Document of
The World Bank

Report No: ICR00004212

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA-41330/IBRD-51590)

ON A

LOAN

IN THE AMOUNT OF SDR 66.0 MILLION
(US$97.0 MILLION EQUIVALENT)

TO THE

REPUBLIC OF INDIA

FOR A

HIMACHAL PRADESH MID-HIMALAYAN WATERSHED DEVELOPMENT PROJECT

September 20, 2017

Agriculture Global Practice
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective March 31, 2017)

Currency Unit = Indian Rupee (INR)
US$1 = INR 64.93
US$1= SDR 0.74

FISCAL YEAR

April 1 – March 31

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
A/R	Afforestation and Reforestation
CAS	Country Assistance Strategy
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CIG	Common Interest Group
CPD	Chief Project Director
CPS	Country Partnership Strategy
EFA	Economic and Financial Analysis
ERR	Economic Rate of Return
FM	Financial Management
FMIS	Financial Management Information System
GHG	Greenhouse Gas
GoHP	Government of Himachal Pradesh
GoI	Government of India
GP	Gram Panchayat
GPWDP	Gram Panchayat Watershed Development Plan
HP	Himachal Pradesh
HPNRMS	Himachal Pradesh Natural Resource Management Society
HVC	High-value Crop
ICR	Implementation Completion and Results Report
IPM	Integrated Pest Management
ISR	Implementation Status and Results Report
IWDP	Integrated Watershed Development Project
IWMP	Integrated Watershed Management Programme
JWC	Joint Watershed Committee
M&E	Monitoring and Evaluation
MHWDP	Mid-Himalayan Watershed Development Project
MTR	Midterm Review
NRM	Natural Resource Management
NRMS	Natural Resource Management Society
NREGS	National Rural Employment Guarantee Scheme
NTFP	Non-Timber Forest Product

O&M	Operation and Maintenance
PAD	Project Appraisal Document
PDD	Project Design Document
PDO	Project Development Objective
PES	Payment for Ecosystem Services
PIP	Project Implementation Plan
PMU	Project Management Unit
PRI	Panchayati Raj Institution
RKVY	Rashtriya Krishi Vikas Yojana
SHG	Self-help Group
TERI	The Energy and Resources Institute
TTL	Task Team Leader
UG	User Group
UNFCCC	United Nations Framework Convention on Climate Change
VFDS	Village Forest Development Society
WDO	Watershed Development Office
WDCO	Watershed Development Coordination Office

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INDIA
Himachal Pradesh Mid-Himalayan Watershed Development Project

CONTENTS

A. BASIC INFORMATION

Country:	India	Project Name:	Himachal Pradesh Mid-Himalayan Watershed Development Project
Project ID:	P093720	L/C/TF Number(s):	IDA-41330,IDA-51590
ICR Date:	09/05/2017	ICR Type:	Core ICR
Financing Instrument:	Specific Investment Loan	Borrower:	GOVERNMENT OF INDIA
Original Total Commitment:	XDR 41.40 million	Disbursed Amount:	XDR 66.00 million
Revised Amount:	XDR 66.00 million		

Environmental Category: B

Implementing Agencies:
Himachal Pradesh Natural Resource Management Society, Forest Department

Co-financiers and Other External Partners:

B. KEY DATES

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	03/15/2005	Effectiveness:	02/24/2006	02/24/2006
Appraisal:	09/19/2005	Restructuring(s):		02/03/2016
Approval:	12/13/2005	Mid-term Review:		11/18/2009
		Closing:	03/31/2012	03/31/2017

C. RATINGS SUMMARY

C.1 Performance Rating by ICR

Outcomes:	Satisfactory
Risk to Development Outcome:	Moderate
Bank Performance:	Moderately Satisfactory
Borrower Performance:	Moderately Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

Bank	Ratings	Borrower	Ratings
Quality at Entry:	Moderately Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Moderately Satisfactory
Overall Bank Performance:	Moderately Satisfactory	**Overall Borrower Performance:**	Moderately Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators

Implementation Performance	Indicators	QAG Assessments (if any)	Rating

Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory		

D. SECTOR AND THEME CODES

	Original	Actual
Major Sector/Sector		
Agriculture, Fishing and Forestry		
Other Agriculture, Fishing and Forestry	43	43
Public Administration		
Sub-National Government	26	26
Social Protection		
Social Protection	4	4
Transportation		
Rural and Inter-Urban Roads	20	20
Industry, Trade and Services		
Agricultural markets, commercialization and agri-business	7	7
Major Theme/Theme/Sub Theme		
Environment and Natural Resource Management		
Renewable Natural Resources Asset Management	10	10
Biodiversity	10	10
Landscape Management	10	10
Finance		
Finance for Development	7	7
Agriculture Finance	7	7
Human Development and Gender		
Gender	14	14
Social Development and Protection		
Social Inclusion	14	14
Participation and Civic Engagement	14	14
Urban and Rural Development		
Rural Development	29	29
Land Administration and Management	10	10
Rural Infrastructure and service delivery	29	29
Rural Markets	7	7

E. BANK STAFF

Positions	At ICR	At Approval
Regional Vice President:	Annette Dixon	Praful C. Patel
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ICR Team Leader:	Ranjan Samantaray	
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F. RESULTS FRAMEWORK ANALYSIS

Project Development Objectives

The objective of the proposed project is to assist Himachal Pradesh in improving its productive potential of the project area and increasing incomes of rural inhabitants in selected watersheds through socially inclusive, institutionally and environmentally sustainable approaches.

Revised Project Development Objectives (as approved by original approving authority)

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	% increase in real income over baseline for households in Project area			
Value (Quantitative or Qualitative)	0%	20%	Original: 15% AF: 8%	32.4% (11.2% above the control group)
Date	02/24/2006	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Partially achieved. In the absence of a baseline for AF, a consolidated comparison of income was carried out for both the Original and AF GPs. Control group showed 21.2% real HH income increase, relative to project HH real income increase of 32.4%.			
Indicator 2:	% increase in production and coverage of grasses, bushes, and trees			
Value (Quantitative or Qualitative)	0	50%	Original: 50% AF: 15%	46.25% increase in biomass production and 65% survival,that is, increase in coverage of trees
Date				03/31/2017
Comments (including % achievement)	Target almost achieved. Overall biomass achieved as envisaged, and the cumulative value exceeds the target.			
Indicator 3:	% increase in yields of milk, paddy, wheat, maize, and horticulture			
Value (Quantitative or Qualitative)	Wheat: 1,064 kg/ha Maize: 1,027 kg/ha Milk: 2.89 l/cow Paddy: 825 kg/ha HVC: 4.65 qtl/ha	50% increase in yields	Original: 30% in wheat 30% in maize 20% in milk 25% in Paddy 50% in HVC	Original: 25.9% in wheat 28.9% in maize 10.7% in milk 26.5% in paddy 700% inHVC

			AF: 10% in wheat 10% in maize	AF: 20.7% in wheat 25.1% in maize 10.7% in milk
Date	02/24/2006	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Indicator target was revised during MTR, on account of remarkable diversification of HVCs at the cost of few traditional crops. Cumulative impact of both original and additional financing has exceeded the revised targets.			
Indicator 4:	% increase in irrigation potential in target areas (new)			
Value (Quantitative or Qualitative)	0	0	30%	38.12%
Date	02/24/2006	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Target achieved. Given the significant increase in irrigated area during the original project, this new PDO level indicator was introduced at AF. The increase was on account of new rain-fed areas brought under assured irrigation supply.			
Indicator 5:	Degree to which the Project has influenced State Policies and guidelines for watershed Development (qualitative measure)			
Value (Quantitative or Qualitative)	na			Influenced many state policies
Date	03/31/2012			03/31/2017
Comments (including % achievement)	Project has influenced many state policies; the concept of "Paravet" by Animal Husbandry Department, "Payment for Ecological Services" in the State's Forest Department and the Financial Management software developed and used by other departments.			
Indicator 6:	Project beneficiaries (no. of households/*no. of persons*, new indicator)			
Value (Quantitative or Qualitative)	—	—	na	144,692 *723,459*
Date	—	—	08/24/2012	03/31/2017
Comments (including % achievement)	The project benefitted on an average number of five persons per household. See details in Table 1 on page 15.			
Indicator7:	Of which are female beneficiaries (persons, new indicator)			
Value (Quantitative or Qualitative)	—	—	na	365,498 (50.5%)
Date	—	—		03/31/2017
Comments (including % achievement)	The project substantially improved administrative capacity of women groups through participatory approach. Results of local government elections indicated that out of 466 project motivators and facilitators elected to PRI, 62% were women			
(b) Intermediate Outcome Indicator(s)				

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Self-Help Groups established with at least Rs.5,000 in accounts			
Value (Quantitative or Qualitative)	0	2,000	Original: 2,200 AF: 200	Original: 1,706 AF: 157
Date	02/24/2006	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Majority of them have achieved the expected target value to as high as INR 500,000.			
Indicator 2:	User Groups established and taking care of resources in a sustainable manner			
Value (Quantitative or Qualitative)	—	2,500	Original: 2,600 AF: 400	Original: 5,613 AF: 1,364
Date	—	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Target achieved. Revised from 2,500 to 3,000 User Groups (2,600 original GPs and 400 in additional GPs) to take care of resources in a sustainable manner.			
Indicator 3:	% of User Groups in place with bank account and operations and maintenance policy for the resources they use			
Value (Quantitative or Qualitative)	—	80%	Original: 85% AF: 80%	Original: 99.71% AF: 99.93%
Date	—	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Target achieved. Revised from 80% to 85% in original GPs, and 80% in additional GPs in MTR-II			
Indicator 4:	% GP meetings with quorum			
Value (Quantitative or Qualitative)	—	50%	—	67.0%
Date	—	03/31/2012	—	03/31/2017
Comments (including % achievement)	Target achieved.			
Indicator 5:	% GPs have agreed empowerment plans			
Value (Quantitative or Qualitative)	—	90%	90%	100%
Date	—	03/31/2012	08/24/2012	03/31/2017

Comments (including % achievement)	Target achieved. Indicator revised as NRMS would monitor the number of tribal and nomads settled in GPs and their participation in GPWDP development.			
Indicator 6:	% GP members trained			
Value (Quantitative or Qualitative)	0%	70%	Dropped	—
Date	02/24/2006	03/31/2012	08/24/2012	—
Comments (including % achievement)	Dropped.			
Indicator 7:	% of targeted GPs have accessed the incentive fund			
Value (Quantitative or Qualitative)	—	40%	Dropped	—
Date	—	03/31/2012	08/24/2012	—
Comments (including % achievement)	Dropped and replaced by indicator 9.			
Indicator 8:	% of GPs have participatory monitoring and evaluation systems in place and providing regular feedback			
Value (Quantitative or Qualitative)	—	50%	Dropped	—
Date	—	03/31/2012	08/24/2012	—
Comments (including % achievement)	Dropped and replaced by indicator 9.			
Indicator 9:	14 project GPs are awarded by a competitive GP incentive scheme every year with their performance evaluated through participatory monitoring and evaluation (PME) (New)			
Value (Quantitative or Qualitative)	—	—	14 per year	117 total
Date	—	—	08/24/2012	03/31/2017
Comments (including % achievement)	The incentive fund for GP was an integral part of the project design, for which there was no indicator set in the beginning. This was well internalized during the AF and a modest indicator value was introduced.			
Indicator 10:	Degree to which NRMS performs as an effective platform for harmonization and development			
Value (Quantitative or Qualitative)	—	—	Dropped	—
Date	—	—	08/24/2012	—

Comments (including % achievement)	Indicator dropped as it is already measured as a PDO indicator.			
Indicator 11:	% of available treatable areas of non-arable land treated			
Value (Quantitative or Qualitative)	—	60%	Original: 70% AF: 20%	Original: 69.1% AF: 85.7%
Date	—	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Target practically achieved. Revised to incorporate additional GPs.			
Indicator 12:	% available rain-fed agriculture land will have access to irrigation facilities			
Value (Quantitative or Qualitative)	—	—	10%	9.4%
Date	—	—	08/24/2012	03/31/2017
Comments (including % achievement)	Target almost achieved. New indicator, introduced in conjunction with PDO indicator on potential irrigation uptake.			
Indicator 13:	% increase in fodder availability over baseline			
Value (Quantitative or Qualitative)	—	20%	—	27.4%
Date	—	03/31/2012	—	03/31/2017
Comments (including % achievement)	Target achieved. The 27.4% achievement is over and above the baseline value.			
Indicator 14:	% farmers to have upgraded livestock			
Value (Quantitative or Qualitative)	—	20%	Dropped	—
Date	—	03/31/2012	08/24/2012	—
Comments (including % achievement)	Indicator was dropped during the first MTR, as the project's focus was less on improved breeds.			
Indicator 15:	% of farmers to have access to improved veterinary care either through public facility or through community managed veterinary care			
Value (Quantitative or Qualitative)	—	50%	—	89.8%

Date	—	03/31/2012	—	03/31/2017
Comments (including % achievement)	Achievement exceeds target.			
Indicator 16:	Two thirds of GPs with tribal or nomads have representation in watershed committees			
Value (Quantitative or Qualitative)	—	2/3 of GPs	Dropped	—
Date	—	03/31/2012	08/24/2012	—
Comments (including % achievement)	Dropped. Participation by tribals or nomads measured by the participation indicator in GPWDP development			
Indicator 17:	% increase over baseline in area under high value crops			
Value (Quantitative or Qualitative)	—	20%	30%	Original: 59.2% AF: 56.9%
Date	—	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Achievement exceeds target. Indicator revised as 30% of the irrigated area diversified into high value horticulture.			
Indicator 18:	% farmers adopting new technologies			
Value (Quantitative or Qualitative)	—	30%	Dropped	—
Date	—	03/31/2012	08/24/2012	—
Comments (including % achievement)	Indicator dropped.			
Indicator 19:	At least 5000 households participate and benefit from bio-carbon plantation			
Value (Quantitative or Qualitative)	—	—	5,000 households	4,374 households
Date	—	—	08/24/2012	03/31/2017
Comments (including % achievement)	Quite a few household (private land) lands were dropped from the target by the Kyoto Validators as it did not confirm to Kyoto methodology 001 guidelines.			
Indicator 20:	% of eligible households have benefitted by the Mountain Livelihood Fund through business plan			
Value (Quantitative or	0	60%	15%	62.3%

