where there are constraints on the forest and land farming system in term of access to grazing and forest products;
- v) Relatively homogenous local communities.

10.11.3 Potential Activities of PFM Committees:- The PFM committees are the future agencies of the forest development, conservation and expansion. The potential activities to be executed through the JFMCs can be:-

- a) Afforestation activity (both departmental, MGNREGA and Green India Mission).
- b) Soil and water conservation through treatment of macro and micro watershed in the catchments.
- c) Recharging of water bodies like Bawaries, Water pond and underground water.
- d) Minor construction works of inspection and bridle paths and buildings.
- e) Awareness programme for forest protection, fire protection, propagation of medicinal herbs on large scale.
- f) Livelihood options like Bee keeping, Khadi (Weaving), Medicinal Plant cultivation, extraction of oil from Chulli, Behmi and vermin-composting etc., through effective training.
- g) Collection, value addition and marketing of NTFP.

10.11.4 Preventive/Remedial Measures:-

- i) To ensure more participation of the local community, there are needs to give training on plantation techniques, protection; of the fenced areas for this purpose special funds need to be created at the PFMC level. To provide technical knowhow to the executive body of PFMC to carry out its responsibilities.
- ii) Field staffs of the forest department are also required to be trained regarding the working procedure of the FDA. Field level training of front line staff should be imparted to through participatory workshops which will encourage and experience based learning. A series of workshop should be organized at different level such as Circle level, Divisional level, Range level, and Beat level.
- iii) The local people are linked with the FDA programme just to earn the wages. It is suggested that more sensitization programme may be conducted at PFMC level. So that local community will come forward to protect the enclosed area from grazing and fire incidence.
- iv) The local people can be given training on forest based minor enterprises. And involvement of grass root level institutions e.g. Gram Panchayats, Mahila Mandals, Schools, VFDCs, NGOs etc. in Eco-restoration.
- v) Women participation in the FDA works must be given priority.
- vi) The field staff and PFMC member’s needs to be given training on maintenance of record and account to avoid any litigation or audit point of view etc.
- vii) The exposure visit of the farmers needs to be conducted where Kandi Project, Watershed Management Project, and any other people participating project is successful in State or outside the State.
- viii) Medicinal plants needs to be given due importance.
- ix) Local people are imparted training in nursery growing of forestry and M&AP, so that they can sell the same to the Forest Department and generate income for their families.
- x) Proper documentation regarding all the different project activities along with photographs is properly maintained to compare the impact assessment.

- xi) Fire case shall be registered with the police under Section 435 of IPC to punish unscrupulous persons who set the fire to forests or plantation area willfully, and with ulterior motives.
- xii) Number of assets of immediate needs have to be created through EPA in all the villages.
- xiii) Legal back up to PFM Committee.
- xiv) Linking village Protection Committee with industries for the sale of produce or JFM product etc.
- xv) Detail projects to be prepared for assistance under FDA, MENREGA and Green India Mission for PFM Areas.
- xvi) Silviculture prescription given in the Working Plan shall be followed for the management of PFM forests through sustainable stake holders etc.

10.11.5 Strengthening of Participatory Forest Management:-

- i) PFM should focus in and around pockets of poverty i.e. remote forested areas (better forest) and where livelihood dependence on forests is high. This would entail several genuine joint management activities (other than plantation) like collective protection against illicit felling, fires, poaching etc. Issues of Rights, equality and benefit sharing are better addressed and conflicts resolved.
- ii) In participatory approaches the process is more important than achieving targets. Choosing and regularly training the right persons for the job is therefore critical.
- iii) Sharing of removals, minor development activities and salvage fellings with VFDSs are necessary to establish long term stake of local communities in PFM.
- iv) Continual policy and rules adjustment and calibration to promote better market returns for wood and non-wood base enterprises. Example, the recent decontrol of bamboo trade and transit and efficient markets for value added products.
- v) Local leadership has to play a critical role in PFM. The successful examples of PFM or CFM show that local leadership roles have been crucial in making the change. It could be an enlightened, accepted local person, and elected representative, a dedicated NGO/CBO or even a committed forest officer. This is also important for sustainability of groups.

10.11.6 Role of Women in PFM:- Women in general and those of rural areas in particulars play an important role in maintaining the family and thereby improving the village economy. It is often said that if a women is developed, the entire family is developed because it is only women who is most intimately connected or dependent on forest for their basic needs. Thus, the woman as a mother in the house-hold assumes the role of efficient manager and undertakes various functions for the welfare of the family.

The entire village abutting the forests actually depends on the forests for the tree based needs in the form of small timber, fuel, fodder, green leaf manure etc, unlike the women in urban area; the rural women are solely dependent on the forests for their fuel needs to a very large extent. It is the woman who collects fuel wood and dried sticks for cooking purposes from forests. Many women also bring fuel wood from forests for their sustenance through wage earning, as they do not have any other alternative sources of employment. The rural women take care of cattle grazing in the forests. In many parts of the country women collect potable water from perennial jungle streams passing through the forests.

The women's attitudes towards forests has been changing conservation strategies at the National and State level. In the Himalayan region, rural men are very much interested in raising pine trees so as to get quick money at the time of harvests. On the other hand, the women are interested in raising broad leaved trees like, *Olea cuspidate*, *Acer* species, *Alnus nitida*, *Grewia oppositifolia*, *Pistacia integerrima*, *Albizzia stipulaata* etc. which improves the diversity and result

in perennial flow of water in mountain streams in the region and the woman have succeeded in this sphere of activity.

In short, women can play a dominant role in the implementation of P.F.M. because of their intimate association with forests. They depend on forests for various livelihood security services; they must get equal representation in the village Forest Councils and have a choice in the decision making viz. in the selection of species and other silvicultural measures for upgrading the degraded forests vegetative cover and bio-diversity.

10.12 Project Impact & Benefits:- This project will maximize and sustain the impact by developing sustainable institutional Framework and capacity building at community level and addressing issue like excessive biotic pressure for fuel wood, fodder, grazing, timber, large population of unproductive cattle unstable terrain and decreased forest cover that have led to unsustainable and inequitable exploitation of forest resources.

This project will have a positive impact on the regeneration and sustainable exploitation of medicinal herbs by focusing on their in-situ as well as ex-situ propagation and scientific harvesting. This project will also have a positive impact on reversal of land degradation process by control of overgrazing, bio-diversity conservation and soil conservation.

By developing fuel wood and fodder plantations on the barren lands near the village, this project will reduce the pressure on existing forests for their products, thus revitalizing these forests to good health. The plantation so raised under the project will increase the forest cover thus progressing towards the goal of bringing two-thirds of the area in the hill under forest cover as envisaged in the National Forest Policy, 1988. This project will directly benefit poor forest dependent communities in the project area by evolving them to improve their livelihoods through increasing sustainable yields from forest lands and through developing other livelihood options which will ultimately reduce their dependence on the forest resource.

By the end of the project community level institutions in the shape of PFMCs will be in place to manage natural resources through linkages with forests and other line department. This project is likely to have a positive impact on the environment if the improved or alternative livelihoods are based on sustainable utilizing and access to natural resources.

10.13 Monitoring & Evaluation:- The progress of implementation of the FDA will be monitored continuously through reports and physical verification of forest works. At the Centre Govt. level the project will be monitored on the bases of quarterly progress reports and through periodic field inspection by the officials of NAEB or its authorized evaluation agencies.

CHAPTER –XI

THE WILDLIFE MANAGEMENT (OVERLAPPING) WORKING CIRCLE

11.1 General Constitution:- This Working Circle is constituted for emphasizing the necessity of conservation of wildlife and collection of information for better management of wildlife. The whole tract dealt under this Working Plan is ideally suited for a variety of wild animals and birds, since, the forests are distributed from low elevation to the high Alpine pastures and snow bound areas. Therefore, this Working Circle overlaps all other Working Circles. In present scenario, wildlife includes faunal as well as floral life on the Earth. It is a biodiversity as a whole, which makes wildlife's worth. Wildlife conservation cannot be executed in isolation. Areas outside the protected area network are often vital ecological corridor links and must be protected with a view to ensuring the ecological and environment security of the State. Thus conservation efforts in Kinnaur Forest Division by virtue of its proximity to Rupī - Bhaba, Rakchham - Chitkul and Lippa - Asrang Wildlife Sanctuaries assume profuse significance. The forests of Kinnaur Forest Division are lying contiguous to Rupī - Bhaba, Rakchham - Chitkul and Lippa - Asrang Wildlife sanctuaries which are rich in wildlife such as Rupī, Sak Kanda, Mulling, Mud, Rani Kanda and Asrang Kanda etc. As these forests are not easily accessible and are far away from habitation, wildlife by and large finds a free and peaceful life in these forests. There is frequent seasonal migration of animals in large herds from the above sanctuaries to these areas and vice versa. The trees and lush vegetation present in these reserves along with the perennial water sources and grasslands create an ideal habitat for wildlife.

Rupī Bhaba Wildlife Sanctuary: Rupī Bhaba Wildlife Sanctuary is named after Rupī and Bhaba valleys of lower kinnaur embraced by Shrikhand mountains of the Dhauladhar range of Himalayas. The sanctuary spreads in 503Km² area within geographical locations i.e. 31.597531 E and 77.836091 L with annual rainfall of 1500 mm and blessed with alpine pasture, Dry Temperate Coniferous Forests, Dry broadleaf and Coniferous Forests, Kharsu Oak Forests and lower Western Himalayan Temperate Forests. The sanctuary adjoins Great Himalayan National Park on the western and Pin Valley National Park on the northern aspect. The sanctuary is amongst the remnant habitats for Western Tragopan and other Himalayan pheasants. Other bird species that occur here include Orange Bullfinch, White-throated Tit and White-cheeked Tit. Snow Leopard is occasionally seen in the higher riches (cold desert and alpine tracts) including its prey Greater Blue Sheep and Asiatic Ibex, and other mammals such as Musk Deer and Himalayan Tahr. Common Leopard is found in the lower elevation with its prey Himalayan Goral and Himalayan Serow. Asiatic Black Bear is frequently seen across the sanctuary area. The sanctuary is also known for its rich butterfly diversity.

Rakchham Chitkul Wildlife Sanctuary (Popularly known as Sangla Wildlife Sanctuary), is named after two old and picturesque villages, Rakchham and Chitkul. The sanctuary spreads in 304 km² area within geographical location i.e. 31.385980 E and 78.360596 L and is in the arid Zone having rainfall 1130mm in middle Himalaya within the catchment area of the Baspa river. The sanctuary is blessed with forests of Deodar, Blue Pine and Chilgoza Pine in the lower elevations. Oak forests, Fir and Spruce with bamboo undergrowth in the higher reaches succeeded by alpine pastures. The sanctuary adjoins Govind Wildlife Sanctuary of Uttarakhand on southern side and Tibetan plateau on the eastern side. Many threatened medicinal plants and herbs are found in the alpine area of the sanctuary. Close to a 100 birds species occur in the sanctuary notable species being Bearded Vulture, Himalayan Griffon, Golden Eagle, Long-legged Buzzard, Rufous-breasted Accentor, Tibetan Snowfinch, Streaked Laughingthrush, Variegated Laughingthrush, White - collared Blackbird, Orange-flanked Bush-Robin and White-bellied Redstart. The large mammals

likely to be seen in the sanctuary are Greater Blue Sheep, Himalayan Tahr, Asiatic Black Bear at high altitudes. At lower elevations, Himalayan Goral, Common Leopard are found. The region is also known for its rich butterfly diversity.

Lippa Ashrang Wildlife Sanctuary: Lippa Ashrang is a high-altitude Wildlife Sanctuary situated within geographical locations i.e. 31.657134 E and 78.331911 L with annual rainfall of 300 mm along the stream of Taiti, a tributary of Satluj. The sanctuary beholds the unique landscape of dry Trans-Himalayan region with most of the sanctuary area being largely flat and in part barren cold desert. The sanctuary is blessed with Himalayan Dry Temperate Forests, Alpine Arid Pastures, Alpine Dry Scrub, Dry Broadleaf Forest with Brown Oak and scanty Coniferous Forests. Occurrence of Snow leopard was recently established in this sanctuary. due to its unique geographical features and the occurrence of the many threatened bird species such as Himalayan Griffon, Himalayan Snowcock, Tibetan Partridge, Ibisbill, Tibetan Sandgrouse, Snow-Pigeon, and Yellow-billed Chough, the sanctuary has been identified as an Important Bird and Biodiversity area (IBA). Other mammalian species in the sanctuary include the Asiatic Black Bear, Brown Bear, Alpine Musk Deer, Himalayan Goral, Asiatic Ibex and Greater Blue Sheep. Lippa Ashrang is one of the few sanctuaries in India where feral Yak has been reported.

11.2 Importance of Wildlife:- Due to the spread of education and awareness, there is a growing concern for protection and preservation of wildlife and there is a steady opposition to their killing and to the destruction of their habitat. With the increased availability of information on biodiversity, a wide spread and intelligent recognition of the immense value of the myriad species of plants and animals to the humankind has been established. Forests provide an excellent opportunity to a man to study living beings in their natural environment. In addition to this, there are material consideration as well, especially ecological. These animals and plants through the intricate food web maintain the delicate balance of nature and any breach in this chain can cause over-population of any one species, which may prove detrimental to human interests. If the people are led to know the importance and worth of wildlife they will appreciate it as an asset and put in efforts to conserve them.

Faunal and Floral life (Biodiversity) play a significant role in maintaining the balance of nature. The value and importance of it from scientific, aesthetic, economic and recreational points of view is immense and is recognized the world over and therefore, adequate protection, and the scientific management of it is absolute necessity. In wider perspective, it is Biodiversity conservation and development and also its further research, which makes it more important.

This region, as a whole, has come under the enormous pressure from biotic interferences' both from the ongoing practice of traditional livelihoods, such as seasonal grazing, hunting and collection of medicinal plants as well as more recent developments such as: farming of temperate cash crops, tourism, and hydro electric power development.

11.3 Distribution of Wildlife:- The distribution of wildlife has been described in details in the beginning under Chapter II B "Fauna" Part I of the Plan.

11.4 Special Objects of Management:-

- i) To protect the diversity of wildlife in the division by appropriate habitat improvement operations.
- ii) Ecological security of the tract by conserving wildlife outside the protected area.
- iii) Community support for wildlife conservation
- iv) Reduction in the dependence of local communities on the important habitat to avoid human-wildlife interface.

- v) Orientation and sensitization of the Territorial front line staff towards the wildlife conservation, protection, monitoring & management.
- vi) To educate staff and public in the management of wildlife.
- vii) To protect and improve upon existing population of endangered species of wildlife both faunal and floral found in the tract.

11.5 Management Imperatives:-

11.5.1 Ecological Security:-For long term ecological security of the tract, the development agenda must recognize the imperative of identifying and protecting natural ecosystems from over-exploitation, contamination and degradation. Short-term economic gains must not be permitted to undermine ecological security.

11.5.2 Peoples' Support:-Local communities, traditionally depend on natural biomass and they must, therefore, have the first lien on such resources. Such benefits must be subject to assumption of a basic responsibility to protect and conserve these resources by suitably modifying unsustainable activities. Conservation programmes must attempt to reconcile livelihood security with wildlife protection.

11.5.3 Human Wildlife Conflict:- The Kinnaur Forest Division faces the problem of mainly three types of wild animal's depredation i.e. Black bear, Leopard and to some extent Monkey. Such incidents are consistently increasing and pose a great threat and challenge in wildlife management.

i) Asiatic Black Bear (*Ursus thibetanus*):- Human conflicts are not a local, small phenomenon; but an issue that spans a diverse array of geographic and human demographic contexts. The increase in number of black bear-human conflict cases is due to competition for resources at different levels. Bear populations, usually require large areas of land to survive. They typically compete directly with people for resources such as space, food, security and cover. Almost all bear species kill or injure livestock, damage agricultural or horticulture crops, or otherwise, directly compete with people.

Black Bear is a forested animal found in areas with dense canopy cover with limited human disturbance. Black bear is typically nocturnal, although occasionally, it is active during day time. In Eastern Himalayas, black bear tend to be active year-round; but in North-Western Himalayas, it undergoes hibernation during winter. It spends this period of hibernation in dens, such as hollow tree, caves and holes dug into the ground. Black bears in North-Western Himalayas may remain in their dens for 3 to 5 months. They breed during the summer months, usually in late June or early July and cubs are born between late December and early February, while the female is still dinning. Black bears are omnivorous in the food habits, foraging largely on fruits and to some extent on leaf material, grasses, insects and other animal matter. The movement and ranging of the black bear is largely dependent on the quality, quantity and distribution of food, which in turn, is influenced by topography and climate. In the tract of this division, especially dense canopy forest cover area, when there is shortage of fruits in certain periods of time they become bolder and travel more widely in search of food towards crop lands so human encounters with bears are more frequent during this period.

ii) Leopard:- Leopard is the most widely distributed large cat in India, but due to expansions of human influence and ever increasing pressure on natural resources has greatly intensified the issue of human leopard in a wide variety of situations. Human-leopard conflict is a complex issue influenced by political and social attitudes, the biology of the species, and management action. Effective management of conflict will have to strike a balance between minimizing serious conflict (attacks on people) and the long-term conservation of the leopard species. Although, the leopard is commoner and more resilient than other large cat species that occur in India, it is poached in the

largest numbers to meet the demand of the illegal wildlife trade. The leopard is very adaptable, and can live close to human habitations. The presence of a species like the leopard in a human dominated landscape will invariably lead to some predation on domestic animals. Carnivore density is known to be dependent on prey density and the leopard is no exception.

iii) Snow Leopard:-The Himalayan region is the center of the globally endangered Snow Leopard's (*Uncia uncia*) the total habitat of the Snow Leopard in India is around 7500 square kilometer. The Snow Leopard numbers have been estimated about 300 to 700 in India. A number of factors have contributed to the decline in the Snow Leopard populations globally which includes reduction in prey population (like Blue Sheep, Tibetan Aragali and Himalayan Thar), illegal poaching and increased human population infiltration in to the species habitat. There are also incidence of increasing occurrences of human wildlife conflict owing to the increasing the interface between humans and wildlife. The severe habitat degradation of the Snow Leopard is also due to unsustainable infrastructure development and land use practices, over exploitation of bio resources especially high value medicinal and aromatic plants and over grazing in high altitude pastures. Illegal trade of wildlife parts and products and other natural resources is also a key concern in the efforts towards conservation.

The Snow leopard is the State animal of Himachal Pradesh, and is mostly confined in the high altitude Himalayan ranges which are of critical importance for their rich biodiversity and unique ecosystem. People depend on these ecosystems for food, water, mineral sources, medicinal and aromatic plants, livestock, cultural traditions and spiritual values. However, these ecosystems are threatened due to unplanned development and unsustainable land and forest use practices. To conserve the snow leopard and its habitats, the Ministry of Environment Forest and Climate Change is implementing the SECURE Himalaya Project in Jammu & Kashmir, Himachal Pradesh, Utrakhand and Sikkim. Owing to the importance of this landscape, the GoI has considered snow leopard as the flagship species for the Himalaya. The snow leopard acts as an indicator of the health of the entire ecosystem in which they live, due to their position as the top (apex) predator in the food web. It has been listed under Appendix – I (species that are the most endangered) of the Convention on International Trade in Endangered species of wild Fauna and Flora (CITES). It has also been listed under Appendix – I of the Convention on Migratory species of Wild Animal (CMS), and in 2002 its status was elevated to 'requiring concerted action'. It is also listed as endangered in the IUCN Red list.

The SECURE Himalaya Project is a new Project of (MoEF&CC) and UNDP supported by Global Environment Facility (GEF). The project is developing landscape based long term strategy through participatory approach to secure the globally and locally significant biodiversity, land and forest resources in the high Himalayan ecosystem, wild enhancing lives and livelihoods of the local communities. The proposed landscapes includes Changthang landscape (J&K), Lahul - Pangi and Kinnaur landscapes (Himachal Pradesh), Gangotri – Govind and Darma – Byans valley in Pithoragarh landscape (Utrakhand and Kanchenjunga – Upper Teesta Valley landscape Sikkim).

Sangla valley and Namgia valley of Kinnaur Forest Division in particular are the prominent hot spot of the Snow Leopard. State Forest Department is committed to conserve the snow leopard. As per the guideline of MoEF, GoI, necessary steps should be taken to protect and preserve the snow leopard for which agencies like Nature Conservation Foundation, Mysore (NCF) have also been collaborating to generate sound scientific knowledge in the Spiti Valley, which is one of the India's most important snow leopard landscapes.

The Wildlife Wing, Himachal Pradesh Forest Department (HPFD) and the Nature Conservation Foundation, Mysore (NCF) has been leading some of the efforts of both research and

conservation in the Snow leopard range in Spiti. The Divisional Forest Officer Kinnaur should also prepare a detailed landscape based and participatory Management Plan for the area in which the snow leopard is found in addition to the proposals laid down by the SECURE Himalayan Project. Further, Divisional Forest Officer Kinnaur should undertake Snow Leopard census outside of the protected areas so as to estimate its actual population. Important questions of Snow Leopard conservation relate to good estimates of its population, area needed for each animal (as per its age-sex), determinants of range quality in terms of prey availability, topography and disturbance, and their ability to movement across human and natural barriers. There is also a pressing need to understand conflicts and the role of individual snow leopards in it.

iv) Monkey:- Monkey is not so widely distributed animal in the tract dealt with. However, the population has increased in human habitations than in the forests. The main cause of increased population near human habitation is availability of waste from kitchen and unsystematic disposal of kitchen waste to dust bins placed near habitations. In the beginning, monkey is shy animal but with the passage of time it becomes aggressive. Similar, incidence of monkey human conflict has gained the attention of conservationists at large. The population has increased manifold in the lower part of the division and there are a lot of complaints of crop depredation by them. All along the National highway, State Highways and even in the link roads and paths, the monkeys can be seen in herds. The monkey also destroys the young seedlings of plants as they suck the roots of the seedlings and in this process they uproot the seedlings. They have left the interiors of the forests and are seen near villages and town. Some tourists also feed them generously with bread, chanas, bananas, food etc. Now the problem of conflict is increasing as the monkeys have become habitual of staying in habitations on rooftops and trees near the buildings. However, the efforts of Forest Department are in progress to reduce number by way of sterilizing male ones.

