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The World Bank

Report No: ICR00002216

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA-39070 IDA-48500 TF-94443)

ON A

CREDIT
IN THE AMOUNT OF SDR 47.40 MILLION AND SDR 5.1 MILLION
(US$ 69.62 MILLION AND US$ 7.98 MILLION EQUIVALENT)

AND A

GLOBAL ENVIRONMENT FACILITY GRANT
IN THE AMOUNT OF US$ 7.5 MILLION

TO INDIA

FOR

UTTARAKHAND DECENTRALIZED WATERSHED DEVELOPMENT PROJECT
(Gramya I)

February 25, 2014

Sustainable Development Department
India Country Management Unit
South Asia

CURRENCY EQUIVALENTS

(Exchange Rate Effective March 30, 2012)

Currency Unit	=	Indian Rupees (INR)
US$1	=	INR 50.95
US$1	=	SDR 0.65

FISCAL YEAR
April 1 – March 31

ABBREVIATIONS AND ACRONYMS

BPL	:	Below Poverty Line
CAS	:	Country Assistance Strategy
CDD	:	Community Driven Development
CPS	:	Country Partnership Strategy
DASP	:	Diversified Agriculture Support Project
DPD	:	Deputy Project Director
DSA	:	Divisional Support Agency
ESMF	:	Environmental and Social Management Framework
FFs	:	Farmer Federations
FIGs	:	Farmer Interest Groups
GEF	:	Global Environment Facility
GHGs	:	Green House Gases
GEO	:	Global Environment Objective
GoUK	:	Government of Uttarakhand
GoI	:	Government of India
GP	:	Gram Panchayat (rural local government)
GPWDP	:	Gram Panchayat Watershed Development Plan
ICR	:	Implementation Completion and Results Report
IFAD	:	International Fund for Agriculture Development
IPM	:	Integrated Pest Management
IWDP	:	Integrated Watershed Development Hills II Project
IWMP	:	Integrated Watershed Management Program
MGNREGA	:	Mahatma Gandhi National Rural Employment Guarantee Act
MDT	:	Multi-disciplinary team
MIS	:	Management Information System
MTR	:	Mid-term Review
MWDP	:	Micro-watershed Development Plan
M&E	:	Monitoring and Evaluation
NAPCC	:	National Action Plan on Climate Change
NCB	:	National Competitive Bidding
NGO	:	Non-Governmental Organization
PDO	:	Project Development Objective
PME	:	Participatory Monitoring and Evaluation
PRI	:	Panchayat Raj Institution

RVC	:	Revenue Village Committee
SDR	:	Special Drawing Rights
SHGs	:	Self-help Groups
SLEM	:	Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector
SWAJAL	:	Rural Water and Sanitation Project
UDWDP	:	Uttarakhand Decentralized Watershed Development Project
UREDA	:	Uttaranchal Renewable Energy Development Agency
VP	:	Van Panchayat
WMD	:	Watershed Management Directorate
WWMC	:	Water and Watershed Management Committee

Vice President:	Philippe H. Le Houerou
Country Director:	Onno Ruhl
Sector Manager:	Simeon Kacou Ehui
Project Team Leader:	Norman Bentley Piccioni / Ranjan Samantaray
ICR Team Leader:	Edward William Bresnyan, Jr. / Ranjan Samantaray

INDIA
Uttarakhand Decentralized Watershed Development Project (Gramya I)

CONTENTS

A. Basic Information			
Country:	India	Project Name:	Uttarakhand Decentralized Watershed Development Project (Gramya I)
Project ID:	P078550 (OP) P124354 (AF) P112061 (GEF)	Credit/Trust Fund Numbers:	IDA-39070 (OP) IDA-48500 (AF) TF-94443 (GEF)
ICR Date:	2/21/2014	ICR Type:	Core ICR
Lending Instrument:	SIL	Recipient:	REPUBLIC OF INDIA
Original Total Commitment:	SDR 47.40M (OP) SDR 5.10M (AF) USD 7.49M (GEF)	Disbursed Amount:[1]	SDR 44.94M (OP) SDR 3.84M (AF) USD 7.49 M (GEF)
Environmental Category: B		**Focal Area**: M	
Implementing Agencies: Watershed Management Directorate (WMD), State of Uttarakhand			
Co-financiers and Other External Partners: GEF Secretariat			

B. Key Dates

Uttaranchal Decentralized Watershed Development Project (Gramya I) - P078550/P124354

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	08/28/2003	Effectiveness:	09/10/2004	09/10/2004
Appraisal:	02/17/2004	Restructuring:		01/11/2011[2]
Approval:	05/20/2004	Mid-term Review:		11/27/2008
		Closing:	03/31/2012	03/31/2012

Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector (SLEM) - P112061

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	09/22/2005	Effectiveness:	11/24/2009	11/12/2009
Appraisal:	03/18/2009	Restructuring(s):		

[1] A closing, SDR 3.72 million was cancelled from Gramya I (7 percent of the total credit, detailed in the Section 2). The SLEM fully disbursed the GEF grant.

[2] The additional financing of January 2011 is a restructuring, as there was a change in one PDO indicator.

Approval:	08/04/2009	Mid-term Review:		04/12/2012
		Closing:	08/31/2013	08/31/2013

C. Ratings Summary

C.1 Performance Rating by ICR

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

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

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

C.3 Quality at Entry and Implementation Performance Indicators

Uttarakhand Decentralized Watershed Development Project (Gramya I) - P078550

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		

Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector (SLEM) - P112061

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
GEO rating before Closing/Inactive Status:	Satisfactory		

D. Sector and Theme Codes		
Uttarakhand Decentralized Watershed Development Project (Gramya I) - P078550		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
Agro-industry	5	5
Animal production	20	20
Crops	20	20
General agriculture, fishing and forestry sector	35	35
Sub-national government administration	20	20
Theme Code (as % of total Bank financing)		
Other rural development	33	33
Participation and civic engagement	33	33
Rural policies and institutions	17	17
Water resource management	17	17

Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector (SLEM) - P112061		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
Agricultural extension and research	50	50
General agriculture, fishing and forestry sector	25	25
Sub-national government administration	25	25
Theme Code (as % of total Bank financing)		
Biodiversity	28	23
Land administration and management	29	24
Other environment and natural resources management	14	9
Water resource management	29	29
Climate change	0	15

E. Bank Staff

Uttarakhand Decentralized Watershed Development Project (Gramya I) - P078550		
Positions	**At ICR**	**At Approval**
Vice President:	Philippe H. Le Houerou	Praful C. Patel
Country Director:	Onno Ruhl	Michael F. Carter
Sector Manager:	Simeon Kacou Ehui	Adolfo Brizzi
Project Team Leader:	Norman Bentley Piccioni / Ranjan Samantaray	Talib B. K. Esmail / Madhavi Pillai
ICR Team Leader:	Edward William Bresnyan, Jr./ Ranjan Samantaray	
ICR Primary Author:	Miki Terasawa	

Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector (SLEM) - P112061		
Positions	**At ICR**	**At Approval**
Vice President:	Philippe H. Le Houerou	Praful C. Patel
Country Director:	Onno Ruhl	Michael F. Carter
Sector Manager:	Simeon Kacou Ehui	Karin Erika Kemper
Project Team Leader:	Ranjan Samantaray	Yuka Makino
ICR Team Leader:	Ranjan Samantaray	
ICR Primary Author:	Miki Terasawa	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

To improve the productive potential of natural resources and increase 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)

N/A

Global Environment Objectives (from Project Appraisal Document)

To restore and sustain ecosystem functions and biodiversity while simultaneously enhancing income and livelihood functions, and generating lessons learned in these respects that can be up-scaled and mainstreamed at state and national levels.

Revised Global Environment Objectives (as approved by original approving authority)

N/A

(a) PDO Indicator(s)

Out of five PDO indicators, three were revised or clarified at Mid-term Review (MTR), which were approved by the Executive Directors (Board) through Additional Financing in January 2011 (changes detailed in the Annex 2).

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	10% increase in household income (over baseline) in targeted villages (disaggregated by gender and socio-economic class)			
Value (quantitative or Qualitative)	Rs 44,482 per household	10%		17%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: Control group showed 9% real HH income increase, relative to project HH real income increase of 26%.			
Indicator 2 :	10% increase in vegetation and biomass index of treated watersheds			
Value (quantitative or Qualitative)	2,612 tons/ha in sample GPs	10%		9.4%
Date achieved	09/10/2004	03/31/2012		12/31/2010
Comments (incl. % achievement)	**Substantially Achieved**: As confirmed through 2010 remote sensing field survey.			
Indicator 3 :	15% increase in availability of water over baseline for domestic use (% of households in treated GPs)			
Value (quantitative or Qualitative)	14% HH with access	15%		12%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Substantially Achieved**: Some 26% of HHs in the targeted GPs now have water available due to a 68% increase in the source water discharge rate and a 60% increase in stream water flow.			
Indicator 4 :	15% increase in availability of water over baseline for agriculture use			
Value (quantitative or Qualitative)	8,100 ha	15%		16%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: An additional 9,402 hectares were brought under irrigation due to water harvesting structures financed under the project.			
Indicator 5 :	20% improvement in administrative capacity of GPs as measured by performance indicators			
Value (quantitative or	27%	20%		21% point

Qualitative)				
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: Performance indicators measured Gram Sabha (village assembly) on attendance, inclusiveness, and frequency of meetings held (see Annex 2).			

(b) GEO Indicator(s)

There were two GEO indicators for the Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector (SLEM), which was financed by the Global Environment Facility (GEF). These indicators remained unchanged.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	20 micro-watershed management plans (MWMP) completed and under implementation			
Value (quantitative or Qualitative)	0	20		20
Date achieved	11/30/2009	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: 20 MWMPs covered 125 GP-level plans and focused on treatment of inter-GP areas, mostly in reserve forests and with VP participation.			
Indicator 2 :	10% increase in livelihood opportunities in treated areas			
Value (quantitative or Qualitative)	882 SLEM beneficiaries were engaged in alternative livelihood activities (with UDWDP support)	10%		4,500 SLEM beneficiaries were engagedin those activities
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: At the end of the project, some 4,500 beneficiaries were engaged in livelihood activities, such as pine needle briquetting, gharats (traditional water mills), biogas, and medicinal and aromatic plant cultivation.			

(c) Intermediate Outcome Indicator(s)

Gramya I. At Mid-term Review, Gramya I revised, dropped, or clarified seven intermediate outcome indicators. These changes were approved by the Board through Additional Financing in January 2011. Annex 2 details the original Gramya I indicators.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Component 1: 80% of households are included in preparation of Gram Panchayat Watershed Development Plan (GPWDP)			

Value (quantitative or Qualitative)	0 in target districts	80%		80%
Date achieved	09/10/2004	3/31/2012		3/31/2012
Comments (incl. % achievement)	**Achieved**: The high level of participation held targeted GPs accountable for the GPWDP implementation, while participatory monitoring and evaluation monitored work quality and ensured the sustainability of the project investments.			
Indicator 2 :	Component 1: 60% of activities, identified during participatory rural appraisal (PRA) exercise, in GPWDP address soil conservation measures, water resource management, forest, fuelwood, and fodder management			
Value (quantitative or Qualitative)	0 in targeted districts	60%		65%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: The activities were erosion control, vegetative treatment, check dam construction, drainage line treatment, water harvesting, afforestation, fuel wood plantation, terrace repair, fodder management, etc. (see Annex 2).			
Indicator 3 :	Component 1: More than 50% of targeted GPs have treated 80% of area proposed for treatment in the approved GPWDPs			
Value (quantitative or Qualitative)	0	More than 50%		52%
Date achieved	09/10/2004	03/31/2012		3/31/2012
Comments (incl. % achievement)	**Achieved**: Treatment includes land degradation, soil conservation and drainage line treatment, water harvesting, afforestation, plantation, terrace repair, fodder development, etc. (see Annex 2).			
Indicator 4 :	Component 2: 10% increase in area (over baseline) of improved varieties and high value crops and fruit trees			
Value (quantitative or Qualitative)	6,169 ha	10%		21%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: As a result of demonstrations on cost sharing basis, improved varieties and high value crops are now cultivated in 7,464 ha.			
Indicator 5 :	Component 2: 20% increase in fodder production (over baseline)			
Value (quantitative or Qualitative)	N/A	20%	10%	9.6%
Date achieved	09/10/2004	03/31/2012	03/31/2012	03/31/2012
Comments (incl. % achievement)	**Substantially Achieved**: Target was reduced to 10%, based on the mid-term impact evaluation results.			
Indicator 6 :	Component 2: 1% increase (over baseline) in number of improved breed animals			
Value (quantitative or Qualitative)	104 cows in sampled HHs	1%		19%
Date achieved	09/10/2004	03/31/2012		03/31/2012

Comments (incl. % achievement)	**Achieved**: Sampled HHs had some 124 improved breed cattle at end of project.			
Indicator 7 :	Component 2: 15% increase in net value of produce realized by farmers adopting post-harvest technologies and establishing market linkages			
Value (quantitative or Qualitative)	0	15%		27%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: Clarified at MTR to measure the increase in net value of produce realized by farmers in treated area			
Indicator 8 :	Component 2: 30% increase in number of functioning self-help groups (SHGs)			
Value (quantitative or Qualitative)	17 functioning SHGs in sampled GPs at baseline; 65 functioning SHGs in sampled GPs at mid-term	30%		98%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: Some 92 SHGs were found in the sampled GPs, of which 87 were active for two or more years old.			
Indicator 9 :	Component 2: 60% of loans repaid to SHG by borrowers			
Value (quantitative or Qualitative)	0	60%		
Date achieved		03/31/2012		
Comments (incl. % achievement)	Dropped at MTR, because the original credit-based mobilization was revised to livelihood-based for the vulnerable groups (detailed in Section 2)			
Indicator 10 :	Component 2: Number of income generating activities (group and individual) funded under the project			
Value (quantitative or Qualitative)	0	Replaced Indicator #9	500	4,573
Date achieved	09/10/2004		03/31/2012	03/31/2012
Comments (incl. % achievement)	**Achieved**: Replaced Indicator # 9 at MTR (see Annex 2). A total of 8,819 vulnerable persons benefitted (5,000 persons benefitted from group activities, while 3,819 persons did from individual activities).			
Indicator 11 :	Component 2: 15% increase in average net income generated by income generation activities for Vulnerable Group households (Rs/HH)			
Value (quantitative or Qualitative)	Rs 33,428/HH in sample GPs	Replaced Indicator #9	15%	30%
Date achieved	09/10/2004		03/31/2012	03/31/2012
Comments (incl. % achievement)	**Achieved**: Replaced Indicator #9 at MTR (see Annex 2)			
Indicator 12 :	Component 2: 50% of enterprises still active after two years			

Value (quantitative or Qualitative)	0	50%		90%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: Enterprises are the income generation activities by Vulnerable Groups (clarified at MTR). At the UDWDP closure, 90% of these activities were still maintained by the Vulnerable Group beneficiaries.			
Indicator 13 :	Component 3: At least 50% attendance in statutory Gram Sabha meetings			
Value (quantitative or Qualitative)	29%	50%		47%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Substantially Achieved**: 47% of the HHs in the targeted GPs attended in statutory Gram Sabha meetings.			
Indicator 14 :	Component 3: 50% increase over baseline in proportion of GP constituents aware of annual budget and expenditure of GP.			
Value (quantitative or Qualitative)	0	50%		49%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Substantially Achieved**: Revised at MTR to measure the level of awareness.			
Indicator 15:	Component 3: 80% of GPs targeted under project having satisfactory annual audit report			
Value (quantitative or Qualitative)	N/A	80%		100%
Date achieved	10/01/2008	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: Placement of youth account assistants led to satisfactory (i.e., clean) audits in all 468 GPs.			
Indicator 16 :	Component 3: 50% of targeted households aware of project objectives, activities, and methodologies			
Value (quantitative or Qualitative)	0	50%		91%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: The high level of project awareness obtained through the PME (see below), targeted training, and communication activities.			
Indicator 17 :	Component 3: 90% of monitoring reports submitted and action taken on 80%			
Value (quantitative or Qualitative)	0	90%		
Date achieved	09/10/2004	03/31/2012		

Comments (incl. % achievement)	Dropped at MTR			
Indicator 18 :	Component 3: Participatory Monitoring and Evaluation (PME) regularly (at least three times) carried out in 400 GPs and reports received by WMD			
Value (quantitative or Qualitative)	0	400		468
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: Replaced Indicator #17 at MTR.			
Indicator 19 :	Component 3: 90% staff deployment, as per agreed schedule			
Value (quantitative or Qualitative)	15%	90%		97%
Date achieved	09/10/2004	03/31/2012		03/31/2012
Comments (incl. % achievement)	**Achieved**: The total staffing requirement at the WMD was revised from 509 at Appraisal to 431 at MTR.			