Qualitative)				
Date	02/24/2006	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Achievement exceeds target. Indicator revised for better clarity, since 60% of eligible households is equivalent to 15% of vulnerable households, and thus the coverage remains the same.			
Indicator 21:	% of funds for livelihood business plans are mobilized through banks or other financial resources			
Value (Quantitative or Qualitative)	—	25%	Original: 15% AF: 10%	Original: 18.7% AF: 23.2%
Date	—	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Target achieved.			
Indicator 22:	% target group have accessed the services of Livelihood Resource Organizations			
Value (Quantitative or Qualitative)	—	50%	Dropped	—
Date	—	03/31/2012	08/24/2012	—
Comments (including % achievement)	Indicator dropped because CIG sustainability already measured by indicator 21.			
Indicator 23:	% CIGs working in partnership with private sector organizations or other institutions.			
Value (Quantitative or Qualitative)	—	70%	Original: 30% AF: 10%	Original: 52.6% AF: 80.4%
Date	—	03/31/2012	08/24/2012	03/31/2017
Comments (including % achievement)	Target achieved. Indicator revised as target reduced, per the 2011 achievement.			
Indicator 24:	% of GPs WDOs and WDCOs receive positive scores (community for GP, GP for WDCO, WDCO for WDO) through community feedback scorecards			
Value (Quantitative or Qualitative)	—	70%	Dropped	—
Date	—	03/31/2012	08/24/2012	—
Comments (including % achievement)	Indicator dropped as score cards replaced by participatory monitoring and evaluation.			
Indicator 25:	At least 4 six-monthly COM revisions based on feedback from the field and independent reviews			
Value	—	4	Dropped	—

(Quantitative or Qualitative)				
Date	—	03/31/2012	08/24/2012	—
Comments (including % achievement)	Indicator dropped			
Indicator 26:	HPNRS Executive Committee and other committees meet at least twice per year and the governing body meets at least once a year			
Value (Quantitative or Qualitative)	—	Yes	—	Yes
Date	—	03/31/2012	—	03/31/2017
Comments (including % achievement)	The Committees met as planned.			
Indicator 27:	Financial and physical reporting submitted on regular and timely basis			
Value (Quantitative or Qualitative)	—	Yes	—	Yes
Date	—	03/31/2012	—	03/31/2017
Comments (including % achievement)	Financial and physical reports were timely submitted.			
Indicator 28:	M&E system in place.			
Value (Quantitative or Qualitative)	—	Yes	—	Yes
Date	—	03/31/2012	—	03/31/2017
Comments (including % achievement)	M&E system was established as planned.			
Indicator 29:	Environmental and social screening and mitigation systems fully functional			
Value (Quantitative or Qualitative)	—	Yes	—	Yes
Date	—	03/31/2012	—	03/31/2017
Comments (including % achievement)	All these systems were fully operational.			
Indicator 30:	Annual work plan being implemented on time and on target			

Value (Quantitative or Qualitative)	—	Yes	—	Yes
Date	—	03/31/2012	—	03/31/2017
Comments (including % achievement)	All plans were timely implemented.			

G. RATINGS OF PROJECT PERFORMANCE IN ISRs

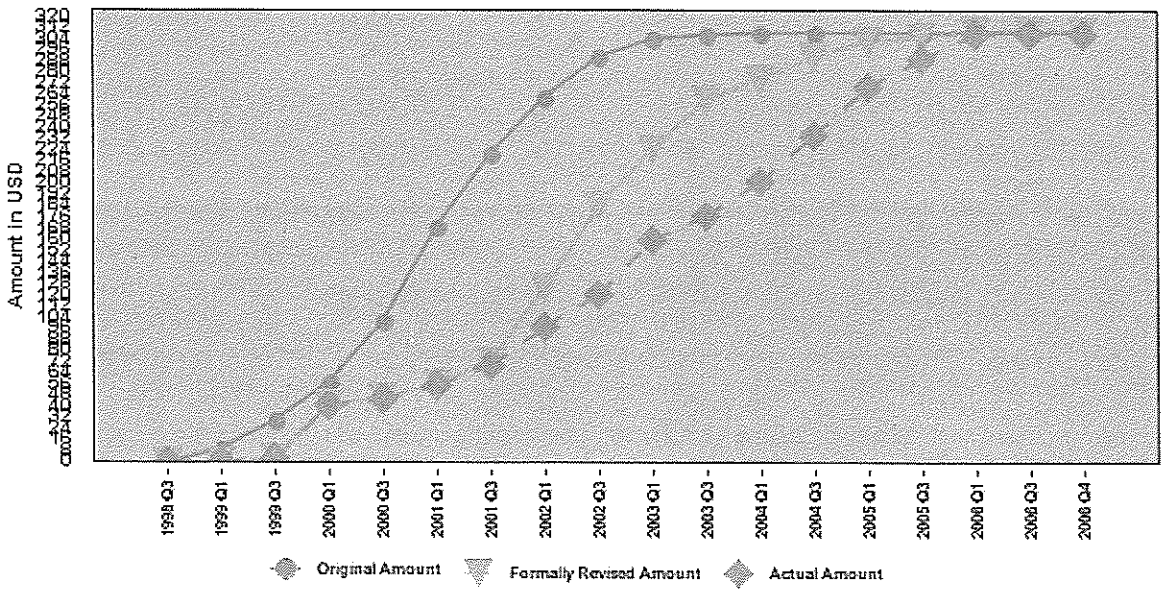
No.	Date ISR Archived	DO	IP	Actual Disbursements (US$, millions)
1	06/02/2006	Satisfactory	Satisfactory	5.24
2	10/18/2006	Satisfactory	Satisfactory	6.83
3	05/17/2007	Satisfactory	Satisfactory	8.05
4	08/02/2007	Satisfactory	Satisfactory	8.05
5	01/17/2008	Satisfactory	Satisfactory	15.82
6	06/22/2008	Satisfactory	Satisfactory	22.01
7	09/06/2008	Satisfactory	Satisfactory	22.63
8	03/05/2009	Satisfactory	Moderately Satisfactory	25.53
9	03/31/2009	Satisfactory	Moderately Satisfactory	26.28
10	08/18/2009	Satisfactory	Moderately Satisfactory	30.40
11	11/28/2009	Satisfactory	Satisfactory	32.10
12	05/26/2010	Satisfactory	Satisfactory	38.63
13	12/05/2010	Satisfactory	Satisfactory	41.82
14	05/28/2011	Satisfactory	Satisfactory	49.12
15	12/27/2011	Satisfactory	Satisfactory	52.44
16	05/29/2012	Satisfactory	Satisfactory	53.00
17	12/12/2012	Satisfactory	Satisfactory	55.20
18	06/18/2013	Satisfactory	Satisfactory	58.09
19	12/13/2013	Satisfactory	Satisfactory	59.16
20	05/05/2014	Satisfactory	Satisfactory	63.42
21	11/19/2014	Satisfactory	Satisfactory	68.53
22	06/24/2015	Satisfactory	Satisfactory	78.08
23	08/19/2015	Satisfactory	Satisfactory	78.42
24	02/27/2016	Satisfactory	Satisfactory	83.54
25	06/10/2016	Satisfactory	Satisfactory	86.11
26	12/15/2016	Satisfactory	Satisfactory	91.11
27	03/31/2017	Satisfactory	Satisfactory	93.27

H. RESTRUCTURING (IF ANY)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in US$, Millions	Reason for Restructuring & Key Changes Made
		DO	IP		

02/03/2016	S	S	83.10	Extension of Closing Date from March 31, 2016 to March 31, 2017 to utilize non-disbursed resources

I. DISBURSEMENT PROFILE



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

1. Himachal Pradesh (HP) is a mountainous state in northern India, known for its rich repository of biodiversity and the catchment of several major rivers. At the time of appraisal in 2005, HP had a population of 6 million with an estimated 28 percent living below the poverty line (compared to 37 percent nationally). The economy of the state is largely agrarian, based on rain-fed crops, horticulture, and livestock. Women play a major role in the agriculture sector. Nine out of ten households are rural and depend on forests and rain-fed agriculture for meeting the daily requirements of food, fodder, and fuel. The largest constraints to rural development in the state include the topographic conditions and limited access to economic and social services. In conjunction with the human and livestock density, there is heavy pressure on the fragile mountain ecosystem, leading to erosion and degradation of grasslands and forests.

2. The project was part of a long-term process that drew lessons from IWDP, and leveraged provisions of other Government programs including NREGS, IWMP and RKVY. It helped in responding to the dual challenges of poverty reduction and sustainable natural resource management (NRM), to which the Government of Himachal Pradesh (GoHP) was committed. While integrated watershed development was viewed as an ideal vehicle for sustainable management of land and water resources, the GoHP took a bold decision to engage constitutionally elected PRIs to implement the project. This was a departure from the convention of engaging village development committees in watershed development across other states, which reflected GoHP commitment to strengthen participatory local governance by empowering PRIs with fiscal and administrative powers.

3. The project was consistent with the World Bank Country Assistance Strategy (CAS) 2005–08 (CAS No. 22541-IN) and built on the successful experience of the IDA-/IBRD-funded Integrated Watershed Development Project (IWDP), which closed on September 30, 2005. Impact evaluation studies of showed that IWDP had considerable success in increasing productivity of watersheds and rural incomes while improving the natural resources base. Also, based on the experience in community-driven development (CDD), and working with Panchayati Raj Institutions (PRIs), the World Bank was well placed to assist the GoHP in its efforts in supporting NRM and decentralization.

1.2 Original Project Development Objectives (PDO) and Key Indicators

4. The Project Development Objective (PDO) as defined in the Loan Agreement is 'to assist Himachal Pradesh in improving its productive potential of the Project Area and increasing incomes of rural inhabitants in selected watersheds through socially inclusive, institutionally and environmentally sustainable approaches'.

5. The following indicators were originally selected for measuring and monitoring progress toward achieving the PDO:

(a) 20 percent increase in real income over baseline

(b) 50 percent increase in production and coverage of grasses, bushes, and trees

(c) 50 percent increase in yields of milk, paddy, wheat, maize, and horticulture crops.

(d) Degree to which the project has influenced state policies and guidelines for watershed development

1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and Reasons/Justification

6. The PDO remained unchanged throughout the project implementation. But the PAD does provide more clarity on the PDO, by defining that the primary objective of the proposed project was to reverse the process of degradation of the natural resource base and improve the productive potential of natural resources and incomes of the rural households in the project area. The secondary objective was to support policy and institutional development to harmonize watershed development projects and policies across the state in accordance with best practices. Considering the fact that the implications of both the PDO were same, PDO defined in the legal agreement remain valid throughout the project.

7. Triggered by the midterm review (MTR), and additional financing (AF) (report no. 70461-IN dated August 24, 2012), new PDO-level indicators were incorporated in the results framework and some of the target values of the original project (602 GPs) were adjusted to reflect the recommendations made during the MTR. However, results for original GPs indicate cumulative indicator values at the closure of the project. Due to the expansion of the project area by 108 GPs, additional target values were defined for some of the PDO and intermediate outcome indicators. The 3 new PDO indicators introduced were: (a) 30 percent increase in irrigation potential in target areas, (b) number of beneficiaries, and (c) percent of beneficiaries are female. In addition, 22 intermediate results indicators were added, revised, or clarified at the MTR (the revisions are detailed in Annex 2).

1.4 Main Beneficiaries

8. Following the primary objective in the PDO, the rural households in the project area are identified as the main beneficiary, to reduce poverty by increasing their real incomes. The project area is spread over the mid to high hill zone of HP with a range of altitude between 600m and 1,800 m. The project targeted 710 GPs (originally 602 GPs, which was topped up by 108 GPs following the AF agreement) from 11 watershed divisions, covering 45 development blocks in 10 districts. The GPs were selected based on three parameters: (a) socioeconomic status (for example, poverty map), (b) erodibility index (for example, land degradation and soil erosion), and (c) accessibility (for example, remoteness and infrastructure).

9. The main beneficiaries, originally estimated at 2.26 lakh rural households (average five persons per household) and extended by an additional 0.46 lakh following the AF agreement, can best be divided in to the following:

- **Smallholders.** These farmers benefitted from (a) watershed treatment, notably the land degradation control and water-harvesting activities, (b) expansion of irrigation leading to increase in productivity, (c) transitioning toward income-generating high-value and diversified crops, livestock, and promotion of value addition.

- **Marginal farmers, landless, nomads, and women.** This vulnerable group benefitted from grants that would support their entrepreneurial off-farm economic activities to enhance their incomes and overall livelihoods. Notably, women were encouraged to form into self-managed community organizations, like self-help groups (SHGs). The Tribal Action Plan supported the tribal populations, who passed by or stayed in the targeted project area.

10. In addition, as the secondary objective in the PDO addressed policy and institutional development, the Project Management Unit (PMU) and facilitating agencies like the 2 Regional Project Offices and 11 Divisional Watershed Development Offices (WDOs), which proactively coordinated the execution of works through the 46 Watershed Development Coordination Offices (WDCOs), were the additional beneficiaries of the project. Notably, the institutional strengthening component aimed at ensuring that the GPs in the project area were capacitated with adequate technical support.

1.5 Original Components

11. The project had 4 components and 11 subcomponents as summarized below:

Component 1: Institutional Strengthening (US$11.28 million)

12. The objective of this component was to strengthen the capacity of the participating PRIs and other local institutions within the GPs of the project area to enable them to assume greater responsibility for planning, implementing, monitoring, and maintaining watershed treatments and livelihood activities. This component was composed of following five subcomponents: (a) achieving awareness through information, education, and communication; (b) local-level capacity building of the PRIs and local villages involved; (c) human resource development, including personnel management and improved outreach to communities; (d) producing an information and knowledge system for effective project implementation, monitoring and evaluation (M&E); and (e) harmonization of watershed approaches by making the Himachal Pradesh Natural Resource Management Society (HPNRMS) the focal point for planning and execution of all related projects in the state.

Component 2: Watershed Development and Management (US$44.97 million)

13. As the key project component, the objective was to support the implementation of watershed treatment as prioritized in the Gram Panchayat Watershed Development Plans (GPWDPs), as well as the treatment of critical lands administered by the GPs. It was broken down into four subcomponents: (a) non-arable land development focused on ecological rehabilitation of degraded catchment by means of soil and water conservation measures (for example, forestry plantation and water-harvesting structures), while also reducing the gap between biomass production and consumption; (b) arable land development followed the objective of improving cropping systems through new agronomic practices, crop diversification, reducing post-harvest losses, and increasing value addition; (c) fodder and livestock development aimed at improving productive potential through better fodder, management practices, and genetic upgrading; and (d) rural infrastructure development covered the construction of footpaths

and small bridges, to improve the accessibility to market and public institutions, as well as, improving availability of potable water.

Component 3: Enhancing Mountain Livelihoods (US$11.23 million)

14. Composed of two subcomponents, the overall objective of this component was to promote value addition in crop, livestock, and non-timber forest products (NTFPs) in the project area. The subcomponent on agricultural marketing and processing focused on improving market links between farmers and buyers by identifying market opportunities, co-financing the entry of producer groups into commercialized production, and co-financing the private sector to improve productivity, processing, and storage to strengthen viable supply chains. The second subcomponent aimed at reaching out to vulnerable groups, like women and the landless, with income-generating activities.

Component 4: Project Coordination (US$7.48 million)

15. The objective of the component was to finance the construction of office/residential accommodation, purchase of equipment and vehicles, as well as incremental operating costs of the project.