11.5.4 Long Term management of Human-Leopard Conflict:- The best form of conflict management is to deal with it before the problem gets out of hand. There are many areas in Kinnaur district where leopards live in croplands outside Protected Areas. The leopard populations in croplands can be managed without serious conflict as long as the biology of the species is considered.

11.5.5 Leopard/Black Bear –Human Conflicts in Kinnaur Forest Division:- As like many other parts of India, the human population in Kinnaur district has also increased over the last 20 years. As a result of growing human population, changing land use practices and resultant anthropogenic pressures, forest cover had either decreased or declined in quality due to habitat degradation. Kinnaur Forest Division being a valley has an interspersed of orchards, croplands with human habitations and forest. The movement of bears and leopards for food outside these forest areas lead to close encounters of man and bear, and sometimes to conflict. The black bear/ leopard–human conflicts are in the form of crop damage, livestock predation, human attacks and sometimes even death of humans. All these have led to strong backlash from people resulting in confrontation with the Forest Department or the Government authorities, and sometimes retaliatory killing of strayed bears. In the lower part of the Kinnaur area and its surrounding forested and agricultural/horticultural landscape has black bear in relatively high density resulting in increasing bear-human conflicts and also providing ample opportunities for ecological research on different aspects of ecology and bear-human conflicts.

11.6 Conflict types & Remedial Measures:-

a) Damage to Agricultural Crops and Orchards:- The croplands and orchards are unintentionally providing high quality food for bears. Black bear has excellent memory that helps it to locate seasonally available cultivated crops around its habitats. Individuals that have once tasted

good quality and high energy food come out regularly to raid the crops and orchards near their natural habitats. As bears become habitual to cultivated crops, growing such kinds of crops actually leads to human-bear conflicts in the immediate area and the broader community.

b) Livestock Killing:- Killing of livestock (sheep, goat, and cow) by black bears is not uncommon and may become a serious problem. Black bear do occasionally kill livestock when there is no food available in wild for their animal protein requirements. There are instances, when grazing domestic animals are predated by bear in their habitats and some cases of livestock killing in night shelters. During late autumn and early winter when food availability in bear habitats is low and due to late snowfall some bears go in for late hibernation and during such period kill livestock.

c) Human Attacks and Killing:- Increased human population in and around forested areas, encroachment on forest land and increased dependence on forests by humans have led to increased frequency of bear-human encounters. Black bear compete directly with people for resources such as space, food, security and cover.

Black bear-human encounters can be classified in to two categories: Predatory and defensive. Black bear generally do not attack people unless and until: - (i) it feels threatened, (ii) if it is a sudden encounter, or (iii) a female black bear with cubs or with food.

11.7 Management Initiatives Required to Address Human-Wildlife Conflicts:-

11.7.1 Database Development and Maintenance:- The basic step towards understanding and developing mitigation strategies for reducing black bear-human conflicts in this Division and elsewhere, in the State would be the development and maintenance of a database. The patterns of black bear-human conflicts in a large landscape both in spatial and temporal scales will be extremely important to understand underlying causes and preventing conflicts. It is extremely important for the Forest Department of Himachal Pradesh to develop and maintain a database on conflicts for its different regions using GIS. It would be necessary to distinguish causes and symptoms of bear-human conflict. Changing land use patterns, development and use of black bear habitats by humans are the causes, while un-natural behaviour, human habituation are the symptoms.

11.7.2 Rapid Response Team:- A fully equipped, well trained and motivated Rapid Response Team comprising of territorial as well as wildlife staff, is formed at the Division/Circle Level to respond to conflict situations, including animal rescue, treatment (if required), translocation and monitoring. Efficient and effective response to complaints is more feasible when rapid communication is possible from and to the conflict site and between the personnel of the Conflict Management Team and when duties are shared amongst the members of the Team.

11.7.3 Awareness Creation:- Knowledge on Black Bear/ Leopard behavior is essential for the villagers who live near bear/leopard habitats and suffer crop losses and are also vulnerable to bear attacks. Awareness generation through elected bodies at the village or block levels, religious or educational establishments, and other government or non-governmental agencies needs to be explored. Simple precautionary measures such as avoiding moving singly during dawns and dusks in crop fields or orchards or forests during summer and autumn could greatly reduce bear attacks on humans. Another crucial factor that can reduce bear attacks is providing a safe passage or escape route for a stranded bear, particularly in the villages. These ‘dos’ and ‘don’ts’ should be widely circulated through posters in local language. T.V and print media should also used for awareness creation for villagers in conflict area.

11.7.4 Reducing Livestock Depredation by Black Bear/Leopard:-As most of the livestock killings have taken place at the night shelters in the villages, it would be necessary to strengthen the doors, windows and other vulnerable portions of these night shelters to reduce loss by predation to

black bear and common leopard. Supervised livestock grazing by at least 3-4 villagers will reduce livestock depredation by black bear and leopard. Villagers affected by livestock depredation by black bear and leopards should be advised to use iron doors and proper lighting at their cattle sheds or night shelters as both have been found to be very effective in reducing livestock loss.

11.7.5 Guarding of Crop/Orchards from Black Bear Damage:- A Village level cooperative effort for guarding of crop fields and orchards on rotational basis could be tried as an option using the effective means of scaring bears such as noise by drumming empty tin/metal containers. Using guard dogs while patrolling and keeping them in villages would be of added advantage. Proper lighting in the corners or boundaries of crop fields and orchards particularly the vulnerable points lying close to forest fringes may be another option that may help to reduce crop depredation as observed in a few cases during the survey.

11.7.6 Changing Agricultural and Animal Husbandry Practices:- Change in local cropping patterns can significantly influence Animal- Human conflict intensity. Similarly, changing animal husbandry practices by keeping a few high-yielding breeds instead of large number of local breeds that are less productive in terms of meat and milk and stall feeding animals in proper shelters, could be an alternative that can reduce conflicts.

11.7.7 Monitoring of Conflict Areas:- Use of passive and preventive actions is an important step in conflict management. There should be proper monitoring of black bear-human conflict areas where at least one of the employees is present at the problem site until the situation is resolved. While monitoring the bear, information such as number, age, location, bear behavior and the direction of the movement of the conflicting animal has to be recorded and reported. Movement of the people should be restricted to give safe passage to the problem causing bear.

11.7.8 Translocation and Marking of Problem Animals:- The problem animals that are captured and translocated from the conflict areas should be marked by radio collar, florescent collar or, by ear tags prior to their release back into the wild so that the movement and the ranging patterns of these animals could be studied. This will be very helpful in better understanding of problem bears and ultimately help in mitigating the problem.

11.7.9 Strengthening of Local and Traditional Black Bear Deterrent Methods:- The traditional methods of burning red chillies mixed in cow dung can also be experimented for orchards in villages which are located in the periphery of forested areas in Apple, Maize production season. This traditional method was found to be effective in preventing bears from entering fields and therefore recommended for the use by local villagers in Bear conflict areas in North and Central Kashmir.

11.8 Compensation for Damages Caused by Wild Animals:- The loss of cattle and human beings due to attack by wild animals are compensated by the forest department to victims vide notification No. FFE-B-A(10)-1/2009 dated 18-August, 2018 (*See Appendix No-XXXIII*). But still there is no provision for compensation to the loss of cultivated field crops due to damage by wild animals in the State of Himachal Pradesh which need attention of the State Government in this regard. Therefore, necessary step may be taken up with Govt. in this regard by the Divisional Forest Officer. This will be very helpful in better understanding of problems of wildlife and ultimately help in mitigating the problem of human-wildlife conflict.

The details of compensation paid for losses to animals and human beings done by Wild Animals for the period 2004-05 to 2018-2019 is tabulated in table No.-11.1

Table No.-11.1
Details of compensation paid to victims against wildlife depredation

S.No	Name of Range	Year	No of case Sanctioned	Domestic (Nos.)	Human being (Nos.)	Compensation (in Rupees)		Total Amount paid in (Rupees)
						Domestic	Humanbeing	
1	Nichar	2004-05	2	21	0	7875	0	7875
2	Kalpa		1	22	0	8063	0	8063
3	B/Nagar		1	25	0	9062	0	9062
1	Nichar	2005-06	18	51	0	49750		49750
2	Pooh		1		0			0
3	Kalpa		6	41		19563		19563
4	Kilba		4	5	0	10250		10250
5	B/Nagar		7	63	1	33739	33000	66739
1	Kalpa	2006-07	1	30	0	11250	0	11250
2	Moorang		2	60	0	22500		22500
3	Kilba		3	22	0	12375	0	12375
4	B/Nagar		3	24	0	11448	0	11448
1	Nichar	2007-08	6	40	1	21604	33000	54604
2	Pooh		1	11	0	4125	0	4125
3	Kalpa		7	73	3	32800	15000	47800
4	Moorang		2	1	1	2500	33000	35500
5	Kilba		1	1	0	2500	0	2500
1	Nichar	2008-09	5	92	2	32693	105000	137693
2	Pooh		2	24	0	7500	0	7500
3	Kalpa		4	100	0	23385	0	23385
4	Moorang		7	69	1	26265	5000	31265
5	Kilba		1	1	0	2500	0	2500
6	B/Nagar		1	22	0	8250	0	8250
1	Nichar	2009-10	9	26	4	15788	143000	158788
2	Pooh		6	24	0	7125	0	7125
3	Malling		1	1	0	1500	0	1500
4	Kalpa		14	49	0	29825	0	29825
5	Moorang		14	102	2	60600	66000	126600
6	Kilba		3	4	1	4875	33000	37875
7	B/Nagar		8	8	0	10875	0	10875
1	Nichar	2010-11	3	3	1	5500	5000	10500
2	Kilba		2	2	0	5625	0	5625

3	Moorang		0	0	1	0	100000	100000
4	B/Nagar		1	1	0	1500	0	1500
1	Nichar	2011-12	4	15	1	19600	5000	24600
2	Kilba		1	3	0	1000	0	1000
3	Moorang		1	0	1	0	5000	5000
1	Nichar	2012-13	1	1	0	1500	0	1500
2	B/Nagar		1	2	0	1875	0	1875
3	Kilba		3	23	1	9500	5000	14500
1	Kalpa	2013-14	5	14	0	10500	0	10500
2	Kilba		1	19	0	7125	0	7125
3	B/Nagar		1	8	0	3625	0	3625
1	Nichar	2014-15	2	2	0	12000	0	12000
2	Kalpa		5	44	0	60750	0	60750
3	Kilba		5	49	0	82500	0	82500
4	B/Nagar		4	61	1	76500	10000	86500
1	Nichar	2015-16	7	36	0	69000	0	69000
2	Kalpa		2	32	0	48000	0	48000
3	Moorang		1	25	0	22500	0	22500
4	Kilba		3	3	0	18000	0	18000
5	Katgaon		1	22	0	31500	0	31500
1	Nichar	2016-17	5	8	0	51000	0	51000
2	Pooh		2	63	0	106000	0	106000
3	Kalpa		2	18	0	25500	0	25500
4	Moorang		1	25	0	34000	0	34000
5	Kilba		2	4	1	24000	150000	174000
6	B/Nagar		3	35	1	54000	75000	129000
1	Kalpa	2017-18	1	1	0	6000	0	6000
2	Moorang		3	1	2	12000	300000	312000
3	Kilba		2	3	0	18000	0	18000
4	Nichar		1	1	0	3000	0	3000
5	B/Nagar		2	41	0	63000	0	63000
1	Pooh	2018-19	3	37	0	64500	0	64500
2	Malling		1	30	0	88500	0	88500
3	Kilba		4	3	1	27000	150000	177000
4	B/Nagar		8	8	0	66000	0	66000
5	Katgaon		2	15	0	40500	0	40500

(Source:- Record of Kinnaur Forest Division)

11.9 Management Prescriptions:-

11.9.1 Habitat Management:-Reversing the process of degradation of forests as prescribed by itself improve the habitat of wildlife. Cost effective check dams and water bodies prescribed in will be constructed in locations with access to wildlife or in known wildlife habitats. The water bodies so constructed will be, to the extent possible, under vegetation cover. Rather, the vegetation cover over the natural water bodies in the wilderness will be left undisturbed, as the water holes without vegetation cover do not attract wild life. Dead and dying trees will be retained as snags for smaller species of mammals and birds. In known wildlife habitats the biotic interference in the form of collection of forest produce also will be discouraged. The availability of food, water and shelter for wildlife has to be improved. Fire protection is one of the best accelerating steps towards better habitat. Augmenting the fodder resources of herbivores through artificial regeneration of fodder species such as grass, herbs and trees help in multiplication of prey species, which in turn, support predators and scavengers. As per the policy of the State Govt. that out of the total plantations to be done in an area, at least 10% plants are to be of fruit bearing species, the species to be planted in a particular area is to be as per the requirement of the wild life species specifically found in that areas. Protection of micro wildlife habitats from forest fire especially during breeding season especially the Western Tragopan and other pheasants and effective patrolling against poaching are required during the month of October to January and April-May by deployment of anti-poachers in sensitive forest areas of this Division.

11.9.2 Veterinary Care:-Veterinary care in areas rich in wildlife may be ensured by:-

- i) Wildlife health monitoring through post-mortem examinations and direct and indirect observations
- ii) Free vaccination and preventive measures like de-worming to grazing domestic livestock and special Veterinary care campaign for foot and mouth disease in nomadic livestock.
- iii) Extension education to owners of domestic livestock.

11.9.3 Training:- For carrying out multidimensional activities, ranging from routine protection to social services, a new breed of staff with entirely different perceptions has to be made available. The available talent can be sharpened only through training. On the job training will be given to staff for capacity building. Trainings in weaponry, unarmed combat, participatory exercises, first aid, veterinary care, intelligence gathering, investigation, public relations, wildlife sciences etc. will be provided in various reputed institutions. Apart from that staff should be well versed in investigation, adducing evidence and material, dealing with wildlife offences/offenders, compoundable and non compoundable cases under the Wildlife (Protection) Act, 1972. Staff should be imparted training in matters like trapping of wild animals, rescue operation, collection of samples of vital organs for histo- pathological, viral and bacterial examination, their preservation and dispatch, sign and symptoms of common wild life diseases, external indicators of health etc.

11.9.4 Research and Monitoring:- Sudden outbreak of diseases, suitability of a given area for a particular species, carrying capacity of the forests, crop raids and methods to check the excessive breeding of a particular species are some of the problems that need research inputs. These problems can be addressed by appointing qualified persons for research and monitoring or by entrusting the same to specialized research organizations like HFRI, WII and local universities. It is essential to monitor the growth and development of wildlife in a given area to assess the impact of management practices, so as to make the needed corrections to suit the objective.

11.9.5 Awareness Programme and People Participation:- Educating the local population about the importance of wildlife in the ecosystem and creating awareness about their conservation will go

a long way in protecting our forests as well as reducing man-animal conflicts. Such awareness can be brought through nature camps to different target groups such as students, fringe dwellers, and orchard owners etc coupled with seminars, workshops and guest lectures.

11.9.6 Mitigating Man Animal Conflicts:- Some of the recommendations to mitigate the conflict at the man-animal interface are:-

- i) Augment sources of browse species, particularly grass and fodder species.
- ii) Encouraging stall-feeding among fringe dwellers may reduce the number of livestock within forests
- iii) Timely action for compensating the loss due to crop raiding.
- iv) To ensure sufficient budgetary support to provide relief to victims. Wildlife compensation has been made part of Public Guarantee Act in Himachal Pradesh.
- v) To explore and promote alternate income generating source for forest dependent population.
- vi) To explore LPG connection on subsidized rates for forest dependent population so that dependence on forest pressure for fuelwood could be reduced.

11.9.7 Census of Monkey:- Proper documentation of the population trends i.e. pre-sterilization and post-sterilization of monkeys is planned to be carried out for effective management. Although no sterilization programme has been conducted in Kinnaur in past few years. This will help in studying the impact of sterilization and making decision for further improvements in future. The Monkey census was carried out during 2015 in this division and the census of Monkey is given in table No.11.2

Table No. 11.2

Monkey Census											G.Total
Name of Ranges	Adults				Infant	Total					
	Male	Female	Young	Un Known		Male	Female	Young	Un Known	Infant	
Bhaba Nagar	118	129	73	0	47	118	129	73	0	47	367
Kalpa	97	193	183	61	0	97	193	183	61	0	534
Katgaon	80	77	52	0	31	80	77	52	0	31	240
Kilba	50	120	82	0	9	50	120	82	0	9	261
Malling	0	0	0	0	0	0	0	0	0	0	0
Moorang	204	158	107	0	0	204	158	107	0	0	469
Nichar	107	120	125	252	0	107	120	125	252	0	604
Pooh	52	46	45	0	0	52	46	45	0	0	143
G.Total:-	708	843	667	313	87	708	843	667	313	87	2618

(Source:- Record of Kinnaur Forest Division)

Similarly, leopard census is to be done as a regular feature and in the present day technologies the camera trap methodologies is to be adopted in place of traditional 'Pug mark Method'.

11.10 Compensation for Damages Caused by Monkey:- No incidence of monkey damages outside of the protected area has been noticed in Kinnaur Forest Division. However, the nature of damages caused by the Monkey is only to the fruit orchards and other crops of the local inhabitants.

11.11 Monkey-Human Interface:- The monkeys have become a problematic animal for last 10 to 15 years. Whether, it is the townships or the rural areas now monkey menace is quite common. Sincere efforts have been made to mitigate the monkey menace.

During the course of Monkey incidence estimation a two step strategy was adopted in this division which included:

- i) Preliminary observations for Monkey estimation to determine the hot spots.
- ii) Comprehensive monkey estimation in the hot spots.

During this process, the following beats of this division have been identified for having high concentration of monkey population and is tabulated in the Table No 11.4.

Table No.11.4

Name of Range	Name of Block	Name of Beat
Nichar	Nichar	Nichar
Nichar	Tranda	Tranda
Kalpa	Kalpa	Peo & Kalpa
Moorang	Akpa	Jangi & Rarang
Pooh	Spillow & Pooh	Spillow & Pooh
Bhaba Nagar	Bhaba Nagar	Chaura
Kilba	Kilba	Kilba & Sapni
Katgaon	Katgaon	Kafnoo

(Source:- Record of Kinnaur Forest Division)

11.12 Conservation Options:-

- i) Create awareness among the students of schools, colleges and public at large in and around Kinnaur Forest Division about the importance of Wildlife conservation with particular emphasis on endemic species of wild fauna.
- ii) Select/make a group of students by forming Eco-clubs. These students will then be trained making use of resource person in the respective fields.
- iii) There is a scheme for payment of cash rewards for providing intelligence about persons indulging in poaching and illegal trade in wildlife product in the state. It was framed in February, 1994. The information for which cash rewards would be made available should fall under either of the two categories:-
 - a) Illegal held stocks of wild animals and wildlife products.
 - b) Any activity related to poaching, illegal trade or transport, illegal export or import committed or to be committed.

CHAPTER –XI+1

GENERAL FINANCIAL FORECAST AND FINANCIAL PLAN OF OPERATION

XI+1.1 Future Revenue and Expenditure:- Due to all round development of the region, rise in the living standards of the people and improvement in the means of communication, the prices of the forest commodities have registered a steep rise during the past years. This trend is likely to continue in the future also. There is a complete moratorium on the green felling in the state since 1980 and there is likely hood of continuance of this moratorium in the near future also. Therefore, the usual fluctuations make it very difficult to prepare a financial forecast that is likely to be accurate for the whole period of the plan. Similarly, it is equally difficult to correctly assess the expenditure likely to be incurred in carrying out the prescription of this working plan. An attempt has therefore been made to estimate the future surplus based on the current price of forest produce and the present cost of carrying out various operations prescribed in the Working Plan. However, an estimate of revenue and expenditure, based on present market rates has been made in the working plan.

XI+1.2 Past Revenue and Expenditure:- The details regarding past revenue and expenditure under various schemes incurred during Rajiv Kumar's plan are given in the Paragraph 7.4. under Chapter No - VII table No.-7.26 of Part I of this plan.

XI+1.3 Future Yield: The total annual yield (in M³) expected from all the Working Circles are tabulated and given in the table No.- **XI+1.1**

Table No.- XI+1.1
Statement showing the Annual Prescribed Yield

Working Circle												
Species	Deodar/Kail WZ			Deodar/Kail DZ			Fir/Spruce			Neoza	Protection	G. Total of yield (In m3)
	PB-I	PB-IV	Total	PB-I	PB-III	Total	PB-I	PB-U	Total			
Deodar	1350	1900	3250	950	650	1600	850	800	1650	Yield not prescribed	Yield not prescribed	6500
Kail	750	500	1250	660	100	760	100	10	110			2120
Fir	1200	870	2070	0	45	45	4650	1400	6050			8165
Spruce	1050	850	1900	0	245	245	2250	1300	3550			5695
Total	4350	4120	8470	1610	1040	2650	7850	3510	11360			22480

The yield from salvage markings has not been taken into account.

XI+1.4 Expected Revenue:- The expected annual revenue based upon the current royalty rates fixed for conifers in Rampur Circle for the year 2018-19 works out is tabulated in the table No. XI+1.2

Table XI+1.2
Future Revenue

a) Sale of Timber trees			
Species	Volume (in M ³)	Rate per cubic meter (in Rs.)	Amount (in lacs)
Deodar	6500	2194	142.61
Kail	2120	1296	27.48
Fir	8165	382	31.19
Spruce	5695	382	21.75
Total	22480		223.03

b) Resin			
	Number	Rate per blaze	Amount (in lacs)
	0	0	0
c) Miscellaneous Revenue			
			80.9
G. Total			303.93

To assess the revenue for subsequent years, 10% increase be given annually.