SLEM. There were 13 intermediate results indicators in the SLEM results framework. The outcomes are as follows:

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Sustainable watershed management mainstreamed into 20 micro-watershed development plans (MWDPs), including parts of watersheds for which two or more GPs have shared governance responsibility			
Value (quantitative or Qualitative)	100% developed	100%		100%
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: 17% of reserve forests or inter-GP areas were treated through land degradation control, soil conservation and drainage treatment, afforestation and plantation, water harvesting, etc. (see Annex 2).			
Indicator 2 :	20% increase of area in targeted MWS' under improved SLEM techniques			
Value (quantitative or Qualitative)	0	20%		21%
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: Increase in soil and moisture retention in targeted areas			
Indicator 3 :	Increase in vegetative cover and biomass by 10% in the treated 20 MWS			
Value	48.5 t/ha	10%		5.5%

(quantitative or Qualitative)	(biomass only)			
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Partially Achieved**: The final impact evaluation measured only vegetative cover.			
Indicator 4 :	Implementation of 5 to 10 alternative technologies and approaches for enhancing water availability for agriculture and other domestic use.			
Value (quantitative or Qualitative)	5	10		10
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: Selected alternative technologies implemented were: (a) rainfall runoff capture and infiltration ponds, (b) water storage tanks, (c) percolation tanks, (d) drip irrigation, (e) nala/khala (natural springs) rejuvenation, and (f) plantation and assisted natural regeneration.			
Indicator 5 :	Reduction in dependency of 2,000 households on forest for fuel wood			
Value (quantitative or Qualitative)	6.9% of targeted 2,000 HHs already producing pine briquettes	100%		102%
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: At the end of the project, more than targeted (102%) households used pine needle briquettes, biogas, or solar cookers.			
Indicator 6 :	At least 20% of targeted households enter market with pine briquettes			
Value (quantitative or Qualitative)	0	20%		57%
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: 192 SHGs (2,880 households) produced pine needle briquettes, 109 of which (1,635 households) sell the briquettes, with the remainder using the briquettes solely for household needs.			
Indicator 7 :	10% increase in opportunities for sustainable alternative livelihoods (non-farm based livelihood options)			
Value (quantitative or Qualitative)	2,970 households benefitted from the Gramya I Vulnerable Group activities	10%		83%
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: Additional 2,470 households benefitted from the SLEM Vulnerable Group activities.			
Indicator 8 :	Increase in (direct and indirect evidence) presence of key species of flora and fauna in 20 micro-watersheds			
Value (quantitative or Qualitative)	Shannon-Weiner Diversity Index – Trees: 2.02; Shrubs 3.04; Herbs 3.59	10%		Shannon-Weiner Diversity Index – Trees: 2.02; Shrubs 3.57; Herbs 2.6

	Species Richness -Trees: 32; Shrubs: 73; Herbs: 38			Species Richness - Trees: 32; Shrubs: 79; Herbs: 28
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: When compared to control group, significantly higher shrubs and overall species richness.			
Indicator 9 :	20% reduction in incidence of fire in treated micro-watersheds			
Value (quantitative or Qualitative)	15.5 ha affected in sample GPs in 2010-11	20%		61%
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: The SLEM financed plantation management and fire control training in pine forests, thereby reducing forest fires and contributing to reduction in emissions of greenhouse gases (GHGs).			
Indicator 10 :	Cultivation of at least 5 local medicinal and aromatic plant species by communities in 20 micro-watersheds			
Value (quantitative or Qualitative)	2 (ginger and turmeric)	5		12
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: Ginger, turmeric, and aloe vera were marketed. Other nine plants were: cardamom, satavar, amia, stevia, rosemary, lemon grass, snake root, and Hedychium spicatum. Some of these species were threatened by unsustainable harvesting practices in the natural forest.			
Indicator 11 :	Study on impact of climate change on mountain ecosystems completed			
Value (quantitative or Qualitative)	No	Yes		No
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Not Achieved**: The lack of technical capacity in climate change in the implementing agency delayed State government clearance for the study.			
Indicator 12 :	Formulation of strategy for managing impact of climate change in mountain ecosystems at the end of the project			
Value (quantitative or Qualitative)	No	Yes		No
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Not Achieved**: The lack of technical capacity in climate change in the implementing agency delayed State government clearance for the study.			
Indicator 13 :	At least 5 to 10 improved and innovative techniques and approaches documented, disseminated and up-scaled within Uttarakhand State			
Value (quantitative or	0	5		11

Qualitative)				
Date achieved	11/30/2011	08/31/2013		08/31/2013
Comments (incl. % achievement)	**Achieved**: 11 good practice notes on natural resource conservation and land degradation control were developed and distributed at local, division, and state levels, including (a) pine needle briquetting, (b) solar lights, (c) solar cookers, (d) biogas plants, (e) gharat renovation, (f) medicinal and aromatic plant cultivation, (g) rejuvenation of nala/khala, (h) roof water harvesting, (i) river bank protection, irrigation tanks, and delivery system, (j) village ponds, percolation tank, and contour trenches with bunds, and (k) forest management (fire control, plantation establishment, and assisted natural regeneration).			

G. Ratings of Project Performance in ISRs

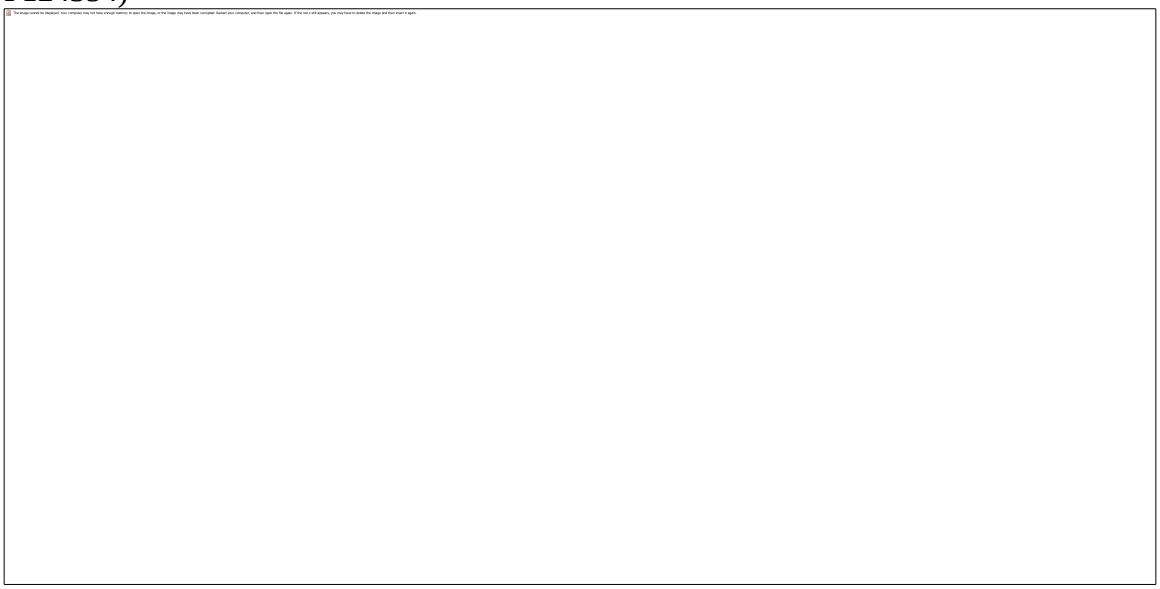
-						
No.	Date ISR Archived	DO	GEO	IP	Actual Disbursements (USD millions)	
					Project 1	Project 2
1	06/29/2004	S		S	0.00	0.00
2	12/14/2004	S		S	0.00	0.00
3	06/08/2005	S		S	4.18	0.00
4	12/20/2005	S		S	4.26	0.00
5	06/25/2006	S		S	6.62	0.00
6	12/26/2006	S		S	7.52	0.00
7	06/25/2007	S		S	13.07	0.00
8	12/19/2007	S		S	16.19	0.00
9	06/28/2008	S		S	25.93	0.00
10	10/11/2008	S		MS	26.88	0.00
11	01/18/2009	S		MS	28.35	0.00
12	07/29/2009	S		MS	37.48	0.00
13	04/01/2010	S	S	S	49.03	0.70
14	05/26/2010	S	S	S	52.47	1.03
15	12/05/2010	S	S	S	57.36	1.54
16	04/28/2011	S	S	HS	66.25	3.14
17	11/07/2011	S	S	HS	73.61	4.18
18	06/17/2012	S	S	S	77.43	5.28
19	12/14/2012	S	S	S	75.42	6.03
20	06/20/2013	S	S	S	75.42	7.49

H. Restructuring (if any)

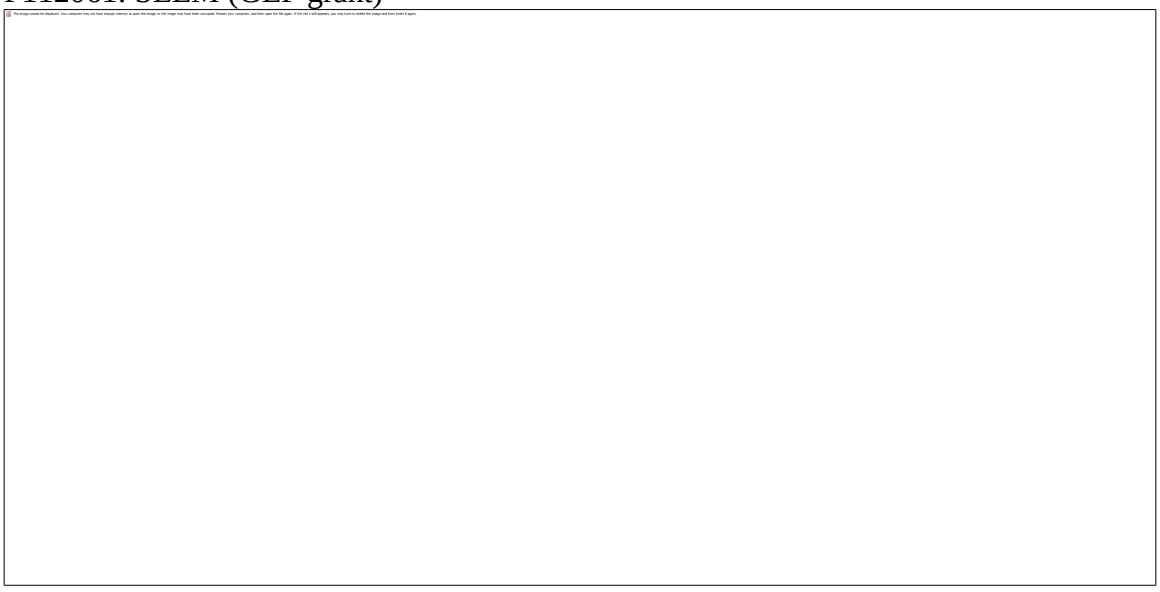
Restructuring Date(s)	Board Approved		ISR Ratings at Restructuring			Amount Disbursed at Restructuring in USD millions		Reason for Restructuring & Key Changes Made
	PDO Change	GEO Change	DO	GEO	IP	Project1	Project 2	
01/11/2011			S		S	58.67		With the additional financing (P124354), there was a change in one PDO indicator (reduction in the target value).

I. Disbursement Profile

P078550: Gramya I (actual includes Additional Financing of US$ 7.98 million – P124354)



P112061: SLEM (GEF grant)



1. Project Context, Development and Global Environment Objectives Design

1.1 Context at Appraisal

1.1.1 Uttarakhand became the 27th State of India in November 2000[3], with a small population of 8.5 million and a total area of 53,483 km^2. About 87 percent of this area is hilly and subject to severe soil erosion and land degradation. Uttarakhand is home to five well-endowed river basins, including the Ganges. But the lifeline of the people in the State has been its innumerable perennial steams and springs, which provide access to water for meeting diverse needs. Severe soil erosion and land degradation has reduced the flow and capacity of these water sources by 40 percent.

1.1.2 Approximately 70 percent of the hills population practices relatively low-yielding rainfed subsistence agriculture. Average productivity of subsistence cereals in the hills is less than 50 percent of that found in the plains. Moreover, landholdings in the hills are as small as 0.87 ha per household and widely dispersed. Farm income, thus, is also small. Over 24 percent of the hills population out-migrated, and there were a high number of female-headed households. At the time of Project appraisal, the incidence of poverty was 46 percent higher in the hills than in the plains[4] and even worse among scheduled caste and tribal populations.

1.1.3 For reducing poverty in the hills, the Government of Uttarakhand (GoUK) was promoting watershed development and considered it a means to conserve natural resources and sustainably increase productivity of rainfed agriculture in the ecologically fragile and erosion-prone hills. The Uttarakhand Decentralized Watershed Development Project (UDWDP or locally known as Gramya I) was designed by building on the predecessor multi-state project, which was the IDA-financed Integrated Watershed Development Hills II Project (IWDP II) - P041264[5]. Gramya I was to scale up the watershed treatment in 20 sub-watersheds in the mid-Himalayan hills, while supporting GoUK's administrative, fiscal, and political decentralization to Gram Panchayats (GPs, rural local government).

1.2 Original Project Development Objectives (PDO) and Key Indicators (as approved)

1.2.1 The PDO of Gramya I was *to improve the productive potential of natural resources and increase incomes of rural inhabitants in selected watersheds through socially inclusive, institutionally and environmentally sustainable approaches*. It

[3]It was a hilly part of the State of Uttar Pradesh and named Uttaranchal upon independence and in 2006, renamed Uttarakhand.

[4] 38.5 percent of the population is below the poverty line in the hills, while it is 26 percent in the plains.

[5]At a total cost of US$ 135 million, IWDP II was implemented in five states (Uttarakhand, Jammu and Kashmir, Himachal Pradesh, Punjab, and Haryana). US$ 45 million was earmarked for Uttarakhand. Impact studies indicated considerable success in this project, including an average of 38 percent increase in incomes of beneficiaries with increased agriculture productivity while sustaining the natural resource base. IWDP II closed on March 31, 2005.

encompassed three broad themes: (a) community participation in watershed development and management aimed at integrating land-water management with the objectives of increased soil moisture retention and improved biomass production, while simultaneously enhancing incomes and livelihood options; (b) strengthening the administrative capacity of GPs to manage project financial resources, implement sub-projects, deliver legally mandated services (in the context of natural resource management), and sustain those services beyond the duration of the project; and (c) ensuring equitable participation by all groups, especially the landless and women who rely disproportionately on common-pool resources for fodder, fuel, and other forest products. The original PDO indicators were:

i. 10 percent increase in household income (over baseline) in targeted villages;
ii. 10 percent increase in vegetation and biomass index of treated watersheds;
iii. 15 percent increase in availability of water over baseline for domestic and/or agriculture use; and
iv. 20 percent improvement in administrative capacity of GPs as measured by performance indicators.

1.3 Original Global Environment Objectives (GEO) and Key Indicators (as approved)

1.3.1 The GEO for the GEF-financed Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector (SLEM) was *to restore and sustain ecosystem functions and biodiversity while simultaneously enhancing income and livelihood functions, and generating lessons learned in these respects that can be up-scaled and mainstreamed at state and national levels.* The GEO was consistent with the Gramya I PDO, with an emphasis on enhancing climate change mitigation and resilience in the watershed ecosystem. The GEO indicators were:

i. 20 micro watershed management plans completed and under implementation; and
ii. 10 percent increase in livelihood opportunities in treated areas.

1.4 Revised PDO and Key Indicators, and reasons/justification

1.4.1 The PDO remained unchanged throughout project implementation. However, one PDO indicator and nine intermediate results indicators were revised or clarified at the Mid-term Review. The target for PDO indicator (iii) was reduced to 10 percent. The revised results framework was approved by the Board as a part of the Additional Financing/restructuring package in January 2011 (the revisions are detailed in Annex 2).

1.5 Revised GEO (as approved by original approving authority) and Key Indicators, and reasons/justification

1.5.1 The GEO remained unchanged throughout the project implementation.

1.6 Main Beneficiaries

1.6.1 Gramya I treated 234,800 ha in 76 micro-watersheds, and benefitted a population of 255,681 in 468 GPs in 18 development blocks in the 11 hill districts of Uttarakhand. These GPs were selected on the basis of: (a) erosion intensity (e.g., land degradation and soil erosion), (b) socio-economic status (e.g., below poverty line populations, resource poor, and gender), and (c) access (e.g., remoteness and infrastructure). In focusing on water source treatment and sustainability, the SLEM additionally provided incremental benefits in land degradation control and climate change mitigation and resilience to the selected 125 GPs (27 percent of Gramya I GPs) in 20 targeted micro-watersheds (detailed in the Annex 2). The main beneficiaries for both Gramya I and the SLEM were as follows:

- **Small and medium landholders in targeted GPs**. These farmers benefitted from (a) watershed treatment, in particular, land degradation control, water harvesting and source sustainability, (b) demonstrations in rainfed and irrigated agriculture technologies and increase in yields, and (c) high value and/or off-season vegetable cultivation, group formation and capacity building, and the agribusiness pilot.
- **Marginal farmers, landless, women, and transhumant**. The Vulnerable Group fund benefitted marginal farmers, landless, and women in enhancing their livelihoods.[6] The Transhumant Action Plan supported the transhumant populations, who passed by or stayed in the targeted GPs.
- **Targeted GP and community members**. The GPs benefitted from the participatory approach in planning and implementing GP watershed development plans (GPWDPs) and micro-watershed development plans (MWDPs). Gramya I built their capacity in GP administration, project management, fiduciary and safeguards compliance, and social accountability through training and exposure visits.

1.6.2 Through the knowledge management activities, Gramya I and SLEM also reached out to state and local stakeholders in watershed development, including the State Departments of Forestry, Water Resources, Agriculture, Livestock, and Rural Development, universities, research institutes, donors, aid agencies, and NGOs.

[6] The project defined the vulnerable households as very small landholders (less than 0.68 ha), landless, with specific housing ("Kacha" house), limited livelihoods opportunities, few livestock, in debt, or socially vulnerable. About 23 percent of the households (who were the poorest of poor) benefitted from the Vulnerable Group fund.

1.7 Original Components (as approved)

1.7.1 Gramya I had three components: (a) participatory watershed development and management, (b) enhancing livelihoods opportunities, and (c) institutional strengthening.

Component A. Participatory Watershed Development and Management (US$ 55.95 million)

1.7.2 This was the key project component, which supported watershed treatment through a participatory approach. The two sub-components were as follows:

- **Sub-component A.1. Promotion of social mobilization and community-driven decision making.** This sub-component supported GP mobilization and GPWDP preparation, which was facilitated by field-based NGOs.
- **Sub-component A.2. Watershed treatments and village development.** This supported GPWDP implementation, including investments in civil works.