1.6 Revised Components

16. Despite AF and restructuring, there were no revisions to the project's components and subcomponents. However, the Bio-Carbon Project was introduced as an add-on sub-project (see Annex 3). This first ever Clean Development Mechanism (CDM) subproject in a watershed project was defined under the Kyoto Protocol, and registered under the United Nations Framework Convention on Climate Change (UNFCCC) on March 4, 2011. The Bio-Carbon Project focused on reforestation to protect watersheds, improve rural livelihoods, and generate additional income through carbon credits. Implemented in 11 watershed divisions falling in 10 districts, a total of 140 GPs was prioritized to sequester greenhouse gas (GHG) emissions through reforestation, mitigate climate change risks, generate additional income through carbon credits, and enable an environment for additional employment opportunities.

1.7 Other Significant Changes

17. Independent third-party evaluations were carried out by Winrock International in 2009 (MTR I) and by The Energy and Resources Institute (TERI) in 2014 (MTR II), during which indicator values for control and sample villages were reconfirmed. Both reviews did not foresee the need for any changes in project scope and components. However, as the project area had achieved its targets, and in some cases exceeded it, MTR I initiated a reflection process on expanding the project area to cover additional GPs, leading to the AF agreement.

18. The time line of the original project (CR-4133-IN) was extended by three years on September 27, 2012, which was also the Board approval date of the AF (CR-5159-IN). While the original project closed, as scheduled, on March 31, 2016, the project closing date for the AF was extended once by 12 months to March 31, 2017, in response to the request from the GoHP and the Department of Economic Affairs of the Government of India (GoI). The purpose of restructuring the Mid-Himalayan Watershed Development Project (MHWDP) for AF (report no.

RES 22265 dated February 3, 2016) was to use the non-disbursed IDA resources (US$10.58 million) accredited on account of exchange rate fluctuations.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design, and Quality at Entry

19. **Project preparation and background analysis.** The project built on the strategies of rural growth by empowering communities set out in the CAS 2004. Supporting better management of watersheds, while enhancing livelihood opportunities of the poor are goals that fall under the broad CAS objective of investing in people for improving rural livelihoods.

20. The MHWDP also drew lessons from the IDA-funded IWDP, the pilot which closed on September 30, 2005. The IWDP covered the Shivaliks foothills in HP and the four neighboring states. Impact analysis showed that the IWDP had considerable success in increasing productivity of the natural resource base in the selected watersheds. Incorporating those practices, the MHWDP focused on increasing farmers' profitability through diversification with a sound scientific approach such as hydrological monitoring.

21. **Project design.** The GoHP demonstrated a strong commitment to the project throughout the identification and design stages. It established a PMU and hired staff from the previous project to benefit from their experience. The project had a well-built design with a paradigm shift of implementation arrangements from the watershed development committees to constitutional elected PRIs. This shift of implementation arrangements helped multiply community participation, induct greater transparency, and directly enhance the institutional capacities at the field level. The principal objectives of the project were suitably incorporated in the design.

22. The project was implemented through the HPNRMS and this multidisciplinary model of implementation and funding was adopted by the State Agriculture Department for its own projects. A key feature of the project was the proactive involvement of village-level institutions of self-governance, that is, the GPs. Building on multi-sector teams under the Chief Project Director (CPD) drawn from the HP Forest Department, the project implementation was managed under 2 Regional Project Directors, heading 11 Watershed Development Divisions in 10 districts of the state. Each division was led by a WDO, which was further supported by 46 WDCOs and the GPs at the local level.

23. Ward-level micro-plans were formulated at the community level and their aggregation led to form the GPWDPs. These plans in turn were aggregated at the micro-watershed level by a Joint Watershed Committee (JWC). Inter-GP spaces (for example, forest land outside GP jurisdiction) could be treated by the project following the JWC's recommendation. District-level watershed development committees, as a part of the Natural Resource Management Society (NRMS), were led by the Deputy Commissioner and included representatives from line departments, banks, and non-official members. The NRMS was constituted and chaired by the Chief Minister for review of NRM-based projects and programs. The society was responsible for harmonization of approaches and guidelines for policy development.

24. The project was responsible for preparation of annual budgets and submission of the same went through the Forestry Department to the Department of Finance. On approval of the

budget, the Drawing and Disbursement Officers of the project were authorized to issue checks at all levels. The WDOs transferred funds periodically to GPs and common interest groups (CIGs) on project works based on approved GPWDPs.

25. **Quality at entry.** There was a strong rationale for the World Bank's involvement and a key imperative to improve NRM in the state, as well as the incomes of rural households. The GoHP's commitment to these objectives was defined from the beginning, and the rationale for the World Bank's involvement was adequately justified. It was also quite timely as rainfed agriculture development with watershed as a tool was gaining momentum in the country to transform the lives of 2/3rd poor farmers. However, when the project (MHWDP) was approved it was assumed that the approach and assumptions of the previous project would be followed and as such, no new implementation guidelines or manuals were prepared. Another consequence of the assumptions maintained at appraisal was that no new economic/financial analysis was conducted.

26. Given the shift in the institutional arrangements and focus of the MHWDP, implementation was initially slow as it took some time for appropriate procedures and guidelines to be put in place. However, the project design and components matched the intended outcomes of the project, though the inclusion of poverty reduction in the PDO was not necessary, as this was adequately covered in the specification of the higher-level objectives to which the project was expected to contribute. The end target results could not be captured for the first-of-its-kind comprehensive watershed treatment project which necessitated frequent revisions of results indicators. These indicators were adjusted to provide more clarity during the AF process in September 2012.

27. **Identification of risks.** The Project Appraisal Document (PAD) outlined three risks to the achievement of the PDO, and an additional six risks to the successful implementation of the four project components. Most of these risks were well-managed. For example, to mitigate the Substantial rated risk of weak financial management (FM) capacity of the GPs, the multidisciplinary design for implementation in conjunction with capacity-building activities proved to be the best solution. On top of that, the pilot of a web-based Financial Management Information System (FMIS) was successfully established and improved efficiency and transparency.

28. Besides the implementation risk relating to yield improvements resulting from introduction of technologies, the PAD did not address the risk due to climatic adverse events like droughts and floods. However, the project design factored in climate variability to a limited extent. Considering the defined PDO outcome indicator on productivity increases and considering rain-fed agriculture, the trend toward lower and more concentrated precipitation as possible impacts of climate change were not considered as a potential risk.

2.2 Implementation

29. The implementation progress is rated Satisfactory. Consistent with the PDO, the project made attempts to engage with the GPs in implementing watershed treatment on arable and non-arable lands, while enhancing mountainous livelihoods. This was done despite concern that the GPs had low capacity to manage finances and implement subproject activities. The project took

up the challenge to enhance the GPs' capacity in fulfilling their constitutional mandate in delivering development services at the local level. This led to improvement in efficiency of the PRIs in managing all development activities.

30. **Bio-Carbon Subproject:** Bio-Carbon subproject became an integral part of the project; however, it could not be undertaken as part of the project from the beginning due to budget constraints. Introduced as an add-on sub-project, the Bio-Carbon project was integrated into the project to draw climate co-benefits through reforestation in selected watersheds. Implemented in 11 watershed divisions falling in 10 districts, the sub-project had a well-designed implementation arrangement (see Annex 3) to mitigate climate change risks, and an institutional arrangement to disburse income from selling carbon credits to project beneficiaries.

31. **MTR.** Conducted in September 2009, MTR I rated the implementation progress Satisfactory. The project investments in the watershed achieved and in some cases exceeded its midterm targets, including catchment treatment. Substantial gains have been achieved in impact, equity, efficiency, and sustainability. While PDO, safeguard ratings, and overall component design did not require any changes, the Results Framework was adjusted to include additional indicators to capture important project outcomes, while deleting some to avoid duplication. Furthermore, several indicator targets were modified based on actual achievements at the time of the MTR. Notably, the PDO target of 20 per cent real income growth was downscaled to 15 percent, as the increase in household real income due to the project were assessed at 7 percent during MTR I.

32. **AF.** With the intention to scale up the project's impact and maximize development effectiveness by enhancing the natural resource base in the catchment areas, the AF in August 2012 led to an expansion of the project area, better consolidation of watershed treatment activities to ensure sustainability, and an increase in the development outcomes by consolidating cost overrun. With an extension of the project by an additional three years, the AF provided good opportunities to improve the quality of the Results Framework. Given the lack of rigor in the initial quality of PDO and intermediary outcome indicators to measure project progress, the team capitalized on the opportunity to address these shortcomings in the Results Framework.

33. **Restructuring.** In February 2016, following the GoI and GoHP request, the World Bank restructured the project to use the non-disbursed IDA resources of INR 70 crore (US$10.58 million) on account of exchange rate fluctuations. This level-II restructuring led to an extension of the closing date for the AF credit by 12 months to March 31, 2017. While most of the activities under the project were successfully completed, the restructuring also provided an ideal opportunity to consolidate the Bio-carbon Subproject and better demonstrate climate change adaptation and mitigation activities.

2.3 Monitoring and Evaluation (M&E) Design, Implementation, and Utilization

34. **M&E design.** The project had a well-designed Project Monitoring and Information Management Unit which was tasked to support all project units on tracking physical and financial progress. The PDO and intermediate outcome indicators were realistically measured for both original and AF GPs. The M&E system consisted of (a) a baseline survey, (b) monthly output monitoring, (c) six-monthly status reports, (d) a midterm report, (e) social and

environment management auditing, and (f) a Final Impact Assessment Report. With the AF being approved at the closing stages of the original project in August 2012, the Final Impact Assessment Report by TERI was considered a de facto midterm report (MTRII), while the actual midterm report by Winrock was counted as MTRI.

35. **M&E implementation.** The M&E system was rated Satisfactory throughout the duration of the project. A baseline survey was conducted in the first year and was followed by regular monitoring of project outputs and targets. The project field staff and PMU created an excellent database on institutional performance of GPs. To enhance their performance, the GP Incentive Scheme was put in place to award the best performing GPs with cash prizes. Before closing of the project, 116 best performing GPs were awarded under the scheme. However, to enhance accountability and ensure transparency, the primary stakeholders were consulted to assess the performance of the project as well. Such a reciprocal system of assessment was crucial in establishing a participatory learning culture in the project. A web-based FMIS and an Android-based mobile application for real-time monitoring of project field activities were significant operative features of M&E implementation.

36. **M&E utilization.** There was significant delay in contracting the third-party monitoring Agency for Final Impact Assessment of the project, leading to re-validation of data generated and quality of impact assessment. However, the PMU's M&E team provided reliable data, which highlighted the project's major achievements and the lessons learned from implementation. In addition, the findings of MTRI and II provided additional evidences on the impact of watershed interventions on communities, as well as on soil and water conservation in the project areas. The mechanism of information gathering, monitoring, and reporting had significantly built the capacity of the project staff at each level to monitor and review their own activities regularly. This had not only led to high level of ownership in the M&E functions but had also increased the staff's involvement in implementation progress and results achievement in the project.

2.4 Safeguard and Fiduciary Compliance

37. The project triggered five safeguard policies, which were Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), Pest Management (OP 4.09), Forests (OP 4.36), and Indigenous Peoples (OP. 4.10). Furthermore, the environmental and social safeguards were an integral part of the GPWDP, and thus the GPs were accountable for ensuring environment and social safeguard compliance using safeguard checklists in selecting and implementing subprojects at the village level.

38. **Environment safeguards.** Environmental safeguards applied during the project were satisfactory, especially given the low level of identified risk. All the triggered safeguard policies were monitored and well captured in the Environmental and Social Safeguards Framework This also included a phased implementation plan for social-environmental monitoring, evaluation, and mitigation activities. No negative impact was reported in the Environmental and Social Management Framework.

39. **Integrated pest management.** The project made significant efforts to incorporate proven technologies to educate, motivate, and guide farmers to adopt integrated pest management (IPM) strategies, stressing on the need for relying on bio-intensive strategies. Appropriate

dissemination of information, strategized capacity building, and selected demonstration packages (on use of bio-fertilizers, organic farming techniques, vermi-compost, and use of mulch for soil moisture conservation) resulted in more than 30 per cent reduction in the use of chemical fertilizers subsequent to replacement by vermi-compost in the project area by production of more than 30,000 MT of vermi-compost.

40. **Social safeguards.** Overall, the social safeguards were satisfactory, demonstrating significant benefits for community groups. The GPs used safeguard checklists in selecting and implementing subprojects at the village level, thus reflecting accountability at the lowest levels of the governance structure. The social assessment conducted during project preparation identified the following principles to guide project implementation: (a) institutional development, (b) gender and social inclusion, and (c) participation.

41. **Institutional development.** The project created a robust institutional structure that resulted in strong community mobilization and enhanced capacities, and generated demand for better services at the PRI levels. The project also shaped several community organizations and covered as much as 75 percent of the vulnerable population. Substantial investments in capacity building of these locally authorized institutions paid dividends that ensured enhanced participation by the village-level project staff, as well as various project-formed group members in planning and implementing various activities, as well as in the PRI elections, thus building stronger accountability.

42. **Gender and social inclusion.** The project had substantial gender outcomes in local governance and livelihood development with more than 60 percent women members in GP executives and more than 70 per cent women members in SHGs and CIGs. The project design enabled inclusion of economically and socially marginalized groups, such as marginal farmers, the landless, women, and transhumance, who were assisted by the vulnerable group funds or the Transhumant Action Plan. A Tribal Development Plan was prepared to address these issues in scheduled areas affected by the project and its implementation provided benefits that were culturally compatible and acceptable to the transhumant groups under the project. Several pilot income-generating activities were implemented successfully, thus creating a stable livelihood for the groups.

43. **Participation.** As inculcated in the design, a robust institutional structure and a focused communication and capacity-building strategy that emphasized raising awareness in the targeted GPs, resulted in enhanced participation by the community organizations in GPWDP planning and implementation. This was fostered by women village motivators through 100 percent representation, thus displaying adequate participation of women at every level of the project implementation, especially in decision making, implementing the GPWDPs, fund management, and project monitoring both at the ward and GP levels.

44. **FM.** Both the original project and the AF have been fully disbursed and closed during the year. The project will be disbursing the entire credit balance within the grace period of four months. The project has reported regularity in submission of interim unaudited financial reports and accounting of Grant-in-Aid Utilization Certificates (UCs) throughout the project period. To enhance efficiency in project management, the project successfully established a web-based FMIS. The project has consistently been rated among the top five 'Best Disbursed Projects' in

the India portfolio. No significant audit observations were reported in any of the financial compliance reports and all audit reports were submitted on time. The approvals of annual financial and disbursement plans were on time.

45. **Procurement.** The project fully adhered to procurement guidelines and effectively achieved its objectives. Despite the highly-staggered project interventions involving participating line departments, the bidding and selection process was conducted in a fair and transparent manner. Despite the large number of activities and subprojects undertaken, there were negligible complaints and the Procurement Plans were regularly updated at 18-month intervals. This is particularly attributed to a well-designed capacity-building plan through regular trainings (for relevant staff, dealing with procurement) and workshops to disseminate knowledge on the World Bank procurement process throughout the implementation period. The minor findings of the internal and external audits were compiled by the project throughout the intervention period.