XI+1.5 Future Expenditure:- The future estimated annual expenditure is calculated on the basis of expenditure incurred for the year 2018-19 and tabulated in the table No. XI+1.3

**Table XI+1.3
Future Expenditure**

Sr. No.	Particulars	Estimated Expenditure (in Lacs)
1	Salary of staff	683.82
2	Travelling Expenses	10.16
3	Office Expenses	5.02
4	Medical Expenses	0.33
5	Wages of contingent staff	0
6	Rent, rate & taxes	0
7	30-Motor Vehicle	1.5
8	20-Other Charges	7.26
9	Training	0.03
10	09-Adv.& Publicity	0.5
	Sub Total	708.62
B Conservancy and Development		
1	Regeneration of forests	0
2	Forest protection	3.4
3	Timber & other produce removed by Govt. Agency	0
4	Timber & other produce removed by consumer and purchasers	0
5	Consolidation & demarcation	0
6	Development of pasture and grazing land	0
7	Improvement of tree cover /raising of plantation and other programmes/ related activities	84.71
8	21-Maintainance of old plantations	10
9	Material and supply	23.26
10	4216 Capital Outlay 37- Major work(Residential Building)	13
11	4406 Capital Outlay Roads, paths and bridges	17.48

12	4406 Capital Outlay Building	5.6
13	Buildings maintenance	2
14	Machinery equipment and plant	0
Sub Total		159.45
Total Expenditure		868.07

Based upon the above calculations, the future annual net revenue, expenditure and surplus / deficit is tabulated Table No:- XI+1.4

Table No:- XI+1.4

Future Net Revenue:- (Amount in lacs)	Future Net Expenditure:- (Amount in lacs)	Surplus /Deficit (Amount in lacs)
303.93	868.07	-564.14

XI+1.6 Cost of Working Plan:-

Table XI+1.5

Sr. No.	Item	Amount (in lacs)
1	Cost of enumeration works, field work, Motor Vehicle and other Wages.	38.3
2	Machinery	0.00
3	Material and supply	8.35
4	Office expenses	5.00
5	Travelling Expenses	2.00
	Total	53.65
	Cost of WP for brought under management (RFs, DPFs & UPFs) per hac.	151.22

CHAPTER –XI+2

MISCELLANEOUS REGULATIONS

XI+2.1 Petty Fellings:- Felling of petty nature, as detailed below may be treated as prescriptions of this Working Plan:-

- i. Where illicit felling of trees has been done to meet the bonafide domestic requirements and the offence is petty in nature.
- ii. Right holders suffering from natural calamities/fire sufferers will be granted timber for construction of house/repair from free of cost as per the actual requirements recommended by the Sub Divisional Officer (Civil) and after personal verification by the ACF/DFO concerned subject to the grant not exceeding the maximum limit prescribed under Rule-4 of Himachal Pradesh (Timber Distribution to the Right Holders) Rules, 2009 and 2016.
- iii. No felling will, however, be done till the alignments of electric lines, or transmission lines, roads or water channels to be constructed have been finally approved by the Govt. of India under Section 2 of Forest (Conservation) Act, 1980.
- iv. Timber required for departmental purpose i.e. for new construction or repair of building i.e. field staff quarter, Inspection Hut or for construction of bridges or inspection path passing through forests etc. may be obtained from free of cost or departmental norms as fixed by the State Govt. from time to time.

The expression ‘petty offences’ in relation to illicit felling shall mean the offence where the amount involved is less than rupees two lakh for determining that the offence is for bonafide domestic use, it must be established during investigation that timber has actually been used for domestic purpose only.

All the trees and poles marked for such purpose shall be recorded in the respective compartment History Files and such felling will appear in Control Forms. Silvicultural principles shall be strictly adhered to while carrying out such marking.

XI+2.2 Deviations:- Any large or unusual felling operation not prescribed in the Working Plan will constitute a deviation, and will require prior sanction of the Principle Chief Conservator of Forests. The following type of fellings will constitute the deviation:-

- i) Large scale damage by fire and wind storms.
- ii) Special fellings to meet the sudden unexpected heavy demand of defense purposes.
- iii) Fellings of trees in the alignment of major road, electric transmission line and Hydro Power Projects etc. approved by the Govt. of India under Section 2 of Forest (Conservation) Act, 1980.
- iv) No Forest working is allowed in forest area, if not, covered by the approved Working Plan by the Govt. of India.

XI+2.3 Demarcations and Survey:- The demarcated Protected Forests including new DPFs has been surveyed and mapped of 4”=1 mile scale, but, no proper boundary register has been prepared. The boundaries of each Demarcated Protected Forest have to be checked with the help of its map and detail boundary register should be prepared and magnetic bearing should be recorded for checking of boundaries and for avoiding encroachments, etc.

Since the boundaries of UPFs has not been properly defined and delineated on the ground which are urgently required to be so attended. The boundary pillars are not properly serially numbered and maintained creating confusion at all stages. This is a specialized job. Special task force comprising of ACF, Rangers and Deputy Rangers be constituted which will carry out complete

checking and all the boundary pillars of DPFs as well as along the boundary of included cultivations must be regularly repaired and maintained in good condition to check encroachments in the forests.

XI+2.4 Forest Settlements:- The erstwhile State of Bushahr Forests was demarcated during 1884-1887. This demarcation was revised by H.M. Glover, during 1916-20 at the time of revision of Forest Settlement of Sutlej Valley Forests of Bushahr State. After that no revision of Forest Settlement has been carried out or done and boundaries are still not properly defined even in Demarcated Protected Forests.

All forests and waste land were declared in Himachal Pradesh as Protected Forests by the Government vide Notification No. Ft. 29-241/49 dated Shimla-4 the 25th February, 1952. Subsequently, the Govt. through Notification No. Ft. 774-1/63 (M) dated 24-2-1964 ordered that these forests be demarcated, and surveyed and rights be determined. At present boundaries of protected forests throughout have not been defined on the ground. Similarly record of rights admitted in these forests is to be prepared and notified under Section 29(3) of the Act and also to be notified in the official gazette. Even the demarcation does not enjoy any legal status so far. The individual forests under this category have, however, got to be defined and notified under the provision of the Chapter-IV of Indian Forest Act, 1927. Thus, no Forest Settlement exists for UPFs which were declared as Protected Forest after the formation of Himachal Pradesh vide notification dated 25-2-1952. Therefore, it is suggested that a forest settlement for the entire tract, to revise and settle the rights of users, urgently needed and should be taken up immediately after the demarcation and survey of UPFs i.e. other than forest land-Charagah billa Darakhatan and Charagah Drakthan etc. to avoid any legal complication. The Hon'ble H.P High Court held that in absence of any proof with regard to the compliance of the mandatory provision of Section 29 to 32 of the Indian Forest Act, 1927, the conviction is bad under Section 33 of the Act.

The State of legal position, forest settlement, entries in revenue record, creation of new DPFs and application of IFA, 1927 and Forest (Conservation) Act, 1980 have been discussed in detail in Chapter-I, Part-I.

XI+2.5 Creation of New Protected Forests:- The existing listed UPFs should be converted into DPFs as in the absence of proper notification, demarcation on ground and due to absence of boundary pillars, there is a lot of confusion regarding their limits, exact extent and application of the provision of the Chapter-IV of Indian Forest Act, 1927.

In addition, with the enactment of H.P. Village Common Lands (Vesting and Utilisation) Act, 1974 and H.P. Ceiling on Land Holding Act, 1972, the ownership of the land which was earlier with the villagers & big landed owners has vested in the H.P. State Government. There are a large number of plantations carried out on these lands over the period of time but these areas do not come under the purview of Indian Forest Act, 1927. Therefore, it is suggested that necessary step should be taken at the earliest and to notify these UPFs area as Protected Forests under the Act and included as addendum in Working Plan. The following listed UPFs are proposed for conversion into DPFs and are tabulated in the Table No. XI+2.1

Table No. XI+2.1
Listed UPFs proposed for conversion into DPFs

Name of range	Sr. No.	Name of Forest	Old No.	New No.	Area in Hac
BHABA NAGAR	1	Rupi	UPF - 1	1	50
	2	Rupi	UPF - 2	2	17.50
	3	Rupi	UPF - 4	3	15
	4	Rupi	UPF - 6	4	15.50

	5	Shorang	UPF -14	5	40.00
	6	Shorang	UPF - 15	6	90
	7	Shorang	UPF - 16	7	35
	8	Lishnam	UPF-46	28	387
	9	--do--	UPF-47	29	305
	10	Janni	UPF-48	30	400
	11	Ramni	UPF-49	31	550
	12	Ramni	UPF - 50	32	470
		Total			2375
KALPA	1	Chini	UPF - 33	15	225
	2	Duni	UPF - 34	16	110
	3	Boktu	UPF- 35	17	110
		G Total UPF			445
KATGAON	1	Saknathpa	UPF - 26	8	200
	2	Kampunng (Darchi)	UPF - 27	9	200.00
	3	Kampunng (Darchi)	UPF - 28	10	200.00
	4	Kampunng (Darchi)	UPF - 29	11	350.00
	5	Dutrang	UPF - 30	12	150
	6	Dutrang	UPF - 31	13	420
	7	Rushmang	UPF - 32	14	220.00
		Total			1740
KILBA	1	Brua	UPF - 36	18	252
	2	Brua	UPF - 37	19	412
	3	Brua	UPF - 38	20	245
	4	Brua	UPF - 39	21	235
	5	Baturi	UPF - 40	22	155
	6	Baturi	UPF - 41	23	75
	7	Tuedan	UPF - 42	24	182
	8	Junpan	UPF - 43	25	242
	9	Phinla	UPF -44	26	330
	10	Punang	UPF -45	27	280
		Total			2408
NICHAR	1	Mazgani	UPF -51	33	417
	2	Mazgani	UPF -52	34	455
	3	Panvi	UPF -53	35	640
	4	Panvi	UPF -54	36	950
	5	Chhachi Dhar	UPF -55	37	400
	6	Nichar East	UPF -56	38	550
	7	Nichar East	UPF -57	39	100

	8	Kandlu Chaunda	UPF -58	40	150
	9	Kandlu Chaunda	UPF -59	41	75
		Total			3737

XI+2.6 Entries in Revenue Record:- The old DPFs do find mention in the revenue record. However, the same should be reconciled with the forest record and discrepancies got rectified. In case of newly created DPFs matter should be taken up with the Revenue Department for making entries in the revenue record under the provision of the H.P. Land Revenue Act, 1954 w.r.t. H.P. Govt. notification dated 4-5-1979. This task requires immediate attention and should be completed within three years.

XI+2.7 Revision of Forest Settlement Rights, 1921:- The Forests of Himachal Pradesh happen to be the first ones to have been taken up for colonial scientific management by the British Empire in Sutlej and Chanab Valley. The local populations were granted the rights and concessions of timber and other forest produce to meet their bonafide needs under the provision of Forest Settlement Report, Sutlej Valley, Bushahr State, 1921. It is very strange to know that the uses of forest resources are still continue to be governed by the Forest Settlement Report, 1921, without any changes, except T.D (Timber Distribution) rights. All these rights and concession is meant for the satisfaction of personal bonafide requirements and subject to the condition that forests are to be maintained in perpetuity. Thus rights will not be exercised to an extent which will endanger the existence of the forests.

Therefore, it is suggested that Century old Settlements of rights should be revised and the rights etc. recorded precisely keeping in view the existing condition and needs of the society in order to meet the changes of such new situations to achieve sustainable management of forests.

XI+2.8 Forest Boundaries:- The state of boundaries has been dealt with in detail in chapter-I, Part-I. The boundary pillars of Demarcated Protected Forests have been erected during the Forest Settlement of Sutlej Valley Forests of Bushahr State and after that no revision of Forest Settlement has been done. Resultantly, boundaries are still not properly defined and the boundary register are also not prepared and updated. It is, therefore, suggested that Divisional Forest Officer may take necessary step for getting demarcation of forest land from Revenue Authority under Section 107 of the H.P. Land Revenue Act, 1954 for ascertaining the position of BPs and extent of encroached land on spot and after that BPs be erected on spot accordingly and BPs register be maintained along with GPS location etc. for record. In the absence of old DPF notification, BPs register and proper demarcation, there have been lot of encroachment on forest land. Detailed boundary registers are required to be maintained for the demarcated protected forests and newly demarcated protected forests. All DPF and listed UPFs shall be demarcated in first five years of the plan and the BPs shall be constructed in dry masonry stone instead of cement concrete as the same is not feasible in high lying forests. To avoid recurring cost of maintenance, it is suggested that all BPs especially near habitations and low lying forest area, be constructed with stone masonry in cement mortar.

XI+2.9 Periodic Checking of Boundaries:-

Little attention has been made for checking of boundaries of the forests. Therefore, it has been suggested that boundaries should be checked at regular intervals for proper maintenance and repair. The checking should be done as per norms fixed are tabulated in the Table No. XI+2.2

Table No. XI+2.2

Forest Guard	100%
Dy. Ranger	50%
Range Officer	25%

ACF	10%
DFO	2%

The quinquennial programme for checking of boundaries is prescribed and is tabulated in the table No. XI+2.3

Table No. XI+2.3

Year of boundary checking	Forest/ No. of compartments prescribed						
	Bhaba Nagar Cmp. No.	Kalpa Cmp. No.	Katgaon Cmp. No.	Kilba Cmp. No.	Moorang Cmp. No.	Nichar Cmp. No.	Pooh Cmp. No.
2019-20, 2024-25	1(a), 1(b), 1(c), 1(d), 1(e), 1(f)	75 (a), 75 (b), 76 (a), 76 (b), 77, 78 (a), 78 (b), 79 (a), 79 (b), 80, 81, 82, 83, 84	20, 21	39, 40 (a), 40 (b), 41, 42 (a), 42 (b), 43 (a), 43 (b), 44 (a), 44 (b), 45 (a), 45 (b), 45 (c),	90, 91, 92 (a), 92 (b), 93 (a), 93 (b), 94 (a), 94 (b)	3 (a), 3(b), 3 (c), 4 (a), 4 (b), 4 (c), 4 (d), 4 (e), 5 (a), 5 (b),	102, 103, 104, 105
2020-21, 2025-26	2 (a), 2 (b), 2 (c), 6, 30, 31	85 (a), 85 (b), 85 (c), 86 (a), 86 (b), 87 (a), 87 (b), 88 (a), 88 (b), 88 (c), 89, 137, 138 (a), 138 (b), 138 (c)	22	46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57 (a), 57 (b),	95, 96, 97, 98, 99, 100, 101	7 (a), 7 (b), 7 (c), 8 (a), 8 (b), 9 (a), 9 (b), 9 (c)	106, 107, 108, 109
2021-22, 2026-27	36 (a), 36 (b), 36 (c) 36 (d), 37	139, 140, 141, 142, 143, 144 (a), 144 (b), 145, 146, 147 (a), 147 (b), 148, 149 (a), 149 (b)	23	58 (a), 58 (b), 59, 60 (a), 60 (b), 60 (c), 61, 62, 63, 64, 65, 66 (a), 66 (b), 66 (c),	120, 121, 122, 123 (a), 123 (b), 124, 125	10, 11, 12 (a), 12 (b), 13, 14, 15, 16, 17	110, 111, 112, 113
2022-23, 2027-28	38 (a), 38 (b), 163, 164, 165, 166	150, 151, 152 (a), 152 (b), 153, 154, 155, 156, 157, 158, 159 (a), 159 (b), 160, 161	24	67, 68, 69, 70, 71, 72, 73 (a), 73 (b), 74 (a), 74 (b), 182, 184	126 (a), 126 (b), 127 (a), 127 (b), 128, 129, 130	18, 19 (a), 19 (b), 32, 33, 34 (a), 34 (b), 35, 168	114, 115, 116
2023-24, 2028-29	167, 178, 179, 180, 181	162 (a), 162 (b), 183, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196	25	NDPF – 1, NDPF – 2, NDPF – 3, NDPF – 4, NDPF – 5, NDPF – 6, NDPF – 7, NDPF – 8, NDPF - 9	131, 132, 133, 134, 135, 136 (a), 136 (b),	169, 170, 171, 172, 173, 174, 175, 176, 177	117, 118, 119

Total 9 numbers of listed UPFs have been converted and notified into New DPFs during the period of Working Plan under revision and the detail is given in **Appendix No.-II**. Necessary entries of the new DPFs in the revenue record is required to be ascertained and the position of construction of boundary pillars of these newly notified DPFs is prescribed and is tabulated in the Table No. XI+2.4

Table No. XI+2.4

Position of construction of boundary pillars of these newly notified DPFs

Sr. No.	Name of Range	New DPF No.	Old DPF No.	BP Constructed	BP Not Constructed
1	2	3	4	5	6
1	Bhaba Nagar	NC-1	163	✓	
		NC-2	164	✓	
		NC-3	165	✓	
		NC-4	166	✓	
		NC-5	167	✓	
		NC-16	178	✓	
		NC-17	179	✓	
		NC-18	180	✓	
		NC-19	181	✓	
	Kalpa	NC-21	183		X
		NC-23	185		X
		NC-24	186		X
		NC-25	187		X
		NC-26	188		X
		NC-27	189		X
		NC-28	190		X
		NC-29	191		X
		NC-30	192		X
		NC-31	193		X
		NC-32	194		X
		NC-33	195		X
		NC-34	196		X
	Kilba Range	NC-20	182		X
		NC-22	184		X
		NDPF - 1	Tiuden Kilba		X
		NDPF - 2	Wadang		X
		NDPF - 3	Baturi Kanda		X
		NDPF - 4	Ananti Dhar		X
		NDPF - 5	Monorang		X
		NDPF - 6	Kamru Chanso		X

		NDPF - 7	Rutrang		X
		NDPF - 8	Punang Kanda		X
		NDPF - 9	Punang		X
	Nichar	NC-6	168	✓	
		NC-7	169	✓	
		NC-8	170	✓	
		NC-9	171	✓	
		NC-10	172	✓	
		NC-11	173	✓	
		NC-12	174	✓	
		NC-13	175	✓	
		NC-14	176	✓	
		NC-15	177	✓	

The boundary pillars have been constructed in 19 nos of NC out of total 34 nos of NC as depicted in the Table No. XI+2.4. The construction of boundary pillars are required to be constructed in the remaining 15 nos of NC and 9 nos of NDPFs. In addition to these, the construction of boundary pillars in C-30 (Bhaba Nagar Range), C-25 (Katgaon Range) and C-136 b, C-90, C-92 b, C-93 b, C-94 a (Moorang Range) are also required. It is therefore suggested that the DFO Kinnaur should initiate the construction of boundary pillars in the balance 15 nos of NC, 9 nos of NDPFs and 7 nos of other forests immediately i.e. preferably during 2019-20 and further checking of these boundary pillars should be done as per quinquennial programme.

XI+2.10 Compartment and Sub-Compartment Boundaries:- These boundaries have been shown on the management and stock maps and are also described in the Compartment History files. The sign board indicating the compartment and sub-compartment though exist in some forests of this division at places, but are required to be prepared and affixed on prominent sites/location indicating the new Compartment No. It is also suggested that such board should be fixed at all prominent points, especially, where the inspection paths, bridle paths cross the boundaries of the compartment and sub-compartments.

XI+2.11 Maps:- Two sets of stock maps showing necessary details for each forest on 1:15000 scales have been prepared and digitized and appended in the respective compartment history files. The administrative map has also been prepared on 1:50000 scale and is lying with Divisional Forest Officer, Kinnaur. The detail of survey sheets/maps available in the division is given in Chapter-I, Para 1.13

XI+2.12 Beat Map:- Each forest guard should be provided with a map of his beat on 4"=1 mile scale showing the boundaries of all the forests, position of boundary pillars, included cultivations inspection and bridle paths etc. The Range Officer/DFO should check these maps during field tours and should ensure that these are kept up to date.

XI+2.13 Water Supplies:- Water supply is deficient in Bhaba Nagar, Katgaon, Kilba, Malling, Moorang, Nichar and Pooh, Ranges. Water supply though available at Divisional / Kalpa Range Head Quarter yet, it requires proper maintenance. This should be ensured by constructing a spacious overhead tank which may supply water to office and forest colony at Shudarang apart from Inspection Hut at Kalpa and Reckong Peo. Similarly, the water supply needs to be strengthened at Shongthong Forest Rest House by taking the water from adjoining source.

XI+2.14 Rain and Snow Gauges:- Rain and snow gauges are available in Nichar, Katgaon, Kilba and Kalpa Ranges of this Division. These gauges need to be repaired. The rain and snow gauges should also be maintained at Tranda, Sholtu and Shongthong. The rain and snow gauges are required to be installed in other Ranges too. It is, also, recommended that Rain and Snow gauges should be installed at Divisional Head Quarter at Reckong Peo

XI+2.15 Timber for Right Holders:- Right holders requirements of timber are increasing manifold, day by day, in view of the general rise in the standard of living. As far possible, local demands of timber will be met with from the salvage trees as per H.P. Govt. Notification No. FFE-B-A (3) 4/2015 Dated: Shimla -2, the 26 February, 2016 under Himachal Pradesh (Timber Distribution to the Right Holders) Rules, 2016, in exercise of recorded rights. The trees for agricultural implements, repairs of water channels, and other ceremonial purposes will be allowed as per settlement regulations in such a way that these species are not ruthlessly exterminated. The detail grant of timber have also been discussed in the Chapter-I, Part-I.

XI+2.16 Forest Rights and Duties:- The bartans are subject to the condition that bartandars will be responsible for the protection of the forests in which the bartans are exercised i.e. they are responsible that no trees are felled without permission and the forests are protected against fire. In case of failure, the rights can be curtailed or suspended. Another condition attached with bartans is that, the forests whether demarcated or un-demarcated cannot be burnt to get fresh growth of grass. Grazing, grant of timber, lopping & collection of minor forest produces are some of the important bartans admitted in the settlement report. This excellent rule has gone a long way in preserving forest wealth of this tract, if sincerely, to be followed by the field functionaries.

In view of the Hon'ble court it has been pointed out that "right and duty co-exist. There cannot be any right without any duty and there cannot be any duty without any right" Our Constitution lays down the fundamental duty of every citizen "to protect and improve the natural environment including forests, lakes, rivers and wild life and to have a compassion for living creatures". A feeling should be generated in them that there should be decreased dependence on the forests and encourage them to avail acceptance of the alternatives. It is a social obligation and get let every citizen be reminded that it is his fundamental duty.

The Hon'ble High Court has also further pointed out that there is no right to claim compensation by means of filing writ petition. When a person performs his duties and unfortunately suffers injury or dies, it is, for the State to decide, whether, it should grant adequate compensation to its citizen or not.

XI+2.17 Person Bound to Assist Forest Officer:- Section 79 (1) of the Indian Forest Act, 1927 makes obligatory on every person, who exercises any right in a reserved or protected forest or who is permitted to take any forest produce from forest or Govt. employee shall be bound to furnish without un-necessary delay to the nearest Forest Officer or Police Officer any information with respect to any commission of forest offence, and shall forthwith take steps, whether so required by Forest Officer or Police Officer or not:-

- a) To extinguish any forest fire in such forest of which he has knowledge or information;
- b) To prevent by any lawful means in his power any fire in the vicinity of such forest of which he has knowledge or information from spreading to such forest, and shall assist any Forest Officer or Police Officer demanding his aid.
- c) In preventing the commission in such forest of any forest offence and when, there is reason to believe that any such offence has been committed in such forest in discovering and arresting the offender.