Component B. Enhancing Livelihood Opportunities (US$ 14.25 million)

1.7.3 The component aimed at increasing production and productivity of irrigated and rainfed crops, while supporting the Vulnerable Groups. The three sub-components were:

- **Sub-component B.1. Farming systems improvement.** On a cost-sharing basis, the sub-component supported demonstrations of improved technologies and practices in water harvesting, agriculture, and horticulture.
- **Sub-component B.2. Value addition and marketing support.** The sub-component piloted agribusiness development, including farmer interest group (FIG) formation and capacity building, value addition, and market linkages.
- **Sub-component B.3. Income-generating activities for vulnerable group.** The sub-component financed income generation activities selected by the Vulnerable Groups, such as livestock, processing and value addition and other service sector activities.

Component C. Institutional Strengthening (US$ 17.29 million)

1.7.4 This component supported the following three sub-components:

- **Sub-component C.1. Capacity building of Gram Panchayats and local community institutions.** Community members were trained on the participatory approach, sub-project management, and fiduciary and safeguard compliance.
- **Sub-component C.2. Information, education, and communication.** The sub-component supported communication and knowledge management.
- **Sub-component C.3. Project coordination, monitoring, and management.** This financed the WMD in its project management and various monitoring tools.

1.8 Revised Components

1.8.1 There was no change to the three components and eight sub-components during project implementation.

1.9 Other significant changes

1.9.1 The GEF-financed SLEM (US$ 7.5 million) was approved as Additional Financing to Gramya I in August 2009. SLEM demonstrated source sustainability towards improving access to water and water security through decentralized water management. It also piloted alternative livelihoods that would enhance climate change mitigation and enhanced resilience to climate shocks in the selected 20 Gramya I micro-watersheds. SLEM implemented the following six activities: (a) participatory development of micro-watershed development plans (MWDPs), (b) land degradation control at the micro-watershed level, (c) reduction in pressure and dependence on the natural resource base, (d) biodiversity conservation and management, (e) two studies on climate change adaptation in natural resource-based production systems, and (f) project management. These activities were to build on Gramya I investments but were not linked to its components. The approved closing date was August 31, 2013.

1.9.2 To complement cost overruns, an Additional Financing IDA Credit of SDR 5.1 million (US$ 7.98 million equivalent) was approved by the Board in January 2011 (detailed in Section 2.2). The re-allocation between categories was also approved at the same time, to ensure satisfactory completion of civil works related to watershed treatment and to strengthen demonstrations under the farming system improvement (detailed in the Annex 2). The Closing Date of Gramya I remained unchanged (March 31, 2012).

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

2.1.1 The project preparation is rated Satisfactory. GoUK had a strong interest in Gramya I, in particular, in advancing decentralization by strengthening Panchayat Raj Institutions (PRIs). Prior to the preparation, the GoUK had granted GPs formal legal recognition in treating watersheds, including land improvement, soil conservation, and social and farm forestry. While the overall project design was built on the multi-state IWDP II, lessons were drawn from the Bank-financed Rural Water and Sanitation Project - SWAJAL (P010484)[7], which promoted decentralization by building GP administrative capacity through enhanced community participation. Gramya I emphasized a participatory approach and built GP financial and procurement capacity in managing sub-grants. To ensure sub-grant management at the GP level, GoUK agreed to place an accounts assistant at every targeted GP and developed a community procurement manual.

[7]SWAJAL was to improve water supply and environmental sanitation services and promote sanitation and gender awareness at community level (total cost US$ 60 million). The project was implemented by the Government of Uttar Pradesh, prior to the independence of the State of Uttarakhand.

2.1.2 Gramya I also drew lessons from the Bank-supported Diversified Agriculture Support Project (DASP) (P035824)[8]. The DASP informed the project in: (a) improving project ownership and sustainability by sharing costs with the community, (b) enhancing the livelihood component by piloting agribusiness development, and (c) engaging NGOs as implementation partners, to mitigate potential delays in project staffing or deputation from line departments (as had happened in IWDP). GoUK agreed to contract NGOs to support (a) overall project management in two districts (i.e., partner NGOs), (b) social mobilization and GPWDP preparation (i.e., field NGOs), and (c) agribusiness development, including FIG mobilization, value addition, and marketing support (Divisional Support Agencies, DSAs). Despite the relatively complex design, Gramya I was prepared in a short period of six months (from the concept review to the appraisal).

2.2 Implementation

2.2.1 The implementation progress is rated Satisfactory. Consistent with the PDO, the project made an attempt to engage with Gram Panchayats in implementing watershed treatment on arable and non-arable lands. This was done despite concern that the GPs had low capacity to manage project finances and implement sub-project activities. The project took up the challenge to enhance the capacities of GPs in fulfilling their constitutional mandate of delivering development services at the local level. This has led to improvement in efficiency of the PRIs in managing all development activities and in creating a roadmap for their involvement in national watershed development program.

2.2.2 By design, disbursement projections were back-loaded, reflecting the decentralized nature of the project, which required community mobilization and training. These were prerequisite for significant disbursements for goods and civil works through GPDWP implementation. By building on the IWDP experiences and by engaging both partner and field NGOs, the expected progress in social mobilization and GPWDP preparation was consistent overall: more than 50 percent of targeted GPs had prepared GPWDPs by end-2006, and almost 100 percent had done so by end-2008 (detailed in the Annex 2). However, the delay in project staffing slowed social mobilization in more remote GPs and GPWDP implementation in some divisions. For example, in the first four years of implementation (2004 to 2008), only about 50 percent of the key technical positions were filled in engineering, agriculture, horticulture, and livestock management. The implementation progress was, thus, rated "moderately satisfactory" in mid-2008. Gramya I increased NGO engagement and hired 10 local NGOs, including six DSAs to support the agribusiness pilot at the divisional level. With these adjustments, project staffing reached 96 percent of expectations by end-2008.

2.2.3 At the Mid-term Review in November 2008, changes were made to the project design to: (a) initiate comprehensive treatment at the micro-watershed level; (b) enhance agribusiness development; and (c) strengthen support for Vulnerable Groups in

[8] DASP, on the other hand, was to increase agricultural productivity by supporting diversified agricultural production systems, promoting private sector development, and improving rural infrastructure (total cost US$ 130 million). Likewise, DASP was also implemented by the State of Uttar Pradesh.

entrepreneurial activities. Diversified crop productivity from rainfed areas induced the project to emphasize agribusiness to enhance rural livelihoods, which the project could not anticipate. While Vulnerable Group support had focused on SHG formation only, the Mid-term Review shifted its emphasis toward entrepreneurial group activities in the livestock and service sectors (detailed in the Annex 2).

2.2.4 Throughout 2009 and 2010, there were consistent improvements in the implementation of both Gramya I and SLEM. Gramya I disbursements reached 84 percent by end-2010. However, due to an increase in the cost of civil works in the targeted GPs and associated agribusiness support, and higher-than-expected inflation, a cost overrun was anticipated. The Original Project budget included a two percent allocation for physical and price contingencies (US$ 1.86 million), but this was not enough to keep up with domestic inflation, which was about 12 percent in October 2008. The Additional Financing of US$ 7.98 million equivalent, approved by the Board in January 2011, helped to fill this financing gap.[9] The reallocation of funds and the revised results framework were also approved at this time. In 2011, the project implementation progress was upgraded to "highly satisfactory", because of the consistent progress in attaining most of the Gramya I targets and even exceeding a few (detailed in section 3). At Credit closure, SDR 3.7 million (about US$ 5.6 million equivalent) was cancelled. Both GoUK and beneficiary contributions exceeded appraisal estimates by some US$11.7 million, thereby reducing the need for additional IDA resources. Moreover, the depreciation of the rupee also played a role in the creation of savings[10]. With the closing of Gramya I in March 2012, the subsequent ISR documented solely SLEM progress; as such, the rating reverted to Satisfactory.

2.2.5 The implementation of SLEM activities continued until August 2013. The SLEM took full advantage of the skills, experiences and lessons learned of the Gramya I-trained staff in its implementation. To ensure the sub-grants were fully disbursed, two reallocations between categories were approved by the Bank. These were to strengthen GP mobilization by reallocating funds earmarked for two climate change studies, which were not carried out due to lack of implementing agency capacity in this emerging subject (detailed in section 3.5). The SLEM fully disbursed the GEF grant and satisfactorily implemented most of the planned activities before project closing. The overall implementation progress of the SLEM remained "satisfactory".

2.2.6 An Inspection Panel complaint was filed by a local NGO in March 2007, claiming that Gramya I had reported achievements that were actually attributable to another livelihoods development project. A subsequent site visit to meet with the claimant NGO led the Inspection Panel to conclude that there was no basis for investigation and the matter was closed.

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[9] GoUK also provided US$ 2.51 million, which totaled to US$ 10.49 million.

[10] The exchange rate was US$ 1 = Rs. 52.63 around the project closure (as of April, 2012). At appraisal, it was US$ 1 = Rs. 45.30 (as of March, 2004). The rupee depreciated by 16 percent, which reduced the actual expenditure in terms of US$.

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

2.3.1 The M&E is rated Substantial. The Gramya I results framework was well-designed to capture the project emphasis on decentralization and GP capacity building in participatory GPWDP planning and implementation. Nonetheless, the indicators did less to capture more science-based aspects of watershed development. For example, while one of the PDO indicators measured increase in vegetation and biomass index, the results framework could have highlighted key physical outcomes in water source treatment and sustainability, by measuring increase in water discharge rate and stream flow duration, and in area under irrigation. As a result, the physical outputs were measured by the GPWDP implementation progress and sub-grant disbursement. This was also the case for the GEF results framework. Also, at hindsight, the target values for some indicators could have been more ambitious in achieving PDO and GEO.

2.3.2 The key physical outputs and outcomes were regularly monitored through WMD's well-established management information system (MIS), and these were reported at every Bank mission. During Gramya I implementation, MIS was enhanced at the divisional level to track progress in WDP development and implementation, area under treatment (including irrigation), production and productivity of rainfed and irrigated crops, value addition and marketing. The information was used to update the results framework, in particular, measuring the project outcomes, and preparing case studies, good practice notes (including 11 notes prepared by the SLEM), and various reports, including the Bank and government ICRs. The results and outcomes of Gramya I and SLEM were widely disseminated to stakeholders at the GP, division, and the state levels.

2.3.3 In addition to the detailed MIS, both Gramya I and SLEM complemented output and outcome monitoring by the innovative participatory monitoring and evaluation (PME, detailed in Section 3.5 as a social accountability tool) and third-party impact evaluation. An independent research firm was hired to conduct the baseline, mid-term and final impact evaluations (with a methodology that included control groups) for both Gramya I and SLEM.[11] These evaluations verified the projects' achievements towards their respective key indicators, such as vegetative biomass, biodiversity index, increase in household income, adoption and uptake of alternative technologies for livelihoods, and GP capacity building.

2.4 Safeguard and Fiduciary Compliance

2.4.1 Safeguards. The project was Category B and triggered five safeguard policies: environmental assessment (OP 4.01), natural habitats (OP 4.04), pest management (OP 4.09), indigenous peoples (OP 4.20), and forests (OP 4.36). The project fully complied with the Bank safeguards. The Environmental and Social Management Framework (ESMF), integrated pest management (IPM) strategy, and Transhumant Action Plan were prepared and disclosed in February 2004. In addition, the project also developed

[11] These were undertaken by The Energy and Resources Institute (TERI), a Delhi-based consulting firm.

guidelines for plastic waste disposal from poly house or poly tunnels and waste management at processing centers.

2.4.2 The environmental and social safeguards were the integral part of GPWDP and MWDP planning and implementation. GPs used safeguard checklists in selecting and implementing sub-projects at the village level. The project trained 23,977 community leaders and stakeholders on the ESMF guidelines and checklists, as a part of project orientation. The safeguard compliance was monitored for all Gramya I and SLEM sub-projects by WMD division offices. The checklists were also used by the GoI-financed IWMP and the livelihoods and local institution development project supported by the International Fund for Agriculture Development (IFAD).

2.4.3 Uttarakhand was declared a certified organic state (in terms of agricultural production) in 2001 and was the first such State to be recognized by GoI. Building on this status, the project's IPM strategy encouraged the reduced use of agro-chemicals by training targeted farmers on composting and appropriate use of farmyard manure and IPM. During Gramya I and SLEM implementation, progressive FIG members were identified and trained as IPM resource persons, and information was made available at the division level at Farmer Development Centers under the Department of Agriculture.

2.4.4 The Transhumant Action Plan supported sedentary or semi-sedentary transhumant communities migrating through or residing in the targeted GPs. They were Bhotiya, Anwals, and Gujars and composed approximately 6.5 percent of the total Gramya I target population. The project provided veterinary support, insurance facilities, fodder blocks, and education for children at a total cost of Rs. 132 million (approximately US$ 2.64 million).

2.4.5 Financial Management. Financial management is rated Satisfactory. The overall accounting and reporting system was functional at the state, division, and district levels throughout Gramya I and SLEM implementation. Each GP managed an average of Rs. 4 million (approximately US$80,000) plus the Vulnerable Group funds (about US$ 20,000). In supporting GP financial management, university graduates in commerce were hired as accounts assistants in all 468 targeted GPs. The assistants underwent continuous training given by WMD and ensured GP-level accounting and auditing. They ensured 100 percent submission of satisfactory GP audit reports.

2.4.6 The project submitted interim unaudited financial reports (IUFRs) on time. The external audit reports were also submitted (albeit with some delays) and were clean in all cases.

2.4.7 Procurement. Procurement also is rated Satisfactory. GPs executed about 80 percent of procurement under the project. Although the amount per transaction was rather small, the sheer quantity of transactions across the 468 GPs had the potential for substantial risk. WMD produced a Community Procurement Manual during project preparation, and trained women village facilitators and other GP members on its contents. For the GP investments, such as water harvest structures, the procurement was conducted

and closely monitored by the water user groups. For the larger public goods, such as roads and bridges, GP members monitored the procurement through PME. WMD conducted the remaining 20 percent of procurement, including large contracting of the PNGOs and FNGOs. Some delays in procurement of PNGOs occurred but did not impact overall implementation significantly.

2.5 Post-completion Operation/Next Phase

2.5.1 In 2009, GoUK developed a Perspective and Strategic Plan 2009-2027 with an aim to treat 537 micro-watersheds in the hills (about 1.9 million ha) by 2027. A repeater project, the Uttarakhand Decentralized Watershed Development Project II (Gramya II) has been negotiated with GoI and is slated for Board presentation in March 2014. Gramya II would treat an additional 280,000 ha in 507 GPs and inter-GP areas. Building on the lessons learned from Gramya I and SLEM, Gramya II would continue the participatory approach in watershed treatment, while strengthening technology and science in natural resource conservation, hydrology, rainfed agriculture development, climate change mitigation, and MIS (see Section 6). Gramya II will also support the farmer federations formed under Gramya I to improve their sustainability by building their capacity in managing agribusiness.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

3.1.1 The objectives, design, and implementation of both Gramya I and SLEM were highly relevant. The objectives were consistent with the India Country Assistance Strategies (CAS) 2001-2004, 2005-2008, and remained so for the Country Partnership Strategies (CPS) of 2009-2012 and 2013-2017. GoI classified Uttarakhand as a Special Category State, due to hilly terrain and low population density and the challenges related to water availability, soil erosion, and natural resource management. Gramya I aimed at addressing these challenges through decentralized, participatory watershed development, enhanced by the SLEM with its focus on climate change mitigation and resilience.

3.1.2 The project was multi-sectoral and contributed to sustainability by ensuring community participation across watershed development, rural development, forestry agriculture, horticulture, and livestock sectors. The State Government's development policy supported the project's decentralized watershed development planning and implementation, which built GP capacities in inclusive local governance. The design was also inclusive of economically and socially marginalized groups, such as marginal farmers, landless, women, and transhumance, who were assisted by the Vulnerable Group funds or the Transhumant Action Plan. In managing reserve forests, the SLEM mobilized VPs, which were mandated to manage community forests and later authorized under a new Government Order to undertake source treatment (e.g., drainage line treatment and check dam management) and natural resource conservation (e.g., afforestation, natural oak regeneration, and other plantation management) in reserve forests.

3.1.3 Project implementation was consistent with India's development priorities. The combination of watershed treatment (i.e., land degradation control, natural resource conservation, and water harvesting), agriculture demonstrations, and agribusiness development contributed an average 15 percent increase in beneficiaries' income. Inclusive growth was also achieved as there was a 30 percent increase in income among Vulnerable Groups, with support from the Vulnerable Groups fund.

3.2 Achievement of Project Development Objectives and Global Environment Objectives

3.2.1 The achievement of both the PDO and GEO were Satisfactory. The Gramya I and SLEM treated an overall area of 234,787 ha with resource conservation treatments, by adopting a decentralized watershed management in 76 MWS', covering 468 GPs. Of this, SLEM adopted much more comprehensive ridge-to-valley treatment in 60,823 ha by including the inter-GP areas.

3.2.2 In response to its theme 1, Gramya I successfully increased water flows and improved water availability by 12 percent for agriculture and domestic use. This, combined with various plantation activities in non-arable lands, contributed to a 10 percent increase in vegetation and biomass index in the targeted areas. Moreover, there was a 15 percent increase in income among targeted households (on average), which was supported by rainwater harvesting, agribusiness pilot, and Vulnerable Group funds. Gramya I outcomes in natural resource conservation were augmented by SLEM's ridge-to-valley treatment, such as land degradation control and water source sustainability in reserve forests in the targeted 20 micro-watersheds. This outcome alone may provide a major opportunity for targeted scaling up of community-led interventions in South Asia and other regions, to combat the recently reported forest declines due to climate change moisture stress in tropical montane forests.

3.2.3 The SLEM also made substantial outcomes in achieving its GEO. 20 micro-watershed management plans were developed and implemented. There was a 50 percent increase in the number of beneficiaries engaged in the alternative livelihood activities that reduced their dependency on the natural resource base through pine needle briquetting, traditional water mills, and medicinal and aromatic plan cultivation. The key project outcomes and outputs, which contributed to the achievement of both the PDO and the GEO are highlighted below (detailed in Annex 2).