46. Various measures taken by the project, such as discouraging cash transactions in favor of World Bank transfers, periodic instructions issued on World Bank-funded procurement procedures, social audit by the community, and proactive actions of ex-post procurement review findings have induced a natural procurement compliance that substantially helped the project ensure transparency in procurement, and earn a Satisfactory rating.

2.5 Post-completion Operation/Next Phase

47. On successful completion of the MHWDP, an idea of a new project was conceived by adopting an integrated approach and involving line departments. In HP, agriculture land is surrounded by forests and to sustain agriculture, irrigation needs to be invariably provided as most of the water sources are in forest lands. Keeping the Forest Department as the nodal department, the GoHP has proposed a new project 'Integrated Project for Source Sustainability and Climate Resilient Rain-fed Agriculture' to the GoI. In principal, approval of this project has been granted by the GoI. The main objectives of the proposed project are climate change adaptation and mitigation with an integrated approach for source sustainability, decentralized water infrastructure development, innovation, diversification and transformation of rain-fed agriculture production systems, and enhancement of carbon stocks.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design, and Implementation

Relevance of Objectives: High

48. The project's objectives were as relevant at the time of completion as they were at initiation in 2005. The objectives were consistent with the CAS 2005–08, and remained so for the Country Partnership Strategies (CPS) 2009–12 and 2013–17. While not particularly defined in the PAD, the objectives also align with the CPS 2013–17 overarching goals of helping the GoI, notably the GoHP, to accelerate economic growth and poverty reduction and increase shared prosperity within a strong enabling environment. In this respect, the project contributed fully to CPS Area-2 on transformation through increased agricultural productivity, while also aligning the objectives to the corporate goals.

49. Reducing poverty and sustainable management of natural resources continue to be priorities for the GoHP. The PDO was therefore appropriately formulated to align with the national and state context. The project scope was realistic given that the PDO aimed at increasing incomes of rural inhabitants in selected watersheds through socially inclusive, institutionally and environmentally sustainable approaches. Aligning with the PDO, the project followed inclusive criteria in (a) diversifying on- and off-farm job opportunities through empowered community participation, (b) improving production and productivity of selected agricultural commodities, (c) converting production surplus into high-value market-oriented sale opportunities, and (d) improving access to water, while capitalizing on ecosystem services through carbon credits.

Relevance of Design and Implementation: Moderate

50. During the extended period of implementation, the GoHP displayed strong support for the project as reflected in the design of a robust and realistic governing structure. Implemented through the NRMS, the governance architecture came in a well-balanced mix of state and local institutions. Leading to a high degree in ownership, the GoHP's development policy supported the project's decentralized watershed development planning and implementation, which strengthened GP capacities in participatory decision making, social accountability, FM, procurement, and safeguards. Beyond the GPs, the project engaged several types of community-based institutions in watershed management, namely SHGs, user groups (UGs), and CIGs.

51. The project was multi-sectoral and contributed to sustainability by ensuring community participation across watershed development, agriculture, forestry, rural development, and fisheries sector. The design of the project was also inclusive of economically and socially vulnerable groups, such as marginal farmers, the landless, women, and nomads.

52. The project was well designed, and the implementation plan was relevant to delivering the PDOs. However, in the first four years the project was in a state of flux whereby some of the data generated during the period could not be captured to maintain the time-series trends. Hence, the implementation was rated moderate. However, the project gained substantially through a combination of effective institutional capacity building, comprehensive treatment of selective catchments, agricultural production enhancement and diversification, and rural livelihood support services during later half of the project.

3.2 Achievement of Project Development Objectives

53. In assessing the PDO level achievements, the ICRR team did consider the need for split-evaluation in light of new indicators introduced due to additional financing. However, there was neither any standalone indicator, nor any indicator that was unrelated to the original PDO. The new indicators reflected consolidation of some of the intermediate level indicators only, and hence split evaluation was not applied.

Overall rating: Substantial

54. Consisting of two objectives: (a) to reverse the process of degradation of the natural resource base and improve the productive potential of natural resources and incomes of the rural households in the project areas and (b) to support policy and institutional development to

harmonize watershed development projects and policies across the state in accordance with best practices, the PDO was well-conceived. The data, various Aide Memoires, and the findings of the end-of-project impact assessment provided considerable evidence for significant achievement of outcomes on most objectives. While two of the PDO outcome indicators didn't quite achieve the original targets, the project had attained significant progress. But as the majority of PDO indicators were met and even partially exceeded their targets (for example, the number of beneficiaries including significant involvement of women), the overall rating was substantial. More detailed findings on information sources and outcomes by components are reinforced by the information presented in the datasheet and in annex 2 and are summarized in the following set of measurable PDO outcome indicators:

(i) Increase in real income over baseline for households in project area

55. The MHWDP contributed to raising incomes among both direct and indirect beneficiaries of the project. Through tailored local-level capacity building, training on climate-resilient agricultural practices, improved irrigation infrastructure, better access to water, investments in rural infrastructure, land amelioration activities, and transitioning toward high-value crops (HVCs), the project contributed to increasing yields, overall agricultural outputs, and above all, it provided the beneficiaries with more on- and off-farm employment opportunities resulting in increased household incomes. The target for increasing the average real income over the baseline income of the households of INR 45,978 was originally set at 20 percent. Following the AF and the expansion of the project area to an additional 108 GPs, the target was revised to 15 percent for the original credit and 8 percent for the AF credit. As explained in Annex 4, due to the lack of data and methodological flaws in the Final Impact Assessment, it is not possible to estimate the increase of real household income separately for the original and AF credits. Based on the methodology described in Annex 4, the overall average increase in real annual household income has been estimated at 32 percent, which is 11 percent above the average increase in real annual household income for the control group.

56. Practically all project activities have contributed to the overall increase in real income of the target beneficiaries. A pre- and post-project comparison shows a significant increase of resources within the project area. The increase in resources in conjunction with their utilization has subsequently increased the income of all categories of beneficiaries. An end project assessment also reveals that the highest percentage increase of income was realized by the marginal and small farmers. Impact studies also showed that the project was proportionally more beneficial to tail-end farmers, especially in areas with arable crops and those transiting toward HVCs. Development of rural infrastructure such as bridges and footpaths provided better access to markets which further boosted the income of households that were transitioning toward HVCs.

(ii) Increase in production and coverage of grasses, bushes, and trees

57. The PAD estimated that the production and coverage of grasses and trees could be increased by 50 percent within the original GPs and by 15 percent in the additional GPs, thereby contributing to the PDO of reversing the process of degradation of the natural resource base. The ecological rehabilitation of the degraded catchments was targeted by carrying out soil and water conservation measures through site-specific treatment plans. Maximum importance was given to vegetative measures, making use of local grasses and trees. Impact studies measured an increase

in biomass coverage of 46.3 percent within the targeted old GPs and 65 percent in the additional GPs. A mix of rehabilitation of plantations, conservation plantations, and community plantations were implemented. Notably the community protected bio-carbon plantations are growing at an average survival percentage of 65.2 percent, while the maximum survival of 75 per cent is seen in the Panchayats of Naun and Dabat. Some 8,752 ha of lantana weed-infested area were rehabilitated with grasses. This also favored the availability of fodder, which increased by 27.4 percent following the plantation activities.

(iii) Increase in yields of milk, paddy, wheat, maize, and horticulture

58. As one core outcome of Component 2, the final impact study confirms that agricultural productivity has improved through the activities of the project. For wheat, the increase in yields of 25.9 percent was measured for the original GPs and 20.7 percent for the additional GPs. For maize, the yield increase was 28.9 percent for the original GPs and 25.1 percent for the additional GPs. However, the yields for these traditional crops turned out to be lower than their target values. It should be noted that the availability of irrigation led to significant changes of cropping patterns in favor of horticulture with much higher returns per unit of land.

59. The PDO indicator for increasing milk yields by 20 percent for the original GPs and 5 percent for the additional GPs was not reached, as the project targeted breeding interventions for buffaloes. Thus, the average increase in milk yield reached 10.7 percent, while buffalo milk yields increased by 19.1 percent.

(iv) Increase in irrigation potential in target areas

60. The utilization and productivity of water has increased substantially due to project interventions. Because of the construction of 13,795 water-harvesting and storage structures (for example, roof rainwater harvesting tanks, ponds, dams, and lift/gravity irrigation infrastructure), 468km *Kuhals* (irrigation channels), some 12,034 ha of culturable command area has been brought under irrigation. Of this, 55 percent of the irrigated land is being used for HVCs (vegetables) showing a remarkable productivity enhancement of 700% over baseline, and the remaining 45 percent has been put under traditional crops like wheat and maize.

61. The PDO target of 30 percent increase in irrigation potential has been exceeded by far, as 38.12 percent of the target area has been brought under irrigation. As a result, yields have improved, contributing to increases in output and value of agricultural production, as well as diversification toward horticulture products. The expansion of irrigated area has been complemented by the introduction of high-yielding seeds, vermi-composting, integrated nutrients, pest management techniques, and other improved crop management practices.

(v) Degree to which the project has influenced state policies and guidelines for watershed development (qualitative measure)

62. The PAD defined the support of policy and institutional development to harmonize watershed development projects and policies across the state as the secondary PDO. Institutional strengthening was therefore designed as one of the four key components. Component 1 of the project built GPs' capacity in participatory decision making, planning and implementation, transparency and social accountability, FM, procurement, and safeguards.

63. While defined as a qualitative measure, the target of influencing state policies and guidelines for watershed development was fully achieved. This can best be highlighted by the following exemplary results: (a) the concept of 'Paravet' (a veterinary para professional) introduced in the project has been adopted by the state Animal Husbandry Department; (b) the Bio-carbon Subproject has helped formulate the 'Payment for Ecological Services' in the state Forest Department; (c) the Financial Management Information System (FMIS) software developed by the project is being used by the state Forest Department; (d) the project's procurement procedures for purchase of veterinary medicine has been adopted by the state Animal Husbandry Department; (e) the society model for project implementation is being replicated for the Asian Development Bank-funded tourism project and for other watershed development projects; and (f) the soil and water conservation manual developed by the project has been adopted by the concerned line departments.

(vi) Number of beneficiaries

64. As an outcome of the first three components of the project, a significant number of beneficiaries benefitted from institutional strengthening, watershed development, and enhancement of mountain livelihood. Notably under Component 1, the project formed a number of community institutions, including 3,027 SHGs, 6,650 UGs, and 5,947 CIGs.[1] Further, the project reached out to a large segment of vulnerable communities in the project area by engaging 1,394 CIGs and 5 federations in 304 clusters. The project not only provided extensive orientation training at the village and division levels on the watershed concept, participatory planning, and implementation, but also imparted technical training to more than 1,330 GP executives, 2,883 staff members, 1,229 motivators, and 71,048 farmers.

65. The project successfully zoomed in on vulnerable groups. Based on the end project assessment, 74 percent of vulnerable members in the original and additional GPs benefitted from the mountain livelihood fund. In total, while respecting the potential overlap, almost 600,000 beneficiaries (120,000 households) benefitted from the project (table 1). Under the Tribal Action Plan, which aimed at improved animal health care and breed management, there were 36,850 beneficiaries of which 7,370 participated in trainings, workshops, and exposure visits.

Table 1. Project Beneficiaries by Component (households/*persons*[a])

Component/Subcomponent	Beneficiaries	Incremental	Comments [c]	Female [d]	% Female
A. Institutional Strengthening	**n.a[b]**	**n.a[b]**			
B. Watershed Development and Management					
1Treatment of non-arable land	**79,231** ***396,155***	**79,231** ***396,155***		***209,962***	**53.0**
2 Treatment of arable land	**104,250** ***521,250***	**25,019** ***125,095***	**0% not benefiting from B1**	***61,046***	**48.8**
3 Rural infrastructure	**23,180** ***115,900***	**4,636** ***23,180***	**20% not benefiting from B1–B2**	***11,312***	**48.8**
4 Fodder and livestock	**46,743**	**9,349**	**20% not benefiting**		

[1]Of these, 2,625 SHGs, 5,802 UGs, and 3,707 CIGs were established/strengthened in the original 602 GPs; while 315 SHGs, 1,697 UGs, and 2,376 CIGs were established in the additional 108 GPs.

development	*233,715*	*46,743*	from B1–B3	*22,811*	48.8
5 Tribal development	7,370 *36,850*	7,370 *36,850*	100% not benefiting from B1–B4	*11,313*	30.7
Total B				*316,444*	50.4
C. Enhancing Mountain Livelihoods	19,087 *95,436*	19,087 *95,436*	100% not benefiting from B or A	*49,054*	51.4
Total Project Beneficiaries		144,692 *723,459*		*365,498*	50.5

Source: PMU status report.

a. Based on an average of five persons per household.

b. Project M&E reports only provide number of participants by type of intervention and do not report total net number of participants, that is, not considering that participants are participating several times in workshops, trainings, and so on. In any case, beneficiaries under Component A are included in the beneficiaries reported under B and C.

c. Assumptions.

d. Project data, with the exception of rural infrastructure and fodder/livestock development for which the official HP sex ratio was applied.

(vii) Of which are female beneficiaries

66. Recognizing the generally marginalized place of women in the rural space, efforts were concerted to ensure that the project's stream of benefits reached the rural women. The empowerment of women was considered in three dimensions: (a) social, (b) economic, and (c) political, and was manifested at the individual and group levels. Although there was no indicator for empowerment, aside from the institutional strengthening component, a considerable achievement of the project was how women were engaged and strengthened directly on several relevant fronts (e.g. see lessons learned, paragraph 95 and annex 2, paragraph 15). Resulting from the activities in the three components, the target of 50 percent of female beneficiaries was achieved.

3.3 Efficiency

Rating: Substantial

67. Project efficiency is a measure of how project resources are converted into measurable results. In the context of this ICR, project efficiency was measured by assessing (a) the actual project costs and duration for realizing the objectives stated in the Results Framework, in relation tothe plan, (b) the cost per beneficiary and per unit of output, and (c) the extent to which the economic outcomes estimated at appraisal were realized. The details are provided in annex4: Economic and Financial Analysis.

68. As presented in the datasheet and Results Framework Analysis (section F), the project has achieved or exceeded most PDO and intermediate outcome indicator targets, while total project costs slightly exceeded the appraisal estimate by 0.6 percent (USD 0.69 million, see Annex 1).

69. Overall, the average project cost per beneficiary household amounts to around INR 45,400 (US$843) which is well below other similar projects in India (see annex 4, table 4.2). As the number of beneficiaries was not estimated at project appraisal, it is not possible to compare the cost per beneficiary with the ex-ante estimate. Annex 4, table 4.8 presents the main project

outputs and cost per unit of output. A comparison between the actual and estimated unit costs is not possible as no targets were set at appraisal for most outputs or only lump sums were allocated.