And any violation of the provision of this Section is punishable under Section 79(2) with imprisonment for term which may extend to one month, or with fine which may extend to two hundred rupees or with both.

Therefore, field functionaries/staffs must take action accordingly so that the object of fundamental duty could be achieved.

XI+2.18 Timber as Free Grant:- The right holders are entitled to grant of trees free of cost for the sake of marriage ceremonies, agricultural implements and religious ceremonies, after obtaining prior permission from the Forest Department. However, free grant of timber for cremation of the dead is permitted and permission of the department is not required and the information of trees so cut or remove is to given within 15 days to the Forest Guard concerned. Resultantly, these days right holders are misusing this practices and trees are felled after cremation of the dead body and use the same for building purpose.

The liberal rights and concessions are admitted in the Forest Settlement Report, 1921. These rights including timber for temple have not been touched upon by the State Govt. in its notification dated 2-1-2010 and would remain to be exercised as they were in the past. For the regulation of grant of wood and avoid of misuse of rights in present system vogue in the department, trees shall be divided into two classes; the first class species of trees must be declared as reserved under Section 30(a) of IFA, 1927 and the second class containing all other species. The trees of second class may be granted by the Range Officer so long as these are not used for building purposes of any kind, whatsoever, and where trees of second class are available, unsound or malformed or crooked trees of the 1st class with the exception of listed second class species can be granted. However, for actual burning of dead, a sufficient quantity of wood from the listed second class species trees may be cut without being first marked provided that the notice is given to local forest official within ten days.

Therefore, Divisional Forest Officer to take up necessary steps, with the Government for the same purpose and may notify the rules and notification under Section 30 (a) of Indian Forest Act, 1927. Similarly, the rules applicable to the un-classed forests i.e. other than DPF under Section 76 of the Indian Forest Act, 1927 may be notified in public interest, so that, the forest resources shall be used or removed in such a way that the resources are perpetuated and not endangered.

XI+2.19 Grazing:- The problem of grazing is very important because it has far reaching effects on forest growth and land and water conservation. There is on one hand, the problem of local Zamindars and on the other, of outside professional graziers like Gujjars and migratory graziers. In order to, reduce the incidence of grazing all forms of grazing by the animals of the professional graziers should be restricted as per the provision of Settlement Report so that more grazing grounds are available for local Zamindars.

It is essential to close effectively, plantation, and regeneration areas in immediate vicinity of villages. But, as the closures are the resented and lead to incendiarism, it is advisable to restrict them to the minimum essential area and time necessary for establishment of plantation and regeneration. Not more than 30% of the area should be closed at a time to avoid causing resentment and hardship to local graziers. The closure should not be more than 10-15 years at a time. Cattle should be admitted as soon as the young plants are established. All closed regeneration areas near villages must be fenced effectively. The grazing requirement of livestock of villages located in and around forests should be addressed within the carrying capacity of forest areas.

XI+2.20 Closure Notifications:- This has been discussed in detail in every Working Circle and suggested that the notification for such closure should be got issued under Section 30 (b) of Indian

Forest Act, 1927. The area will have to be closed for grazing/lopping till the regeneration is established.

XI+2.21 Lopping:- Lopping especially of coniferous species of trees has caused wide spread damage in the past. The forests close to the habitations have suffered on this account. Strict control has to be exercised to curtail this right within the permissible limit. Local communities need to be made aware of the impact of their consumption on forest resources. Persons requiring the fuelwood could obtain by lopping their requirements as per the norms of Forest Settlement Report, 1921. Heavy and indiscriminate lopping of Deodar during Rainy season makes Deodar susceptible to attack by *Fomes annosus* fungus. In blue pine heavy lopping results in attack by beetle *Pityohenus scitus*. Severe attack by this beetle make tree dry within 6-7 months. Heavily lopped Chir- pine trees of diameter 28-57 cms are susceptible to infestation by destructive bark borer *Polygraphus longifolia*. The sale of fuelwood head loads from forests by individual sellers particularly **Gorkhas** in Peo Township must be stopped. Similarly, lopping of forests beyond the prescribed limit as per the provision of Forest Settlement Report must stop and violation of cases not to be compounded and be treated as forest offence under Section 33 of Indian Forest Act, 1927. Alternative source of fuelwood especially LPG connections need to be provided at free of cost and subsidized rates to forested region area depending upon their economic conditions of the local people. The local residents should be encouraged to take the fuelwood from fuelwood sale depot of this Division. Similarly there should be policy of the State Govt. for providing free electricity in rural areas for domestic purpose and solar energy also needs to be given a much greater attention to reduce the biotic pressure from forest biodiversity.

XI+2.22 Fire Protections:- Forest fires are very frequent in low lying area of this division. Most of these fires incendiary, started by villagers to get new flush of green grass. The worst to suffer are the coniferous forests, where regeneration is damaged by such fire. The detail of fire protection measures has been described in Chapter No. IX and taken care of accordingly. The budgets under fire lines and controlled burning should be demanded regularly, so as to maintain fire lines, engage fire watchers in the fire prone areas. Publicity and Extension for education of local population regarding fire protection etc. should also be done. While on tour, the DFO and his staff should personally contact villagers and Panchayats members and try to convince them, inter-alia, about the harmful effects of forest fires and gravity of forest offence under the Indian Forest Act, 1927 and IPC. Other fire preventive measures have also been discussed in Chapter-IX, Part-II.

XI+2.23 Encroachments:- Encroachments / Unauthorized Occupation of Forest Land are common throughout the Division. All categories of forests are affected with this menace but there have been large scale encroachments in the garb of Nautor and enactment of Forest Rights Act, 2006 {Scheduled Tribes & other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006}, almost all UPFs or other land in absence of proper demarcation and record of such areas. Boundary pillars have been displaced and the forests have been converted into orchard and agricultural fields. Many of the boundary pillars in DPFs have been shifted, washed away or removed from their original position in adjoining to cultivated private land. This should be looked into priority. It is important to note that included cultivation as identified during the Glover's Forest Settlement, 1921, in the demarcated protected forests have not been properly delineated and proper record of such lands have not been maintained by the forest department. These cultivations have increase in area through encroachment over a period of time and trees adjoining have been removed through griddling and consequent drying etc, there is an urgent need for proper demarcation of land from competent revenue authority and reconciliation with revenue record. As per remarks given in compartment history files by the WPO/AWPO in respect of encroachments, the legal action should

be initiated and forest lands should be liberated from unauthorized possession. Other encroachment preventive measures have also been discussed in detail in Chapter-IX, Part-II.

XI+2.24 Illicit Felling, Illegal Mining and Poaching:- The preventive and control mechanism under the various Act has been discussed in detail in Chapter-IX, Part-II so no detailed recapitulation is necessary. DFO should make it a point to get a certificate from field staff on monthly basis and plan the combat of forest offences under the Act. The various forests have been categorized as sensitive forest depending upon the frequency of illicit felling cases that occurred in the past is given in the Table No. XI+2.5.

Table No. XI+2.5

Range wise list of forests prone to illicit felling in Kinnaur Forest Division

Sr. No	Name of Range	Name of sensitive Forests	Compartment No. (Old)	Compartment No. (New)	Area in Hac.
1	Bhaba Nagar	Nil			
2	Kalpa	Telangi	C-239	143	192.63
		Putka	NC-23	185	114.96
		Chini	UF 33	15	225
		Kashang-I	C-234(a)	138 (a)	87.00
		Kashang-I	C-234(b)	138 (b)	79.72
		Kashang-I	C-234 ©	138 (c)	26.71
		Telangi	C- 240 (a)	144 (a)	74.46
		Chini	C242	146	162.68
		Runang	C-248 (a)	152 (a)	74.46
		Runang	C-248 (b)	152 (b)	63.53
		Eula Miru II	C-250	154	3.24
		Yulla-Miru-III	C-251	155	7.28
		Yulla-Miru-IV	C-252	156	38.04
		Gunshanang	NC-26	188	141.76
		Tharu	NC-28	190	286.38
		Kashti	NC-29	191	121.98
3	Katgaon	Nil			
4	Kilba	Limsanthang	C-154 (b)	60 (b)	35.60
		Rukti Hurba	C-156	62	177.25
		Chansu	C-152 (b)	58 (b)	75.7
		Chidu	C-153	59	144.88
		Bassaring	C-157	63	234.72
		Seringche	C-162 (a)	66 (a)	42.49
		UF-160			4007.74
		Barang	C-170 a	74 (a)	55.04

		Barang	C-170 b	74 (b)	23.88
		Ralli	C-167	71	260.60
		Sapni	C-143	49	55.45
		Sapni	C-144	50	17.80
		Baturi	C-146	52	36.00
		Shoang	C-151 (b)	57 (b)	147.3
		Baturi	C-148	54	39.65
		Tikru - Wasankan	C-138 a	44 (a)	75.70
		--do--	C-138 b	44 (b)	50.60
		Punang	C-134 a	40 (a)	66.75
		Punang	C-134 b	40 (b)	48.95
		Junpan	C-137 (a)	43 (a)	34.4
		Junpn	C-137 b	43 (b)	60.30
5	Malling	Nil			
6	Moorang	Kirarng	C-225	129	62.32
		Rirang	C-223(a)	127 (a)	36.83
		Kirarng	C-223 (b)	127 (b)	147.71
		Jangi	C-226	130	209.22
		Rirang	C-222(a)	126 (a)	78.10
		Rirang	C-222 (b)	126 (b)	80.94
7	Nichar	Nil			
8	Pooh	Nil			

XI+2.25 Communication Network:- Under present circumstances, the huge network of roads exists in the Division and to cope up with nefarious smuggling of timber, the field staff should have improved communication system. In this respect, it is proposed that all the Range Officers, Block Officers and Forest Guards be provided patrolling vehicle at range level and mobile phones or telephone so that the system can work more efficiently to combat the illicit felling, poaching and halted the encroachment on forest land etc.

XI+2.26 Geo-Referencing in Forestry Operations:- Geo-referencing is the process of scaling, rotating, translating and desk wing the image to match a particular size and position. The word geo-reference was originally used to describe the process of referencing a map image to a geographic location. Geo-referencing, is thus, imperative to data modeling in the field of geographic information systems (GIS) and other cartographic methods.

Geo-referencing is crucial to making aerial and satellite imagery, usually raster images, useful for mapping, as it explains how other data such as the GPS points relate to the imagery. Very essential information may be contained in data or images that were produced at a different point of time.

Keeping in view the importance and imperativeness of geo-referencing, Govt. of India, MOEF vide D.O. No. 13.5/2010-FC dated 11-9-2012 has directed that all the forestry operations in the State should be geo-referenced henceforth and the department will comply with the directions.

XI+2.27 Research and Sample Plots:- The sample plots were identified during the British period and after that one sample plot in Kalpa Range above Boktu farm was also identified but the same are now in neglected state in this Forest Division. Similarly, the existing HFRI sample plot at Annodan near Barang in Kalpa Range should also be maintained in proper condition. A sample plot for Deodar may also be laid in C-5 (b) near FRH Tranda. The necessity of laying out such plots needs no emphasis and the Divisional Forest Officer should select suitable areas and request the State Silviculturist to lay them properly.

XI+2.28 Preservation Plots:- No preservation plots exist in the area at present. In view of the necessity for laying out preservation plots of important species, the Divisional Forest Officer should select suitable areas and request the State Silviculturist to lay them properly. As suggested in the plan under revision, in Para No 16.11, 25 hac plot in section X of DPF 73 and 25 hac plot in section of VII of DPF 74 (c) is important from biodiversity point of view and are recommended for being kept as preservation plot. Divisional Forest Officer should request to lay them properly.

XI+2.29 Roads, Paths & Buildings:- Efficient management of forests is not possible in the absence of good roads & paths. Regeneration forest protection and other forest improvement works cannot be effectively carried out or supervised or control against smuggling or poaching in case the forests are not connected with good inspection path and jeep-able road. The existing roads and paths are detailed in **Appendix No-XXXVI** these will be maintained. A large network of roads and paths has been constructed during the past in the area by HPPWD and forest department, but there still needs more construction of motor-able road in the forest area. To avoid duplication the Public Works Department and Block Agency should be invariably consulted so that an integrated approach to the road construction work becomes possible under the prior permission of the Govt. of India under Section 2 of Forest (Conservation) Act, 1980 and Forest Rights Act, 2006 {Scheduled Tribes & other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006}. DFO must ensure that no works related to non-forestry activities should be allowed to be taken up on forest land.

The present buildings i.e. residential accommodations and inspection huts/rest houses are available for subordinate and protection staff and also for inspecting officers at most of the places. Still some of the localities lack this facility and therefore, the following buildings are proposed to be constructed. DFO may modify this according to administrative needs during the currency of the Plan. The proposed new buildings are tabulated in the Table No. XI+2.6

Table No. XI+2.6
Proposed New Buildings

Sr. No.	Name of Range	Name of Beat/Block	Name of Building	Location	Type of building
1.	Bhaba Nagar	Bhaba Nagar / Bhaba Nagar	Inspection Hut	<u>Bhaba Nagar</u>	III
		Bhaba Nagar / Bhaba Nagar	Store	<u>Bhaba Nagar</u>	-
		Rupi / Bhaba Nagar	Fgd Hut	Rupi	II
2	Kalpa	Pangi / Kalpa	C/o I/hut at Pangi	Pangi	III
		Kalpa / Kalpa	C/o Tracker hut at Chaka Kanda	Kalpa	I
		Barang / Shongthong	C/o Glass House at Shongthong	Shongthong	-
		R/Peo / Kalpa	C/o Type I Qtr. = 2 Nos. at R/Peo	R/Peo	I

		R/Peo / Kalpa	C/o Type II Qtr. = 2 Nos. at R/Peo	R/Peo	II
		Roghi / Kalpa	C/o Fgd Hut at Roghi	Roghi	II
		Kalpa / Kalpa	C/o Chowkidar Qtr at Kalpa	Kalpa	I
		Barang / Shongthong	C/o Chowkidar Qtr at Shonthong	Shongthong	I
		Kalpa / Kalpa	C/o Store at Kalpa	Kalpa	-
		R/Peo / Kalpa.	C/o Fuelwood Depot Store.	R/Peo	-
3	Katgaon	Kafnoo / Katgaon	B.O. office cum residence.	Katgaon	II / III
		Nathpa / Katgaon	Fgd Hut	Nathpa	II
		Kafnoo / Katgaon	Store	Katgaon	-
4	Kilba	Kilba / Kilba	C/o Range Office Cum Residence at Kilba	Kilba	III
		Sangla / Seringcha	C/o Fgd hut at Seringcha	Seringcha	II
		Sangla / Rakcham	C/o Fgd hut at Rakcham	Rakcham	II
		Karchham/ Ralli	C/o Main Store N.H- 5 Near Ralli Nry	Near Rally Nursery	-
		Karchham/ Ralli	C/o Tracking Hut / Inspection Hut at Meber	Meber	III
		Sangla / Sangla	C/o B. O. Qtr at Sangla	Near FRH Sangla	II
		Kilba	C/o Chowkidar Hut at Kilba	Near Range office Kilba	I
		Sangla	C/o Tracking Hut at Sangla Kanda	Sangla	II
		Chansu	Fuel wood store at Kuppa	Kuppa	-
5	Malling	Leo / Hango	Fgd Hut	Hango	II
		Leo / Leo	Fgd Hut	Leo	II
		Leo / Leo	Chowkidar Qtr.	Leo	I
		Malling	Fgd Hut	Malling	II
		Malling / Chango	Fgd Hut	Chango	II
		Malling	Fgd Hut	Sumra	II
		Malling	Chowkidar Qtr.	Malling	I
		Malling / Chango	Chowkidar Qtr.	Chango	I
6	Moorang	Jangi	Chowkidar Qtr	Near Range Office	I (2 nos.)

		Jangi	Inspection Hut Lippa	Near Fgd hut Lippa	III
		Jangi	C/o Toilet.	Near Range office Moorang at Akpa	-
		Ribba	FRH Kunu Charang	Kunu Charang	III
		Ribba	Fgd Hut	Ribba	II
		Ribba	Mali Hut	Near Ribba Nursery	I
		Jangi	Mali Hut	Near Lippa Nry	I
		Jangi	FRH	Nesang Village	III
7	Nichar	Bari / Sungra	I/ Hut	Bari	-
		Nichar / Nichar	Store	Nichar	-
		Nichar / Nichar	Fgd Hut	Near Nichar Nry	II
		Panvi Nichar	Fgd Hut	Panvi	II
8	Pooh	Kanak / Kanam	Fgd Hut	Kanam	II
		Pooh / Pooh	Fgd Hut	Pooh	II
		Pooh / Pooh	Range Store	Pooh	-
		Pooh / Dubling	Multi purpose store	Dubling Nry	-
		Kanam / Giabung	Gang Hut	Giabung	-
		Pooh / Pooh	Fuel wood Depot Chowkidar Hut	Near Fuel wood Depot	I

XI+2.30 Ban on Green Fellings:- The Govt. of HP had imposed a complete ban on green fellings for the year 1993-94 in high conifer forests. This resulted in complete stoppage of regeneration fellings and thinning. The ban has since been lifted by a cabinet decision during 1997, yet due to an order of the Hon'ble Supreme Court of India in CWP No. 202 of 1995 titled as T.N. Godavarman v/s Union of India dated 12-12-1996 and 14-2-2000 and there remains a complete ban on green felling till date. The detail of felling in Govt. forests has been discussed in Chapter-I, Part-II and may continue to be followed till the disposal of affidavit filed by the H.P. Govt. before the Hon'ble Supreme Court of India.

XI+2.31 Land Bank:- The land bank so identified shall be surveyed demarcated and declared as Protected Forest under the provision of Chapter-IV of Indian Forest Act, 1927. This has been discussed in detail in Chapter-VII, the plantation (Overlapping) Working Circle.

XI+2.32 Diversion of Forest Land:- The Forest land cannot be diverted to any non forestry use without prior approval of Govt. of India under Forest (Conservation) Act, 1980. The Hon'ble H.P. High Court has also taken a serious note of violation of FCA, 1980 in the Contempt Petition No. 56/2009 titled as Kuldip Singh Chauhan V/S Balbir Thakur and others dated 28-8-2009 and has directed not to undertake the construction of any road in the forest area without the mandatory permission under the FCA, 1980. Therefore, field must ensure that no work related to non forestry

activities should be allowed to be taken up without prior approval of Govt. of India under FCA, 1980 and in terms of the Supreme Court's order dated 12-12-1996.

XI+2.33 Non-Timber Forest Produce:- Right holders have recorded rights to collect fruits, edible seeds, medicinal roots leaves, and roots for the preparation of dyes and honey for their own use for domestic purpose and sale of forest product free of cost under the provision of Forest Settlement Report, 1921. The export of NTFP is regulated under the Himachal Pradesh Forest Produce Transit (Land Routes) Rules, 1978. No species are allowed to extract from the prescribed area which has not been approved in extraction cycle by the competent authority. The extraction of NTFP shall be done in a sustainable manner and so as not to cause any ecological or environmental damages. Micro planning should be undertaken by the Divisional Forest Officer with consultation of HFRI Shimla to conserve, manage, scientifically harvest and sustainable utilize medicinal plants found in forest areas. There is a great scope for growing medicinal plants on private agriculture holdings, which would require the supply of plants, marketing assistance and technical inputs at least in the initial stages and this can be met from the Agriculture, Ayurveda departments as well as forest department. The detail of NTFP extraction, collection, export and right holders requirements have been discussed in detail in Chapter-VIII, Part-II.

XI+2.34 Saw Mill and Depot:- In Kinnaur Forest Division, there are 70 nos Saw Mills registered. Few saw mills are functional and some are non functional. The Hon'ble Supreme Court of India in T.N. Godavarman v/s Union of India dated 16-11-2002 held that no state or Union Territory shall permit any unlicensed Saw Mills, Veneer, Ply wood industry to operate and they are directed to close all such unlicensed unit, forthwith, no state or Union Territory will permit the opening of any Saw Mills, Veneer, Plywood industry without prior permission of the Central Empowered Committee. The Chief Secretary of each state will ensure strict compliance of this direction. There shall also be no relaxation of rules with regard to the grant of License without previous concurrence of the Central Empowered Committee. In compliance of Hon'ble Supreme Court order, no saw mills are being registered under the provision of H.P. River Rules, 1971.

The following guidelines/instructions are issued for shifting and or change of ownership of the existing licensed saw mills:-

- i) Where change of location of the existing license saw mill is not involved, change of ownership in case of inheritance or purchase of the saw mill shall be allowed by the DFO concerned.
- ii) The cases of shifting of existing licensed sawmills including change of ownership (whether inheritance or through purchase) within the same Forest Division shall within the same circle by Conservator of Forests concerned, from one division to another from the jurisdiction on one circle to another shall be allowed with the prior approval of the Principal CCF HP.
- iii) Cases regarding change of ownership and /or shifting of other wood based industries will be decided by the Principal CCF, HP.

Provided that:-

- i) The shifting of sawmills shall not be allowed in a routine manner, but only after examining the merit of each case.
- ii) The parameter/conditions applicable for registration of new sawmills shall be fulfilled in case of shifting also.
- iii) In no case, the capacity of the unit shall be allowed to be enhanced.
- iv) The cases in which the process for shifting and / or change of ownership of sawmill was started as per the prevalent instructions prior to clarification conveyed by the Law

Department vide Principal Secretary (Forests) to the GoHP letter No. FFE-B-E (3) 10/2005 dated 27th August, 2005 shall be decided by the competent authority on merit of each case as indicated above in para 2.

- v) The above instructions regarding shifting of saw mills shall not be applicable on the unlicensed sawmills allowed to be registered by the CEC vide its proceedings dated 31.03.2008 as the same were allowed to be registered on specific conditions.
- vi) As per proceeding dated 31.03.2008 of the Central Empowered Committee no new license for any saw mill or wood based industry shall be issued till specifically allowed by the CEC.