3.2.2 Community participation in watershed development and management aimed at integrating land-water management with the objectives of increased soil moisture retention and improved biomass production, while simultaneously enhancing incomes and livelihood options (PDO theme 1). A total of 468 GPWDPs and 20 MWDPs were successfully prepared and implemented by the targeted GPs through a participatory approach. Some 65 percent of the planned activities under the GPWDPs were related to water and natural resource management (relative to a target of 60 percent), such as off-farm and on-farm soil conservation and drainage line treatment, water

harvesting, afforestation, and fodder development.[12] Meanwhile, the SLEM MWDPs focused on stream source treatment and rejuvenation, soil conservation, and forestry (afforestation and assisted natural regeneration of oak forests) in inter-GP areas, most of which were reserve forests. For their excellent work in comprehensive stream rejuvenation and drainage line treatments to stop and reverse stream bank erosion and gully formation with the SLEM financing, Selalekha GP in Nainital division was awarded in 2010 the National Ground Water Augmentation Prize by the Ministry of Water Resources. The beneficiary contribution was about three times more than the appraisal estimate, and the cost sharing facilitated ownership and sustainability in the project investments, in particular, water harvesting structures. In operationalizing and maintaining these structures as well as plantations (see below), Gramya I and the SLEM formed almost 2,000 user groups (more than 15,800 farmers or community members). 90 percent of these groups saved Rs. 1.6 million (approximately US$ 32,000) for operation and maintenance and used about 20 percent of these savings to maintain irrigation tanks and channels during the Gramya I implementation.

3.2.3 In integrating land-water management and source rehabilitation by enhancing moisture retention and biomass production, , Gramya I and SLEM interventions contributed directly to rehabilitate dried up stream sources and capillary-based water springs, by establishing rainfall runoff capture and infiltration ponds at strategic locations in the watersheds. The additional water retained at higher levels of the catchments resulted in about 68 percent increase in water discharge rate. It also resulted in increased water flows throughout the year as opposed to only seven to eight months of the year before the project. In addition, as flow rates were more even over the year, the erosive power of sudden discharges that result from storm events was also mitigated, resulting in reduced soil erosion and reduced losses of soil carbon. The treatment of 167,556 ha of non-arable lands by Gramya I and SLEM reduced runoff and soil erosion. The outcome of SLEM soil conservation was an estimated 142,438m^3 of soil loss reduction, which protected topsoil on 185 ha and increased gross cultivable land to 278 ha.

3.2.4 Gramya I investments were significant in developing rainfed agriculture. The water harvest structures developed by both Gramya I and SLEM created additional water holding capacity of 671,536 m^3. As a result, 9,402 ha of arable lands were irrigated by the projects. Combined with Gramya I's demonstrations in rainwater harvesting, an additional 6,908 ha came under cultivation. Crop yields in the arable lands increased by 35 to 60 percent. The annual production of cereals increased by 79 MT, while that of pulses increased by 2 MT.

3.2.5 The small timber and fuel wood plantation and fodder development by Gramya I and SLEM increased the biomass production in 17,475 ha in the targeted areas. The plantations increased annual production by about 121 MT. In the 468 targeted GPs, the 2010 remote sensing survey confirmed an increase of about 10 percent in the biomass and vegetative coverage. It is plausible that Gramya I surpassed its target (10 percent

[12] The remaining 35 percent of the activities were related to improving rural access, such as rehabilitation or construction of rural roads, bridges, etc.

increase) in 2013, after the seven years of implementation. Over two years, the SLEM interventions increased the biomass coverage by an estimated 5.5 percent in the targeted 125 GPs. The SLEM also contributed to biodiversity conservation in the targeted areas, as the richness in shrubs was significantly higher than the baseline values.[13]

3.2.6 In enhancing incomes and livelihood options, the project adopted various innovations in rainfed agriculture, which accounted for 80 percent of the arable land, including use of improved rainfed seeds developed by local institutions/universities As the rainfed areas accounts for 80 percent of the arable land in the State, the project made conscious efforts to enhance partnership with local universities and research institutions in providing targeted farmers with improved rainfed seeds and initiating exposure visits by progressive farmers in farmer field schools in improving productivity. These resulted in a four-fold increase in cropping intensity. In the irrigated areas, Gramya I demonstrated improved farming practices, such as the cultivation of high value crops (3,105 ha) and off-season vegetables (3,081 ha), with beneficiary contributions amounting to US$3.2 million. As a result, improved varieties and high value crops were cultivated in 7,464 ha, which contributed to a 21 percent increase over baseline (while the target was 10 percent). Gramya I piloted agribusiness in 327 GPs (about 70 percent of targeted GPs). Some 690 FIGs were formed, 85 percent of which were aggregated into 27 farmer federations. These federations represented 8,408 farmers and facilitated the sale of 41 MT of high value crops, off-season vegetables, and processed farm products in 19 facilities financed under the project, resulting in total sale volume of Rs. 486 million (about US$ 9.7 million). 6,743 farmers participated in processing, 42 percent of whom were women SHG members. These farmers realized a 27 percent increase in net revenue, which was 80 percent more than the 15 percent target.

3.2.7 Strengthening administrative capacity of GPs to manage project financial resources, implement sub-projects, deliver legally mandated services and sustain these services beyond the duration of the project (PDO theme 2). Gramya I substantially improved administrative capacity in targeted GPs through its participatory approach and capacity building activities, including training, exposure visits, knowledge management, and participatory monitoring and evaluation (PME, detailed in section 3.5). As a result, the Gram Sabha participation by women and vulnerable households increased substantially, by four times for women (from 11 percent to 45 percent) and double for vulnerable households (from 16 percent to 32 percent). The increase in women's participation was facilitated by women village motivators, who supported establishment of Aam Sabha (women's assembly) (detailed in section 3.5). There also were substantial increases in the number of GP meetings, which had more than doubled from 4.8 to 11.1 meetings per year, and attendance in Gram Sabha meetings by 62 percent. Three rounds of PME were undertaken, as planned. The project awareness rate was as high as 91 percent in targeted GPs (while the target was 50 percent). Almost 50 percent of targeted GP constituents became more aware of GP annual budget and expenditure (on target). Moreover, 305 village-level project staff and group members were elected for local

[13] According to the species richness index (source: SLEM final impact evaluation)

government positions, 73 percent of whom were women SHG/FIG members, village motivators, or Vulnerable Group members (detailed in section 3.5).

3.2.8 Ensuring equitable participation by all groups, especially the landless and women who rely disproportionately on common-pool resources for fodder, fuel, and other forest products (PDO theme 3). Both Gramya I and SLEM ensured that women and vulnerable households not only participated in local governance but also benefitted from livelihoods development. Under Gramya I, 8,819 vulnerable individuals benefitted from the Vulnerable Group fund (US$1.7 million in total), which financed 3,819 individual and 754 group entrepreneurial activities. These activities increased their income by 30 percent (on average). Some 49 percent of these beneficiaries were women. About 50 percent of their income generation activities were in the livestock sector,[14] and they also benefitted from the project's livestock interventions, including fodder development that increased the production by almost 10 percent. Moreover, 536 SHGs were formed prior to the Mid-term review (see Section 2.2), which saved Rs. 12.5 million (about US$ 208,000). About 190 of these SHGs (or some 2,800 women) took part in value addition at processing centers. Most of the income generation activities financed by the Vulnerable Groups fund were still active at the closure of Gramya I.

3.2.9 Enhancing climate change mitigation and resilience in the watershed ecosystem (GEO theme). Besides supporting 125 targeted GPs in planning and implementing 20 MWDPs (incremental benefits detailed above), the SLEM significantly scaled up the alternative livelihood options that would reduce dependence on the natural resource base, such as pine needle briquetting and gharats (traditional water mills). The pine needle briquetting reduced fuelwood extraction by about six percent per producer household. 192 SHGs (2,880 women) produced about 420 MT of briquettes, 80 percent of which were consumed by these SHG member households, while the rest was marketed on pilot basis in the villages (sold for about Rs. 3 million or about US$50,000). The SLEM also provided plantation management and fire control training in the pine forests. As a result, the fire affected areas were reduced by 61 percent in the targeted forests, which also contributed to reduction in emissions of greenhouse gases (GHGs).

3.2.10 The refurbishment and use of gharats was another innovation in climate change mitigation. With SLEM interventions contributing to both an increase in and the duration of water flows throughout the year, the milling capacity of the refurbished gharats increased by 32 percent, and the income of 78 SHGs (418 members, 23 percent of whom were women) increased by 28 percent. In partnership with the Uttarakhand Renewable Energy Development Agency, these refurbished gharats were equipped with micro hydro electricity generators, which generated 2.5 kw of clean energy. The communities saved an estimated 78,247 liters of diesel annually, equivalent to about Rs. 4.3 million (approximately US$ 71,700). The gharats, therefore, contributed to reduction in fossil fuel GHG emissions and made a local contribution to climate change mitigation.

[14] This comprises of 21 percent goat rearing (including breed improvement), 16 percent poultry, and 14 percent dairy.

3.3 Efficiency

3.3.1 The efficiency is rated Substantial. Cost-benefit analysis of the project was conducted over a 30-year horizon. Costs and benefits were estimated at 2013 prices with a 12-percent opportunity cost of capital. The present value of discounted project financial benefits was estimated at Rs 6.4 billion distributed among watershed services (20 percent), plantations (40 percent), agriculture (33 percent), and enhanced livelihoods (7 percent). Total project costs, including contingencies, were Rs 6.8 billion. Beyond the project implementation period, annual recurrent costs and replacement costs are provided for the assets like water harvesting infrastructures. Financial analysis was done at market prices. The estimated financial rate of return (FRR) for the project as a whole is 17.7 percent and the Net Present Value is Rs 2.4 billion.

3.3.2 Economic analysis was conducted after making appropriate adjustments to financial benefits and costs. Economic project costs are estimated at Rs 6.1 billion after adjusting for transfers, taxes, subsidies, and converting financial prices to economic prices. Economic prices for internationally traded commodities (e.g., fertilizer, paddy and wheat) are derived and applied. The difference in economic and market prices for fertilizers and use of human labor by small farm holders in the project area has resulted in economic rate of return (ERR) marginally lower than financial rate of return. The present value of discounted project benefits over the project life, due to the project interventions, are estimated at Rs 5.4 billion distributed among watershed services (21 percent), plantations (42 percent), agriculture (31 percent), and enhanced livelihoods (6 percent). The estimated economic rate of return for the project as a whole is 16.7 percent, which aligns well with the estimate at appraisal of 16.9 percent. The Net Present Value at 12 percent opportunity cost of capital for 30-year project life is Rs 1.8 billion.

3.3.3 The decentralized comprehensive watershed development approach adopted by the project is cost effective. Water harvesting structures and resource conservation investments under Gramya I and SLEM, covering irrigation tanks, DLT works, irrigation channel, plantations, and village ponds were analyzed and compared with similar publicly funded investments. Community-led investments generated asset creation with unit costs (at 2013 prices) from 2 to 57 percent higher (in the case of plantations, irrigation tanks, village ponds and DLT works) and 4 percent lowers (in case of irrigation channels). However, in terms of performance, plantations registered a 45 percent survival rate in the Gramya I/SLEM areas, as against no survival in the control areas. The economic life of community-led assets under Gramya I increased by 40 to 100 percent, when compared to the control. Annual operation and maintenance cost in Gramya I/SLEM areas also 60 to 67 percent less than the control areas. Annual amortized investment costs and O&M costs together were 10 to 30 percent less, compared to the control.

3.4 Justification of Overall Outcome and Global Environment Outcome Rating

Rating: Satisfactory

3.4.1 Gramya I, which was augmented by the SLEM, was highly relevant to India's development priorities by supporting participatory water and natural resources management, rainfed agriculture, and GP capacity development. The project met almost all targets and even exceeded some, with key development outcomes in the increase in water discharge rate, area under irrigation, biomass production, crop diversification (in particular, production and productivity of high-value vegetable crops), rural income, and participation of women and Vulnerable Groups in local governance. The GEO targets were also met or exceeded. The SLEM contributed to the reduction of GHGs emissions from reduced forest fires, reduced fuelwood extraction and burning, and reduced soil erosion (loss of soil carbon). In addition, there was a rejuvenation of ecosystem services (e.g., hydrological flows), and increase in biodiversity. The efficiency of the UDWDP and the SLEM was substantial, as the economic rate of return met the estimate at appraisal. These investments are also likely to be sustained by GPs, VPs, user groups, SHGs, and farmer federations, all of which were supported extensively by Gramya I and SLEM.

3.5 Overarching Themes, Other Outcomes and Impacts

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

3.5.1 Both Gramya I and SLEM supported women, marginal land holders, landless, and other vulnerable households in the targeted GPs by providing the Vulnerable Group funds as well as facilitating their participation into the mainstream project activities in livestock and agribusiness. The transhumant populations in the targeted GPs were given livestock production, human health and education support through the Transhumant Action Plan.

3.5.2 Poverty impacts. Implemented in the hills districts, where 38.5 percent of the population lives below the poverty line, Gramya I and the SLEM were clearly poverty focused. Socio-economic status was one of the project selection criteria for GPs, and about 45 percent of the households in the targeted GPs were small and marginal farmers. When compared to the control group, project HH real incomes increased by 17 percent, exceeding the PDO indicator. These farmers benefitted from the major Gramya I interventions in soil conservation, water harvesting, terrace repair, agriculture demonstrations, and agribusiness support. As a result, when compared to without-project, per hectare revenue for rainfed crops increased by 44 percent.

3.5.3 Moreover, Gramya I also supported the 8,819 poorest of poor, including women, marginal farmers (whose lands were too scattered for the above interventions), and landless, with the Vulnerable Group fund, which increased their income by 30 percent (on average). The fund was an integral part of the GPWDP, and the GPs were accountable for its management. Each GP identified the fund beneficiaries through participatory rural appraisal (PRA) during the GPWDP preparation, supported procurement, and ensured environment and social safeguard compliance. . About 50

percent of the Vulnerable Group activities were in livestock, such as dairy, poultry, and goat rearing, which was followed by the service sector activities (e.g., party tent house/equipment rental and shops). The SLEM also had the Vulnerable Group fund provision, which benefitted 2,470 persons, who were mobilized in SHGs under the Gramya I prior to the Mid-term Review thus did not initiate entrepreneurial activities (see Section 2.2). 29 percent of these beneficiaries undertook tent house rental, 27 percent managed gharats, and 9 percent reared livestock. The SLEM was truly pro-poor, as it also supported other such SHGs in the climate change mitigation and resilience interventions, such as reducing dependency on natural resource base (e.g., pine needle briquetting and biogas) and conserving biodiversity (e.g., medicinal and aromatic plant cultivation). Additional 5,565 vulnerable persons benefitted from the alternative livelihood opportunities.

3.5.4 Gender. Both Gramya I and SLEM had substantial gender outcomes in local governance and livelihood development. Women's participation in GPWDP or MWDP planning and implementation was fostered by 1,017 women village motivators, who were recruited from within the targeted villages. Gramya I established women's Aam Sabha at the GP level to ensure women were effectively represented and participated in decision making discussions at Gram Sabha in GPWDP or MWDP planning. In implementing GPWDPs or MWDPs, women ward members were co-signatories in fund management in every targeted GP, and women were actively engaged in PME (detailed below in Social Development).

3.5.5 In livelihood development under Gramya I, about 50 percent of the Vulnerable Group fund beneficiaries were women, while it was about 70 percent under the SLEM. In Gramya I-established processing centers, 42 percent of the processors were women SHG members (more than 2,800 women). The SLEM's alternative livelihood development was women focused, in particular, pine needle briquetting: all of the 2,800 beneficiaries under this activity were women. Women also played a key role in the assisted natural oak regeneration, preservation and maintenance. This was one of SLEM's key activities in climate change mitigation and resilience in the forestry sector.

3.5.6 Women's active engagement in the project activities resulted in their increasing participation in local public administration. Fifty percent of GP representatives were women (while the national average was 33 percent). In the Panchayat elections, 304 village-level project staff (village motivators or account assistants) and project-formed SHG or FIG members were elected for various positions in PRIs. Some 73 percent of those elected were women (detailed in Annex 2).

3.5.7 Social development. As described above, the project's participatory approach effectively engaged with Vulnerable Groups, particularly women, in local governance and livelihood development. The project design emphasized a natural resource management approach in GPWDP and MWDP preparation and implementation, which was successfully demonstrated within hydrological boundaries of micro-watersheds and completely executed by communities under the overall guidance of PRIs in which the participatory approach provided an integral part. There was proper accountability in

terms of benefit sharing of all resources, built in the micro plan at the design stage. The PME improved communication between the project and beneficiaries, in particular, women and other Vulnerable Groups in the targeted GPs. PME was facilitated by partner NGOs and all targeted GPs participated in three rounds of PME. Early in the project, PME was a tool to improve project awareness, while at later stages it gave voice to GP members in redressing grievances or undertaking social audits of sub-projects, such as rural access roads. The PME was considered an effective social accountability tool at the state level and was adopted by the Bank-financed SWAJAL and the GoI-supported Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).[15]

3.5.8 The grievances received through PME were channeled to the project's grievance redress mechanism. Some 38 grievances were received (nine were from PME), and all of them were resolved. The project was also in compliance with the GoI's Right to Information Act (detailed in Annex 2).

(b) Institutional Change/Strengthening

3.5.9 Both Gramya I and SLEM built GP capacity in participatory decision making, planning and implementation, transparency and social accountability, financial management, procurement, and safeguards. Gramya I also formed a number of community-level institutions, including water user groups, FIGs and SHGs (see Section 3.2). The project also provided GP and these group members with various training and exposure visits. These were enhanced by the SLEM, which engaged 20 in- and out-of-state organizations, including academic institutions in water, agriculture, forestry, and other sectors (detailed in the Annex 2). The group members actively participated in PME and held the GP accountable for GPWDP or MWDP implementation.