70. It is also not possible to compare the economic rate of return (ERR) of the project at completion with the ERR at appraisal as no exante economic and financial analysis (EFA) was conducted. However, at appraisal it was assumed that the EFA carried out for the ICR of the IWDP would give some indication about the ERR that can be expected from the MHWDP, given the similarity of the two projects. The ERR for the IWDP for the two main project benefit scenarios was 14.7 percent and 15.7 percent respectively. Based on the results of the MHWDP's Final Impact Assessment Report, the average real income increases realized by beneficiary households and the total number of beneficiaries as presented in table 1 (in a phased manner, assuming an average of five persons per household), as well as the total economic project costs (excluding taxes but including beneficiary contributions), the ERR for the MHWDP has been calculated at 18.1 percent.

71. Given the fact that the targets for all PDO indicators and almost all intermediate outcome indicator targets were reached or exceeded and the project generated a very satisfactory ERR, the project's efficiency is rated Substantial, despite the original project being extended by three years and the extension of the revised closing date, including the AF credit, by 12 months from March 31, 2016 to March 31, 2017 (see paragraph 16).

3.4 Justification of Overall Outcome Rating

Rating: Satisfactory

72. The overall project outcome is rated Satisfactory based on the substantial rating for relevance of objectives, design, and implementation, in conjunction with the achievement of the PDO and intermediate outcome indicators, as well as project efficiency. The project was economically efficient, environmentally sustainable, and enhanced the livelihoods of the vulnerable population in an inclusive manner.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

73. **Poverty impacts.** Based on a household survey conducted in 1998/99 and as noted in the PAD, 28 percent of the HP population were at risk of poverty or social exclusion. In this regard, the state was more favored compared to the national average of 37 percent. While poverty reduction was not an explicit objective of the project, an assessment of various socioeconomic parameters was conducted throughout the course of the project, which provides an indication on some proxies of poverty. The construction of water-harvesting structures, the uptake on irrigation, the increase in fodder availability, and the positive impact on productivity of various crops and milk also helped raise awareness on farm income increases and contributed to the diversification of employment opportunities for targeted beneficiaries.

74. The project increased awareness on various alternatives for on- and off-farm income-generating activities, like handloom, knitting, and fish-rearing, as well as goat and poultry

farming. On asset possession, the results show ownership of handloom tools, knitting and tana machines, as well as of goats, which were distributed for respective rearing purposes.

75. Taken together, the awareness on employment alternatives, increase in household incomes, and increase in agricultural assets suggest that there was an enabling environment for poverty reduction in the project area. While the end-of-project assessment indicates that the marginal and small farmers outweigh the large farmers and landless population, the project activities did help all farmer groups improve their financial situation.

76. **Gender aspects.** As the project defined the share of female beneficiaries as one of seven PDO outcome indicators, the gender aspects were already described under section 3.2.

77. **Social development.** As described under section 3.2, the project's participatory approach effectively engaged with vulnerable groups, notably women, in local governance and livelihood development.

(b) Institutional Change/Strengthening

78. The project had setup a robust institutional structure that resulted in strong community mobilization, enhanced capacities, and generated demand for better services within the 710 GPs. With 304 clusters engaging 1,394 CIGs and 5 federations, it has been able to reach out to a large segment of the vulnerable community in the project area. The successful formation of SHGs, UGs, and CIGs enabled linking of farmers with other ongoing schemes funded by the GoHP and GoI for continued and improved services.

79. The project strengthened the institutional capacity of the GPs. The PMU deployed dedicated staff to strategize and coordinate training activities. The UG, SHGs, CIGs, and the key community representatives at the GP and village levels were reached and engaged through specific training and capacity development activities by the project. This bottom-up and participatory approach was the key for success in successful preparation and implementation of the GPWDPs.

(c) Other Unintended Outcomes and Impacts (positive or negative)

80. By design, the project did not consider mainstreaming climate change mitigation and adaptation measures, but has effectively promoted several good practices through the Bio-Carbon sub-project. The MHWDP ensured that the outcomes of the project are relevant to all stakeholders. As an outcome, a total project area of 16,114 ha, including 3,216 ha of bio-carbon parcels was covered under forestry plantation and 8,132 ha of lantana-infested plantation has been rehabilitated with grasses. By integrating economic incentives, such as the payment for ecosystem services (PES) and payment for Certified Emission Reductions (CERs) through the Bio-Carbon sub-project, the project succeeded in creating a sustainable mechanism based on long-term incentives to ensure the sustainable management of the micro-watersheds (annex 3).

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

Not applicable.

4. Assessment of Risk to Development Outcome

Rating: Moderate

81. The risk to development outcome is rated Moderate based on three aspects: (a) the sustainability of assets created by the project, (b) the sustainability of institutional capacity established and supported by the project, and (c) the financial sustainability. By demonstrating efficacy and value of project activities and by building awareness on the benefits of interventions at both the state and local levels, there is a high likelihood of ongoing support for project activities continuing beyond the life of the project. The MHWDP improved the overall credit culture in rural areas. The project has increased the local banks' trust in farmers and members of the rural community, as banks are more willing to provide financial support through credits based on successfully implemented business models.

82. The maintenance of irrigation infrastructure poses moderate risks to the MHWDP's development outcomes. These and other assets financed by the project are simple in construction and thus easy to maintain. Users are familiar with the type of assets that have been built. No complex spare parts need to be transported from outside the project area. Still, the users need continuous training and handholding. Recognition from the farmers, who see the impact on productivity, provides a strong foundation for further improvements in their functioning.

83. The project set up robust institutions. The sustainability of institutions established and supported by the project is secured through extensive capacity-building activities. The institutional sustainability of SHGs, UGs, and CIGs is assessed to be high, as their members would continue to secure the functioning of these community-level institutions.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry
Rating: Moderately Satisfactory

84. The World Bank's performance during the identification, preparation, and appraisal stages of the project was rated Moderately Satisfactory. In designing the project, the World Bank respected both the development priorities of the GoHP and the CAS. Also, the project's design drew lessons from the successful IWDP and other earlier projects on watershed development around India. Poverty impacts, gender prioritization, and social development aspects were adequately identified during appraisal, just as environmental sustainability and safeguard compliance concerns were. Implementation arrangements were addressed through the preparation of a detailed PIP and FM and procurement conditions were also covered in separate annexes of the PAD.

85. Although the project was subject to an AF and a restructuring near the end of the project cycle, these were not a reflection of gaps or failures in project preparation and the overall design of the project was upheld throughout the implementation. In fact, both the AF and restructuring evolved during the project implementation and responded to the request of the GoI.

86. While the quality of project preparation was rated Satisfactory, the project lacked a robust Results Framework from the start as reflected in the PAD. Only at the AF stage, nearly seven years after the project initiation, three PDO outcome indicators were added and several intermediate outcome indicators modified, as these provided clearer evidence on the logical progression along the results chain to better demonstrate an effective theory of change.

(b) Quality of Supervision
Rating: Satisfactory

87. The World Bank supervision of the project was continuous, comprehensive, and responsive to the needs of the borrower, and supported the project team at critical points to adapt to the new national watershed guidelines. The World Bank maintained a proactive relationship with the GoHP, providing consistent advice on key issues at MTR and course corrected accordingly. Regular implementation and supervision review missions took place throughout the project cycle and detailed Aide Memoires were prepared after every mission. In addition to procurement, safeguards, fiduciary, and M&E support, the World Bank fielded multidisciplinary teams with expertise in agriculture, watershed development, and environment. Following these implementation and supervision review missions, the project was consistently rated Satisfactory. Only in 2009, just before the MTR, the project was rated Moderately Satisfactory due to implementation progress and FM aspects.

88. It should be noted, however, that there was a complete absence of implementation support and supervision of the EFA. The EFA was neglected at appraisal and during implementation, despite the focus of the project being on increasing beneficiaries' incomes. Financial analysis should have been an integral part of the project's M&E system to (a) inform decision making on project interventions, (b) regularly assess the project's impact on beneficiaries, and (c) provide a sound basis for the EFA at project completion. It was only for the final ICR mission that the World Bank mission included economists. The involvement of external economists in the design of the Final Impact Assessment, and the supervision of the impact assessment consultants would have been beneficial.

89. Both the MTR and end-project missions were held on time and attention was given to all major aspects of the project. For instance, during the midterm mission in November 2009, which assessed three and a half years of project implementation, the World Bank team engaged well in a consistent strategic dialogue with the GoHP to (a) include additional GPs in the project area, (b) consolidate the drainage line treatment for better sustainability, and (c) improve rain-fed arable farming for inclusive growth. Also, following the MTR mission, the World Bank incorporated the first ever Bio-Carbon technical assistance for creating Carbon-sink with significant benefits.

(c) Justification of Rating for Overall Bank Performance
Rating: Moderately Satisfactory

90. World Bank supervision was proactive and supported the project team at critical points to adapt to the new national watershed guidelines, provided timely guidance to keep the project on track, recognized key issues at MTR and made adjustments accordingly. Considering that the

quality at entry is rated as Moderately Satisfactory, the overall Bank's performance is rated as Moderately Satisfactory.

5.2 Borrower Performance

(a) Government Performance
Rating: Satisfactory

91. The GoI, notably the GoHP, was highly supportive of the project both during the preparation and implementation. Counterpart financing was made available on time. In fact, the GoHP demonstrated ongoing commitment for project activities through the allocation of state funds for operation and maintenance (O&M) in the project area.

92. On the implementation arrangements, the Government also demonstrated high levels of commitment to the project by establishing an institution with a well-defined governance structure, constituting the HPNRMS, which was chaired by the Chief Minister to overview NRM-based projects. The Forest Minister, who is also the Vice-Chairman of the Governing Council reviewed the project occasionally, which also contributed to ownership at highest level and enabled efficient and effective performance. The fact that the NRMS is mandated to develop policy guidelines aimed at harmonizing watershed approaches in the state adds credence to robust institutional architecture. As a platform, the NRMS facilitated multidisciplinary approach, extending to other line departments. Also, by appointing a cadre of experienced staff from previous comparable projects, continuity in leadership during the implementation process was provided for.

93. From the preparation stage of the project, the GoHP was fully committed to increasing the productivity of rural areas while preserving its natural heritage. Notably, through its vision on decentralization, the GoHP entrusted the responsibility of project implementation to the local governments to streamline the project activities. By empowering the local communities this vision led to strengthened ownership and commitment to watershed development.

(b) Implementing Agency or Agencies Performance
Rating: Moderately Satisfactory

94. On behalf of the GoHP, and through the NRMS, a PMU was created, which was headed by the CPD. The institutional and functional setup of the CPD's head office enabled planning, M&E, and information management. The CPD was the superior of two Regional Directors, who facilitated implementation of the project at the regional level. While the positive impacts were well evident in the field, quite a few of the positive gains were not quantified.

95. The main implementing office in each of the 10 districts was the WDO. The WDO carried the responsibility for providing technical guidance to the GPs and proved successful in undertaking community organization and capacity-building activities, while supervising watershed development progress. Entrusted with all administrative and financial matters, each WDO was assisted by multi-sectoral teams consisting of staff from forestry, agriculture, horticulture, and animal husbandry departments. Overall, this multidisciplinary arrangement proved to be the critical mix in inspiring ownership, strengthening commitment, and engaging a participatory process.

(c) Justification of Rating for Overall Borrower Performance
Rating: Moderately Satisfactory

96. Based on the performance rating of the implementing agency, the overall performance of the borrower is rated as Moderately Satisfactory.

6. Lessons Learned.

97. **Developing local institutional capacity.** As a departure from the convention of working through the village watershed development committees, the project took bold steps in engaging exclusively with the democratically elected PRIs in project planning and implementation. Substantial investments in capacity building of these locally authorized institutions ensured gender parity, and led a significant number of women getting elected to the PRIs, thus creating an approach that can provide dividends for future watershed projects.

98. **Enhanced fiscal decentralization.** To enhance efficiency in project management, it is important that fiscal decentralization and community empowerment move hand in hand. The project successfully established a web-based FMIS for operational effectiveness; developed an Android-based mobile application for real time monitoring of field activities; and discouraged cash transaction in favour of bank transfers. Coupled with a social audit by the community, these innovations contribute to financial transparency and accountability.

99. **Building infrastructure to access services.** The project has consciously encouraged PRIs to build infrastructure (footpaths, foot bridges, and rain shelters) on undisputed community land with appropriate cost-sharing norms and regular monitoring plans. In addition to improving all-weather rural connectivity and access to markets, these structures have ensured sustained access to services (for example, healthcare, school education, transport) which are crucial for building overall resilience to unforeseen exigencies in the project areas.

100. **Promoting agribusiness opportunity.** The package of precision farming practices and the resultant shift to high-value niche crops is reported to have enhanced productivity and improved profitability. However, at the design stage the project was not geared to assess the quantum of surplus for creating agribusiness opportunities. Since such projects promote many CIGs around selected agriculture products, it will serve such projects better if productivity projections and agribusiness promotion are made integral part at the design stage.

101. **Creating resilient watersheds.** Comprehensive treatment of selected catchments and application of a package of productive practices have opened multiple income streams for beneficiaries from diversified agriculture productivity, improved livestock development, and monetized ecosystem services. This makes watershed development projects relevant for transforming rainfed agriculture productivity, and for creating conditions for doubling of farmers' income, which create resilient watersheds that contribute to post-project sustainability.

102. **Harvesting climate co-benefits.** By distinguishing itself as the first watershed project that aligned with the Kyoto Protocol in harvesting global environmental benefits by sequestering carbon from degraded lands, it helped beneficiaries become co-creators of the 'greater global good' alongside developing a blueprint for the third-generation of watershed projects which not only harness gains from watershed treatment but maximize environmental, and economic

benefits from carbon sequestration, demonstrating an excellent PES model for the mountain states.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

103. Annex 7 provides the views by the CPD of the GoHP on the project. In general, the GoHP is satisfied with the results of the project.

(b) Co-financiers

Not applicable.

(c) Other partners and stakeholders

Not applicable

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in US$, Million equivalent)

Components	Appraisal Estimate (US$, millions)	Actual/Latest Estimate (US$, millions)	Percentage of Appraisal
A. Institutional Strengthening	15.88	20.81	131.0
B. Watershed Development	75.50	72.90	96.6
C. Enhancing Mountain Livelihood	14.43	11.56	80.1
D. Project Coordination	15.42	16.66	108.0
Total Project Costs	**121.24**	**121.93**	**100.6**
Front-end fee PPF	0.00	0.00	
Front-end fee IBRD	0.00	0.00	
Total Financing Required	**121.24**	**121.93**	**100.6**

(b) Financing

Source of Funds	Appraisal Estimate (US$, millions)	Actual/Latest Estimate (US$, millions)	Percentage of Appraisal
Borrower	24.25	23.95	98.8
International Development Association (IDA)	97.00	97.98	101.0

Annex 2. Outputs by Component

Component 1: Institutional Strengthening

1. This component was designed to strengthen the capacity of the participating PRIs and other local institutions within the GPs of the project area to enable them to assume greater responsibility for planning, implementing, monitoring, and maintaining watershed treatments and livelihood activities. The following intermediate outcome indicators in the Results Framework relate to this component. It must be noted that several indicators are actually representing project outputs.