Depot is being registered under the provision of H.P. (Sale of Timber) Act, 1968 as conveyed by Conservator of Forests Rampur vide office memo No. 2890 dated 3-8-2007. The definition of depot is given in para 2 (ii) of H.P. (Sale of Timber) Rule, 1969 under which “depot” means any building or place where timber is brought or stored for sale, as it is or processed through sawing or any other method/process. Furniture manufacturing involves storing and processing of wood for manufacture of furniture hence any units/shops involving in storing and processing of wood of manufacture of furniture would also come under the meaning of “depot” and required to be registered under the HP (Sale of Timber) Act, 1968 and governed under the rules made there under. However, shops procuring and selling readymade furniture only, and not modifying/ processing timber for manufacture of furniture would be exempted from the provisions of the above Act.

Regarding Registration of Timber Fuel wood Depots Pr. CCF vide Letter No. Ft-20-17/77 (s) 16-10-98 has given the following guidelines for future management of the depots.

- i) No new private sale depot shall normally be registered in future and in case of demand, HPSFDC Ltd. may be requested to open the depot. However, in Notified Area Committees and Municipal Committee areas, the request for opening of timber, fuelwood and charcoal depot may be considered by C.F. on merit after ascertaining quarterly demand based on facts and going through supply from existing depot, if any.
- ii) The depots which have carried-out any transaction in past two years may not be renewed.
- iii) A clause should be added in the registration deed that depot can be cancelled by registering authority to the relevant rules / guidelines etc.
- iv) If at a particular place depots of HPSFDC Ltd. exists, then in future private sale depot may not be allowed within a radius of 15 Km. In case, any depot holder is found violating the provisions of H.P. (Sale of Timber) Act, 1968, Indian Forest Act, 1927 and other Acts and Rules, the action should be initiated as per as per Rules, / Instructions on the subject.

Regarding registration of Imported Timber Sale Depot, HP Government vide letter No. FFE-B-F (15)-1/2008-Vol-1 dated 24-7-2012 has accorded permission that Imported Timber Sale Depots will be opened in urban/semi urban/rural areas taking into account the demand of people. As a result of this decision, there will be no restriction of opening of Imported Timber Sale Depot. Only Imported Timber will be purchased or sold by the registered depot under the H.P. (Sale of Timber) Act, 1968.

XI+2.35 Felling in Private Areas:- In Kinnaur Forest Division, the private areas also bear good tree growth both in compact patches and in the cultivated fields along the boundaries of forest. The main economic species are Deodar, Kail, Spruce, Fir etc. In pursuance of H.P. Govt. Order No. FFE-B-A (3) 4/99 dated Shimla-2, the 10th September, 2002 in District Kinnaur owner can fell trees upto three trees of coniferous (except Chil trees) and in case of Chil and other trees 5 trees each year without permission for their bonafide domestic and agricultural use, up to 10 trees with written

permission of the Range Officer concerned and more than 10 trees with written permission of the Divisional Forest Officer concerned. There will be no restriction on the number of trees to be felled for purposes of bonafide domestic uses of fodder and fuel. There shall also be no prohibition or restriction on felling of species of trees of Poplar, Eucalyptus, Albizzia, Bahunia, Willow and Mulberry.

Provided further that the trees for sale shall be felled in accordance with the 10 years felling programme approved by the State Govt. and in compliance of the Supreme Court's order dated 12-12-1996 and 8-5-2009.

The felling of trees in private forests in State of Himachal Pradesh, the Apex Court order dated 8-5-2009 held that felling of trees from the forest area approved for non forestry use under Section 2 of the Forest (Conservation) Act, 1980 may continue to be permissible.

Compact wooded blocks of above 5 hac. which are otherwise not notified/recorded as forest, should be treated as "forests" for the purpose of the Forest (Conservation) Act. Felling of trees and non forest use of such areas should be permissible only after obtaining approval under the Forest (Conservation) Act, 1980. Thus, where the land in question recorded as Van/Bani/Vani or Jungle in revenue record felling should be permissible under Forest (Conservation) Act, 1980 only.

Felling of trees in non forest areas should be strictly regulated as per the provisions of the H.P. Land (Preservation) Act, 1978.

XI+2.35.1 H.P. Land Preservation Act, 1978:- It is notified for the information of all concerned and interested that the Ten years Felling Programme for the felling of trees except bamboos for sale from private lands within the jurisdiction of Kinnaur Forest Division framed under provisions of Section 4 of H.P. Land Preservation Act, 1978 and approved by H.P. Govt. vide letter No. Fts (F) 13-30/89 D/sala) dated 13/7/89 from Deputy Secretary (Forests) to the Govt. of Himachal Pradesh Shimla-2 addressed to Pr.CCF H.P. Shimla-1.

Ten year felling programme in respect of Kinnaur Forest Division w.e.f. 2019-20 to 2028-29 is tabulated in Table No. XI+2.7.

Table No. XI+2.7
Ten year felling Programme in respect of Kinnaur forest Division w.e.f. (2019-20 to 2028-29)

S.No	Year	Name of Range	Name of Block	Name of Beat
1	2019-20	Nichar	Nichar	Nichar
				Panvi
				Kaksthal
2	2020-21	Nichar	Sungra	Bari
				Sungra
		Bhaba Nagar	Bhaba Nagar	Bhaba Nagar
3	2021-22	Nichar		Thach
		Nichar		Tranda
		Bhaba Nagar	Bhaba Nagar	Chaura
4	2022-23	Bhaba Nagar	Sholtu	Sholtu
		Bhaba Nagar		Jani-Ramni
		Katgaon	Katgaon	Katgaon
				Nathpa
5	2023-24	Kilba	Kilba	Punang

				Kilba
		Katgaon	Katgaon	Musarang
				Yangpa/Shango
6	2024-25	Kilba	Karchham	Sapni
				Shong
				Rally
7	2025-26	Kilba	Sangla	Chansu
				Sangla
8	2026-27	Kalpa	Kalpa	Pangi
				Kalpa
				Reckong Peo
				Roghi
9	2027-28	Kalpa	Shongthong	Shongthong
				Tangling
				Purbani
10	2028-29	Kalpa	Urni	Runang
				Urni
				Tapri

XI+2.35.2 Punishment for Offences:- Section 16 provides that any person who, within the limits of any area notified under Section 3 commits any breach of regulation made, restrictions or prohibitions imposed, order passed or requisition made under section 4,5,6 or 9 or obstructs/resists in any way, whatever, the execution of the acts or things done under section 10 shall be punished with imprisonment for a term which may extend to 6 months or with a fine which may extend to rupees 500/- or with both. Section 7 provides that every order made under Section 4, 5 or 6 shall be published in the official Gazette and shall set forth the State Government is satisfied, after due inquiry, that regulations restrictions, prohibitions or directions contained in the order are necessary for the purpose of giving effect to the provision of the Act. The Forest Officers also have powers to take cognizance of offences in such areas as per the provisions of Section 52,54 to 62, 64, 66 and 73 of Indian forest Act, 1927 under Section 17 and to compound such offences under Section 19 of the Act.

XI+2.35.3 Forest Produce (Regulation of Trade) Act, 1982:- The provision of H.P. Forest Produce (Regulation of Trade) Act, 1982, regarding regulation of the trade of forest produce, no owner of forest produce shall sale of any forest produce to a person other than the State Govt. or the agent appointed under Section 3 of the Act and no person other than the State Govt. through its authorized officer or agent i.e. H.P. State Forest Corporation appointed under Section 3 shall purchase forest produce specified in the schedule annexed to this Act from any owner under Section 4 of the Act. Forest produce purchased by the State Govt. through its authorized officer or agent shall be sold or otherwise disposed of in such manner as the State Govt. may direct. “Forest Produce” means trees of any of the species standing, felled or otherwise fashioned, specified in the scheduled annexed to this Act and any other produce declared as such by the Govt. from time to time by a notification published in official Gazette. Contravention of any of the provision of this Act shall be punishable with imprisonment which may extend to one year or with fine which extend to five thousand rupees or with both and the forest produce in respect of such contravention has been made shall be forfeited to the Govt. under Section 12 of the Act or to compound such offences under

Section 15 (4) of the Act provided that no case shall be compounded by any authority competent to compound without providing for the forfeiture of the forest produce involved in the said case to the government in lieu of prosecution for the offence.

XI+2.35.4 Forest Produce Transit (Land Routes) Rules, 1978:- The provisions of H.P. Forest Produce Transit (Land Routes) Rules, 1978, regarding transport/export of forest produce, shall apply to the forest produce obtained from such areas also. The Rules regarding registration of property mark(s), issue of export/transport pass, issue of challans etc. should be strictly enforced. Contravention of these rules is punishable to imprisonment for a term which may extend to 6 months or with a fine which may extend to rupees 500/- or with both. The penalties will be doubled in cases where the offence has been committed after sun set or before sun rise, or after resistance to the lawful authority or where the offenders have been previously convicted for an offence.

In the year 1991 all restrictions were removed on felling of following six species vide notification No. fts. (a)3-1/84 Part dated 8/2/1991.

- i. Popular
- ii. Eucalyptus
- iii. Albizzia
- iv. Bauhinia
- v. Willow
- vi. Mulbury

Accordingly, felling of these species does not attract the provisions of H.P. land Preservation Act, 1978 and the forest department has little control over the felling and transport/export of the produce obtained there from.

Since the management of the private area is not the concern of forest department neither there can be any prescription for these areas nor can be yield from these areas be regulated /controlled in the plan. However, the following two broad objectives should be kept in mind while implementing the legal provisions in respect of fellings from private areas:-

- i. The overall impact of the felling should not lead to the environmental degradation of the area.
- ii. There should be no damage to the govt. forests of adjoining area because of the negligence of the staff of forest department as well as revenue department.

In order to safeguard above two objectives following guidelines may be followed:-

- i. Marking rules for the marking of various species should be strictly adhered to.
- ii. The provision of planting three plants in lieu of every tree felled should be strictly adhered to. The registration of the person who does not comply with this provision should be cancelled.
- iii. All legal provisions on the subject should be strictly implemented at the time of marking/demarcation, felling and transport/export of the forest produce.
- iv. The felling of six species as notified by the Govt. notification dated 8-2-1991 on which there are no restrictions under Section 41/42 of the Act, however, the transport/export permit should be made compulsory. This will help in ensuring that there is no illicit felling of these species from the Govt. forests.

XI+2.36 Punishment for Offences:- Section 14 provides that if any persons contravenes any of the provisions of this Act or the Rules made there under, he shall be deemed to have committed a forest offence and the resin or resin products, if any, in respect of which such offence is committed shall in, relation to the commission of such offence be deemed to be forest produce and the provisions of chapter-IX of the Indian Forest Act, 1927. Section 16 further provides that no court shall take cognizance of any offence punishable under this Act except on a report in writing of the facts

constituting such offence made by a forest officer not below the rank of Forest Ranger or any officer authorized by the State Govt.

XI+2.37 Watershed Management:-Water is one of the most important factors in increasing productivity and forests play an important role in maintaining sustained supply of water in the rivers, nalla and streams for irrigation, drinking, Hydro Electric Projects and various other uses. Water conservation in forests, therefore, deserves special attention and special emphasis should be given on water conservation and water harvesting etc. Water shed management is the priority approach to ensure the land and water resources for sustainable management and to enhance the livelihood of the rural inhabitants. The essence of water shed development programme is proper use of land and water from ridge to valley. The aim of the water shed development programme is to conserve and manage the area, land and water so that the basic need of local people like food, fodder and water are met in sustainable and socially just manner and also to reduce the damaging impacts of soil erosion.

It is essential that not only intensive effort are made to protect and improve the forest in the catchment but also, there should be judicious, reasonable and planned use of forest and other Natural resources in the area. The Government of H.P. has committed to preservation of natural resources and also to increasing the productivity of rural areas through Integrated water shed management. Water shed management is the priority approach to ensure the land and water resources for sustainable management and to enhance the livelihood of the rural inhabitants.

XI+2.37.1 Objectives of Watershed Management:- The main Objectives of the watershed management are:-

- i) **Reduce the damaging impacts of soil erosion:-** It is essential to harvest rain water for the purpose of irrigation, plantations, including horticulture and floriculture, pasture development, fisheries etc. to create sustainable sources of income for the village communities as well as for drinking water supplies.
- ii) **Improve capacity of natural source of water:-** Ensuring overall development of rural areas through the Gram Panchayats and creating the regular sources of income for the Panchayat from rain water harvesting and management.
- iii) Restoring the ecological balance by harnessing, conserving and developing natural resources i.e. land, water, vegetative cover especially through plantation.
- vii) Mitigating the adverse effects of extreme climatic condition such as drought and diversification on crops, human and livestock population for the overall improvement of Catchment areas.
- viii) Encouraging village communities toward sustained community action for operation and maintenance of assets created and for development of potential of natural resources in the water shed.
- ix) Promotion and propagation of non-conventional energy saving devices, energy conservation measures, bio-fuel plantation etc.

XI+2.37.2 Causes of Watershed Management:-

a) **Geological Erosion:-** Geological soil erosion represents the erosion of soil in its natural state. Semi-arid and arid soil, which lack protective plant cover, may erode naturally. This erosion takes place at such a slow pace that a balance is always maintained between soil lost by erosion and soil formed from parent material. As far as, effect on agricultural lands is concerned geological erosion is not of much consequence. It is responsible for wearing of hills and mountains and is the cause of various land features such as existing canyons, stream channel and valley etc. Geological

erosion is caused mainly by the action of water, wind, temperature and is responsible for soil formations and their distribution on the earth's surface.

b) Accelerated Erosion:- When the natural balance is disturbed by human activities, large scale deforestation or leveling of field for cultivation, the process of erosion is increased manifolds. This rapid erosion as a result of human interference is referred to as accelerated erosion or abnormal erosion. This depletes the soil fertility in agricultural lands. The various forces involved in accelerated erosion are.

- Attacking forces –
- i) Which detach and transport the soil particles.
 - ii) Resisting forces- Which resist erosion.

- c) Forms of Erosion:-**
- i) Rain drop erosion.
 - ii) Sheet erosion
 - iii) Rill erosion
 - iv) Gully erosion
 - v) Stream erosion
 - vi) Land slide/land slip erosion.

Of the five major river basin in Himachal Pradesh, Satluj basin has the highest potential of producing electricity 9227 MW. To harness this vast potential, several HEP, on river Satluj and its tributaries have been identified and constructed. During the plan under revision, many major and minor Hydro Electric Projects has been constructed in this Division. Accordingly, the Catchment Area Treatment Plans has also been formulated and are being implemented in this Division. Comprehensive CAT_Plan (CCP) for Satluj Basin has also been formulated by H. P. Forest Department through NERIL. The CCP of Satluj River basin covers an area of 20000 KM² upstream of Koldam and envisages an expenditure of Rs. 1440 crore on various treatment measures, to reduce the silt load in the streams catering the various projects and bring the ecology of the catchment on a sound footing. The spatial unit of this study is a Micro-watershed. As per **ALL INDIA SOIL AND LAND USE SURVEY REPORT (AISALUSR)**, there are 179 nos of MWSs from Koldam to Wangtoo and similarly, as per Status Report of Kinnaur & Spiti by HP KVV Palampur there are 31Nos sub catchments from Wangtu up to Spiti.

The detail of Micro Watersheds and Subcatchments which covers the tract of Kinnaur Forest Division is tabulated in the Table No. **XI+2.8** and Table No. **XI+2.9**.

Table No. XI+2.8

Sr No	Name of Range		Micro water shed numbers	Area in Ha	Remarks
1	Bhaba Nagar	1	sp 5a	2140	Micro watershed sq4d sq5a fall in B/Nage and Nichar range. However, the total area of the micro water shed is shown under B/Nager Range
		2	sp 5b	2988	
		3	sp 5c	2680	
		4	sp 5d	2300	
		5	sp 5f	2000	
		6	sp 5g	4000	
		7	sp 6a	1312	
		8	sq 4c	3856	
		9	sq 4d	1156	

		10	sq 5a	2360	
		11	sq 5b	3040	
	Total		11	27832	
2	Katgaon	1	sp 6b	1760	
		2	sp 6c	2032	
		3	sp 6d	3448	
		4	sp 6f	2728	
		5	sp 6g	2368	
	Total		5	12336	
3	Nichar	1	sq 5c	2000	
		2	sq 5d	1600	
		3	sq 5f	2120	
		4	sq 5g	2620	
		5	sq 5h	2200	
	Total		5	10540	
	G Total		21	50708	

Table No.XI+2.9.

The detail of Sub Catchments in Kinnaur Forest Division					
Catchment - Satluj Basin					
Total Sub No. of Sub Catchments = 23 Numbers.					
Total area of Sub Catchments above wangtoo= 539200 Ha.					
Sr No.	Sub Catchment No.	Area in Ha.	Name of Range	Name of Beat	Name of Khad
1	1	7500	Nichar	Panvi nand Kaksathal	Panvi
2	2	6000	Bhaba Nagar	Janni Ramni	Ramni
3	3	5900	Bhaba Nagar and Kilba	Sholtu and Punag	Duling
4	4	2000	Kilba	Kilba and Sapni	Sitling
5	5	9000	Kilba	Sapni And Brua	Baturi and Brua
6	6	3000	Kilba	Brua	Shong and Chawin
7	7	43000	Kilba	Sapni, Brua, Chansu, Sangla , Batseri Rakchham and chitkul	Rukti, Gangrang Hurba Seringche, kharogla, Gograng, Mansashoni, Shushing, Kutang and Chitkul
8	8	54600	Wild Life Sangla	Chitkul	Baspa beyond Chitkul
9	9	13700	Katgaon	Katgaon and Musrang	Wanger and Bhaba
10	10	40200	Kalpa	Chagaon, Runag and Urni	Choiling Khad
11	11	2300	Kalpa	Peo and Kalpa	Kalpa and Kothi
12	12	2600	Kalpa	Runag and Roghi	Roghi and Kashti

13	13	9000	Kalpa	Pangi	Dumti and Pangi
14	14	7500	Kalpa and Moorang	Pangi and Rarang	Kashang
15	15	4400	Moorang	Rarang	Kiran
16	16	52800	Moorang and WL Sangla	Jangi, Lippa and Asrang Beat of WL	Kiran
17	17	6100	Pooh	Kanam	Shaso
18	18	66400	Pooh	Giabung, Sunam, Pooh	Shaso
19	20	80500	Pooh	Namgia and Dubling	Titang and Hogis
20	21	30900	Moorang	Moorang	Nesang
21	22	66400	Moorang	Moorang	Tidong
22	23	8600	Moorang	Rispa and Ribba	Rihaldang
23	24	17800	Kalpa and Kilba	Ralli, Tangling, Barang and Purbani	Tangling

XI+2.38 Eco-Tourism:- Himachal Pradesh, known for its rich natural heritage, is amongst the top tourist destinations in the country, both for national as well as international visitors. Recent estimate, place the numbers at about 160 lakhs visitors – more than twice the State’s population. However much of the tourism related activity is concentrated in four major locations, Shimla, Manali, Dharamshala and Dalhousie. A majority of the visitors do not get an opportunity to experience the rich bio –cultural diversity contained in the many Forest areas, Sanctuaries and National Parks that comprise such a large part of Himachal Pradesh. Tourism in State of Himachal Pradesh is a growing industry after hydro electric power project. Therefore, the question arises whether tourism will lead to disturbances in environmental equilibrium. In an article on Eco-tourism, Down to Earth, 31st July, 2002, a Mexican eco-tourism consultant is given with the credit for introducing the term “eco-tourism”. He has defined it is “traveling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations found in these areas”. The International Eco-tourism Society (IETS) considers eco-tourism to be responsible travel to natural areas which conserves the environment and improves the well being of local people. It demands ‘responsible’ travel so that the impact on ecology is minimized and the benefits of travel trade are shared, not just with tour operators, but with local communities an environment friendly smokeless industry for the many beautiful but destitute regions of the world.

Responsible eco-tourism includes programmes that minimize the negative aspect of conventional tourism on the environment and enhance the cultural integrity of local people.

The Govt. of Himachal Pradesh, Forest Department has notified the “H.P. Forest Department Revised Policy on Development of Eco-Tourism in Himachal Pradesh, 2005. Eco-tourism policy of Himachal Pradesh aims to bring the wilderness of Himalayas closer to the tourist visiting the state and at the same time attempts to put in place adequate safeguards and system leading to the preservation of these natural resources. The vision of the eco-tourism is to preserve and protect the forest, natural heritage, flora and fauna and attract discerning tourist and visitors to the state and to make Himachal Pradesh a leading eco-tourism destination in the country. The details objectives and strategies of the policy could be accessed from the website:- www.himachalecotourism.nic.in/trekking.html.

The Eco-Tourism Policy, 2005 needed revision mainly due to the procedural requirements of obtaining clearance of Eco-tourism sites under Forest Conservation Act, 1980 as per guidelines of the Ministry of Environment, Forest & Climate Change (MoEF&CC) Government of India.

Some changes in the existing policy document have also been necessitated in the context of the evolving understanding of Eco- Tourism concepts and principles.

The Revised Eco- Tourism policy 2016 aims at bringing the wildness and virgin ecosystems of Himachal Pradesh closer to visitors and at the same time ensure adequate safeguards and systems for the protection and conservation of these natural resources. By involving local communities, the Policy would help in increased livelihood opportunities as well as their involvement in awareness building protection and conservation. It also envisages generation of financial returns which can be ploughed back into proper upkeep and maintenance of the environment. It shall also promote greater understanding and appreciation for natural and cultural heritage. The Government of Himachal Pradesh vide notification No FFE-B-C(15)-3/2005-III dated 25-02-2017 has notified the “HP Forest Department Re-revised Eco – Tourism Policy- 2017” which is annexed as **Appendix No. XLV**.

Eco-tourism interacts with environment in a two way process. The environmental resources provide a critical input for the production of tourism product and virtually the tourism development of an area is dependent on the availability of attractive natural or manmade resources. On the other hand, tourism produces a variety of unwanted by products that are disposed to the environment causing negative effects on the environment of the host area. Among the negative effects of tourism on environment are:-

- i) Disruption of breeding habits, killing of wild animals and change in extent and nature of vegetation cover through clearance to accommodate infrastructure.
- ii) Water pollution through discharge of sewage, air pollution and noise pollution due to vehicle and population.
- iii) Change in character of built area, changes to urban fabric and over load of infrastructure.
- iv) Increased interest in cultural resources, changes in cultural landscape and festivals, prostitution and crime rate increased.
- v) Problem of pollution and garbage disposal.