3.5.9 Gramya I initiated Van Panchayat (VP, village forest council) capacity building in maintaining plantations and drainage lines in reserve forests. The SLEM scaled this up by engaging VPs in MWDP planning and implementation. The VPs were strengthened at the policy level by the Government Order of December 2009.

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

3.5.10 Gramya I informed GoI in developing the Common Guidelines for Watershed Development Projects in 2008,[16] in particular, on the aspects of rainfed agriculture development in combination of watershed treatment technologies (rain water harvesting, etc.), decentralization, participatory approach, and inclusiveness (gender as well as resource poor).

3.5.11 Because of the introduction of high value vegetable crop production, there was feedback from the beneficiaries that the targeted GPs had better food and nutrition security, even among vulnerable households and that reverse migration was observed in

[15]MGNREGA finances soil and water conservation activities in arid, rainfed areas in GPs.
[16] http://www.iwmp-uttarakhand.in/documents/CG/CommonGuidelines2008.pdf

some project GPs. [17] It was also observed that the improved farming practices demonstrated by Gramya I were replicated by farmers in non-targeted GPs, and that there were increasing access by targeted farmers to other government programs, such as subsidy for poly house.[18]

3.5.12 Gramya I has provided climate change mitigation and resilience co-benefits, by inducing crop diversification and introducing locally relevant appropriate technologies, like pine needle briquetting. The SLEM was designed to further increase the co-benefits in the selected 20 Gramya I micro-watersheds, with the GEF grant allocated by the Sustainable Land and Ecosystem Management Country Partnership Program in India. The SLEM took four years from concept to appraisal (from 2005 to 2009), because India SLEM CPP was approved in end-2007 by the GEF Council. The Uttarakhand SLEM was effective in November 2009.

3.5.13. The SLEM planned to undertake a study on the climate change impact on mountain ecosystems and develop a mitigation strategy. These were not completed because of delay caused by the limited capacity in developing highly technical ToRs. This was also coupled with the delay in state government clearance and identification of an appropriate institution to conduct the study. The shelving of this study was unfortunate given emerging scientific evidence of the decline of mountain forests in the Himalayas as a result of increased mean ambient temperatures in recent decades.[19]

3.6 Summary of Findings of Stakeholder Workshops

3.6.1 Both Gramya I and SLEM organized exit workshops at the division and GP levels, with various stakeholders, including Gram Pradhans (GP heads), account assistants, water user groups, FIGs, and SHGs. A number of positive comments were made on (a) the participatory approach e.g., decision making in open meetings, (b) transparency on budget and work progress, (c) employment opportunities in the village through civil works, agriculture interventions, and self-employment for women and Vulnerable Groups, (d) learning through exposure visits to universities and research institutes, (e) project interventions in natural resource management e.g., increasing water availability, and (f) the importance given to women's involvement (detailed in the Annex 5).

4. Assessment of Risk to Development Outcome and Global Environment Outcome

Rating: Moderate

4.1 The risk to development and global environment outcomes is moderate. Because of the cost sharing, the beneficiaries have an incentive to maintain the water harvest structures and/or demonstration plots. A Government Order was issued in December 2011 to hold GPs accountable for sustainability of the assets created by Gramya I and the

[17] Source: WMD, Vulnerable Group Fund in UDWDP 2011-12. No quantitative information available.
[18] However, there is no quantitative data available with the project.
[19] http://timesofindia.indiatimes.com/home/environment/global-warming/East-Himalayan-forests-turning-brown-Study/articleshow/24455913.cms

SLEM, such as water harvesting structures and livelihood activities by the Vulnerable Groups. This is bounded by Memorandum of Understanding (MoU) signed between WMD and the targeted GPs. The Water user groups will maintain the water harvesting structures, because of their own investment through cost sharing. The users also saved and used some of the funds for operation and maintenance during the Gramya I implementation. The livelihoods activities are highly likely to continue, as 90 percent of these activities have been sustained for more than two years. SLEM's alternative livelihood activities, such as gharat, medicinal and aromatic plants, and pine needle briquetting, are also likely to continue, as there is effective market demand for these goods and works. Both Gramya I and SLEM also made substantial investments in building GP administrative capacity in GPWDP and MWDP participatory planning and sub-project management. This translated into increased participation and fund disbursement by GPs in the implementation of GoI- or other donor-financed projects.[20] The participatory approach in local governance would likely be maintained in targeted GPs with the 304 project-related staff at village level that was elected for local government positions.

4.2 However, there remains a need for technical support to FIGs and agribusinesses to improve their institutional capacity and ensure their economic sustainability. Because of the delays in the initial Gramya I implementation, some farmer federations were not fully operational at project closing. The proposed Gramya II would build farmer federation capacity in self-managing value addition and marketing and scale up the activities begun under Gramya I.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

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

5.1.1 The Bank team ensured that Gramya I incorporated the lessons learned from the relevant Bank-supported projects in Uttarakhand (e.g., IWDP, DASP, and SWALAJ), in supporting the State Government's decentralization and agribusiness pilot. The project design strengthened GP administrative capacity building through the participatory WDP planning and implementation. The design also incorporated development of an agribusiness model that built on increased water availability through watershed treatment and source sustainability by demonstrations and extension services, FIG mobilization, and engagement of NGO DSAs at the district level. The SLEM strengthened climate change mitigation and resilience in Gramya I design by piloting ridge-to-valley treatment in watersheds, including land degradation control and increased source sustainability, and alternative livelihoods that supported reducing dependence on the natural resource base, thereby conserving biodiversity. The project design was complex overall with the mobilization of a number of village-based groups in implementing GPWDPs and the

[20] This was observed by senior government officials (source: January 2011 mission Aide Memoire).

varieties of interventions in the watershed, agriculture, horticulture, livestock and service sectors. Nevertheless, both Gramya I and the SLEM achieved substantial results. In hindsight, the Bank team could have made more allowances at appraisal for physical and price contingencies.

(b) Quality of Supervision
Rating: Satisfactory

5.1.2 The Bank invested in 245 staff weeks in support of the Gramya I and SLEM implementations. 12 implementation support missions were carried out, and additional technical support was provided by the Delhi-based Bank team in social mobilization and institution development, water management, irrigation, forestry, agriculture, financial management, procurement, and safeguards. Considering the complexity in implementing this multi-sectoral project, the Bank's implementation support was adequate. While the emphasis on the participatory approach was maintained and strengthened through the social accountability tools, such as PME, the Bank team took opportunities to enhance the balance between participation/CDD and science/technologies in watershed treatment by supporting WMD to strengthen rainfed agriculture development[21] and outcome data collection and analysis in hydrology and other technical aspects. The ridge-to-valley watershed treatment was initiated in Gramya I, including land degradation control and water source treatment at the micro-watershed level. The Bank team supported its scale-up by mobilizing the GEF grant and, at the same time, piloted alternative livelihood activities that enhanced climate change mitigation and resilience in the mountain ecosystem.

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

5.1.3 Overall Bank performance is rated Satisfactory. The team provided adequate implementation support and follow-up, in particular, technical assistance from the Delhi office. The team took opportunities to enhance project outcomes by strengthening the watershed development outputs and proactively addressing bottlenecks in slow disbursement and project staffing at MTR. The SLEM was an innovative pilot, which enhanced Gramya I's design in climate change mitigation and resilience through land degradation control and improved water source sustainability.

5.2 Borrower Performance
(a) Government Performance
Rating: Satisfactory

5.2.1 GoUK was highly committed to Gramya I and the SLEM. Drawing lessons learned from Gramya I and SLEM implementation, the GoUK prepared the Perspective and Strategic Plan 2009-2027, which aims to treat 537 micro-watersheds by 2027. Moreover, the GoUK provided 15 percent more counterpart financing (about US$3

[21]The project demonstration in the agriculture and horticulture was limited to the provision of improved seed until March 2007.

million) than agreed in Gramya I project documents.[22] Also, in support of Gramya I and SLEM implementation and sustainability, GoUK issued two Government Orders, which (a) allowed VPs to manage plantations and natural resource conservation in reserve forests and (b) ensured the responsibility of the maintenance of the assets created by these projects. The GoUK prioritized adequate staffing of a multi-disciplinary team at WMD by enabling secondments from relevant departments, despite an overall staffing shortage in the state.[23]

(b) Implementing Agency Performance
Rating: Satisfactory

5.2.2 WMD implemented the predecessor IWDP and strengthened Gramya I implementation by contracting 10 partner NGOs in project management, GP mobilization, and the agribusiness pilot. WMD also capitalized on the experienced and dedicated project staff at the state and division levels and ensured staff at the village and GP levels, such as women village motivators and youth account assistants, were adequately trained in the project's concept and activities. Despite the complex project design and the enhancement by the SLEM, there was no confusion among the project staff in the project implementation. Moreover, the WMD initiated and scaled up the innovative alternative livelihood activities by reviving local traditions with improved technologies, such as pine needle briquetting, gharat, and bamboo baskets. These activities were truly in line with the climate change mitigation and resilience and gave opportunities to WMD to build capacity in this important emerging subject.

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

5.2.3 Overall Borrower performance is rated Satisfactory. The Borrower was committed to watershed development and had strong ownership in the project as evidenced by the higher than expected counterpart contributions and the various Government Orders issued to ensure sustainability.

6. Lessons Learned

6.1 The project provides the following lessons learned in project design and implementation:

- **Fiscal decentralization and community empowerment are necessary but not sufficient to promote improved community management of natural resources.** The massive increase in transfers from GoI to PRIs potentially provides communities,

[22] The agreed counterpart financing for Gramya I was US$ 19.1 million (US$ 16.62 million for the original project and US$ 2.51 million for the Additional Financing). GoUK contribution amounted to US$ 22 million. There was no counterpart financing for SLEM.
[23] The Government of Uttarakhand is building human resource capacity since the independence from Uttar Pradesh in 2000. There also were staff exchange issues with the Government of Uttar Pradesh, but this was resolved in the second year of project implementation (2005).

particularly GPs, with a source of funds for needed watershed treatment. Successful implementation of GPWDPs also requires training in financial management as well as technical knowledge transfer to GPs to both maintain and sustain these investments. Gramya I promoted a participatory approach in preparing and implementing GPWDPs, which strengthened GP administrative capacity, including social accountability. The youth engagement was particularly effective as account assistants. The participatory approach also fostered ownership among water users, FIGs, SHGs, and the Vulnerable Group in targeted GPs, which helps to ensure the sustainability of project investments.

- **Science and cutting-edge technology in hydrology cannot be overemphasized: watershed development should balance participation and science in its design and implementation.** The Gramya I was designed and implemented with an emphasis on decentralization and participation, which was appropriate considering the GoUK priority at the design phase. However, science and technology should not be compromised in GPWDP or MWDP development/implementation and outcome monitoring in the results framework. The science and technology were enhanced in the project design and implementation and highlighted in the results framework in the proposed Gramya II, without compromising the participatory approach.

- **Watershed development projects are a relevant response to the needed increase in rainfed agricultural productivity in India.** GPWDP investments increased the water holding capacity, and comprehensive watershed treatment at the micro-watershed level, including reserve forests, has proven effective by SLEM, in sustaining natural water source. Building on these investments, Gramya I demonstrated the effectiveness of rainwater conservation and harvesting in rainfed areas, when combined with improved seeds and management practices. More attempts must be made to quantify costs and benefits relative to alternative interventions. Impact evaluation and economic analyses of Gramya I quantified the relevant costs and benefits accruing to the GPWDPs and by WMD in watershed development and considered these relative to alternatives.

- **Revival of traditional energy sources can address climate change mitigation, boost resilience and contribute to livelihoods.** Gramya I initiated pine needle briquetting, which was scaled up by the SLEM. The SLEM piloted other traditional activities, such as gharat power generation, natural regeneration of oak, and bamboo basket making, and promoted local plants. All these activities demonstrated the potential for not only increased incomes, but also diversified income sources, thereby contributing to added resilience of livelihood and market options, which were developed in partnership with the public and private sectors.

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

(a) Borrower/implementing agencies

N/A

(b) Cofinanciers

N/A

(c) Other partners and stakeholders

(e.g. NGOs/private sector/civil society)

N/A

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Uttarakhand Decentralized Watershed Development Project - P078550 & P124354 (AF)					
Components	**Appraisal Estimate (USD millions)**			**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
	Original at Appraisal	AF	Total with AF		
A. Participatory Watershed Development and Management	55.95	5.98	61.93	64.29	104%
B. Enhancing Livelihoods Opportunities	14.25	5.86	20.11	23.06	115%
C. Institutional Strengthening	17.29	0.48	17.77	19.53	110%
Total Baseline Cost	**87.49**	**12.32**	**99.81**	**106.88**	**107%**
Physical Contingencies	0.18	(0.18)	0	0	
Price Contingencies	1.68	(1.68)	0	0	
Total Project Costs	**89.35**	**10.46**	**99.81**	**106.88**	**107%**
PPF	0.00	0.00	0.00	0	
Front-end fee IBRD	0.00	0.00	0.00	0	
Total Financing Required	**89.35**	**10.46**	**99.81**	**106.88***	**107%**

* Negative figures under the AF indicate reallocation of Credit resources. The total expenditure in local currency was Rs. 8.52 billion. The exchange rate was US$ 1 = Rs. 52.63 (as of April 25, 2012). At appraisal, it was US$ 1 = Rs. 45.30 (as of March 31, 2004). The rupee depreciated by 16 percent, which affected the conversion of the actual expenditure into US$.

Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector - P112061			
Activities	**Appraisal Estimate (USD million)**	**Actual/Latest Estimate (USD million)**	**Percentage of Appraisal**
A. Watershed planning through community participation	0.07	0.37	181%
B. Controlling land degradation through the SLEM approach at watershed level	2.94	3.19	108%
C. Fostering markets for non-timber forestry products	2.10	1.38	48%
D. Biodiversity conservation and management through watershed planning and community participation	1.05	1.52	131%
E. TA on adaptation to climate change	0.14	0.00	0%
F. Documentation and dissemination of project experiences and practices	0.18	0.31	142%
G. Project management	0.52	0.72	128%
Total Baseline Cost	**7.00**	**7.49**	**107.14%**
Physical Contingencies	0.49	0.00	0%
Price Contingencies	0.00	0.00	0%
Total Project Costs	**7.49**	**7.49**	**100%**
PPF	0.00		
Front-end fee IBRD	0.00		
Total Financing Required	**7.49**	**7.49**	**100%**

(b) Financing

P078550 - Uttaranchal Decentralized Watershed Development Project						
Source of Funds	**Type of Financing**	**Appraisal Estimate (USD mil)**			**Actual/ Latest Estimate (USD mil)**	**Percentage of Appraisal**
Recipient	Grant	16.62			21.99	114.95%
Local Communities	In-kind	3.11			9.46	304.18%
IDA	Credit	69.62			75.44	97.22%
Total		89.35	10.49	99.84	106.89	107.06%

P112061 - Sustainable Land, Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sec tor				
Source of Funds	**Type of Financing**	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
Global Environment Facility (GEF)	Grant	7.49	7.49	100.00%

Annex 2. Outputs by Component

This section is composed of (a) revisions in the Gramya I results framework and (b) key Gramya I and SLEM outputs by component.

1. Revisions in the Gramya I Results Framework.

The table below lists changes (revised, dropped, or clarified) in the results framework as approved by the Board in January 2011 (a complete list of original PDO and intermediate indicators is provided in Section F):

Table A2.1 Results framework – original and revised indicators

	Original	Revised at Additional Financing
PDO indicator		
Indicator 1	10% increase in household income (over baseline) in targeted villages (disaggregated by gender and socio-economic class)	Indicator clarified: "10% increase in household net income (in real terms) in targeted villages (Rs/HH)"
Indicator 3	15% increase in availability of water over baseline for domestic use	Target revised, and the indicator clarified: "10% increase in percentage of households accessing water for domestic use (% of HH in treated GPs)" The downward revision was based on the achievement by MTR (6.5% increase).
Indicator 4	15% increase in availability of water over baseline for agriculture use	Indicator clarified: "15% increase in irrigated area in treated areas (ha)"
Intermediate Result Indicator		
Indicator 4	10% increase in area (over baseline) of improved varieties and high value crops and fruit trees	Indicator clarified: "10% increase in area (over baseline) of improved varieties and high value crops (Ha)"
Indicator 5	20% increase in fodder production (over baseline)	Target revised: "10%increase in fodder production over baseline". The achievement at Mid-term Review was 3%.
Indicator 6	1% increase (over baseline) in number of improved breed animals	Indicator clarified to measure no. of improved cattle
Indicator 7	15% increase in net value of produce realized by farmers adopting post-harvest technologies and establishing market linkages	Indicator clarified: "15% increase in net value of produce realized by farmers in treated area"
Indicator 9	60% of loans repaid to SHG by borrowers	Dropped
Indicator 10	N/A (replaced Indicator 9)	Number of Income Generating Activities (IGA) funded under the project
Indicator 11	N/A (replaced Indicator 9)	15% increase in average net income generated by IGA for Vulnerable Groups households (Rs/HH)
Indicator 12	50% of enterprises still active after two years	Indicator clarified: "50% of income generation activities (IGAs) still active after two years from the start of activity"
Indicator 14	50% increase over baseline in proportion of GP constituents aware of annual budget and	Indicator does not measure increase but level of awareness: "50% of GP

	Original	Revised at Additional Financing
	expenditures	constituents aware of annual budget and expenditure"
Indicator 17	90% of monitoring reports submitted and action taken on 80%	Dropped
Indicator 18	N/A (replaced Indicator 17)	Participatory Monitoring and Evaluation (PME) regularly (at least three times) carried out in 400 GPs and reports received by WMD

The PDO Indicator 5 was "20 percent improvement in administrative capacity of GPs as measured by performance indicators". The project exceeded its target in all of these performance indicators, in particular, inclusion of women and Vulnerable Groups in decision making: participation of women in Gram Sabha meetings (from 11 percent at baseline to 45 percent at the end of the project); and that of Vulnerable Groups (from 16 percent to 32 percent). The performance indicators and achievements by mid-term and the end of the project were as follows:

Table A2.2 PDO Indicator 5 – performance indicators

Performance Indicator	Baseline	Mid-term	Final	% point increase from baseline to final
Attendance in Gram Sabha meetings (% HH)	29%	42%	47%	18%
Participation of women in Gram Sabha meetings (% women)	11%	22%	45%	34%
Participation of vulnerable groups in Gram Sabha (% HH)	16%	27%	32%	16%
Number of GP meetings per year	4.8	8.8	11.1	6.3 meetings
Attendance to GP meetings (% members)	52%	65%	68%	16%

2. Key Outputs by Component

This section summarizes key outputs by both Gramya I and SLEM. The SLEM outputs were highlighted in the respective components. Table A2.3 indicates the targeted micro-watersheds by Gramya I and SLEM. The SLEM provided incremental benefits in 26 percent of Gramya I GPs.