Intermediate Outcome Indicators

- Self-Help Groups established with at least Rs. 5,000 in accounts
- User Groups established and taking care of resources in a sustainable manner
- Percentage of User Groups in place with bank account and operations and maintenance policy for the resources they use
- Percentage GP meetings with quorum
- Percentage GPs have agreed empowerment plans
- 14 project GPs are awarded by a competitive GP incentive scheme every year with their performance evaluated through participatory monitoring and evaluation (PME)
- Percentage CIGs working in partnership with private sector organizations or other institutions
- HPNRMS Executive Committee and other committees meet at least twice per year and the governing body meets at least once a year
- Financial and physical reporting submitted on regular and timely basis
- M&L system in place
- Environmental and social screening and mitigation systems fully functional
- Annual work plan being implemented on time and on target

2. **Robust governing structure.** During the period of implementation, the GoHP displayed strong support for the project as reflected in its robust and realistic governing structure. Implemented through the HPNRMS under the chairmanship of the Chief Minister, the governing council had conducted three formal meetings to provide guidance to the project. Informally, however, the Forest Minister is reported to have frequently reviewed the project. Such ownership at the highest level of the Government gave fillip to the project to perform efficiently and effectively. The fact that the NRMS is mandated to develop policy guidelines aimed at

harmonizing watershed approaches in the state adds credence to robust institutional architecture. Institutional strengthening was well balanced between local level and state headquarters level for capacity building.

3. The project built the GPs' capacity in participatory decision making, planning and implementation, transparency and social accountability, FM, procurement, and safeguards. It formed several community-level institutions, including 3,027 SHGs, 6,650 UGs, and 5,947[2] CIGs. Further, the project reached out to a large segment of vulnerable community in the project area by engaging 1,306 CIGs and 5 federations in 263 clusters. The success of these institutions is evident from the fact that most of the farmers and UGs have established links with other ongoing schemes funded by the GoI and GoHP for continued and improved services.

4. The targeted GPs managed approximately 22 percent of the project funds in implementing watershed development and management. The project provided extensive orientation training at the village and division levels on watershed concept, participatory planning and implementation, budgeting and FM, and safeguards. It provided technical training (Integrated Nutrient Management (INM)/awareness camps) to more than 1,330 GP executives, 2,883 staff members, 1,229 motivators, and 71,048 farmers. In addition, more than 7,842 community members and 1,467 project staff had exposure visits, both inside and outside the state. Nearly 24 members attended international training programs (see tables 2.1 and2.2).

Table 2.1.Institutional Strengthening (Human Resource) - Beneficiaries Covered

Intervention	Category of Participants				
	Senior Staff	Frontline	Line Department	Others	Total[a]
Workshops/meetings	8,587	20,594	4,135	20,443	**53,759**
Trainings	1,054	2,771	1,416	1,071	**6,312**
Exposure visits	337	363	103	783	**1,586**
International trainings	24		1		**25**

Note: a. Not considering that participants may have benefited several times from an intervention.

Table 2.2.Institutional Strengthening (Capacity Building) - Beneficiaries Covered

Intervention	Category of Participants						
	Para Professionals	GP Executives	CBOs	Community	Others	Total[a]	Female (as %)
Workshops/meetings	30,656	14,639	51,622	74,353	35,352	**206,622**	114,793 (55.65)
Trainings	4,399	3,347	35,276	18,968	14,117	**76,107**	40,362 (53.0)
Exposure visits	1,118	1,445	18,675	7,881	2,465	**31,584**	20,483 (64.9)

Note: a. Not considering that participants may have benefited several times from an intervention.
CBO = Community-based Organization.

5. Another successful intervention of the project was the tuning of project activities with various other programs. More than 27 percent of the project activities are harmonized with the

[2] Of these, 2,625 SHGs, 5,802 UGs, and 3,707 CIGs were established/strengthened in the original 602 GPs; while 315 SHGs, 1697 UGs, and 2376 CIGs were established in the additional 108 GPs.

Mahatma Gandhi National Rural Employment Guarantee Act and other line departmental funds for strengthening/scaling catchment treatment. The State Rural Development Department, Forest Department, and IWMP are adopting soil conservation technologies, mountain livelihood best practices, and other lessons learned from the MHWDP. The GoHP is mainstreaming the HPNRMS institutional model for the Asian Development Bank Tourism project and other watershed development projects.

Component 2: Watershed Development and Management

6. As the key project component, the objective was to support the implementation of watershed treatment as prioritized in the GPWDPs, as well as the treatment of critical lands administered by the GPs. It was broken down into the following four subcomponents: (a) non-arable land development focused on ecological rehabilitation of degraded catchment by means of soil and water conservation measures (for example, forestry plantation and water-harvesting structures), while also reducing the gap between biomass production and consumption; (b) arable land development followed the objective of improving cropping systems through new agronomic practices, crop diversification, reducing post-harvest losses, and increasing value addition; (c) fodder and livestock development aimed at improving productive potential through better fodder, management practices, and genetic upgrading; and (d) rural infrastructure development covered the construction of footpaths and small bridges, to improve the accessibility to market and public institutions, as well as, improving availability of potable water. The following intermediate outcome indicators in the Results Framework relate to Component 2, some of which represent project outputs.

Intermediate Outcome Indicators

- Percentage of available treatable areas of non-arable land treated
- Percentage available rain-fed agriculture land will have access to irrigation facilities
- Percentage increase in fodder availability over baseline
- Percentage farmers to have upgraded livestock

7. **Natural resource regeneration.** In line with its development objective, the project has treated selected watersheds to regenerate and stabilize drying water sources. A sample study reports 40 percent increase in water discharge in spring and stream sources. Effective catchment treatment and construction of locally relevant water-harvesting structures have benefitted 76,991 households, including 28 percent vulnerable families. Equitable irrigation and water use efficiency has been triggered, and 25 percent beneficiaries are using sprinkler/drip irrigation. Overall, there has been a marked improvement in the water regime beyond the project areas. Selected studies suggest that only 15 percent of the water discharge in the steams and springs are used by the project areas and the remaining 85 percent flow to downstream villages.

8. The Final Impact Assessment confirms that the project has achieved and exceeded PDO indicators toward reversing natural degradation, improving agricultural productivity, increasing irrigated area, generating biomass, and improving rural livelihoods. This component was one of

the main drivers of the project, dealing with both irrigated and rain-fed agriculture. Constituting 60 percent of the total project cost, this component has led to the implementation of effective water management practices, productivity enhancement through improved crop and animal husbandry, and promotion of climate-resilient agriculture and forestry. Creation of CIGs and their subsequent trainings has led to the adoption of technologies transferred by the project and in capitalizing gains from the revival of water regime in both arable and non-arable areas. Farmer Field Schools have contributed significantly to farmers' adoption of HVCs, and improved animal husbandry practices.

9. **Irrigated land.** The project has covered 592,390 ha land in 710 GPs spread over 272 micro-watersheds and has created 202 ha-m pondage. Because of construction of 13,795 water-harvesting and storage structures (rainwater harvesting tanks, ponds, dams, lift/gravity irrigation, and Makowal structures) and 468 km *Kuhals* (irrigation channels), 12,034 ha of culturable command area has been brought under irrigation (table 2.3). A total of 55 percent of the irrigated land is now under high-value vegetable crops and the remaining 45 percent is under maize, wheat, and other traditional crops. The expansion of the irrigated area has been complemented by the introduction of high-yielding seeds, vermi-composting, integrated nutrient and pest management technologies, and other improved crop management practices. Production and application of 31,150 tons of vermi-compost per year has reduced dependence on chemical fertilizers (for example, urea) and has improved the soil biophysical environment for higher productivity.

Table 2.3. Detail of Water-harvesting Structures

Type of structure	Units	Culturable Command Area	Irrigation Potential Used	Pondage Developed	Water Harvested	Potential Used (ha)	
		(ha)	(ha)	(ha-m)	(ha-m)	HVC	Traditional
Roof rainwater harvesting tank	7,010	853.03	982.80	11.279	56.672	545.07	437.73
Village ponds/tanks	3,958	2,729.88	2,604.79	53.619	358.424	1,183.22	1,421.57
RCCdams*	884	1,855.71	1657.68	38.697	438.507	871.44	786.24
Earthen dams	130	232.08	188.01	82.001	79.084	42.89	145.12
Masonry dams	616	737.60	723.30	4.460	205.886	298.46	424.84
Lift/gravity irrigation system	858	2,014.22	2657.09	11.727	384.414	1,482.87	1174.22
Makowal structures	339	708.76	688.98	2.205	70.786	385.22	303.76
Irrigation channels/*Kuhals*	467.94	2,322.08	2531.20	0	343.136	1,408.23	1,122.97
Total		11,453.36	12,033.85	203.988	1,936.91	6,217.4	5,816.45

Source: Status Report, March 31, 2017. *RCC dams: Reinforced Cement Concrete dams

10. **Crop diversification.** Farmers have broken the traditional crop production cycle by replacing an estimated 90 percent area under wheat crop with high-yielding vegetable crops (cauliflower, cabbage, capsicum, chili, cucurbits, onion, pea, potato, tomato, turmeric, lady finger, brinjal, bitter gourd, French bean, spinach, ginger, and garlic), resulting in 180 percent increase in overall production. A total of 15,391 HVC demonstrations have led farmers to divert 52 percent of cultivated area under high-value vegetables crops. The area under traditional

irrigated crops has come down by about 7 percent, whereas horticulture crops now occupy 58 percent of the irrigated area. Because of storage of sufficient water, in some areas farmers have made additional investment for the cultivation of flowers.

11. **Rain-fed land development.** In situ conservation of rainwater in conjunction with improved rain-fed crop husbandry practices has proved critical for enhancing crop productivity in the hilly terrain with elevation ranging from 600 m to 1,800 m, where more than 90 percent of the annual rainfall is received during monsoon months (June to September). It has been promoted for enhancing the productivity of maize, wheat, and other crops by organizing 5,215 demonstrations on farmers' fields. The key elements of package of practices demonstrated for rain-fed crops include cultivation of short duration and high-yielding varieties/hybrids, use of the recommended seed rate, application of vermi-composting to promote root growth, and life-saving irrigation. Under rain-fed crop demonstrations, the yield of maize and wheat increased by 25 percent and 28 percent respectively.

12. **Livestock and fodder development.** Various activities implemented for improving and sustaining livestock productivity included setting up 299 natural breeding centers (for genetic upgrade of cow and buffalo), supply of 466 bucks/rams (for genetic upgrade of goat), 45,994 fodder production/conservation demonstrations and 5,484 animal health camps, construction of 27,927 mangers, and supply of 7,659 chaff cutters. Fodder availability has increased by 16 percent, the proportion of improved breed of cattle has increased by 60 percent, and consequently milk production has increased by 11.55 percent. The project's impact on livestock improvement has been high; the setting up of a liquid nitrogen plant for artificial insemination at Mandi has led to breed improvement in buffalo and F1 progeny reporting as high as 40 percent increase in milk yield.

13. **Climate-smart agriculture.** In addition to the Bio-carbon Subproject for eliciting carbon credits, the project has promoted climate-smart agriculture through source stabilization, crop productivity enhancement, and improvement in adaptive capacity in the fragile agro-ecological region of the mid-Himalayas. Through extensive catchment treatment, the project has developed 202 ha-m pondage capacity capturing 1,904 ha-m of rainwater which was earlier lost as runoff, carrying with it productive top soil. The stored water is now largely used for irrigating high-value vegetable crops. Use of drip and sprinkler irrigation by 4,250 families has considerably improved water use efficiency. The micro-irrigation sector has made a conscious effort to benefit almost 2,300 households, with 44 percent and 56 percent adoption of drip and sprinkler irrigation respectively. Forestry plantation on 24,858 ha, including rehabilitation of 10,931 ha of lantana-infested area with grasses has improved soil moisture regime, reducing water stress in rain-fed crops.

Component 3: Enhancing Mountain Livelihoods

14. Composed of two subcomponents, the overall objective of this component was to promote value addition in crop, livestock, and NTFPs in the project area. The subcomponent on agricultural marketing and processing focused on improving market links between farmers and buyers by identifying market opportunities, co-financing the entry of producer groups into commercialized production, and co-financing the private sector to improve productivity,

processing, and/or storage to strengthen viable supply chains. The second subcomponent reached out to vulnerable groups, like women and the landless, to develop income-generating activities.

Intermediate Outcome Indicators

- Percentage of eligible households have benefitted by the Mountain Livelihood Fund through business plan
- Percentage of funds for livelihood business plans are mobilized through banks or other financial resources
- Percentage target group have accessed the services of Livelihood Resource Organizations
- Percentage CIGs working in partnership with private sector organizations or other institutions.

15. **Inclusion and empowerment.** The project substantially improved the administrative capacity of women in the targeted GPs through its participatory approach and capacity-building activities, including training, exposure visits, and knowledge management. As a result, in the GPs participation by women and vulnerable households increased substantially, by nearly four times for women and double for vulnerable groups. The increase in women's participation was facilitated by women village motivators. The project's participatory approach and capacity building encouraged the village-level project staff and various project-formed group members to participate in local government elections/PRI. The results indicate that 466 of them were elected, 62 percent of whom are women.

16. Under this component, the project extended grants to vulnerable groups, including the landless and marginal farmers in support of their entrepreneurial activities to enhance their incomes. A series of capacity-building programs for the development of income-generation skills through enterprise development were taken up by the project. To ensure profitability and sustainability of income, sufficient inputs in the form of trainings, exposure visits, interactions with other SHGs, federations, consumers, agencies, and so on were provided to the groups.

17. More than 80 percent of SHG's interventions were based on income-generation activities. That included vermi-composting, vegetable growing, mushroom cultivation, and livestock (for example, dairy, poultry, and goat rearing). The vulnerable populations also benefitted from investments in 'off-farm' and 'service sector', that is, knitting, cutting and tailoring, electrician, plumbing, and beautician courses. In addition, the transhumant/tribal populations especially *Gaddis* and *Gujjars* in the targeted GPs were given flock management, animal health care, and breed improvement support through the Transhumant Action Plan.

18. Overall, the component successfully operationalized 32 livelihood activities benefiting 62,239 members, implemented by 5,409 groups (4,208 in the original GPs and 1,201 in the additional GPs). The project observed more than 52 percent income being generated through on-farm activities as compared to 22 percent from off-farm activities. More than 50 percent CIGs in the MHWDP and 81 percent under the AF are market-linked, and five federations are already running successfully.

19. **Income generation for vulnerable groups.** The project supported socially and economically marginalized vulnerable groups, such as marginal farmers, the landless, and women, by forming SHGs and by financing income-generation activities through the mountain livelihood activity/vulnerable fund. It supported 58,817 vulnerable persons in the targeted GPs, of which nearly 83 percent were women. The project (in both the original and additional GPs) witnessed more inclination toward group activity among women (66 percent) and vulnerable groups (76 percent) than individual activity (women 23 percent and vulnerable 32 percent).