There is large scope in eco tourism in the tract of this Division. In Kinnaur Forest Division, the eco tourism activities are going on and Nature Parks has been developed in Kalpa and Sangla. Establishment of Nature Park at Nichar is under way. Large number of tourist is visiting these places. Divisional Forest Officer must take preventive measures and the negative effect of tourism on environment under the provision of Indian Forest Act, 1927 and Environment Protection Act, 1986 and for the same purpose shall have to notify the rules under Section 32 of Indian Forest Act, 1927.

XI+2.38.1 Kinner Kailash Yatra:- The hills and mountains have special significance and mountains have traditionally been regarded as abodes of gods. Mountains area also held sacred due to their association with deities, mythology and legends. Kinner Kailash is one such revered mountain peak in Himachal about which not much has been written.

According to Hindu Mythology, this is a very sacred place in the Indian Himalayas as it is associated with lord Shiva and Mata Parvati. A natural pond/Kund near Kinner Kailash peak, known as Parvati Kund, is considered to be a creation of Goddess Parvati. She worshipped here for a long time. It is also the meeting place for Lord Shiva and Mata Parvati. For this reason Ganesh Park or Kailash Darshan Park was earlier called Ashiqui Park. This place is believed to be the home of Lord Shiva from where he regulates the Universe. Earlier, the Parikrama to this holy place was about 200 kms, but now the path has been cut short for the convenience of the pilgrims. The Parikrama or circumambulation at this place starts from Kalpa via Thangi, Kunu Charang, Lalanti Pass, Chitkul, Mastrang, Rakchham, Sangla, Karchham, Powari and back to Kalpa.

Mount Kinner Kailash has the huge "SHIVA LINGAM", which is about 79 feet vertical rock formation that looks like a Shivlinga. This rock formed representation of Lord Shiva believes to change its colours throughout the day. The Kinnaur Kailash (Kailash Parvat Mountain) is considered most sacred and important as per Hinduism, Jains and Buddhism. In Sanskrit Kailash means crystal. This mountain is sometimes confused with the [Mount Kailash](#) in Tibet. The monolithic pillar (Shivling) is located at an altitude of around 4500 meters.



It is believed there are total seven Kailash mountains. The well known Mansarovar Kailash in Tibet, Adi Kailash in Pithoragarh District of Uttarakhand, Amarnath Kailash in J&K, Raldang Kailash popularly known as Kinner Kailash in Kinnaur district of Himachal Pradesh, Mani Mahesh Kailash in Chamba district of Himachal Pradesh, Sri Khand Kailash in Shimla/Kullu districts of Himachal Pradesh. Seventh one is believed to be Boorha Kailash and is yet to be located.

Kinner Kailash is situated at 6050mtr above sea level. Usually, many pilgrims visit this sacred place every year during the month of August. It can be accessed from Shongthong, Tangling, and also from Purbani and Ribba. Rare medicinal herbs and shrubs are also found in the track particularly Brahm Kamal, which is considered to be sacred flower.

XI+2.38.2Yulla Kanda:- It is situated about 3800 mtrs. above sea level. Many pilgrims visit this sacred place every year during Janamashtami. There is motorable road upto Yulla village and thereafter one has to travel on foot for about 10 to 15 Kms. Beautiful temple is situated in the center of lake and around the lake there are meadows / wonderful grassy land. Rare medicinal herbs and shrubs are also found.



XI+2.38.3Eco-Tourism in Nichar:- As per the revised Eco- Tourism policy 2017 which aims at bringing the beauty of the wilderness of Himachal Pradesh closer to visitors while at the same time ensuring adequate safeguards and systems for the protection and conservation of this natural resources. By involving local communities, the policy focuses on increased livelihood opportunities as well as protection and conservation. It also intends to encourage formulation of strategies for generation of financial returns which can be ploughed back for proper upkeep and maintenance of natural resources and the environment as a whole. The policy encourages greater understanding and appreciation for natural and cultural heritage both among tourists as well as local residents.



Forest Rest House Nichar.



Chot Village



Chhot Kanda



Chhot Kanda Top



Pasture Area of Chot Kanda

Nichar is situated about 60 Kms from Reckong Peo. After the shifting of Kinnaur Forest Division from Nichar to Reckong Peo, the old heritage buildings / infrastructures are lying vacant beside this; there are beautiful pure Deodar forests. There is also a unique “Usha Mata Temple” and natural water source “Chelong Bawari”. It can also be developed into medicinal / herbal garden as there are lots of medicinal plants in and around Nichar. The trackers can also visit Chhot Kanda above Nichar which has natural beauty and visitors can also track to Dodra Kwar area of District Shimla.

XI+2.38.4 Chaka Kanda in Kalpa:- It is situated about 5-6 Kilometers above old Reckong Peo - Pangi Kalpa road. The HPPWD has now constructed about 5 Km motor able road below Chaka Kanda. Many tourists visit this place every year during summer session. The tourist has to travel about 1 to 2 kilometer to reach this beautiful spot. In the center of the meadows / wonderful grassy land there is small beautiful lake which is surrounded by beautiful conifers trees like Deodar, Kail and Spruce. Rare medicinal herbs and shrubs are also found. It can further be developed as tourist spot as per the revised Eco- Tourism policy 2017.



Lake view in Chhaka Kanda Kalpa



Pasture area of Chhaka Kanda

XI+2.38.5 Ribba Kanda in Moorang:- Ribba Kanda is beautiful spot situated about 4-5 Kilometers above Ribba Village. The construction of motor able road by HPPWD is under way. Every year, the local deity (Kassu Raj) of Ribba village visit this spot during 16th / 17th September and stay there for four days. The local inhabitants have constructed temporary sheds in their cultivated lands for the stay, during the visit. Many pilgrims also visit Kinner Kailash from this route every year during the month of August. There is beautiful meadows / wonderful grassy land which is surrounded by beautiful conifers trees like Spruce, Deodar and Chilgoza. Rare medicinal herbs and shrubs are also found. It can further be developed as tourist spot as per the revised Eco- Tourism policy 2017.





Photos of Ribba Kanda

XI+2.38.6 Remedial Measures:- Divisional Forest Officer must take the following remedial / preventive measures:-

- i) To avoid too much habitation and consequential effects of it will have a warming effect and occasion a temperature rise in alpine meadows. This will have direct effect on the glacier and flora etc. Let man made activity not disturb this natural Himalayan phenomenon especially at Kinner Kailash Yatra, Kinner Kailash ParikarmaSangla Kanda and the route ofGangotri from Rani Kanda etc.
- ii) The Eco-tourism society will be registered by the Forest Department andtemporary tea shops will be managed, monitored and controlled by them in the track to Kinnar Kailash. Adequate arrangement shall be made to receive the packaging material which is non-biodegradable and prevent the littering of it on the mountains side or the streams.
- iii) In every kilometer of the track to the Kinnar Kailash route shall have containers bins or receptacles to receive these throw away wastes of packages. Each of the receptacles or bins shall be marked in Hindi and English to Signify bio-gradable & non-bio-gradable etc.
- iv) The ultimate lodging facility on this route shall be provided by the Eco-tourism society under the administrative control of the Forest Department. The priority in this region and the perspective in reference to the environment of the area requires preventing the cutting of forest wood for fire and other purposes. Energy saving devises must be endowed ecologically.

- v) No permanent structure will be developed as hotels or resorts on the meadows and pasture lands. This area should not be encroached upon and to take preventive measures for not damaging the forest, environment and ecology.
- vi) The use of plastic packages or bottles or non degradable materials should be banned from entering the hills or discouraging is much better than collecting the garbage under the provision of the Indian Forest Act, 1927 and Environment Protection Act, 1986 or to discourage the entry of plastics and non bio-degradable materials into the hills under the H.P. Non-Biodegradable Garbage (Control) Act, 1995.
- vii) No worships materials will be thrown away at the sweet wills of the pilgrims and it should be kept in proper place i.e. dust bin be kept in proper place and managed by local administration or the Eco-tourism society so that these materials may not be thrown all over the hill side or wet land or Glacier or stream etc.
- viii) Tourist and trekking pilgrimage routes i.e. Shongthong FRH to Kinnar Kailash should be maintained properly and also proper camping sites must be identified & maintained or developed.
- ix) No commercial activities will be allowed in forest areas especially in meadows and alpine pasture and hoardings/rock painting etc.
- x) The pilgrims should be advised not to pluck the Braham Kamal from the route of Kinnar Kailash
- xi) In the light of remedial measures, Divisional Forest Officer Kinnaur may take initiative step for formation of eco-tourism society at village level and declaration of safe eco-trail from road side to ultimate destination i.e. Kinnar Kailash and Gangotri via Rani Kanda.

Mountains and fresh water, water streams are to be kept free of garbage, filth and open defecation. Tea shops, lungars and worships place managed by local people are to be regulated to avoid any stampede and environmental hazard by local administration with the help of Eco-tourism society. For strict monitoring and protecting the environment, the State administration as a trustee is under a legal duty to protect the natural resources. These resources meant for public use cannot be converted unto private ownership.

XI+2.39 Biodiversity Conservation and Development:-The Biological Diversity Act, 2002 provides for preservation of biological diversity in India, and also provides mechanism for equitable sharing of benefits arising out of the use of traditional biological resources and knowledge. The Act was enacted to meet the obligations under Convention on Biological Diversity (CBD), to which India is a party. Forests provide habitat for many plant and faunal species. The contribution of individual species to the overall diversity within a community or ecosystem varies to a great extent. The coexistence of organisms that differ widely from each other contributes more to overall diversity than the co-existence of very similar species. Functional diversity is considered to be one of the main factors determining the long-term stability of an ecosystem and its ability to recover from major disturbances. Assessment of status of plant and faunal species and their periodic monitoring can be helpful in formulating strategies for conservation, maintenance and enhancement of overall biodiversity through sustainable management and use practices especially the lower forms of life (algae, fungi, lichens, epiphytes, parasites, etc.) with the support from State Biodiversity Board. All these assessments will help in updating and enriching the People's Biodiversity Registers (PBRs) as provided in Biodiversity Act, 2002.

XI+2.39.1 Guidelines:-The guidelines with regard to PBRs in Biological Diversity Act, (2002) are as under:-

- That every local body shall constitute a Biodiversity Management Committee within its area for the purpose of promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivars, domesticated stocks and breeds of animals and microorganisms and chronicling of knowledge relating to biological diversity.
- That the main function of the BMC is to prepare People's Biodiversity Registers in consultation with local people. The Register shall contain comprehensive information on availability and knowledge of local biological resources, their medicinal or any other use or any other traditional knowledge associated with them.
- That peoples' Biodiversity Register is a document which contains comprehensive information on locally available Bio-resources including landscape and demography of a particular area or village. Bio-resources mean plants, animals and micro organisms or parts thereof, their genetic material and by-products (excluding value added products) with actual or potential use or value but does not include human genetic material.
- That the Authority and the States shall take steps to specify the form of the People's Biodiversity Registers and the particulars it shall contain and the format for electronic database.
- That the National Biodiversity Authority and the State Biodiversity Boards shall provide guidance and technical support to the Biodiversity Management Committees for preparing People's Biodiversity Registers.
- That the Peoples' Biodiversity Registers shall be maintained and validated by the Biodiversity Management Committees.
- That the Committee shall also maintain a Register giving information about the details of the access to biological resources and traditional knowledge granted, details of the collection fee imposed and details of the benefits derived and the mode of their sharing.
- That the National Biodiversity Authority and the State Biodiversity Boards shall consult the Biodiversity Management Committees while taking any decision relating to the use of biological resources and knowledge associated with such resources occurring within the territorial jurisdiction of the Biodiversity Management Committee.
- That the Biodiversity Management Committees may levy charges by way of collection fees from any person for accessing or collecting any biological resource for commercial purposes from areas falling within its territorial jurisdiction.

XI+2.39.2 Issues in preparation of PBRs:-

- i)** PBR jurisdiction
- ii)** Role of departments / Institutes / Scientists / Industries
- iii)** Survey and sampling
- iv)** Conservation and Management

The PBRs should not be treated as mere documentation exercise but it should be used to develop an agenda for conservation action based on local knowledge. It should also serve as biodiversity impact assessment tool for developmental activities / mining. The PBRs is a legal document and needs to be endorsed by the state Biodiversity Board. The Divisional Forest Officer

Kinnaur should take necessary step in this regard during the first two years of the working Plan period.

XI+2.40 Gaushala or Gausadan:-The cow plays an important role in the economy of farmers. Almost every household in Himachal Pradesh maintains a few heads of cows. The cow are dependent on grazing / pasture land and feed provided by the owners. When these cows become unproductive, non-lactating, old or sick, there is a general tendency to abandon them rather than be responsible for feeding them. These days, the problem has been exacerbated by the shortage of fodder as holdings have become smaller and the extent and productive of the common grazing lands has also reduced. Male animals are also being abandoned by the farmers due to large scale plantation of horticulture species like Apple, Pears, Badam and Khurmani etc. Therefore, the rearing of the male animals is often not considered necessary these days. These are the main reason for generation of stray cattle.

Although there are number of statutory provisions for a fair treatment of the cattle like Prevention of Cruelty to Animals Act, 1960, HP Government Policy dated 04-06-2014 and Hon'ble High Court order Dated 07-10-2014 to tackle the problem of stray cattle but still the poor abandoned cattle are wandering on National Highways, State Highways and other paths and cultivated fields. Sometime these also result into road accidents. Therefore, the situation has become alarming in the tract of this Division. It is, therefore, necessary to layout land in the Un-demarcated Protected Forest for the stay and up keeping of these stray cattle. The solution of this problem could only be overcome by creation of Gaushalas at different locations which are having sufficient grass lands, Gausadan and water resources.

Gaushala are meant for the care of stray, abandoned cows, bulls, retired oxen, and orphaned Calves. Cattle's are provided with hey, flour, fresh grass, clean water, medical attention and a place where they can recuperate from injuries and stay peacefully.

Gaushala protect the cows and improve their feeding and living standards and keep them in clean atmosphere. At the same time Gaushala aim to setup a urine therapy research center and practicing center for critical ailments. It also aims to spread the awareness about the importance of cow and rich properties of cow. It also underscores the importance of spiritualism in human life and to create a complex where people can do research, meditate, enjoy a multimedia experience and learn about the facts of happy and prosperous life in a pristine historic and environment. This tract is facing problem of stay cattle all along national high way, link road and other public places attracting the attention of conservationists for some time past.

The sites which are identified for creation of Gaushalas are as under:-

Sr No.	Name of Range	Area Identified / Proposed
1	Bhaba Nagar and Nichar	Kaksthal and Chaura
2	Katgaon	Near Sherpa Colony
3	Kalpa	Karchham (on right bank of river Satluj) and Runang
4	Kilba	Karchham (on left bank of river Satluj) and near Cholling
5	Moorang	Holdo between (Rispa and Skibba) and Reta Khan (near ITBP & SSB camp below Jangi)

The above proposed sites will be taken care by Animal Husbandry Department, concerned Gram Panchayat, registered NGO's and Trust etc. Their credentials are to be verified by the local bodies such as Panchayat through local administration. However, the registration of such agency will be mandatory and non profitable. The Gaushala will be established only on Government waste land / Un-demarcated Protected Forests. This will be very helpful in better understanding of problem of stray animals and ultimately, help in mitigating the problem of grazing in plantation area i.e. along the national high ways, link road and other nearby forest areas. Therefore, need the Govt. Policy for addressing the problem of stray animals and livelihood issue of the poor people. Not only to this poor people can be engaged for collection of grasses from forest/plantation areas under MGNREGA Scheme for encouragement of stall feeding. This will help to reduce the biotic pressure from forest/plantation and fire during fire season.

Therefore, Divisional Forest Officer Kinnaur must ensure that Gaushala or Goa-Sadan shall be setup or established during the Plan period as per time to time guidelines issued by the Government of Himachal Pradesh in this regard.

XI+2.41 Regeneration Assessment Survey:- Regeneration assessment in the forests gives a clear/actual picture of forest stocking, which plays a vital role in the management of forests. It is suggested that regeneration assessment survey of PB-I forests should be regularly carried out every year. This can be great help and should be kept in view while preparing the APO for next year. The regeneration should keep pace with the fellings/removals. And in case of variations corrective measures should be taken by resorting to artificial regeneration/closure, so that the area is restocked in prescribed time.

XI+2.42 Carbon Stock Carbon Sequestration and Mitigation: - The Himachal State is a mountainous state located in Western Himalayan Range which present wide range of land use systems owing to the diverse physiographic and demographic mosaic. It extends over geographical area of 55673 Km² which is 1.69 % of country area. The predominant land use system comprises of forest and agricultural. Forest comprises of 38.30 % of total land mass. This include plantation as well as trees outside forest e. g. trees on agriculture land. The forest of Himachal Pradesh is rich in vascular flora, which forms the conspicuous vegetation cover.

The Kinnaur Forest Division falls in the District Kinnaur Himachal Pradesh which is primarily Tribal area and consists of Deodar Kail Fir and Spruce as major species. The Chilgoza Pine occurs mainly in the dry zone of this division. The detail description of about the flora is given in the chapter - II of part one of the current plan.

The Agricultural landscapes are characterized by undulating topographic where in a terraced field are made on medium to steep slopes. In Kinnaur forest division, the crop fields are on sloppy lands, in general. The agricultural fields of this division generally have trees on boundaries for interspaced trees are also present. Natural and planted trees like Chuli, Behmi, Chilgoza etc. The farmers generally plant horticultural crops but at places forest species are also preferred.

The climate change now is a common phenomenon and the time is not about trying to find the conclusive evidence but is for action. The need is to give up priority to mitigate climate change, through judicious use of natural resources and implement programmes for enhancement of carbon stock. One of the strategies is to look into the present land use system. The need is to increase efforts in research on the function of forestry and the agro forestry system as carbon sinks. Among the green houses, CO₂ is the most important component, accounting for 60% of global warming.

Although the forests are the main land based CO₂ sinks, yet the forest ecosystems play a crucial role in general and global terrestrial carbon cycles because they store large quantities of carbon in vegetation, detritus and soil and exchange large amount of carbon with the atmosphere

through photosynthesis and respiration. However, it is difficult to determine how and to what extent forest carbon sinks and reservoirs may be managed to mitigate CO₂. Therefore, understanding the determinants of forest carbon storage and allocation in different ecosystems component is important for predicting the response of carbon balance to climate change and forest management.

There is a rapid increase in interest in agro forestry and plantation as a land use practice in this division. Plantation generally comprises of monoculture i. e. single tree species. The agro forestry system involved in greater diversity and complexity compared to plantation, have become a research interest which is posing fundamental question like how much carbon is sequestered in such land use system. The agro forestry is an attractive option for carbon mitigation as it sequesters carbon in vegetation and soil depending on the pre-conversion vegetation and soil carbon.

The agricultural lands are believed to be a major potential sink and could absorb large quantity of carbon if trees are introduced to these systems and judiciously managed together with crops. The growth and productivity of plants including trees are directly related to the nutrients present in soil system as well as their uptake by the plant system. The Land Use, Land Use Change and Forestry (LULUCF), an approach that became popular in the context of Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), allows the use of carbon sequestration through forest (Polyculture and Monoculture) and agro forest.

Carbon sequestration potential depends upon the biological productivity, which in turn depends upon interaction between species, climate, topographic, management practices imposed. Thus carbon density and sequestration potential varies from place to place which need to be worked out on region to region species to species basis.

XI+2.42.1 Biomass Production and Carbon Stock:- The Kinnaur district of Himachal Pradesh, is situated in the north western part of the state having an elevational range from 1000 to over 6000 m above mean sea level. The area is famous for the Kinnaur Kailash, a sacred mountain, close to the Tibetan border. The area experiences high hill dry temperate climatic conditions due to its high elevation, with long winters from October to May and short summers from June to September. The texture of the soil is sandy to loamy.

Climatically the tract of Kinnaur Forest Division by virtue of elevation falls in temperate zone. The area covered by the plan is divided into three climatic zone namely Wet Zone, Dry Zone and Arid Zone. The inventory of high-altitude dry temperate land use systems in North Western Himalaya has been carried out. According to the study the carbon estimation in different land use system at three altitudinal ranges viz, (1900-2170 m.a.s.l, 2170-2440 m.a.s.l and 2440-2710 m.a.s.l) were selected in Kinnaur District of Himachal Pradesh. The study was aimed at estimating the difference in Biomass and carbon stocks in different land use systems and recommendation of the suitable environment friendly land use for the region. Six land use system viz, Agriculture, Horticulture, Agri-Horticulture, Agri-Horti-Silviculture, Silvipasture, and barren land common at all the three altitudes were selected for experimental setup.

It was found that the maximum mean above ground biomass (84.65 t ha), below ground biomass (19.50 t ha), and total biomass (104.10 t ha) were recorded in the Silvipasture land use system. Total biomass production of different land use systems followed by the sequential order: Silvipasture > Agri-Horti-Silviculture > Agri-Horticulture > Horticulture > Agriculture > Barren land respectively. Maximum soil organic carbon (1.41%) was recorded in Silvipasture land use systems, which however, remained statistically at par with the organic carbon contents of Horticulture. Soil organic carbon, irrespective of the

land use system increased with increase in altitudinal range and decreased with increase in soil depth. Maximum carbon density (155.77 t ha) in 0–100 cm layer was in Agri-Horticulture LUS. The order of carbon density under different land use systems was Agri-Horticulture > Agri-Horti-Silviculture > Silvipasture > Horticulture > Agriculture > Barren land. Irrespective of the land use system, the carbon density at different altitudinal gradient followed the trend i.e, 1900–2170 m.a.s.l., > A3, 2440–2710 m.a.s.l and > A2, 2170–2440 m.a.s.l.

The outcome of the study can play an important role, while selecting different land use systems and different crop combinations for effective management of carbon budget to mitigate climate change and global warming issues in fragile Himalayan ecosystems.

The problem in the Himalayas is complex, having intricate linkages between social, economic and ecological concerns. The landholding in Kinnaur District is often so small that for the survival of poor families, Agroforestry land use system becomes a lifeline for sustaining daily needs. The introduction of more woody perennials in and around the orchards and other agriculture landscapes of the Himalayan region can enhance and safeguard the biodiversity and in turn will improve livelihood opportunities. These Agroforestry land use systems provide ecosystem services by becoming reservoirs for carbon stock storage and mitigation of climate change along with the sustenance of livelihood.