Table A2.3 Gramya I and SLEM Coverage

District	Micro-watersheds (no)		Micro-watersheds (ha)		GPs (no)		Beneficiaries (no)	
	Gramya I	SLEM	Gramya I	SLEM	Gramya I	SLEM	Gramya I	SLEM
Dehradun	7		19,192		52		27,666	
TehriGarhwal	8		12,127		31		14,278	
Uttarakahsi	5	5	16,835	8,357	33	22	16,800	10,035
PauriGarhawal	6		12,995		30		11,107	
Rudraprayag	5	5	20,349	20,349	52	52	38,111	38,111
Chamoli	7		32,075		27		179,731	
Almora	3		12,669		46		24,034	
Bageshwar	13	5	35,743	8,742	47	11	27,788	8,057
Champawat	8		28,510		66		37,358	

Pithoragarh	9		17,242		44		25,004	
Nainital	5	5	27,050	23,375	40	40	17,935	17,935
Total	**76**	**20**	**234,787**	**60,823**	**468**	**125**	**258,054**	**74,256**
% covered by SLEM		**26.3%**		**25.9%**		**26.7%**		**28.8%**

Targeting: The number of targeted GPs was four percent more than originally planned, while the area under the treatment was about 21.7 percent less than originally planned. According to the PAD, Gramya I was to support 450 GPs in 19 development blocks to treat 300,000 ha in 76 target micro-watersheds in the following 19 development blocks: Augustmuni, Bageshwar, Bhikiyasain, Chinyalisaur, Choukhutiya, Dwarhat, Dwarikhal, Gairsain, Gangolihat, Garur, Jaiharikhal, Jaunpur, Kalsi, Kapkot, Karnprayag, Lohaghat, Munakot, Thouldhar, and Vin. Gramya I was not implemented in Bhikiyasain, Karnprayag, Munakot, and Vin but in Barakot, Dhari, and Okhalkhanda instead (in 18 blocks in total). In maintaining the number of targeted GPs at 450, the target area was adjusted to 234,000 ha (22 percent less than originally planned) in 18 blocks in June 2007 (acknowledged in the June 2007 mission Aide Memoire). In the revised target areas, 118,000 ha of land was available (excluding reserve forest), which was composed of 67,000 ha of arable land, 25,000 ha of non-arable land, 5,000 ha of bio-carbon forestry, 5,000 ha of degraded un-demarcated forest, and 16,000 ha of inter-GP areas. At the Mid-term Review in November 2008, the number of targeted GPs was increased to 468 (four percent more than originally planned) to fully treat the target 76 micro-watersheds.

Component A. Participatory Watershed Development and Management

Sub-component A.1. Promotion of social mobilization and community driven decision making.

Under Gramya I, all targeted 468 GPs had prepared watershed development plans (GPWDPs) by 2010 (Table A2.4), and ensured participation by the poorest of poor and socially marginalized (including marginal farmers, landless, women, and scheduled castes/tribes). Within the envelope of about US$ 80,000 per GP, 65 percent of the sub-grants were invested in water and natural resource management, such as soil conservation, drainage line treatment, and water harvesting (outputs detailed in the Table A2.5). Some 80 percent of households in the targeted GPs participated in the GPWDP preparation.

Table A2.4 GPWDP preparation under Gramya I

FY (April-March)	No. of GPs completed GPWDP preparation		% Completed
	FY	Cumulative	
2005-06	43	43	9%
2006-07	208	251	54%
2007-08	126	377	81%
2008-09	89	466	99%
2009-10	2	468	100%

Building on Gramya I's efforts, SLEM supported 125 GPs in preparing and implementing 20 MWDPs, which focused on land degradation control, water source

sustainability, and forestry by treating inter-GP area, most of which were reserve forests. All 20 MWDPs were prepared in a participatory manner by 2011.

Sub-component A.2. Watershed treatments and village development.

The Table A2.5 summarizes key outputs by the GPWDP and MWDP implementation. The UDWDP was more focused on soil conservation and drainage line treatment, water harvesting structures, afforestation, and fodder management in the targeted GP areas. On the other hand, SLEM, because of its emphasis on the ridge-to-valley treatment in reserve forests, invested more on forestry (in particular, assisted natural regeneration of oak forests), off-farm soil conservation (contour trenches and retaining wall), and water source rejuvenation (rainfall runoff capture and infiltration ponds and village ponds, which recharge springs and irrigation water).

Table A2.5 Major outputs under the watershed treatments and village development sub-component

	Activity	Gramya I Outputs	SLEM Outputs	Total
Soil conservation and drainage line treatment	**Off-farm**			
	Vegetative check dams	4,381 dams	536 dams	4,917 dams
	Dry stone check dams	322,247 m^3	21,569 m^3	343,816m^3
	Cement masonry check dams	4,538 m^3		4,538 m^3
	Crate wire check dams	226,520 m^3	50,876 m^3	277,396m^3
	Contour trenches with bunds		91,711 trenches	91,711 trenches
	Roadside erosion control	82,320 m^3	4,682 m^3	87,002m^3
	Landslide treatment	28,129 m^3	508 m^3	28,637m^3
	Retaining wall	19,799 m^3	12,819 m^3	32,618m^3
	On-farm			
	Vegetative treatment	186,278 Rm		186,278 Rm
	Spur (river training work)	5,926 m^3	1,995 m^3	7,921m^3
	River bank protection	144,800 m^3	22,613 m^3	167,413m^3
	Cross barrier	2,575 m^3		2,575 m^3
	Diversion drain	3,911 m	10,755 m	14,666 m
Water harvesting	Roof water harvesting tanks	19,113 tanks	125 tanks	19,238 tanks
	Irrigation channels	579 km		579 km
	Irrigation tanks	2,233 tanks	18 tanks	2,251 tanks
	Village ponds	554 ponds	318 ponds	872 ponds
	Tal/Naula/Khala(traditional water source) rejuvenation	2,709 sources	423 sources	3,132 sources
	Rainfall runoff capture and infiltration ponds		1,087 ponds	1,087 ponds
	Khal-Chal	584		584
	L.D.P.E. tanks	68 tanks		68 tanks
Forestry	Afforestation	4,463 ha	830 ha	5,293 ha
	Silvi pasture	669 ha		669 ha
	Plantation	1,655 ha fuel wood 33 ha bamboo 6 ha agave		1,655 ha fuel wood 33 ha bamboo 6 ha agave
	Assisted natural regeneration of oak areas	27 ha	115 ha	142 ha

Agriculture	Terrace repair / vegetative field boundary	242,164 m^3		242,164 m^3
Horticulture	Orchard development	586 ha		586 ha
	Community fruit plantations	132 ha		132 ha
	Homestead plantation	1,044 ha		1,044 ha
Livestock	Fodder development	379 ha forage production 128 ha napier crop border plantation		379 ha forage production 128 ha napier crop border plantation
Road program	Rural road improvement	846 km		846 km
	Bridges	319 bridges		319 bridges

Box 1 highlights the positive source conservation outcomes, based on WMD's case studies, which were corroborated during the ICR mission's field visits:

Box.1 Rejuvenation of traditional natural water sources

Residents of Selalekh GP in Nainital District faced domestic water scarcity due to reduced discharge in four traditional natural water sources in the area. Water was available only for seven months annually. Community-led catchment treatment of the area was undertaken by the Van Panchayat. Under the SLEM, four village ponds, 1,166 staggered contour trenches, 8 vegetative check dams, 63 dry stone check dams, and 9 crate wire check dams were constructed. Local species, such as oak, bhimal, utees, majnu, tejpat, along with lemon grass, were planted on 5 ha. Climate change over recent decades appears to be favoring the invasion of pine species in areas that were previously dominated by oak species. The assisted natural regeneration of oak forests thereby contributes to conserving natural ecosystem level species diversity.
This treatment resulted in the revival of four traditional water sources. The project impacts were as follows:

- Average water discharge increased from 7.5 to 12.6 lpm.
- Water discharge is sustained throughout the year.
- The households dependent on traditional water sources increased from 122 to 127.
- Before the project, women walked an average distance of 1.5 km per trip to fetch water due to low discharge (seven months) and no discharge (five months). They now have access to the revived traditional water sources in the villages throughout the year.

Moreover, the improved soil moisture regime in middle and lower ridges and project led irrigation tank investments effected change in irrigated crop pattern towards high value seasonal/off-seasonal vegetables.

Source: Government ICR (SLEM)

Similar evidence is also documented by the project in other villages and GPs in Nainital and Agastyamuni Divisions.[24] Box 2 assesses the impact of watershed treatment under the SLEM.

Box. 2 Watershed treatment impacts of SLEM

Under SLEM, MWDPs were prepared and implemented by the targeted GPs. Technical and social facilitation was provided by the project. This has resulted in greater sensitization of the community to issues of natural resource conservation and sustainable management. The project has documented the watershed treatment impacts in Tala Kanda, Katna,Thali and Selalekh GPs of Nainital Division. Comprehensive treatment using integrated watershed approach was followed by carrying out soil moisture control, drainage line treatment, afforestation, water harvesting, and river bank protection works. This has helped in arresting 580 MT of soil loss and providing protection to 15.5 ha of farm land, which is currently cultivated with 200 percent cropping intensity.

Source: Government ICR (SLEM), SLEM Best Practices, and PMU database

In maintaining these investments, Gramya I formed almost 2,000 water user groups of more than 15,800 farmers for water harvesting structures. Ninety percent of these groups started saving, which amounted to Rs. 1.6 million (approximately US$ 32,000). About 20 percent of these savings were used to maintain irrigation tanks and channels. Moreover, SLEM built capacity of Van Panchayats (VPs, village forest councils) in maintaining the investments in reserve forests, including plantations and drainage lines. While the reserve forests are under the State Forestry Department, VPs were authorized to work there by the Government Order (Box 3).

Box 3. Government Order allowed Van Panchayats to treat reserve forests

A first of its kind Government Order, dated December 2, 2009 and allowing the VPs to work in reserve forest areas within the watershed, added to effective implementation of the project activities. VPs manage village forests and are among the oldest institutions in the state: they were created under the Indian Forest Act of 1927. The VP executive is an elected body of the villagers, and the usufruct and revenue-sharing arrangements are defined by the rules known as *Uttarakhand Van Panchayat Niyamawali*, 2005. VPs are also the solely authorized institutions which can act as partners with the Forest and other Departments under Joint Forest Management. During the SLEM implementation, GoUK initiated this unique model which enabled holistic treatment of micro-watersheds.

Source: Government ICR (SLEM)

[24]SLEM Implementation Completion Report, Watershed Management Directorate, Uttarakhand, Dehradun, August 2013; SLEM Best Practices, Watershed Management Directorate, Uttarakhand, Dehradun; and PMU database.

Component B. Enhancing Livelihood Opportunities

Under this component, Gramya I provided demonstrations of improved technologies in agriculture, horticulture and livestock, and piloted agribusiness development. Gramya I also piloted pine needle briquetting to reduce fuel wood dependency, which was scaled up by SLEM. The SLEM also piloted other alternative livelihood activities that would reduce pressure and dependence on natural resource base, including biogas installation, gharat revival (traditional water mills with coupled, modern electricity micro generators), solar energy, and medicinal and aromatic plant cultivation. Both Gramya I and SLEM provided small grants to Vulnerable Groups in support of their entrepreneurial activities.

Sub-component B.1. Farming systems improvement

This sub-component built on the increased water availability in irrigated and rainfed areas and other Gramya I investments, such as 242,164 m^3 terrace repair. It supported transfer of improved technology with a focus on agribusiness development in selected 327 GPs (about 70 percent of all targeted GPs). This included forming 690 FIGs and providing demonstrations on high-value crops and off-season vegetables.

FIGs and farmer federations. In forming FIGs, the sub-component clustered two to three villages and provided demonstrations on one to two crops for bulk production. Gramya I also built FIG capacity by training 2,070 FIG members on group formation, accounting and record keeping, and bank linkage. More than 8,000 farmers saved a total of Rs. 285 million (approximately US$ 5.7 million). Moreover, 85 percent of these FIGs were aggregated into 27 farmer federations, all of which were registered under the Self Reliant Cooperative Act, 2003. Table A2.6 provides FIG and farmer federation breakdown by division.

Table A2.6 FIGs and farmer federations by division

Division	GPs (no.)	FIGs (no.)	FIGs in Agribusiness (no.)	Farmers in Agribusiness (no.)	Farmer Federation (no.)	FIG Savings (000' INR)
Vikasnagar	28	69	47	528	3	495.87
Chinyalisaur	43	84	84	1,098	5	256.93
Agastyamuni	34	102	87	1,143	4	378.84
Gairsain	27	74	74	1,341	2	322.32
Kotdwar	28	50	50	678	1	350.00
Champawat	34	67	34	512	3	85.63
Nainital	19	43	43	643	1	266.61
Bageshwar	24	46	34	397	2	158.08
Gangolihat	44	51	32	595	3	235.00
Dwarahat	46	104	104	1,473	3	302.60
Total	**327**	**690**	**589**	**8,408**	**27**	**2,851.88**

Demonstration of improved technologies. The sub-component provided agribusiness input support worth Rs. 13,000 per ha (approximately US$ 260 per ha)[25] through demonstrations. Demonstration outputs included: high-value crops (3,105 ha), off-season vegetables (3,081 ha), bio/vermi compost (4,805 demonstrations), poly-tunnel (1,247 demonstrations), and poly-house (834 demonstrations).[26] These demonstrations covered about 50 percent of the project areas under irrigation and were co-financed by FIGs, amounting to US$ 3.2 million.[27] The demonstrations, combined with the increased water availability (by the sub-component A.2), resulted in cultivation of high-value crops in 7,464 ha (Table A2.7). As a result of these demonstrations, the farmer federations produced and sold 41,474 tons of high-value crops and off-season vegetables. Prior to the UDWDP, these crops were not cultivated in the targeted GPs.

Table A2.7 Farm production and sales by farmer federations

Crop / Product	Area (Ha.)	Produce marketed (Tons)	Sales (Rs 000)
Brinjal	131.04	394.63	4,889
Broccoli	15.40	15.25	304
Cabbage	650.24	3436.18	24,607
Capsicum	497.13	1992.09	33,942
Cauliflower	242.54	1025.34	12,121
Chilly	604.11	3057.08	39,022
Coriander	284.42	135.97	6,078
Cucurbits	201.93	276.13	5,086
French bean	576.27	1451.98	25,465
Garlic	97.98	509.44	13,377
Ginger	178.00	380.00	10,590
Okra	240.27	221.85	3,129
Onion	250.24	1,165.81	8,631
Pea	883.30	2,257.49	34,050
Potato	674.43	4,507.07	452.21
Tomato	945.99	13,418.69	102,265
Other vegetable crops	343.07	2,109.58	33,545
Other crops (fruits, pulses, cereals, medicinal plants)	647.79	4,343.37	60,012
Processed products (juice, jam, pickles)	N/A	775.94	24,546
Total	**7,464.15**	**41,473.89**	**486,880**

Fodder development. The sub-component supported 969 fodder crop demonstrations. On-farm fodder was planted in 1,127 ha, pasture was developed in 1,676 ha, and Napier crop border was created in 1,907 running kilometers. As a result, there was an overall 9.6

[25] These included quality seeds, bio-pesticide, bio-fertilizers, bio-compost, poly-house, poly tunnel, plant protection equipment, crates and packaging material, etc.
[26] There were also other demonstrations related to tree crops, such as orchard development (2,121 ha) and community fruit plantation (453 ha).
[27] The beneficiary contributions were 20 percent for poly house and poly tunnel and 30 percent for other demonstrations, such as compact area, vermi-compost pit, high-value crops, seasonal and off-season vegetables, and community fruit plantation.

percent increase in fodder availability in the targeted GPs. The fodder strips have the added benefit of trapping nutrients such as nitrogen and phosphorus that are susceptible to removal via surface runoff, leaching and/or erosion and converting these nutrients into high value fodder thereby increasing not only total production but also the nutrient use efficiency of production. This issue is important because lost nitrogen can result in the emission of nitrous oxide – a greenhouse gas that is 310 times more potent than CO_2.

Livestock. In improving breeds, Gramya I set up 265 natural breeding centers and 71 artificial insemination centers. The natural breeding centers were established with 15 percent beneficiary contributions. These centers produced a total of 20,527 improved breed animals with average success rate of 58.3 percent (Table A2.8).