Component 4: Project Coordination

20. The objective of the component was to finance the construction of office/residential accommodation, purchase equipment, and vehicles, as well as incremental operating costs of the project.

21. The project has had an in-house monitoring and reporting system that has functioned smoothly and efficiently throughout the project period. The process involved periodic data collection by the field-level functionaries, which was then transferred in standard reporting formats for review by the Watershed Development Coordinator at the sub-divisional level. The information was compiled at this level and forwarded to the divisional level for final report generation for management review by the regional- and state-level project teams. Based on these reports, the half yearly and annual progress reports were generated, which have been providing M&E reports for management review over the project period.

22. The mechanism of information gathering, monitoring, and reporting using an in-house approach by the Watershed Department has significantly built the capacity of the project staff at each level to monitor and review their own activities regularly, thereby creating right synergies for effective implementation of the project. This has not only led to high level of ownership in the M&E functions but has also increased the staff's involvement in implementation progress and results achievement in the project.

23. The project undertook two sets of mid-term Impact Assessments, the first in 2009 and the second in 2014. The findings of these studies provided good evidences on the quality of impact of watershed management interventions on communities as well as on soil and water in the project areas.

Annex 3. Bio-Carbon Subproject

1. As a significant departure from conventional watershed development involving simple soil and water conservation, the MHWDP converted selected catchments into multifunctional watershed units through comprehensive treatment and generated carbon credits from degraded catchments by adopting protective conservation measures. Tapping into the Kyoto Protocol by generating carbon credits from highly degraded land parcels in 20 percent of the project area, the project has created an innovative carbon sequestration mechanism for the local population to monetize ecosystem services. Carbon revenue worth INR 1.9 crores (US$316, 000) has accrued and has been distributed to project beneficiaries.

2. A total project area of 16,113.6 ha, including 3,216 ha of bio-carbon parcels was covered under forestry plantation, and 8132.2 ha of lantana-infested plantation was rehabilitated with grasses. Plantations and bioengineering measures have stabilized the degraded land, reduced soil erosion, and maintained ecological functions. By integrating economic incentives such as the PES and payment for CERs through the Bio-Carbon Subproject, the project has created a mechanism based on long-term incentives to ensure sustainable management of the micro-watersheds.

Bio-Carbon Subproject

3. The subproject is the first of its kind in India, which achieved its carbon credit value in a relatively short period, compared with other global carbon sequestration projects, making the beneficiaries (farmers) in the watersheds sellers of carbon credits. The bio-carbon plantations achieved a survival rate of 75 percent; while the average survival rate of similar species elsewhere in the state is 40 percent to 50 percent. This demonstrates the farmers' commitment toward the project despite the complex methodology and procedures.

4. The project was conceptualized based on enhancing global environmental benefits, while at the same time creating an incentive for local communities to conserve forests. The project was jointly implemented by the MHWDP, the Forest Department, and the GPs. The project area covered 177 GPs, 419 parcels comprising a total area of 3,216 ha. A summary of the total land area and categorization is shown in table 3.1.

Table 3.1. Summary of the Total Land Area and Categorization

Land Category	Reforestation Model	Area (ha)
Degraded forestland	Restoration	2,947
Degraded community land	Community forestry	240
Degraded/abandoned private land	Farm forestry	29

Project Implementation

5. The Emission Reductions Purchase Agreement was signed in March 2008 and the project was registered under the CDM of the Kyoto Protocol. The project is implementing afforestation and reforestation (A/R) CDM activities on 3,216 ha of degraded lands in the watersheds of the mid-Himalayan region and the methodology AR-ACM0001 Version 03 has been applied to the project. Each discrete parcel of land in the project is identified by a unique geographic code and boundary to enable successful monitoring. The officials responsible for coordinating project

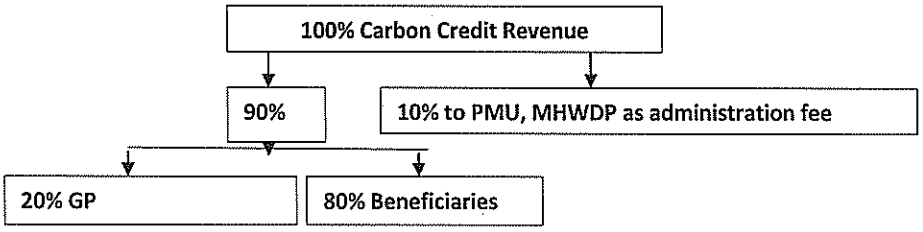
implementation and organization of data/information/reporting of the project were designated at various levels.

6. The PMU, MHWDP has been supervising the project in accordance with the monitoring methods specified in the Project Design Document (PDD), and indicators for estimating the GHG emissions and removals, according to the methodology AR-ACM0001. The first monitoring report was prepared for July 1, 2006 to December 31, 2012 and was disclosed on the UNFCCC CDM website[3] immediately after the first verification[4] in October 2014. Collation of primary data for the second monitoring report for January 1, 2013 to December 31, 2017 is in process. The data collection process and quality of data collected is in compliance with the project design. The project has provided a number of trainings to forest guards, range officers, and frontline staff of the Forest Department on various monitoring parameters and calculations.

7. Following the first verification that took place by the Kyoto auditors in October 2014, the bio-carbon fund initiated transfer of payment for carbon credits to the designated bank account of the Forest Department, GoHP. The credit amount (INR 1.9 crores) has already been disbursed.

8. Because the carbon credit period follows a 20-year cycle of payment, the bio-carbon cell has already shifted to the state Forest Department to continue to manage and transfer the carbon revenue to the GPs. The project has taken many steps to ensure that when the funds are transferred, they would reach the beneficiaries in time.These include (a) signing of contractual agreement with all the beneficiaries—clearly outlining the name of beneficiaries under each group and (b) ensuring that all 144 UGs opened dedicated bank accounts, only after that verifiers went ahead with carbon stock verification. The percentage fund sharing mechanism between the PMU and the beneficiaries is as shown in figure 3.1.

Figure 3.1.Fund Sharing Mechanism Between the PMU and Beneficiaries (Percentage sharing)



Monitoring

9. An effective monitoring system has been put in place through which periodic monitoring is carried out. The monitoring covers parameters such as area planted, condition of parcels, survival, growth, status of contractual agreements, and so on. Plantation journals are being maintained and updated for each parcel to reflect relevant information. Monitoring of forest establishment and management is done to ensure that the planting quality conforms to the technology and practices described in A/R CDM PDD. A total of 147 sampling plots were created, which are monitored regularly for the parameters identified in the PDD. A conservative

[3]http://cdm.unfccc.int/Projects/DB/TUEV-SUED1291278527.37/iProcess/RWTUV1381207091.5/view
[4]https://cdm.unfccc.int/Projects/DB/TUEV-SUED1291278527.37/view

estimate suggests a minimum of 2 tons of fodder grass production per hectare per year in these parcels—creating an annual production of circa 6,400 tons from the bio-carbon project area. According to inspection reports, grass production has gone up to 5 tons per hectare in selected parcels.

10. The Bio-carbon Project enhanced the MHWDP's capacity in M&E involving the following interrelated steps:

- **Survival.** The survival rate was computed in detail. According to estimates, 75 per cent survival rate was maintained in all three categories of land. All 45 locally identified species specified in the PDD are reflected in project areas, with varying composition, while maintaining diversity. There was no significant report for a particular species being under the 25 percent mortality rate.

- **Inspection.** In addition, the PMU maintained inspection notes from the field and these were fed into the plantation journal. The PMU also monitored and took preventive measures for any possible natural hazards such as forest fire, silt load, pest attack, and invasive species. The inspection report is updated quarterly, as stipulated in the PDD.

- **Protection.** The PMU ensured that parcel boundaries are maintained and that theses remain intact. The MHWDP took adequate initiatives in fencing parcels and checking geographical coordinates. The incremental growth measurement of Bio-Carbon parcels has continued as prescribed in the PDD annex 4 for different parcels. This will be collated before the next verification which is scheduled in 2017.

Project Benefits

11. **Multiple environmental benefits.** In addition to the economic incentives resulting through the sale of carbon credits, there is added benefit from biomass production in the form of dead wood and grasses harvested (estimated to be 120 tons per year) and sold by farmers. Incomes from these 'ecosystem services' provide economic incentive for farmers to maintain and protect the parcels. Other benefits accrued include improved soil moisture content, higher soil organic carbon, and increase in the discharge rate (by 40 percent) in the nearest spring downstream of the parcels, which have also proved to be good success indicators of the community's efforts.

12. **Invasive species management.** The unregulated grazing has contributed to the spread of invasive species such as Lantana, Parthenium, and Eupatorium. With the protection and management of these parcels, the germination and growth of invasive alien species has been controlled. Majority of the species planted in the CDM plantations are indigenous or locally adapted species. The mix of species considered for the reforestation models reduces the threats of major pest attacks and does not include any profusely spreading exotic tree species. Large-scale colonization by any invasive weed species has not been reported in the project areas. Protection and management (controlled grass harvesting practices, weeding) helped suppress the germination and growth of invasive alien species. No pest attack has been reported so far.

13. **Grazing.** The risk of grazing in planted areas has been minimized due to the fact that the CDM plantations are protected by physical measures like fencing and are being managed and protected by village UGs following the joint forest management principles. Further stall feeding is being promoted under the MHWDP in the same area. Increased fodder/grass production has encouraged improved livestock rearing in the area.

14. **Forest fire management.** An effective watch and ward mechanism especially during the summer is helping in the prevention of fire accidents. The project implemented fire prevention measures such as the establishment of fire lines and clearance of brushwood and dry vegetation close to project parcels. Large-scale fires have not been reported in the project area. During the first monitoring period, few isolated fire events were reported, which were recorded and measures were taken to control them.

15. **Safeguards implementation.** Environmental and social benefits of the subproject were discussed at all stages of project preparation with the PMU and local communities. More importantly, it was highlighted that the project has developed a mechanism that incentivizes communities in the form of CDM revenue to protect and regenerate forests.

16. A bio-carbon cell has been established in the Forest Department, with the Chief Conservator of Forests (CCF) as the head to coordinate and guide project-related activities at the state level and engage with the various divisions. The cell will conduct the carbon stock validation for 2017 onward and distribute the carbon revenue to the UGs and GPs. Each land parcel or a group of land parcels will have a registered Village Forest Development Society(VFDS) (under the Societies Act 1860). These institutional arrangements will continue to sustain the project and its benefits over the life time of the project.

17. The project has commenced the process of the next verification for the second five-year monitoring period (2012–17). A terms of reference(ToR) for the monitoring report was finalized (a precursor to the verification), which will be carried out by an independent consultant firm. The actual verification will be conducted after the growing season in September 2017 and all reports will be disclosed on the project website.

Annex 4. Economic and Financial Analysis

A. Introduction

1. This annex provides an ex-post EFA of the project and assesses the project's efficiency. It should be noted that an ex ante EFA of the project at project appraisal was not conducted. Instead, the EFA that was carried out for the ICR of the IWDP was presented in the PAD. As the MHWDP was to scale up the interventions of the IWDP in new areas of HP and given the similarity of proposed activities, the EFA of the IWDP, at project completion, was the most accurate prediction of economic and financial performance of the MHWDP.

2. The preparation of a project-specific EFA at appraisal would have been a good basis for a refined and continuing EFA during implementation and for the EFA at project completion. However, during project implementation only very limited analyses were conducted to assess the financial viability and sustainability of the various production systems and income-generating activities promoted by the project and of the productive investments made by SHG households using SHG or bank loans. A financial analysis should have been systematically conducted during implementation to (a) estimate the potential financial impact before promoting economic activities and (b) measure the actual performance of these activities during implementation. In fact, a financial analysis should have been an integral part of the project's M&E system to (a) inform decision making on project interventions, (b) regularly assess the project's impact on beneficiaries, and (c) provide a sound basis for the EFA at project completion. Only the final ICR mission included economists to prepare the EFA for the ICR, while the EFA was generally not addressed by the World Bank implementation support missions. The involvement of external economists in the design of the Final Impact Assessment and the supervision of the impact assessment consultants would have been beneficial.

3. The project data from studies, M&E reports, were used to prepare financial models of production systems and productive investments supported by the project. The ex-post economic analysis for the ICR was prepared based on these financial models prepared by the PMU for various income generating activities identified as the major sources of benefits under each project component.

B. Results of Economic and Financial Analysis at Appraisal

4. As stated earlier, instead of conducting an EFA specifically for the MHWDP at appraisal, the EFA in the ICR of the IWDP was presented as an estimate of the economic and financial outcomes expected from the MHWDP. The ICR EFA for the IWDP followed the methodology used at appraisal, focusing on quantifying the incremental benefits from specific project interventions in rain-fed areas, supplemental irrigated areas, roads, drinking water, and income-generating activities, aggregating these benefits for the project and deducting total project costs. Overall the IWDP's economic analysis was done for the same two scenarios as presented in the PAD: Scenario 1 with incremental benefits from crops, water supply, roads. and livestock and Scenario 2 with all incremental benefits, including the natural resource benefits arising from saved/reclaimed land area. The IWDP ICR ERR estimates for Scenario1 and Scenario2 were 14.7 per cent and 15.7 per cent respectively.

C. Methodology of Economic and Financial Analysis for ICR

5. As there was no EFA for the MHWDP at project appraisal, it was not possible to follow the standard approach to the EFA at project completion, that is, to repeat such an analysis with the actual project costs and duration and the estimated benefits based on real project data. To have a solid database for a meaningful EFA at project completion, it would have been important to (a) establish periodic collection and analysis of data relevant for EFA in the project's M&E system, (b) integrate EFA-specific data collection and analysis in the Final Impact Assessment, and (c) start the ex-post EFA before the end of the project (including, as appropriate, additional surveys to complement the Final Impact Assessment)and not wait until the final (and only) ICR mission three months after project closure.

6. Therefore, in the absence of sound data for a comprehensive financial analysis that could be used as a building block for an overall project economic analysis, a different approach was taken. Based on the financial models of the various income generating activities and the data collected from the field for the representative sample of villages, the incremental real incomes for each of the activities were calculated. It was assumed that beneficiaries realize 50 percent of the average incremental annual income reported in year 2 after they joined the project and 100 percent of the reported income increase from year 3, with no changes thereafter. The total annual economic project costs (excluding taxes but including beneficiary contributions) were deducted to arrive at annual project incremental net benefits. The period of analysis was 20 years, including the project investment period and it was assumed that beneficiaries' contribution to O&M during the last project year would continue for the remaining period. Table 4.1 presents the project costs by component and beneficiary and the total number of project beneficiaries (see details for calculation of the latter in table 1). Table 4.2 shows the cumulative number of beneficiary households per project component that were included in the analysis while Table 4.3 presents the calculation of real income increase based on the Final Impact Assessment.