Introduction of more and more tree-based land use systems like Agroforestry is one alternative to deal with problems related to land use and CO₂-induced global warming. The significance of Agroforestry with respect to Carbon sequestration and other CO₂ mitigating effects has gained praise in the past as well as in the present throughout the globe, but there is still paucity of quantitative data on specific systems. Studies has also been carried out in the past few years on carbon and climate change issues in other regions of the state of Himachal Pradesh but no literature is available for higher altitudes from the region.

XI+2.42.2 Forest and land Use:- Forest ecosystems also play an important role and provide a wide range of provisioning, regulating, and cultural services broadly termed the 'ecosystem services'. But together with existing socio-economic processes such as population growth, Forest fragmentation, deforestation, degradation and habitat loss, climate change could lead to significant changes in the delivery of such services. However, the forest sector is, unique as regards to the climate change issue in several respects as

- Forests contribute significantly to global CO₂ flux thus providing significant opportunities to reduce the current or projected emissions.
- Forests also provide a means to remove CO₂ accumulated from past emissions in the atmosphere, and sequester it in soil, vegetation and wood products.
- Forest sector is closely linked to socio-economic systems, particularly the livelihoods of forest dwellers and rural communities.
- Future climate change, due to increased Greenhouse Gas (GHG) concentration in the atmosphere is likely to have adverse impacts on forest structure, composition, biodiversity, biomass and geographic distribution of plant species, all of which in turn would affect the environment and socio-economic systems.

The forest and land use sector has received significant attention globally in addressing the climate change problem. However, the mitigation potential assessment in the land use change and forest

sector has been limited by availability of information at the global-level, and by the lack of disaggregation of mitigation potential at the national and sub-national level. Further, these mitigation potential assessments provide technical potential estimates rather than economic or market potential.

Forests in the state and also in the tract of this division are subjected to degradation, due to anthropogenic pressure. Degraded or open forests are subjected to unsustainable harvesting of timber and non-timber products and heavy infestation of weeds. This has led to thinning of forest cover, loss of biodiversity, reduced biomass productivity, changes in plant community structure and composition, disturbed nutrient cycle and reduced organic carbon in soil. As a consequence, these forests have limited capacity to regenerate by natural means under the prevailing land use. Forest plantations have been raised in Himachal Pradesh and in Kinnaur Forest Division under different schemes and projects such as the pasture and grazing improvement scheme, afforestation of blank areas, compensatory afforestation, Catchment Area Treatment Plan of the ongoing Hydro Electric Projects in this division, and the recent launched JICA Project.

Himachal Pradesh like the other states of India is also carrying out afforestation programmes under different schemes as given in the above Para and now gaining momentum under the National Action Plan for Climate Change in the Greening Mission. Given this and the policy to increase forest tree cover to 2/3rd of the total geographic area, there is a need to look at the potential for increasing the forest area and thereby the biomass and carbon stocks

XI+2.42.3 Approach and methods: - The three land categories are considered essential for estimating the mitigation potential for increasing forest area and thereby the biomass and carbon stocks. They include:

- i. **Degraded forest land:-** This land category is owned and controlled by the State Forest Department. However, the communities have right of access to some of the identified forest products as per Forest settlement report which has discussed in detail in the chapter of the plan. According to the prevailing laws, felling of trees in these lands are banned as governed by the Forest Conservation Policy, laws and regulations (Indian Forest Act of 1927, Forest Conservation Act of 1980, Minor Forest Produce Act, Timber for Dwelling Rights Act). Conversion of this land for non-forestry purposes such as agriculture or infrastructure development is banned. These lands are devoid of any significant vegetation cover for the last several decades and are subjected to unsustainable biomass extraction (such as fuelwood and continued degradation caused by soil erosion on the sloping topography (about 15 - 25 degrees).
- ii. **Other Forest Waste Land:-** This category includes protected forests declared under 1952 notification. Conversion of this land for non-forestry purposes such as agriculture or infrastructure is banned. However, in tribal area relaxation in grant of nautor have been allowed by the GoHP during 2017 for two years as discussed in the current plan. However, in these land the local community exercises their right as per settlement report for grazing, collection of NTFP and fuelwood etc. Due to continuous exercise of liberal rights over decades, maximum of this category of land has been rendered

without vegetation cover, suppression of regeneration and periodic fires. All such interventions have led to degradation of vegetation and soil erosion on the sloping topography (about 15 - 25 degrees).

- iii. **Degraded and abandoned private land:-** These lands are owned and managed by individual farmers, often inherited. These lands have been left fallow due to lack of resources or their unsuitability for crop production. These lands were once grasslands or forests on sloping hills but were subjected to land conversion many decades ago. Cropping was practiced in the past. These lands were abandoned and left fallow due to low crop productivity caused by land degradation. These lands have very shallow soils subjected to continuous soil erosion and unsustainable grazing and harvesting of grass, further leading to degradation.

XI+2.42.4 Strategy: -To deal with problems related to land use and global warming, it is suggested that introduction of more and more tree-based land use systems like Agroforestry is one of the best option to deal with problems related to land use and global warming. The amount of Carbon sequestered largely depends on the Agroforestry system, structure and functions, determined by environmental and socio-economic factors. Maximum above ground biomass is in the Silvipasture system, followed by Agri-Horti-Silviculture. Maximum below ground biomass is also in the Silvipasture which is significantly higher than all other LUS.

Silvipastoral systems help in greater accumulation of soil organic matter and thus more carbon storage when compared to grass only or tree only. The plant component of the Silvipastoral system invests higher proportion of growth into the development of the root system compared to those growing singly. The LUS recorded the above ground biomass in ascending order as Barren land, Agriculture, Horticulture, Agri-Horticulture, Agri-Horti-Silviculture and Silvipasture respectively and lowest belowground biomass is in the Silvipasture and Agriculture land use systems of the tract.

Species density and management practices can play an important role to influence biomass under different Agroforestry systems. Improvement of management practices, is also important component in carbon sequestration.

Forests and wood products can effectively reduce the process of climate change in several ways. Growing trees absorb carbon dioxide from the atmosphere and store the carbon so efficiently that about half the dry weight of a tree is carbon. This carbon remains locked up in the form of wood and wood products. Sustainably grown and harvested wood (and other biomass) also provides a renewable alternative to fossil fuels and enhance carbon storage. Enhanced carbon sequestration through recognized and innovative Silvicultural practices, Ecorestoration of degraded/mined out forestlands, improved biomass productivity, etc. will help in improving forest health and vitality. Forest soil must be kept healthy and fertile. The growth of forest crops must be kept vigorous to attain the most desirable level of biomass production within an optimal time scale.

The carbon stock storage and climate change mitigation cannot be easily achieved in the high-altitude Himalayan regions, because of the type of land use available, cold climate and the land holding capacity of the people. As discussed above, the maximum biomass density capacity is for the Silvipasture system followed by the Agri-Horti-Silviculture system. The Fruit-based systems, viz., Horticulture and Agri-Horticulture system also play important role in carbon storage potential. These fruit-based LUS, like horticulture, Agri-culture and Agri-Horti-Silviculture are first and

foremost choice of the farmers of the region because fruit grown under these land uses are of high quality, and also have better storage life, and low disease infestation. At the same time, it also fulfills both objectives of carbon mitigation and economic growth.

CHAPTER –XI+3

ESTABLISHMENT AND LABOUR

XI+3.1 Establishment:- The list of existing Ranges, Blocks and Beats is given in *Appendix No-XL*. The position of sanctioned staff and existing staff has been given in Chapter-VI of Part-I, paragraph No. 6.1. In view of the increased workload on account of developmental activities, more special duty staff shall be required for smooth working in the division. Even the protection work has also become more difficult due to the construction of roads, increasing population and tremendous increase in the prices of timber. Even the remotest forests have become prone to the illicit fellings and encroachments.

The Beats, Blocks and Ranges are small and administratively convenient except Kafnoo Beat of Katgaon Range, Moorang Beat of Moorang Range which has larger area. Similarly, the existing Urni block of Kalpa Range is also required to be transferred to Kilba Range. Therefore, Shango beat is to be created from the existing Kafnoo beat, Thangi beat is to be created from Moorang beat, Urni block to be transferred to Kilba Range and thereafter, no further reorganization of beats, Blocks and Ranges is suggested. The quantum of office work at Range level has increased considerably, consequently the Range Officers have to devote more time in the office at the cost of field works. Therefore, all Range Officers should be provided with Range Clerks having knowledge of operating Computer. Similarly, additional ministerial staff is required to cope up the increasing work load in the division office. Services of all the permanent Forest Workers should be utilized in nurseries and for miscellaneous forest protection and regeneration operations.

XI+3.2 Labour:- The position of labour supply has been discussed in Chapter-VI of Part-I. All the exploitation and harvesting works are being done by HPSFDC Ltd. and labour supply mates of Forest Corporation, for carrying out exploitation of Forests have to import labour from Mandi, Kangra and Chamba Districts. The present rate of unskilled daily wage labour is Rs.250 per day with an additional increase of 25 % for tribal which is likely to be revised from time to time.

Many developmental schemes are in operation in the tract under various departments, thus there is some shortage of labour. Harvesting and sowing seasons of the agricultural/horticultural crops coincide with the forestry works and adequate local labour is some time not available. Similarly, the local labours are mostly working under MNEREGA. Gorkha labours from Nepal are also employed as unskilled daily waged labour in various departmental works. The apple season starts from August onwards. For ensuring the success of forestry work, alternative arrangements may have to be thought of. Permanent labour gangs should be maintained in case of nurseries which require expertise.

CHAPTER –XI+4

CONTROL AND RECORDS

XI+4.1 System of Control:- The system of control and records adopted in the forest department will be followed. It has been unfortunate that some of the prescription of Working Plan under revision were not given a serious trial while others were completely ignored. Obviously, the objects of management as set out could not be fully realized. Some of the forest journals do not contain complete information about various operations carried out in the past while some entries are not accurately recorded. Control should be considered as an integral part of plan and record of all operations must be maintained. The following records will be maintained in the division:

XI+4.2 Control Forms:- To exercise proper check and control on the prescription and suggestion made in this Working Plan, control forms as prescribed in the Punjab Forest Leaflet No. 11 will be properly maintained/ prepared every year by DFO. The Divisional Forest Officer will submit the control forms 2(a), 2(b), 4 and “C” annually in duplicate, before 30th April to the Chief Conservator of Forests Rampur for scrutiny and counter signature of the Chief Conservator of Forests every year. The control forms must be completed in all respect along with the deviation statement as laid down in Chapter X of National Working Plan code, 2014.

XI+4.3 Compartment History Files:- Compartment history files have been prepared in duplicate for all DPFs and UPFs on standard pattern laid down in chapter-IX of National Working Plan code, 2014 and as per Manual for collection of field data given in **Appendix No – IX**. The old compartment history files of the all demarcated protected forests have also been filed along with the new ones for reference. It is prescribed that the compartment history files will be maintained properly and kept posted up to date in April every year. The notes on important silvicultural operations, markings, progress of regeneration and other cultural and subsidiary operations will be recorded in these files by the Inspecting officers. During field tours and annual office inspection, the Divisional Forest Officer will ensure that the compartment history files are properly maintained and are kept up-to-date. The Inspecting officers will invariably write inspection notes on the standard proformas prescribed in this chapter copies of which will be placed in the concerned compartment history files.

It is prescribed that one set of history files shall remain in the office of DFO and second set in the office of concerned RO. It will be responsibility of DFO and RO to maintain and post each and every compartment history file in his own office.

XI+4.4 Divisional Note Book:- This is mainly a record for use by DFO which shows auction results, handing over of lots to HPSFDC Ltd, estimation of outturn of lots, result of experiments carried out if any, records of annual seeding of important species, injuries to crop, divisional statistics notes on the trial of exotics and their performance and any other important information regarding divisional works. No such record, is being maintained at present and this should be started now. This note book will contain a summary of all the statistics concerning the district and divisional working. This record will be very useful and handy at the time of Working Plan revision.

XI+4.5 Fire Records:- A complete record of fires will be maintained both in the Range office and Divisional office. It should also find mention in the concerned compartment history files. Maps of forests burnt showing extent of area burnt will be filled in the compartment history files concerned along with relevant date such as place from which fire originated, nature of fire, damage caused by fire, duration of fire and how it was fought and brought under control.

XI+4.6 Forest Guard book/ Beat Manual:- Guard book and forest guard Beat Manual is an important and handy record of beat statistics and activities like details of forests, forest boundaries included cultivation encroachments, record of rights and concession, sowing/plantation, nurseries, seed collection and other silvicultural operations. The forest guard/ beat manual/ book should also

contain the information pertaining to boundaries of forest, beat maps showing forests, roads and paths and record of rights and concessions. The un-demarcated protected forest which has been constituted as new DPFs and brought under the systematic management under this plan should also be entered in the forest guard beat manual and all the above information should be maintained in respect of these areas also. Every Forest Guard should maintain it for his beat and DFO will check these manuals during field tours and ensure that these are properly maintained.

XI+4.7 Register of Books and Maps:- Register of books and maps will be maintained at Range and Divisional level and kept up to date. All roads, bridle paths, inspection paths and buildings constructed during the year should be shown in maps in April every year.

XI+4.8 Register of DPFs and Listed UPFs:- Register of Demarcated Protected Forests and Listed Un-demarcated protected Forest will be properly maintained and all changes in the area or boundaries recorded every year giving reference of Government orders and notifications.

XI+4.9 Register of Roads and Buildings:- Register of roads and buildings will be maintained at Range and Divisional level and kept up to date. All roads and buildings constructed during the year should be entered in April every year along with cost of construction.

XI+4.10 Nursery Journals:- A nursery journal for each nursery shall be maintained on the standard format, wherein, the details of all the nursery operations like sowing, germination, weeding, pricking etc. shall be incorporated along with cost.

XI+4.11 Plantation Journals:- Plantation journals will be maintained on the standard format for all the plantation areas according to the standing instructions from time to time. The journals must also contain the following information's:-

- i) Location, legal status, boundaries, configurations, aspect, slope, rock, geology and soil, drainage and depth of soil.
- ii) Soil suitability and treatment map.
- iii) Map showing prominent natural features.
- iv) A statement showing area planted and cost of planting item wise for each year.
- v) A critical note on success or failure of plantation and corrective steps, if any, required to be taken for the success of plantation.

XI+4.12 Research Journals:- The research journals should be maintained in the division and relevant research activities conducted/undertaken should be entered.

XI+4.13 Divisional FCA cases Register:- This will contain data regarding diversion of forest land allowed and compensatory afforestation details and trees permitted by GOI to be felled in the area concerned and CAT Plan details, if there is any.

XI+4.14 Divisional Forest Rights Act, 2006 {Scheduled Tribes & other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006} cases Register:- This will contain data regarding diversion of forest land allowed and other relevant stipulations and trees permitted by DFO to be felled in the area and other details, if there is any.

CHAPTER –XI+5

SUMMARY OF PRESCRIPTIONS

XI+5.1 Important Prescriptions: The important prescriptions and suggestions of the working plan are as under:-

Sr. No	Headings	Prescriptions	Paragraph of the plan																								
BASIS OF PROPOSALS																											
1	Supreme Court on Green Felling and Regeneration	Felling of trees from forest area shall be allowed only as per approved working plan by the Government of India.	1.2																								
The Deodar Kail Wet Zone Working Circle																											
1	Felling Series	There will be only one felling series for the whole Working Circle i.e. <i>Satluj felling series</i>	2.6																								
2	Silvicultural System	The Indian Irregular shelter Wood System	2.8																								
3	Regeneration Period	30 years	2.10																								
4	Rotation & Exploitable diameter	120 years rotation and exploitable diameter of 60 cm d.b.h.	2.11 & 2.12																								
5	Felling Cycle	30 years	2.13																								
6	Division into Periodic Blocks	Four Periodic Blocks have been formed	2.14																								
7	Calculation of Yield	The yield has been calculated by volume for PB-I and PB-IV	2.15																								
8	Prescribed annual Yield	The prescribed annual yield in M ³ is as under:- <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Species</th><th>PBI</th><th>PBIV</th><th>Total</th></tr> <tr> <td>Deodar</td><td>1350</td><td>1900</td><td>3250</td></tr> <tr> <td>Kail</td><td>750</td><td>500</td><td>1250</td></tr> <tr> <td>Fir</td><td>1200</td><td>870</td><td>2070</td></tr> <tr> <td>Spruce</td><td>1050</td><td>850</td><td>1900</td></tr> <tr> <td>Total</td><td>4350</td><td>4120</td><td>8470</td></tr> </table>	Species	PBI	PBIV	Total	Deodar	1350	1900	3250	Kail	750	500	1250	Fir	1200	870	2070	Spruce	1050	850	1900	Total	4350	4120	8470	2.16
Species	PBI	PBIV	Total																								
Deodar	1350	1900	3250																								
Kail	750	500	1250																								
Fir	1200	870	2070																								
Spruce	1050	850	1900																								
Total	4350	4120	8470																								
9	Control of Yield	The control of yield and the deviation for a year, a period of five year and a plan period shall not exceed +- 25%,+10% and +-05% respectively.	2.17																								
10	Method of executing felling in PB-I areas	The general principles laid down	2.18.1																								
11	Treatment of PB-II areas	No commercial felling prescribed	2.18.2																								
12	Treatment of PB-III areas	No commercial felling prescribed	2.18.3																								
13	Method of executing felling in PB-IV areas	The general principles laid down	2.18.5																								
14	Sequence of fellings in PB-I & PB-IV	The felling programme has been laid down	2.19																								
15	Subsidiary Silviculture operations in PB-I	Works to be carried out and general principle discussed	2.20.1																								

16	Artificial regeneration in PB-I area	To be carried out to supplement natural regeneration discussed and prescribed.	2.20.2																								
17	Planting Programme	Prescribed	2.20.3																								
18	Fire protection	The areas will be protected from fire discussed and prescribed.	2.21.1																								
19	Grazing and grass cutting	The grass cutting will be prohibited in all the PB-I areas, till the young crop is beyond the damage i.e. 75 cms and above.	2.21.2																								
19	Right holder's Demand	The requirements of right holder for timber will be granted as per revised timber distribution policy as notified by H.P. Govt. Notification No. FFE-B-A (3) 4/2015 Dated: Shimla -2, the 26 February, 2016 dated 2nd January, 2016 and rest of the demand of right holders will be met as per the provision of Forest Settlement Report, 1921.	2.21.3																								
20	Closures	Effective closure of all the PB-I areas prescribed	2.21.4																								
21	Lopping	Lopping may be allowed to the right holders strictly as per the provision of Forest Settlement Report, 1921	2.21.5																								
22	Regeneration survey	Discussed and prescribed.	2.21.6																								
The Deodar-Kail Dry Zone Working Circle																											
1	Felling Series	There will be only one felling series for the whole WC i.e. Satluj felling series	3.6																								
2	Silvicultural System	The Indian Irregular Shelter Wood System	3.8																								
3	Regeneration Period	45 years	3.10																								
4	Rotation & Exploitable diameter	135 years rotation and exploitable diameter of 60 cm d.b.h.	3.11 & 3.12																								
5	Felling Cycle	30years	3.13																								
6	Division into Periodic Blocks	Three Periodic Blocks have been formed	3.14																								
7	Calculation of Yield	The yield has been calculated by volume for PB-I and PB-III	3.15																								
8	Prescribed annual Yield	The prescribed annual yield in M³ is as under: <table border="1"> <thead> <tr> <th>Species</th><th>PBI</th><th>PBIII</th><th>Total</th></tr> </thead> <tbody> <tr> <td>Deodar</td><td>950</td><td>650</td><td>1600</td></tr> <tr> <td>Kail</td><td>660</td><td>100</td><td>760</td></tr> <tr> <td>Fir</td><td>0</td><td>45</td><td>45</td></tr> <tr> <td>Spruce</td><td>0</td><td>245</td><td>245</td></tr> <tr> <td>Total</td><td>1610</td><td>1040</td><td>2650</td></tr> </tbody> </table>	Species	PBI	PBIII	Total	Deodar	950	650	1600	Kail	660	100	760	Fir	0	45	45	Spruce	0	245	245	Total	1610	1040	2650	3.16
Species	PBI	PBIII	Total																								
Deodar	950	650	1600																								
Kail	660	100	760																								
Fir	0	45	45																								
Spruce	0	245	245																								
Total	1610	1040	2650																								
9	Control of Yield	The control of yield and the deviation for a year, a period of five year and a plan period shall not exceed+- 25%,+10% and +-05% respectively of the annual prescribed yield.	3.17																								

10	Method of executing felling in PB-I areas	The general principles laid down	3.18.1
11	Treatment of PB-II areas	No commercial felling prescribed	3.18.2
12	Method of executing felling in PB-III areas	The general principles laid down	3.18.3
13	Sequence of fellings in PB-I & PB-III	The felling programme has been laid down	3.19
14	Subsidiary Silviculture operations in PB-I	Works to be carried out and general principle discussed	3.20.1
15	Artificial regeneration in PB-I area	This is to be carried out to supplement the natural regeneration discussed and prescribed	3.20.2
16	Planting Programme	Detailed planting programme given in the plantation (overlapping) Working Circle in Table No.7.2.	3.20.3
17	Tending operations	Detailed prescribed.	3.20.4
18	Weeding	Procedure prescribed	3.20.5
19	Cleaning	Detailed prescribed.	3.20.6
20	Fire protection	The areas will be protected from fire discussed and prescribed	3.21.1
21	Grazing and grass cutting	Detailed prescribed.	3.21.2
22	Right holder's Demand	The requirements of right holder for timber will be met from the depot as per H.P. Govt. notification dated 2nd January, 2010 and 26 February, 2016 rest of the demand of right holders will be met as per the provision of Forest Settlement Report, 1921.	3.21.3
23	Closures	Effective closure of all the PB-I areas prescribed	3.21.4
24	Lopping	Detailed prescribed.	3.21.5
25	Regeneration survey	Discussed and prescribed.	3.21.6
THE FIR/SPRUCE WORKING CIRCLE			
1	Felling Series	There will be only one felling series for the whole WC i.e. <i>Satluj felling series</i>	4.6
2	Silvicultural System	The Indian Irregular Shelter Wood System	4.8
3	Regeneration Period	30 years	4.10
4	Rotation & Exploitable diameter	150 years rotation and exploitable diameter of 45 - 55 cm d.b.h.	4.11 & 4.12
5	Felling Cycle	30 years	4.13
6	Division into Periodic Blocks	Three Periodic Blocks have been formed	4.14
7	Calculation of Yield	The yield has been calculated by volume for PB-I and PB-U	4.15