Table A2.8 Natural breeding centers

Livestock	No. of livestock inseminated	No. of progeny born	Success rate
Natural breeding centers			
Buffalo	21,360	12,794	59.9%
Cow	2,202	1,261	57.3%
Goat	6,595	4,542	68.9%
Sub-total	**30,157**	**18,597**	**62.0%**
Artificial insemination centers			
Buffalo	1,817	1,016	55.9%
Cow	1,716	914	53.3%
Sub-total	**3,533**	**1,930**	**54.6%**
Total	**33,690**	**20,527**	**60.9%**

The sub-component also introduced stall feeding and provided 5,066 animal shelters, 3,925 mangers and 1,105 chaff cutters. In enhancing animal health, the project vaccinated 225,979 livestock against animal diseases. There was no outbreak of major animal diseases during the project implementation.

Sub-component B.2. Value addition and marketing support

This was originally a pilot activity, yet it substantially contributed to an increase in rural income in 327 targeted GPs and sustainability of the project investments. With the implementation support from six DSAs, the 27 farmer federations produced and sold 41,474 tons of high value crops and off-season vegetables, which include 775.94 tons of processed products at a total value of Rs. 486 million (approximately US$ 9.7 million). These produce and products were sold not only at the local markets but also in urban centers in the region, such as Delhi and Lucknow, through 17 private and public entities (see a list of partners in the sub-component C.3).

Value addition. The sub-component set up 19 processing centers, which collected fresh produce from 414 FIGs (84 percent of the targeted GPs for agribusiness) and produced 775.94 tons of processed products, which were graded, packaged, and sold with local

brand names[28]. These were income generation activities, which emerged as a result of Gramya I interventions. About 70 percent of these centers were established between 2009 and 2010. Forty-two percent of FIG/SHG members working in the processing centers were women. In Augustmuni and Dwarahat divisions, women involvement was about 80 percent (Table A2.9). The SHGs were formed as a part of the Vulnerable Group assistance prior to the Mid-term Review. The project, thus, created additional employment opportunities in the villages, in particular, for vulnerable women.

Table A2.9 Processing and value addition activities

Division	Examples of Value addition and processing	FF (no.)	FIG/ SHG (no.)	Farmers (no.)			Processing center (no.)	Production (tons)	Sales (Rs 000)
				M	F	Total			
Vikasnagar	Buransh juice, lime juice, tomato puree and chutney, graded spices	3	24	283	0	283	3	3.51	284
Chinyalisaur	Processing of aonla, garlic, tomato, buransh; grading of pulses	5	84	1,120	294	1,414	2	3.25	650
Augustmuni	Grading/packaging/processing of malta, citrus, pulses, traditional crops	4	87	238	952	1,190	2	543.94	4,930
Gairsain	Tulsi powder, mint oil, malta squash, mandua flour, maize flour,	2	74	826	515	1,341	2	49.00	3,759
Kotdwar	Juice, pickles, spices	1	9	60	68	128	1	6.13	889
Champawat	Soybean flour, mandua flour, maize flour, pulses, cereals, dried ginger	3	11	284	179	463	1	16.92	2,818
Nainital	Pulses, cereals, juice, pickles, spices	1	16	236	35	271	1	44.50	1,087
Bageshwar	Mango pickles, mandua biscuits,spice powder, malta squash, cereals	2	20	156	72	228	2	2.62	183
Gangolihat	Mixed pickles, Mandua biscuits, Dried Mango powder, Spices powder,	3	26	379	60	439	4	101.35	9,591
Dwarahat	Juice, Pickle & Spices	3	55	192	638	830	1	4.72	355
Total		**27**	**414**	**3,904**	**2,839**	**6,743**	**19**	**775.94**	**24,546**

[28] Each division made its own local brand. For example, Augustmuni used Mandakani Valley Fresh, and Gangolihat had Hill Fresh. Lohaghat and Kotdwar branded themselves with the project name (Gramya Masala and Gramya Fresh, respectively).

Sub-component B.3. Income-generating activities for vulnerable groups

Gramya I supported socially and economically marginalized Vulnerable Groups, such as marginal farmers, landless, and women, by forming SHGs or financing income generation activities through the Vulnerable Group fund. Building on Gramya I efforts, the SLEM supported the SHGs in (a) piloting alternative livelihoods to reduce dependency on natural resource base, including pine needle briquetting, gharats, biogas, solar energy, medicinal and aromatic plant cultivation, and bamboo basket making, and (b) financing income generation activities. The impact evaluation and PMU database documented in detail the multiple impacts (social, environmental, and economic) of the SLEM interventions in reducing the pressure on natural resources (Box 4). The scaling up of alternative sources of energy reduced soil erosion and runoff, and increased infiltration and soil moisture regime contributing to the sustainability of traditional natural water source discharges. These were other significant environmental impacts realized in the project villages.

Box. 4 Pine needle briquetting

Pine needle briquetting was initiated by Gramya I and scaled up by the SLEM. In the targeted GPs located near pine forests, 665 briquette-making machines were acquired and some 6,600 women were trained to operate them. SLEM, in particular, supported 192 SHGs, which produced about 420 MT of briquettes. 80 percent of the production was consumed at the households (approximately 336 MT), while the remaining 20 percent was sold for about Rs. 3 million (approximately US$ 50,000). The briquettes reduced the fuelwood use by about six percent per producer household, which saved approximately 11 woman days per annum in collecting fuelwood in the forests. The SLEM trained the women SHGs on the pine needle collection, coupled with plantation management and fire control in reserve forests. As a result, by the project closure the fire affected areas were reduced by 61 percent.

Some controls on the extraction of pine needles will likely be necessary to avoid interference in the natural carbon and nutrient cycles. Nonetheless, the modest removal of pine needles for fuel briquetting appears to be more than compensated by reduced carbon and nutrient losses as a result of the reduced need for fuelwood and reduced forest fire incidences in the dry season due to flammable pine needle forest littler.

SLEM survey of 25 SHGs involved in pine briquette production (Harsila, Uttrauda, Gairkhet and Baisani GPs in Bageshwar division) documented that all these SHGs produced and used 7.7 MT of briquettes annually, which helped the estimated CO_2 reduction of 26 MT. Furthermore, over a period of three years (2010/11 to 2012/13), they produced and marketed 78 MT of pine briquettes. The annual pine needle fall in the forest is 4.6 MT per ha of pine forest. By using up 150 MT of pine needle waste, the SHGs cleared 33 ha of forest area, where other plant species, such as fodder for cattle, were able to regenerate.

Source: Government ICR (SLEM)

Gharats. The SLEM supported 78 SHGs (418 members, 23 percent of them were women) in renovating gharats. With the rehabilitation and the increase in water availability, the milling capacity of these gharats increased by 32 percent, and the income of the SHG members increased by 28 percent. By using water power as an alternative source of energy, the potential savings on diesel was estimated as 78,247 liters per annum. Moreover, with the technical support from the Uttarakhand Renewable Energy Development Agency, these gharats were able to generate electricity: one gharat reported generation of 2.5 KW of clean energy, which was locally distributed.

Biogas. The SLEM installed 66 biogas plants in the targeted GPs. Some 66 user groups of 990 households were formed. Biogas from animal manure reduces methane and nitrous oxide emissions, while providing energy for cooking, thereby requiring less fuelwood. The biogas reduced the use of fuelwood by about 75 percent per household and generated savings of Rs. 5,900 per household (about US$ 100). This translated into estimated savings of about 25 MT of biomass in the forest, which was estimated to reduce carbon dioxide emissions by 140 tons. The residual substrate from the biogas plants is an excellent fertilizer that enhances crop and fruit tree yields (Box 5).

Box. 5 Biogas as an alternative fuel

The SLEM has supported the installation of 124 units of floating drum type biogas models in the project villages. Each unit is of 3 m^3 capacity, costing Rs 41,000 (2012 prices). Biogas production is sufficient to meet the household demands except in winter, when fuel wood is used (mid-Nov to mid-Feb).

Environmental gains: The household dependency on fuelwood as energy source is 100 percent without the project. With project, biogas reduced fuelwood use by 75 percent. In Uttrauda GP, installation of 17 biogas plants in 2011 and 2012 reduced resulted in a reduction of 35 MT in CO_2 emissions. Annually, 230 MT of cattle dung used in the biogas plants is now recycled into 563 MT of slurry, a by-product which improves the soil texture and water holding capacity in 8 ha of farm lands. This has increased vegetable production by about 20 percent.

Social impacts: Based on the SLEM primary survey, saving in collection of firewood, cooking and cleaning of utensils are estimated at 3 hrs per day. After netting out time needed for biogas plants, net saving of 2.5 hrs per woman per household is reported. Overall annual drudgery firewood collection has decreased from 120 days to 35 days for these women. Saved time has high opportunity social cost for household activities and economic cost in other income generating activities.

Economic benefits: Each biogas plant is annually producing the equivalent of about 14 LPG cylinders per household. Annual production of slurry per plant is 3.5 MT. Net annual returns from each biogas plant are estimated at Rs 10,550.

Source: Government ICR (SLEM)

Solar energy. Another clean energy promoted by the SLEM was solar energy. The project provided 3,378 solar lanterns, 190 solar street lights, and 69 solar cookers in the targeted GPs.

Medicinal and aromatic plants. The SLEM piloted cultivation of 12 medicinal and aromatic plants in targeted rainfed areas, including ginger, turmeric, stevia, aloe vera, lemon grass, aonla, cardamom, stevia, satavar, sarpgandha, rosemary, and tejpatta. Nineteen nurseries were set up on 582 ha of targeted rainfed areas, including 1.25 ha of barren land. Some 179 FIGs were formed and 247 poly houses were set up. Market linkages were created for ginger and turmeric. The production of ginger and turmeric reached 1.3 MT and 5.3 MT respectively, which generated net household income of Rs. 15,346 (about US$ 256) and Rs. 8,681 (about US$ 145), respectively. In addition, *Hedychium spicatum* (locally known as Kapur Kachari or Sathi in Ayurvedic classics, is documented for the treatment of cough, hiccup, fever and asthma) plantation was piloted in the targeted GPs.[29] The cultivation of medicinal and aromatic species is especially relevant for the protection of these species from predatory harvests that deplete the natural gene pool.

Bamboo basket making. Building on the 33 ha bamboo plantation financed under Gramya I, 15 SHGs (77 beneficiaries, 31 percent of them were women) used Vulnerable Group funds for bamboo basket making. Local controlled harvests of native bamboo for basket making contributed to preservation of age-old basket weaving traditions and value addition to local botanical resources and set the right incentive for sustainable management of bamboo.

Vulnerable group funds. Gramya I and SLEM supported almost 11,300 vulnerable persons in the targeted GPs. Both projects provided enterprise development training and a one-time grant to enhance income generation activities at a total cost of Rs. 95 million (approximately US$ 1.6 million). Overall, women comprised 54 percent of the Vulnerable Group fund beneficiaries. However, the SLEM alone accounted for 71 percent, because of its targeting of women SHGs formed under Gramya I. About one-half of the income generation activities in Gramya I were livestock (e.g., dairy, poultry, and goat rearing). These vulnerable populations also benefitted from investments in fodder development, natural breed improvement, and stall feeding. In the SLEM, the tent rental (29 percent) and gharat (27 percent) were the most popular activities.

[29] The plant was highly traded from the Himalayan region, as its rhizome was used in Ayurvedic and Unani medicine. Haphazard harvesting in natural forests was resulting in depletion of the native gene pool. By planting the species in deforested and degraded areas, the communities were not only conserving the native germplasm but also providing and more controlled and reliable source of raw material and have secured a more favorable contract for the supply of Hedychium root to local pharmaceutical industries. This would be followed up by the proposed Gramya II.

Component C. Institutional Strengthening

Sub-component C.1. Capacity building of Gram Panchayats and local community institutions

Each targeted GP under Gramya I managed approximately US$ 100,000 in implementing the GPWDP, including the Vulnerable Group fund.[30] The project provided extensive orientation training at the village and division levels, on the watershed concept, budget envelope, participatory planning and implementation, financial management, and safeguards. Gramya I also provided technical training to more than 32,000 GP members and female village motivators (on participatory rural appraisal), 468 youth account assistants (accounting and auditing), and 7,020 community members (PME). In addition, more than 60,000 community members and 3,000 project staff had exposure visits in and outside of Uttarakhand in partnership with academic institutions and specialized government agencies.

Participatory monitoring and evaluation (PME). Gramya I conducted three rounds of PME between 2006 and 2012, facilitated by the FNGOs. All 468 targeted GPs participated in at least two rounds. A 15-member PME team was established in each GP, representing project beneficiaries.[31] The team obtained feedback from community members, initially more on project awareness (PDO, GP budget, and expenditure) but later on inclusiveness in beneficiary selection and benefit sharing. Nine grievances were filed and resolved through PME (six project related e.g., payment delays, and three staff related), but there were none in the third round. The PME team also conducted social audits for the project-financed infrastructure (e.g., irrigation canals, roads).

Active local governance participation. The project's participatory approach and capacity building seemed to have encouraged the village-level project staff as well as various project-formed group members to participate in local government elections. The results indicate that 304 of them were elected, 73 percent of whom were women. Fifty-two percent elected Gram Pradhans (GP heads) were either women SHG members or village motivators. Likewise, 66 percent of Block Development Committee members were women SHG members, village motivators, or Vulnerable Group activity presidents. Table A2.10 provides the details.

[30] On the average, the targeted GPs had an allocation of Rs. 4 million (approximately US$ 80,000). The sub-grant allocation was determined by potential treatment area and populations (70 and 30 percent weightage respectively). The allocation varied between Rs. 3 to 7 million.

[31] The team is widely represented, including Gram Pradhan, ward member, 2 RVC members, 2 FIG members, 2 water user group members, 2 Van Panchayat members, 2 VG/SHG members, and 3 community members.

Table A2.10 Project group members in public functions

	Account Assistant		FIG member		Motivator		RVC member		SHG member		User group member		Vulnerable Group President		WWC Chairman		Van Sarpanch		PME member		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Pradhan[32]	3		2			11	6	1		20	1		2	10	1	1	2				17	43
Up Pradhan[33]										1											0	1
Sarpanch[34]	2		1			1	1														4	1
District Development Committee (DDC)			1																		1	0
Block Development Committee (BDC)	2		14	4		21	21	13		95	1		10	23		4	4				52	160
Panchayat Member										1				2	1					1	1	4
Revenue Village Committee (RVC)										2			1	3							1	5
Motivator in SarvShikshaAbhiyan	5					1															5	1
Aganwadi Helper						9															0	9
Total	12	0	18	4	0	43	28	14	0	119	2	0	13	38	2	5	6	0	0	1	81	224

Sub-component C.2. Information, Education, and Communication (IEC)

The sub-component developed a communication strategy in February 2004. The communication activities focused on raising awareness in targeted GPs, in particular, on the project's objective and participatory approach through various media, including video and print newsletters, folk theatre and wall paintings. The newsletters, in particular, facilitated learning and technical knowledge sharing among GPs, in addition to exposure visits. The project name, Gramya I, was given in local language, which was widely used and recognized by the project beneficiaries. The project website (http://wmduk.gov.in/index.html) was set up and provided comprehensive information and implementation update. These activities contributed to the project awareness being as high as 91 percent.

[32] Head of Gram Panchayat (GP)
[33] Deputy Head of GP
[34] Head of Van Panchayat

As a part of knowledge management, SLEM produced 11 good practice notes on natural resource conservation and land degradation control, which were distributed at local, division, and state levels. The notes were on: (a) pine needle briquetting, (b) solar lights, (c) solar cookers, (d) biogas plants, (e) gharat renovation, (f) medicinal and aromatic plant cultivation, (g) rejuvenation of nala/khala, (h) roof water harvesting, (i) river bank protection, irrigation tanks and delivery system, (j) village ponds, percolation tank, and contour trenches with bunds, and (k) forest management (fire control, plantation, and assisted natural regeneration).

Sub-component C.3. Project coordination, monitoring, and management.

Grievance Redress Mechanism. In 2007, Gramya I established a grievance redress mechanism and received 38 grievances, 9 of which were received through PME exercises. They were all addressed at the district level. Following the GoI's Right to Information (RTI) Act, Gramya I prepared a citizen charter in 2005 and designated a Public Information Officer at the state, division, and district levels. A total of 39 appeals were received and addressed at the state level, while there were 250 requests for information, which were also addressed at the state level.

Staffing. WMD was slow in staffing Gramya I, completing it only by the Mid-term Review. The project had 509 posts, about 40 percent of which were occupied by state government staff through secondments from the Departments of Agriculture, Forestry, Horticulture, Animal Husbandry, Irrigation, and Rural Development. Because the State of Uttarakhand is a relatively new state, there is an acute shortage of state government staff, in particular, for the Agriculture and Horticulture Departments. The staffing for these technical positions was around 70 percent. To ensure project implementation, WMD contracted various service providers, including NGOs, in overall project implementation, social mobilization, and PME, and new graduates for junior engineers and accounting assistants.

Partner agencies. One of the strengths of Gramya I and SLEM was the outreach and partnership with NGOs, academic institutions, and the private sector. Fifty-five agencies provided overall project implementation support, social mobilization and PME, value addition and marketing, and/or technical assistance in water, land degradation control, agriculture, horticulture, livestock, forestry, and energy (Table A2.11).