Table 4.1. Project Costs by Component and per Beneficiary

Component/Subcomponent	Costs [a]		Number of Beneficiaries [b]	Number of Beneficiary households [c]	AverageCosts Per Beneficiary Household	
	INR,Crore	US$, million			INR	US$
A Institutional Strengthening	**114.63**	**20.81**	**n.a.[d]**	**n.a.[d]**		
BWatershed Development and Management						
B1Treatment of non-arable land	277.14	51.00	**396,155**	**79,231**	**34,979**	**643**
B2Treatment of arable land	33.82	6.17	**521,250**	**104,250**	**3,244**	**59**
B3Rural infrastructure	53.47	10.55	**115,900**	**23,180**	**23,066**	**455**
B4Fodder and livestock development	21.84	4.19	**233,715**	**46,743**	**4,672**	**90**
B5Tribal development	5.71	1.01	**36,850**	**7,370**	**7,747**	**137**
Total Component B[b]	**391.97**	**72.90**	**628,023**	**125,605**	**31,207**	**580**
C Enhancing Mountain Livelihood	**62.99**	**11.56**	**95,436**	**19,087**	**33,002**	**606**
D Project Coordination	**87.50**	**16.66**	**n.a.**	**n.a.**		
Project Total [ab]	**657.10**	**121.93**	**723,459**	**144,692**	**45,414**	**843**

Note: a. Excluding beneficiary contribution of INR 56.17 crore (US$10.13 million).
b. Total number of beneficiaries is not the sum of component/subcomponent beneficiaries as many beneficiaries benefited from several interventions. See details in table 1.
c. Based on average five persons per household.
d. Project M&E reports only provide the number of participants by type of intervention and do not report net number of participants, that is, it is not considered that participants are benefiting from several interventions. In any case, beneficiaries under Component A are included in the beneficiaries reported under B and C.

Table 4.2. Comparison of Project Costs per Beneficiary for similar projects in India

Project Name	Imple-mentation Period	Project Cost (USD million)	Number of beneficiary households	Cost per beneficiary household (USD)	Cost per bene-ficiary (USD)
Himachal Pradesh Mid-Himalayan Watershed Development Project	2006 - 2017	121.93	144,692	843	169
Madhya Pradesh Water Sector Restructuring Project	2005 - 2015	418.47	243,796	1,716	343
Uttarakhand Decentralized Watershed Development Project	2004 - 2012	106.88	19,697	5,426	1,085

Table 4.3.Phasing of Project Beneficiaries Used for the Economic Analysis

Year	Water Harvesting Program	Fodder and Livestock Development	Tribal Development	Mountain Livelihood	Total
	Number of beneficiary households (cumulative)				
2006	—	—	—	—	—
2007	—	—	—	—	—
2008	376	0	0	0	376
2009	4,416	2,706	278	235	7,635
2010	10,435	6,625	654	596	18,310

2011	17,620	8,432	1,104	1,161	28,317
2012	24,291	10,794	1,268	2,648	39,001
2013	31,632	13,125	1,784	5,784	52,326
2014	36,265	26,667	2,351	8,562	73,844
2015	37,662	32,281	3,797	12,578	86,318
2016	48,026	36,560	5,125	14,845	104,556
2017	59,492	39,945	7,047	17,773	124,257
2018	72,727	45,385	7,370	19,087	144,569
2019–2025	79,231	46,743	7,370	19,087	152,431

Note: It was assumed that beneficiary households start realizing the reported incremental annual income from year 2 after they joined the project (50 percent in year 2 and 100 percent of the reported income increase from year 3, with no changes thereafter).Beneficiaries from plantations and soil conservation under B1 Treatment of non-arable landand beneficiaries under B2 Treatment of arable land are not incremental and therefore not counted separately (see table 1). Furthermore, beneficiaries who only benefit from B3 Rural infrastructure (that is, not covered by B1 or B2) were not included.

D. Results of Economic Analysis at Project Completion

7. Based on the estimated average real income increases realized by beneficiary households and the phasing of total number of beneficiaries as described earlier, as well as the total economic project costs, the ERR for MHWDP has been calculated at 18.1 per cent. This is well above the social discount rate of 10 per cent currently being used for World Bank-funded investment projects in India and higher than the ERR estimates for the IWDP ICR ERRs (14.7 percent and 15.7 per cent for the two scenarios analysed).

8. The assumption that the incremental annual incomes of project beneficiaries engaged in climate-smart production systems promoted by the project, in comparison to the without-project situation ('change nothing scenario'), will remain constant may result in underestimating the project benefits. This is because, without the project, it can be expected that the impact of climate change would negatively affect farmers' incomes in coming years, which would lead to increased incremental incomes of project beneficiaries over time.

9. Furthermore, it should be noted that many social and environmental benefits can be expected from the project that are difficult to quantify in monetary terms and that are not fully captured by an analysis based on income increases. These include (a) reduced vulnerability and increased resilience to climate change and disaster impacts, resulting from the implementation of climate-adapted farming practices, (b) increased participation of women and the poor in decision making at the local level, (c) reduced environmental degradation and conserved natural resource base for sustainable livelihoods of present and future generations, (d) carbon sequestration resulting from reforestation or introduction of other land use systems, and (e) reduced negative environmental impact due to environmentally friendly agronomic practices.

10. It should also be noted that the project's investment in rural infrastructure (mainly foot paths, foot bridges, and rural roads) will have benefits that go well beyond what is reflected in beneficiaries' increased incomes. While some of these benefits can be estimated in economic terms, given the lack of data, such an analysis was not attempted in the context of the ICR. Main benefits that can be expected to result in increased producer incomes include the following:

(a) Increased marketed output and volumes of transported produce, due to improved access to markets and improved accessibility throughout the year

(b) Changed patterns of production/increased area under production, due to introduction/expansion of higher-value crops which become financially viable due to improved market access and reduced losses

(c) Increased agricultural productivity, due to increased availability and reduced cost of inputs and improved access to support services, including extension

(d) Increased livestock production, due to better access to inputs and markets

(e) Increased producer prices, due to

(i) Reduced transport costs,
(ii) Higher quality of produce resulting from timely transportation and reduced quality losses during transport, and
(iii) Better access to markets.

(f) Reduced losses, due to accessibility throughout the year and reduced transport time.

11. Improvement of rural roads will also benefit vehicle operators and transport users in terms of reduced transport costs, travel time, and vehicle O&M costs. The important employment benefits from rural roads include(a) jobs created in road construction/maintenance, (b) better access to job opportunities close to/along road, and (c) increased petty trade along road. Rural roads, footpaths, and foot bridges also have numerous social benefits, including improved access to potable water, sanitation, healthcare centres, schools, and information, which all have indirect economic benefits.

12. Based on the above, as many potential project benefits have not been quantified in economic terms, it can be assumed that the ERR calculated based on incremental incomes of project beneficiary households is well below the economic returns that can be expected from the project. Furthermore, it is impossible to quantify the likely multiplier effects of the project, including increased tax revenues, resulting from increased economic activities in the project area.

E. Results of Financial Analysis

13. As stated earlier, there is limited data available for the various production systems and income-generating activities promoted by the project. Table 4.4 clearly shows, for a sample village, how the project contributed to crop diversification, as well as increased yields, revenues, and profits. Table 4.5 presents the financial profitability of selected livelihood activities promoted by the project, showing very favourable returns to labour for those activities for which labour requirements have been specified.

Table 4.4 Overview of Cropping Pattern and Financial Analysis for Agriculture Crops in Rano Village

Annex 5. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Dhimant Jayendraray Baxi	Sr Procurement Specialist	SARPS – HIS	Procurement
Michelle Lisa Chen	Program Assistant	GSU12	Program Assistant
Samik Sundar Das	Senior Rural Development Specialist	GFA06	Rural Development
Tanuj Mathur	Sr Financial Management Specialist	GGO24	Finance
Tapas Paul	Lead Environmental Specialist	GEN06	Environment
Daniel M. Sellen	Chair, Staff Association	WBGSA	Agriculture
Mridula Singh	Senior Social Development Specialist	GSU06	Social Development
Supervision/ICR			
Naila Ahmed	Senior Social Development Specialist	GSU06	Social Development
Michele Bruni	Consultant	ECSHD - HIS	M&E
Debabrata Chakraborti	Consultant	GGO06	Procurement
Mam Chand	Senior Procurement Specialist	SARPS - HIS	Procurement
Moho Chaturvedi	Local Consultant ST	GEN06	Environment
Samik Sundar Das	Senior Rural Development Specialist	GFA06	Rural Development
Mohan Gopalakrishnan	Sr Financial Management Specialist	GGO24	Finance
T. C. Jain	Sr Agricultural Specialist	SASDA - HIS	Agriculture
Gaurav D. Joshi	Senior Environmental Specialist	GEN06	Environment
Ashok Kumar	Sr Highway Engineer	GTI06	Transport
M. P. G. Kurup	Consultant	SASDA - HIS	Livestock Specialist
Smriti Lakhey	Consultant	CDPPR	Institutional Development
Tanuj Mathur	Sr Financial Management Specialist	GGO24	Finance
Benjamin Powis	E T Consultant	EAPVP	Livelihoods
Ranjan Samantaray	Sr Agricultural Specialist	GFA12	Agriculture
Prachi Seth	Program Assistant	SASDO - HIS	Program Assistant
Mio Takada	Senior Agriculture Economist	GFA06	Agriculture
Ai Chin Wee	Consultant	CSABI	Monitoring & Evaluation
Hans C. Kordik	ICR Lead Author	GFA03	Sr. Agriculture Economist
Jacqueline Julian	Analyst	GFA12	Operations Analyst
Sudhirendar Sharma	Consultant (Watershed, M&E)	GFA12	Watershed & M&E
Saumya Srivastava	Consultant (Agriculture / Agribusiness)	GFA12	Agriculture
Thomas Muenzel	ICR Economist; FAO	FAO	Agriculture Economist
Kundan Singh	ICR team; FAO	FAO	Economist
Leena Malhotra	Program Assistant	GFA12	Program Assistant

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	US$, Thousands (including travel and consultant costs)
Lending		
FY05	18.48	67.53
FY06	13.68	47.72
Total:		115.25
Supervision/ICR		
FY06	13.60	54.87
FY07	15.00	82.66
FY08	14.27	83.33
FY09	24.12	135.31
FY10	38.86	206.18
FY11	30.04	141.47
FY12	35.26	128.49
FY13	18.81	91.29
FY14	19.36	73.19
FY15	16.88	77.70
FY16	8.54	38.90
FY17	13.00	44.56
FY18	6.66	20.50
Total:		1178.45

Annex 6. Beneficiary Survey Results

Not Applicable.

Annex 7. Stakeholder Workshop Report and Results

Not Applicable.

Annex 8. Summary of Borrower's ICRR and/or Comments on Draft ICRR

1. The GoHP has emphasized since the beginning of the project that NRM is the ideal approach for ensuring sustainable management of land and water resources while enhancing the livelihood of rural inhabitants. The HPMHWDP has played a significant role in increasing income, diversifying on- and off-farm income opportunities, improving agricultural productivity, and contributing to the state's commitment on maintaining the natural heritage. In addition, entrusting the local governments through the GPs for the project's implementation strengthened the ambitions for empowering local communities. The project had become operative in 10 districts of the state and with the World Bank's financial assistance, covered 710 GPs of 45 development blocks.

2. The project was implemented by the HPNRMS, a society registered under the Societies Registration Act, 1860. A key feature of the project was the proactive involvement of village level institutions of self-governance that is, the GPs. The GPs implemented the approved works under the project through the UGs, though some works were implemented directly by the GPs through qualified agencies. Livelihood enhancing activities were implemented through the UGs, SHGs, and CIGs. It was believed that these groups will ultimately ensure empowerment to the community. The project implemented many activities such as livelihood activities, plantations in the inter-GP areas of higher reaches of the hills, infrastructure-related works, capacity-building initiatives, and project management.

3. With the advent of AF of the project, the objectives, design, and institutional arrangements remained unchanged. The AF also used the same approach and strategy as used by the original MHWDP. However, consequent to the MTR, based on the experiences and learning of the MHWDP the approach and strategy were fine tuned.

4. One of the hallmarks of the project was the Bio-carbon Project. Forest and afforestation activities are important carbon sinks, influencing climate by absorbing CO_2 from atmosphere—the most prevalent and important GHG and storing carbon in wood, litter, leaves, roots, and soil. The project has been registered with the UNFCCC. Under the CDM of the Kyoto Protocol, GHG emission offsets are measured in tons of CO_2 equivalents and are called 'CERs'. A total of 3,216.48 ha of area was covered under the Bio-carbon Subproject. Verification of carbon stocks will be carried out at five-year intervals and the CERs generated will be sold accordingly. The CERs (65,582) generated for the first five-year period (2006–12) were sold at the rate of US$4.75 per tCO_2efor an amount of US$3,11,514.50 (INR 193 lakh). After deduction, the net carbon revenue amounting to US$2,56,514.50 (INR 163 lakh) has been earned during 2015–16 by the state. This amount has been distributed to various stakeholders/community/VFDSs according to the already finalized carbon revenue distribution scheme.

5. Regular supervision and review missions by the World Bank helped in guidance and hand-holding to achieve the project objectives. The mission members have always been very cooperative, and the wrap–up discussion with the topmost Government-level functionaries aided in resolving implementation issues very promptly. Field visits by the mission members and the missions' Aide Memoires have provided objective and useful feedback to track the project progress and for initiating corrective actions. The Task Team Leader (TTL) of the World Bank and other mission members has always been proactive in providing guidance. Regular follow-up

of the progress through email/phone calls by the TTLs were a catalyst for overwhelming achievements by the project. The TTLs were very prompt in responding to proposals forwarded to the World Bank. The overall performance in project identification, preparation assistance, appraisal, and supervision has been highly satisfactory.

6. The MTR mission of the World Bank had sorted out the deficiencies of the project design by objectively assessing all the relevant aspects. It may be worth mentioning that the project had received focused attention from the World Bank post-MTR and many micro implementation-level issues were sorted out. Close review of the safeguards-related issues of the project, particularly on the social and environmental sector by the mission members and ample guidance in this regard ensured better community involvement and adequate environmental mitigating measures. The support by the procurement and FM specialist ensured fiduciary compliance and highest level of transparency and efficiency.

7. We look forward to continue the engagement with the World Bank in the future through a follow-on project. Strengthening agribusiness and improving market links is one of the possibilities.

Annex 9. Comments of Co-financiers and Other Partners/Stakeholders

Not Applicable

Annex 10. List of Supporting Documents

Project Preparation
Project Appraisal Document, November 2005

Supervision
Implementation Status and Results Reports; Aide Memoires; and Management Letters, 2006–17
Project Paper: Additional Financing, August 2012
Financing Agreement: Additional Financing, November 2012
Project Agreement: Additional Financing, November 2012
Project Paper: Restructuring, February 2016

MAP

INDIA

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