8	Prescribed Annual Yield	The prescribed annual yield in M³ is as under:- <table> <tr> <th>Species</th><th>PBI</th><th>PBU</th><th>Total (M³)</th></tr> <tr> <td>Deodar</td><td>850</td><td>800</td><td>1650</td></tr> <tr> <td>Kail</td><td>100</td><td>10</td><td>110</td></tr> <tr> <td>Fir</td><td>4650</td><td>1400</td><td>6050</td></tr> <tr> <td>Spruce</td><td>2250</td><td>1300</td><td>3550</td></tr> <tr> <td>Total</td><td>7850</td><td>3510</td><td>11360</td></tr> </table>	Species	PBI	PBU	Total (M ³)	Deodar	850	800	1650	Kail	100	10	110	Fir	4650	1400	6050	Spruce	2250	1300	3550	Total	7850	3510	11360	4.16
Species	PBI	PBU	Total (M ³)																								
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9	Control of Yield	The control of yield and the deviation for a year, a period of five year and a plan period shall not exceed +10% of the annual prescribed yield.	4.17																								
10	Method of executing felling in PB-I areas	The general principles laid down	4.18.1																								
11	Treatment of PB-II areas	No commercial felling prescribed	4.18.2																								
12	Thinning	Thinning prescribed in accordance with the principles of thinning laid down in Punjab Forest Leaflets No. I and IA.	4.18.3																								
13	Method of executing felling in PB-U areas	The general principles laid down	4.18.4																								
14	Sequence of fellings in PB-I & PB-U	The felling programme has been laid down in PB-1 and in PB-U the thinning and improvement felling given.	4.20																								
15	Subsidiary Silviculture operations in PB-I	Works to be carried out and general principle discussed	4.21.1																								
16	Artificial regeneration in PB-I area	This is to be carried out to supplement the natural regeneration	4.21.2																								
17	Planting programme	Detailed planting programme given in the plantation overlapping) Working Circle in Table No.7.2.	4.21.3																								
18	Closure and fencing	Discussed and detailed prescribed.	4.21.3																								
19	Weeding	Discussed and prescribed.	4.21.4																								
20	Fire protection	The areas will be protected from fire discussed	4.22.1																								
21	Grazing and grass cutting	Detailed prescribed.	4.22.2																								
22	Right holder's Demand	The requirements of right holder for timber will be met from the depot as per H.P. Govt. notification dated 2nd January, 2010 and 26 February, 2016 rest of the demand of right holders will be met as per the provision of Forest Settlement Report, 1921.	4.22.3																								
23	Closures	Effective closure of all the PB-I areas prescribed	4.22.4																								
24	Regeneration survey	Discussed and prescribed.	4.22.5																								
THE NEOZA WORKING CIRCLE																											
1	Silvicultural System	Since the object of management is to conserve and improve the existing forests and to restock	5.7																								

		the mature and under stocked areas, hence no commercial fellings are envisaged. Therefore, no silvicultural system is prescribed	
2	Rotation	Physical rotation.	5.9
3	Felling Cycle	No felling cycle is prescribed.	5.9
5	Calculation of yield	No yield prescribed.	5.10
6	Sequence of fellings	No sequence of fellings is prescribed	5.11
7	Methods of Treatment	Discussed.	5.12
8	Plantation Programme	The planting program laid down and is given in the plantation (overlapping) Working Circle in Table No.7.2.	5.13
9	Planting Technique	Laid down	5.13.1
10	Raising of Neoza Pine nursery	Laid down	5.13.2
11	Plantation Time Table	Laid down	5.13.3
12	Closure and fencing	Detail discussed	5.13.4
13	Fire protection	The areas will be protected from fire discussed	5.14.1
14	Grazing and grass cutting	Detailed prescribed.	5.14.2
15	Right holder's Demand	The requirements of right holder for timber will be met from the depot as per H.P. Govt. notification dated 2nd January, 2010 and 26 February, 2016 rest of the demand of right holders will be met as per the provision of Forest Settlement Report, 1921.	5.14.3
16	Collection and sale of Neoza Seed	Detail discussed	5.14.3.1
17	Closures	Effective closure of all the areas prescribed	5.14.4
18	Lopping	Detail discussed	5.14.5
19	Assesment of Annual Production of Neoza Seed	Data for annual collection of Neoza Seeds discussed	5.14.6
THE REHABILITATION WORKING CIRCLE			
1	Silvicultural System	No silvicultural system prescribed as no commercial fellings are proposed.	6.8
2	Rotation	Only physical rotation prescribed.	6.10
3	Calculation of Yield	No yield prescribed as no commercial fellings are proposed	6.11
4	Sequence of Felling	No sequence of fellings proposed	6.12
5	Plantation Programme	Plantation Programme laid down and is given in the plantation (overlapping) Working Circle in Table No.7.2.	6.14
6	Fire Protection	The areas will be protected from fire discussed	6.15.1
7	Closures	The areas to be taken up for plantation and reclamation will be closed to grazing.	6.15.2
8	Grazing	Detail discussed	6.15.3

9	Grass cutting	Detail discussed	6.15.4
10	Lopping	Detail discussed	6.15.5
11	Right holder's Demand	The requirements of right holder will be met as per the provision of Forest Settlement Report, 1921.	6.15.6
THE PLANTATION (OVERLAPPING) WORKING CIRCLE			
1	Silvicultural System	No silvicultural system prescribed as no commercial fellings are proposed and only plantation will be raised by planting and sowing.	7.8
2	Rotation & Exploitable diameter	No rotation and exploitable diameter is prescribed.	7.10 & 7.11
3	Calculation of Yield	No yield prescribed as no commercial fellings are proposed	7.12
4	Table of Planting	The Working circle wise and Range wise planting program laid down.	7.13
5	Subsidiary Silviculture operations	Works to be carried out and general principle prescribed	7.15
6	Nurseries	The importance and technique of nursery prescribed.	7.16
7	New Plantations	Plantation techniques prescribed	7.17
8	Tall Planting	Planting of tall plant discussed and prescribed.	7.18
9	Land Bank	The detail of Land Bank area identified and discussed.	7.19
10	Closures	Effective closure of all the areas prescribed	7.20.1
11	Fire protection	The areas will be protected from fire described.	7.20.4
12	Plantation Records	Detailed instructions prescribed.	7.21
13	Monitoring and evaluation	Monitoring and evaluation of plantation activities prescribed.	7.22
THE NON TIMBERFOREST PRODUCE (OVERLAPPING) WORKING CIRCLE			
1	Silvicultural System	No silvicultural system prescribed as no commercial fellings are proposed	8.7
2	Calculation of yield	No yield prescribed as the most NTFPs are extracted through right holders and however, maintaining proper record suggested.	8.8
3	Method of treatment	Only rotational extraction is prescribed	8.9 & 8.9.1
4	Artificial propagation and conservation	Measures are suggested for the conservation, protection and propagation of medicinal plants.	8.10
5	Propagation Techniques	The technique of propagation and harvesting of some important plants species prescribed.	8.12
6	Other Non TimberForest Produce	Brief description of other NTFP like Morchela deliciosa, Dioscorea deltoidea etc. discussed.	8.13

7	Campaign for conservation and preservation of endangered species	Discussed and prescribed.	8.14
8	Other Regulations	Legal Measures for extraction/collection and export of NTFP's prescribed under the provision Indian Forest Act, 1927.	8.15
9	Fire Protection	The areas will be protected from fire described.	8.15.2
10	Right Holders Requirements / Demand	The requirements of the Right holders will be met as per settlement provision.	8.15.3
11	Issues and Challenges	Detail issues discussed	8.16
12	Strategy	Discussed and prescribed.	8.17
THE FOREST PROTECTION (OVERLAPPING) WORKING CIRCLE			
1	General constitution	General constitution of working circle described	9.1
2	General character of vegetation	General character of vegetation described	9.2
3	Special Objects of management	Special Objects of management of the working circle described.	9.3
4	Illicit felling	The illicit felling of trees, causes and modus operandi of illicit felling discussed and described	9.4
5	Forests area prone to illicit Fellings	The detail of forests area are prone to illegal felling/cutting and effectives protection and measures discussed	9.4.4
6	Preventive/Remedial measures	Preventive/Remedial measures discussed and prescribed.	9.4.5
7	Prosecution of forest offences	Procedure discussed and prescribed with case Law.	9.4.6
8	Compounding of Forest Offences	Procedure discussed and prescribed with case Law.	9.4.7
	Disposal of Forest Offences	Procedure discussed and prescribed with case Law.	9.4.8
9	Indian Forest (HP 2 nd Amendment) Act, 1991	The provisions of IFA 2 nd amendment Act, 1991 is discussed and prescribed.	9.4.9
10	Fire protection	Causes of forest fire, factor contributing to Fire Damage, fire season, Special Fire Risk Zones etc. discussed and described.	9.5 to 9.5.5
11	Fire Lines	The detail of existing and proposed fire lines given.	9.5.7
12	Control Burning	Triennial cycle for control burning is proposed and prescribed.	9.5.9
13	Preparation of Annual Plan	Preparation of annual plan and administrative measures are suggested.	9.5.11

14	Legal Measures	Procedure discussed and described with case law.	9.5.13
15	Assessment of Loss caused by fire	The mythology for assessment of fire loss discussed and prescribed.	9.5.14
16	Fire Record	Maintenance of fire record suggested.	9.5.15
17	Encroachment	Causes of encroachment, preventive measures, and steps taken for eviction of encroachment along with annual programme for detection of encroachment is discussed and prescribed.	9.6 to 9.6.3
18	Mining	The Supreme Court on mining, state mining policy and list of stone crushers in Rampur Forest Division, condition for running of stone crusher and mining lease, delegation of powers etc. discussed and described with case law and rules.	9.7
19	Illegal Mining	Legal provision for detection, search, penalty, preventive measures and monitoring and review of the mining areas discussed and prescribed under Mines & Minerals Rules and Act.	9.7.8 to 9.7.15
20	Poaching	Detection of poaching, preventive measures etc. discussed and described under the Wild Life (Protection) Act, 1972.	9.8 to 9.8.3
21	Penalties, Bail and Cognizance of Offences	Legal provisions discussed and described under the provision of Wild Life (Protection) Act, 1972.	9.8.4
THE PFM (OVERLAPPING) WORKING CIRCLE			
1	Emergence of Joint Forest Management	The evolution of joint forest management is discussed and prescribed.	10.2
2	Concept of participatory forest management	Concept of participatory forest management is discussed and prescribed.	10.3
3	Joint Forest Management In H.P.	Discussed and prescribed	10.4
4	Formation of Forest Development Agency (FDA)	Procedure prescribed.	10.5
5	Special Objective of JFM	Discussed and prescribed.	10.6
6	H.P. Forest Eco-system Climate Proofing project	Discussed and prescribed.	10.7
7	Strategic Approach of Participatory Forest Management (PFM) in Himachal Pradesh (H.P.)	Discussed and prescribed.	10.8
8	Implementation of JFM in Kinnaur Forest Division	Discussed and prescribed.	10.9
	Constraints to Participatory Management	Discussed and prescribed.	10.10

9	Scope of JFM	Discussed and prescribed.	10.11 to 10.11.2
10	Potential activities of JFM committees	Potential activities of JFM committees suggested.	10.11.3
11	Preventive/Remedial Measures	Preventive/Remedial Measures prescribed.	10.11.4
12	Strengthening of Joint Forest Management	Procedure for Strengthening of Joint Forest Management is prescribed.	10.11.5
13	Role of Women in JFM	Role of Women in JFM is discussed and prescribed.	10.11.6
14	Project Impact & Benefits	The project Impact & Benefits prescribed.	10.12
15	Monitoring & Evaluation	Process of monitoring & evaluation discussed.	10.13
THE WILDLIFE MANAGEMENT (OVERLAPPING) WORKING CIRCLE			
1	Importance of wild life	The importance of protection and preservation of wild life is discussed and prescribed.	11.2
2	Management Imperatives	Discussed and prescribed.	11.5 to 11.5.2
3	Human Wild Life Conflict	Discussed and prescribed.	11.5. 3 to 11.5.5
4	Conflict types & Remedial Measures	Discussed and prescribed.	11.6
5	Management Initiatives required to Address Human-Wild Life Conflicts	Discussed and prescribed.	11.7 to 11.7.10
6	Compensation for damages caused by wild animals	The rates for grant of relief for damages prescribed.	11.8
7	Management Prescriptions	Management Prescriptions Described and prescribed.	11.9
8	Mitigating Man Animal Conflicts	Discussed and prescribed.	11.9.6
9	Census of Wild Life	Latest census of monkey given.	11.9.7
10	Compensation for damages caused by Monkey	The detail of compensation paid for the damages caused by the monkey.	11.10
11	Monkey-Human Interface	Discussed and prescribed.	11.11
12	Conservation Options	Suggested	11.12
GENERAL FINANCIAL FORECAST AND FINANCIAL PLAN OF OPERATION			
1	Future revenue and Expenditure	The future revenue and Expenditure anticipated is described.	XI+1.1

2	Future Yield	Annual expected yield in different WC	XI+1.3
3	Expected Revenue	The expected future revenue anticipated to be Rs. 303.93per annum (in lacs)	XI+1.4
4	Future Expenditure	The expected future expenditure anticipated to be Rs. 868.07 per annum (in lacs)	XI+1.5
5	Cost of Working Plan	The total cost for preparation of Working Plan is Rs. 53.65 lacs.	XI+1.6
MISCELLANEOUS REGULATIONS			
1	Petty felling	Petty fellings have been defined	XI+2.1
2	Deviations	Deviations defined and regulations made regarding the same	XI+2.2
3	Demarcation of forest	Checking of boundaries of the demarcated forests with the help of their maps and preparations of boundary register has been prescribed. Survey and demarcation of un-demarcated protected forest has been suggested.	XI+2.3
4	Forest Settlements	Discussed and prescribed.	XI+2.4
5	Creation of New Protected Forests	Discussed and prescribed.	XI+2.5
6	Entries in Revenue Record	Needs to be reconciled and entries made in the Revenue record.	XI+2.6
7	Revisions of Forest Settlement Rights, 1921.	Discussed and prescribed.	XI+2.7
8	Forest boundaries	Discussed and described. Necessary step for getting demarcation of forest land from Revenue Authority under Section 107 of the H.P.Land Revenue Act, 1954 for ascertaining the position of BPs.	XI+2.8
9	Periodic checking of boundaries	The periodic checking of boundaries is prescribed and norms fixed. A quinquennial programme for checking of forest boundaries has also been prescribed.	XI+2.9
10	Compartment and sub compartment boundaries	The sign board indicating the compartment and sub-compartment are prescribed to be affixed on prominent sites/location.	XI+2.10
11	Maps	Procurement of new maps/survey sheets suggested.	XI+2.11
12	Beat Map	Beat map on 4"=1 mile scale is suggested to be provided to each forest guard.	XI+2.12
13	Water supply	Discussed and prescribed.	XI+2.13
14	Rain and snow gauges	No rain gauges are available and new gauges to be installed are suggested.	XI+2.14
15	Timber for right holders	Discussed and prescribed.	XI+2.15
16	Forest Rights and Duty	Discussed and prescribed.	XI+2.16

17	Person bound to Assist Forest Officer	Legal provision to assist forest officer is discussed and prescribed under the provision of Indian Forest Act, 1927.	XI+2.17
18	Timber as Free Grant	Discussed and prescribed.	XI+2.18
19	Grazing	Discussed and prescribed.	XI+2.19
20	Closure notification	Closure should be got issued under Section 30 (b) of Indian Forest Act, 1927.	XI+2.20
21	Lopping	Discussed and prescribed.	XI+2.21
22	Fire Protections	Detail of fire protection measures prescribed.	XI+2.22
23	Encroachments	Encroachments discussed and suggestions to prevent encroachments prescribed.	XI+2.23
24	Illicit felling, illegal mining and Poaching	The preventive and control mechanism under the various Act with regard to Illicit felling, illegal mining and Poaching discussed and prescribed.	XI+2.24
25	Communication Network	Improvement of communication system is suggested.	XI+2.25
26	Geo-referencing in Forestry Operations	Geo-referencing of forestry operations suggested.	XI+2.26
27	Research and sample plots	Detail of old sample plots described.	XI+2.27
28	Preservation Plots	Selection of suitable preservation plots suggested.	XI+2.28
29	Roads, paths & buildings	Discussed.	XI+2.29
30	Ban on green fellings	Ban on green fellings discussed and described.	XI+2.30
31	Land Bank	Discussed and prescribed.	XI+2.31
32	Diversion of Forest Land	Discussed and prescribed.	XI+2.32
33	Non-Timber Forest Produce	Discussed and prescribed.	XI+2.33
34	Saw Mill and Depot	Discussed and prescribed.	XI+2.34
35	Felling in Private Areas	Discussed and prescribed.	XI+2.35
36	H.P. Land Preservation Act, 1978	Ten year felling Programme is discussed and prescribed.	XI+2.35.1
37	Punishment for offences	Discussed and prescribed.	XI+2.35.2
38	Forest Produce (Regulation of Trade) Act, 1982	Discussed and prescribed.	XI+2.35.3
39	Forest produce transit (Land Routes) Rules, 1978	Discussed and prescribed.	XI+2.35.4
40	Punishment for Offences	Punishment for contravention of any provisions of Act or the Rules made there under, is discussed and prescribed.	XI+2.36
41	Watershed Management	Detail discussed and described	XI+2.37
42	Objectives of Watershed Management	Detail discussed and described	XI+2.37.1

43	Causes of Watershed Management	Detail discussed and described	XI+2.37.2
42	Eco-Tourism	Scope of Eco-Tourism along with various relevant provisions discussed and prescribed.	XI+2.38
43	Kinnar Kailash Yatra	Religious sanctity of Kinnar Kailash Yatra along with route to visit the deity and remedial measures are discussed and prescribed.	XI+2.38.1
44	Yulla Kanda Lake	Discussed.	XI+2.38.2
45	Eco-Tourism in Nichar	Discussed.	XI+2.38.3
46	Chaka Kanda in Kalpa	Discussed.	XI+2.38.4
47	Ribba Kanda in Moorang:-	Discussed.	XI+2.38.5
48	Remedial Measures	Discussed and prescribed.	XI+2.38.6
49	Biodiversity Conservation and Development	Discussed and prescribed.	XI+2.39
50	Gaushala or Gausadan	Discussed and prescribed.	XI+2.40
51	Regeneration Assessment Survey	Regeneration assessment survey of PB-I forests discussed and prescribed.	XI+2.41
52	Carbon Stock Carbon Sequestration and Mitigation	Detail Discussed	XI+2.42
ESTABLISHMENT AND LABOUR			
1	Establishment	Necessity to increase of the staff is suggested.	XI+3.1
2	Labour	Maintenance of permanent labour gangs suggested.	XI+3.2
CONTROL AND RECORDS			
1	System of control	Records of all the operations be maintained.	XI+4.1
2	Control Forms	Maintenance of control forms for fellings, subsidiary operations and regeneration are prescribed.	XI+4.2
3	Compartment History files	Proper maintenance and up to date posting in April each year prescribed.	XI+4.3
4	Divisional note book	Suggested and to be maintained	XI+4.4
5	Fire records	To be maintained in the Ranges as well as in the Division Office.	XI+4.5
6	Guard book/beat Manual	Proper maintenance and up to date posting of Forest Guard manual prescribed.	XI+4.6
7	Register of books and maps	Maintenance of registers of books and maps in Ranges and Division Office prescribed.	XI+4.7
8	Register of DPFs and UPFs	To be maintained in the Ranges as well as in the Division Office.	XI+4.8

9	Register of roads and Buildings	To be maintained in the Ranges as well as in the Division Office.	XI+4.9
10	Nursery Journals	To be maintained in all the Ranges.	XI+4.10
11	Plantation Journals	To be maintained in all the Ranges.	XI+4.11
12	Research Journals	To be maintained in Ranges and in the Division.	XI+4.12
13	Divisional FCA cases Register	To be maintained in Ranges and in the Division.	XI+4.13
14	Divisional Forest Rights Act, 2006 {Scheduled Tribes & other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006} cases Register	To be maintained in Ranges and in the Division.	XI+4.14

Dated: 29th February, 2019

Sd/-
(Dr. Chaman Lal Rao), HPFS
W.P.O-cum- DFO Kinnaur

Sd/-

Conservator of Forests,
Working Plan, Mandi, H.P

Sd/-

(Gopal Chand, IAS)
Deputy Commissioner,
Kinnaur, H.P.

Sd/-

(H. S. Dogra, IFS)
Addl. Pr. CCF Working Plan
Forests,
& Settlement, Mandi, H.P

Sd/-

(Ajay Kumar IFS)
Pr. Chief Conservator of

Himachal Pradesh, Shimla

Office of the Principal Chief Conservator of
Forests (Wildlife) and Chief Wildlife Warden,
Himachal Pradesh.



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H.P. FOREST DEPARTMENT, ARANAYA BHAWAN, TALLANI SHIMLA-171001

No. WLM/Working Plan/ 6931 Dated/ 26/11/19

To

The Divisional Forest Officer,
Kinnaur Forest Division at R/peo, HP.

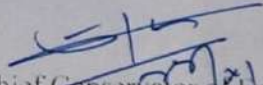
Subject: Vetting of Chapter's on Wildlife Management of under revision Working Plan of
Kinnaur Forest Division-regarding.....

Memo:

Kindly refer to your Office Memo. No. 4805 dated 14.11.2019 on the Subject
cited above.

2. The Chapter-II B Flora and Fauna and Chapter-XI Wildlife Management
(Overlapping) Working Circle Management Plans of Kinnaur Forest Division has been
approved by the undersigned. ^{Hand bound} A copy of the final Working Plan document may be sent to this
office for record.

Encls: As above.


Pr. Chief Conservator of Forests (W.L.)
and Chief Wildlife Warden, Shimla, HP

ip blu

For / DFB
A
Gm