Table A2.11 Partner agencies

Activity	Agency
Partner NGOs	• Asian Society For Entrepreneurship Education & Development • Institute Of Himalayan Environmental Research and Education
Field NGOs	• MANAVA BHARATI • Himalayan Study Circle for Environment Child Education and Research
Soil conservation and water augmentation	• Central Soil and Water Conservation Institute • Kumaon Agriculture and Greenery Advancement Society • Mahila Samridhi Sansthan
Agriculture and horticulture	• G.B. Pant Agriculture University

Activity	Agency
	• Indian Council of Agricultural Research • Uttaranchal Livestock Development Board • Agriculture Department • Himalayan Action and Research Center
Livestock/Vulnerable Group	• G.B. Pant Agriculture University
Forestry/ VPs	• Uttarakhand and Forest Academy • G.B. Pant Institute for Himalayan Environment and Development, KosiKatarmal • Bamboo and Fiber Development Board • Jal Bhagirathi Foundation, Ogna, Rajasthan
Gharat revival (water mills)	• Uttarakhand Renewable Energy Development Agency
Solar energy	• Renewal Energy Corporation (a channel partner under GOI solar mission)
Non conventional energy use-SOLAR ENERGY	• IRE society-Chinyalisaur
Medicinal and herbal plants	• Central Institute of Medicinal and Aromatic Plants • Herbal Research and Development Institute • Dabur India Ltd. Dineshpur, US Nagar
Floriculture	• National Horticulture Board • Horticulture Department
Organic farming	• Sristi Gyan Kendra • Uttarakhand Organic Commodity Board • SUPA Biotech • Institute Of Himalayan Environmental Research and Education
FIG capacity building	• GIZ
Fiduciary (financial management and procurement)	• D.S. Jajj & Co, Chandigarh • RIRD Haridwar • Suchetana Bareilly
Environment and social safeguards	• G.B. Pant Institute for Himalayan Environment and Development, Kosi Katarmal • Uttarakhand Forest Academy • Environmental Management and Policy Research Institute
Value addition and market linkages	• Uttaranchal Renewable Energy Development Agency (solar dryers) • VPKAS (agro processing center) • Mother Dairy, New Delhi • Bharti Wal Mart • Gujarat and Reliance Industries Ltd. • Navdania Foods • Ferrocon Pvt. Ltd. • Garhwal MandalVikas Nigam, Uttrakhand • Uttarakhand Vinodhara Agrotech • Himalayan Trading Company • National Bank of Agriculture and Rural Development • Himalayan GraminVikasSamiti (dairy outlet)
Divisional Support Agencies (DSA)	• Himalayan Action and Research Center • Centre for Business Entrepreneurial Development • Asian Society For Entrepreneurship Education & Development • Central Himalayan Environment Association • Grameen Evam Krishi Vikas Samiti • Society for Uttaranchal Development & Himalayan Action • Institute Of Himalayan Environmental Research and Education

Annex 3. Economic and Financial Analysis

A. ICR Estimation Methodology

The Gramya I and SLEM treated an overall area of 234,787 ha with resource conservation treatments, by adopting decentralized watershed based ridge-to-valley approach in 76 MWS', covering 468 GPs. Out of this, SLEM project adopted much more comprehensive treatment in 60,823 ha by including the inter-GP areas also. SLEM project covered 20 MWS' spread over 125 GPs. The Gramya I supported predominantly small and marginal farm holdings in the project area. Only 13 percent of the farmers had access to irrigated land, and the remaining 87 percent depended on rainfed land. Marginal farmers (< one hectare) comprise some 78 percent of project farmers, of which two-thirds had less than 0.5 ha.

Project benefits were generated from multiple sources: (i) arable land benefits from irrigated and rainfed farming, (ii) non-arable land benefits from afforestation, silvipasture, and fuelwood plantations, (iii) resource conservation benefits from treated arable and non-arable lands, (iv) improved eco-system services from treated MWS', (v) enhanced price margins for farmers due to agri-business linkages, and (vi) improved livelihood through individual and group income generation activities (IGAs) for resource poor and vulnerable households in the project MWS'.

The database for the ICR analysis was compiled from Gramya I and SLEM documents, including (i) study reports compiled periodically by the PMU, (ii) secondary database publications, and (iii) baseline and impact evaluation reports and database compiled by external M&E agencies contracted by WMD. The impact evaluations for Gramya I and SLEM covered a treatment sample of 2,087 households drawn from 90 GPs and a control sample of 700 households from 35 GPs, representing socio-economic and topographic diversity in the project area. The quality of the impact evaluation survey instruments and data analysis proved to be inadequate to capture the project intervention specific benefits. The study report restricted the analysis to the sample data and failed to project the realized values for some of the results indicators based on their analysis, which was left to the ICR team to fill this gap. Supplemental field visits were utilized to objectively capture the project-led benefits.

B. PAD Estimated Project Benefits and Rate of Return

At appraisal for both Gramya I and SLEM, no economic and financial analysis was done for the proposed project investments. Rather, the Gramya I PAD quoted the positive impacts of the predecessor project (IWDP II), which was documented in its ICR to justify the economic and financial worthiness of the proposed investments in Gramya I. The IWDP II ICR estimated its impacts as follows: (i) ERR for the project as a whole was 15.7 percent; and (ii) incremental farm financial income impacts varied from 94 to 152 percent across diverse farming situations.

C. Project Benefits:

Major benefits due to project interventions are summarized in Table A3.1, in the areas of (i) watershed treatment and source sustainability, (ii) rainfed agriculture development, (iii) irrigated agriculture and agribusiness development, and (iv) income generating activities.

Table A3.1 Gramya I - Summary of Project interventions and estimated impacts

Component	Project Interventions	Unit	Impact	Incremental Benefits	Unit	Impact
Watershed Treatment/ Source Sustainability	Afforestation/Silvipasture / Fuelwood plantations	ha	17,475	Fuel production Fodder production Small Timber production	MT/ yr MT/ yr MT/ yr	10,364 27,226 83,631
	Runoff harvesting/ capacity created	m^3	237,705	Watershed Services net benefits	Rs/ha	46,420
	Drainage Line Treatment/ Soil conservation	ha	234,787			
Rainfed Agriculture/ Agribusiness	Terraces repaired with vegetative boundary for resource conservation	m^3	417,437	Gross cropped area	Ha	6,908
	In situ SMC/Improved technology Demonstrated	ha	13,577	Gross irrigated area	Ha	9,402
	Polyhouse/ tunnel/ Vermicompost Demos	No.	10,291	Crop productivity Rainfed farm income	% Rs/ha	35 to 60 7,884
	Horticulture/Seasonal and Off seasonal Vegetable Demos	ha	5,655	Irrigated farm income	Rs/ha	27,991
IGA	Agribusiness linkages	HHs	8,408	Household farm income	Rs/yr	14,598
	IGA support/adoption	HHs	11,289	Average HH income	Rs/yr	4,693

i. Watershed Treatment and Source Sustainability

The two major benefits were increased resource conservation and ecological functions, including biomass production from plantations. Gramya I and SLEM (i) reduced runoff and soil erosion by treating non-arable lands; (ii) increased water discharge by 68 percent by rejuvenating traditional natural water sources, (iii) developed 17,475 ha of small timber/fuel/fodder plantations, and (iv) improved watershed services by Rs. 46,420/ha. On the average, the plantations increased annual fuelwood production by 10,364 tons, fodder production by 27,226 tons, and small timber production by 83,631 tons.

Non-arable lands covered 71 percent of the project area and were treated with resource conservation measures. About 15 percent of the projects' total MWS area was categorized as moderately erodible (E-1) and 85 percent as medium to highly erodible. Annual soil loss ranged from 11 tons/ha (moderate) to 65 tons/ha (high). Prior to the

project, traditional natural water sources had become unsustainable, with many completely dried up. Project interventions reduced sedimentation and runoff losses and rejuvenated traditional natural water sources. Enhanced biomass production from the non-arable lands resulted in increased small timber, fuel and fodder production.

The SLEM implemented soil and conservation measures including 536 vegetative check dams, 72,445 cum of stone check dams, 10,755 m of diversion drains, and 91,711 contour trenches. Based on the secondary data sources available for similar eco-systems, it is estimated that these SLEM investments in soil moisture control, drainage line treatment, and river bank protection have the potential to arrest the soil loss of 142,438 m^3. This provides protection to 185 ha of farm lands. A gross area of 278 ha of farm lands is, thus, saved from getting out of cultivation in the future, due to continuous soil erosion. At 2013 prices, about Rs 45 million worth of cereal production is saved annually due to the watershed treatment.

Watershed Service Benefits: Valuation of forest ecosystem services are based on the study of Himachal Pradesh state[35] by converting them to constant 2013 prices. Annual net benefits of forest ecosystem services is estimated at Rs 82,100 per ha, contributed by watershed services, carbon storage, biomass production, and ecotourism. Watershed services, including the value for natural resource conservation and hydrological services, accounted for nearly one-half of the value of forest ecosystem services, followed by carbon storage, which accounted for 28 percent. Biomass production, including fuel, fodder, timber and NTFP is underestimated, since the study considered only unprotected forest areas. For this analysis, only watershed services and carbon storage are valued and included in the project benefits. Biomass production (fodder, fuel and small timber) values are estimated separately. Forest cover in project area is classified into very dense (15 percent), moderately dense (55 percent) and open forests (30 percent). Using Himachal Pradesh study[36] and forest cover types in the project area, annual net benefits from watershed services and carbon storage for the project area is assessed at Rs 46,420 per ha at constant 2013 prices at full development. Incremental area covered under afforestation, silvipasture and fuel wood plantations are 17,475 ha. The survival rate for these plantations is estimated at 45 percent.[37] As such, annual net financial benefits from watershed services and carbon storage are estimated at Rs 365 million per year, at full development.

Afforestation: As a part of watershed treatment and source sustainability, about 17,475 ha of plantations were taken up in the project MWS'. The treatment was as follows: (i) afforestation model in 5,676 ha, (ii) silvipasture model in 5,340 ha, and (iii) fuelwood model in 6,459 ha, with the plant density varying from 800 to 1,600 plants per ha. No

[35] Report of the Expert Committee on Net Present Value, Constituted by IEG, Delhi as mandated by the Supreme Court of India, 2005.
[36] HP study moderated the value of watershed services to 80% for very dense and moderate dense forest cover types and 60% for open forests.
[37] Gramya, Implementation Completion Report, UDWDP, Watershed Management Directorate, Uttarakhand, Dehradun, March 2012

systematic documentation of plant establishment, growth, and yield assessment was done by the project. Given the plantation survival rate of 45 percent, yield projections are calculated based on the available WMD database resulting from afforestation interventions which are similar to the Gramya I interventions. Across the plantation models, annual yields were as follows: (i) fuelwood (3 to 15 MT/ha); (ii) fodder (2 to 6 MT/ha); and (iii) small timber (100 to 450 MT/ha). Annual average production from plantation area is therefore projected at 10,364 MT of fuelwood, 27,226 MT of fodder and 83,631 MT of small timber. Valued at constant 2013 prices, average annual benefits (undiscounted) from the plantation area is projected at Rs 73 million from fodder, Rs 134 million from fuelwood, and Rs 2,245 million from small timber. At 45 percent survival rate, incremental annual financial benefits from plantations in the project area are projected at Rs 1,103 million, at full development.

ii. Rainfed Agriculture

The major benefits here were the increased production of cereals, pulses, and vegetables from arable rainfed lands (net area, 50,103 ha) and arable irrigated lands (net area, 13,430 ha). As a result, incremental revenue from rainfed crops increased by 44 percent.

- Incremental arable land area cropped (gross area, 6,908 ha)
- Incremental arable land area irrigated (gross area, 9,402 ha)
- Increased crop yield by 35 to 60 percent in arable lands (gross area, 98,356 ha)
- Annual cereals production by 79,488 tons
- Annual pulses production by 2005 tons
- Annual vegetables production by 65,621 tons

The project area farmers are currently cultivating 67,231 ha of arable lands, of which, 77 percent is rainfed, 12 percent is irrigated, with the remaining 11 percent left fallow. Rainfed cropping patterns are dominated by cereal, millet and pulse crops (Table A3.2). Major dominating crops are ragi, wheat, paddy, pulses and rapeseed mustard, occupying 95 percent of cropping pattern in project villages. With project (WP), cropping pattern and crop intensity are assumed at the same levels for economic analysis. Resource conservation interventions shifted 50 percent of the fallow lands into cropping to increase the arable lands for cultivation by 6 percent. Irrigated area (measured in ha) increased by 66 percent over without project (WOP). There is a marginal reduction of 3 percent in rainfed area. Crop area allocations under WP remained the same as those of WOP. Adoption of conservation practices and improved production technologies is assumed to stabilize at 50 percent at full project development. Diversion drains and river bank protection works helped in protecting farm lands from erosion, thereby preventing the likely loss of lands for future production. Given the small size of farm holdings in the

Table A3.2 Rainfed agriculture area impacts

Project level	**Unit**	**WOP**	**WP**
Rainfed area	Ha	51,766	50,103
Cropping Intensity:	%	150%	150%
Paddy	ha	11,906	11,524
Ragi	ha	31,059	30,062
Pulses	ha	6,212	6,012
Wheat	ha	25,883	25,051
Rapeseed Mustard	ha	2,588	2,505
Adoption Rate	%	10%	50%

project area, preventing farm lands from soil erosion has significant socioeconomic impact.

Table A3.3 Rainfed yield & income impacts

Project level	Unit	WOP	WP
Crop yield:			
Paddy	tons/ha	1.8	2.5
Ragi	tons/ha	1.3	1.8
Pulses	tons/ha	0.7	1.0
Wheat	tons/ha	1.3	1.9
Rapeseed Mustard	tons/ha	0.6	0.9
Financial Income	Rs/ha	17,761	25,645
	Rs M	919	1,285

Rainfed crop yields are low, varying from 0.6 tons/ha (Rapeseed Mustard) to 1.8 tons/ha (Paddy) under WOP (Table A3.3). A total of 62,550 demonstrations (with each demonstration area varying from 0.04 to 0.2 ha) covering 4,500 ha of area were organized to promote improved rainfed crop production technologies, covering major crops in all project villages. At full development, about 50 percent of the rainfed farmers are projected to adopt and sustain efficient crop production technologies demonstrated in the project villages.

WP yields are higher than WOP by 35 to 40 percent across cereals, pulses and oilseeds. Still, actual crop yields are only 55 percent of the potential crop yields in rainfed agriculture, indicating a remaining technological gap that could be closed. Average annual rainfall in the project area is over 180 cm, ranging from 100 to 270 cm across project districts. About 75 percent of annual rainfall occurs during June to September. Improved inter- and intra-terrace conservation techniques through farm level *in situ* moisture conservation practices are critical to recover this yield gap and stabilize the productivity across diverse rainfall situations in the project area. While the project has promoted improved production technologies through organized demonstrations, it is important to bundle this with *in situ* moisture conservation practices to get the maximum yield during normal rainfall seasons and minimize yield loss during intra-seasonal dry spells. In other words, demonstrations need to focus more on efficient resource conservation practices within the terrace along with less monetary inputs like quality seed, optimum plant population, and contingency plans for varying soil moisture scenarios during the crop growing season to recover the remaining 45 percent yield gap through various stages. The project-led initiatives through watershed treatment and promoting agriculture technologies contributed to improve farm financial income (INR/ha) by 40 percent. Rainfed agriculture interventions generated incremental financial benefits of Rs 183 million per year, at full development.

iii. Irrigated Agriculture and Agribusiness Development

The annual incremental financial benefits from irrigated arable lands were increased by 75 percent. Moreover, the average income increased by Rs 14,598 for 8,408 farmers because of marketing support and value addition, of which:

- 85 percent of the farmers benefitted by agribusiness linkages;
- 68 percent of the farmers benefitted by farmer federation linkages; and
- 51 percent of the farmers benefitted by value addition.

Irrigated farming is practiced in 12 percent of the arable lands. Project-supported investments in location-specific water harvesting structures permitted efficient recycling of runoff for irrigating additional farmland. High-value crops are produced, which further enhanced farm incomes. A total of 23,516 water harvesting structures and 579 km of irrigation channels were financed in the project villages (Table A3.4) benefitting

Table A3.4 Irrigation Development through Runoff Harvesting and Recycling

		Incremental irrigated Area		Water Storage
Infrastructure	**Quantity**	***Net***	***Gross***	**Capacity**
Water Harvesting Tank	19,238	577	1,039	48,106
Irrigation Tank	2,251	1,688	2,870	77,309
Irrigation Channel (km)	579	2,320	4,176	0
Village Pond	872	724	1,230	108,640
LDPE Tank	68	51	87	2,346
Recharge Pits	1,087	0	0	1,304
Total	24,095	5,360	9,402	237,705

individual as well as groups of farmers. Collectively, all irrigation infrastructures completed by the project had a total storage capacity of 237,705 m^3. Most of these structures are filled several times during the rainy season, in addition to inflows from the rejuvenated traditional water sources to support the cultivation of off-seasonal vegetables. Consequently, net irrigated area has increased by 5,360 ha and gross irrigated area has increased by 9,402 ha, which is two-thirds more than the WOP-irrigated area.[38] Irrigated cropping patterns are dominated by cereals, followed by vegetables and potato.

Irrigated cropping intensity is 171 percent. Potato and vegetables account for 21 percent of the gross irrigated area. Project MWS' receive average annual rainfall of 180 cm in about 90 rainy days. Project interventions (Table A3.4) helped in capturing, storing and recycling rainwater. Average irrigated cropping intensity marginally improved to 173 percent, but area under vegetables and potato increased to 35 percent of the gross irrigated area, aided by agribusiness linkages supported by the project through 690 FIGs covering 9,850 farmers.

During the project implementation period, a total of 46,315 demonstrations (demonstration area varied from 0.04 to 0.2 ha) covering 3,575 ha of area were organized to promote improved irrigated crop production technologies, covering high-value crops, seasonal and off-seasonal vegetables in all project villages. About 2,189 poly houses and poly tunnels; and 8,102 bio/vermi compost production units were supported by the project to ensure quality seedlings of short duration off-season high value crops for the farmers. At full development, about 65 percent of the irrigated farmers are projected to adopt and sustain efficient crop production technologies demonstrated in the project villages. Crop productivity at full development is estimated at 49 to 60 percent higher than WOP productivity levels across major irrigated crops (Table A3.5). The project-led

[38] *Net irrigated area* refers to actual hectares irrigated, while *gross irrigated area* counts actual crops under irrigation annually.

Table A3.5 Irrigated agriculture area impacts

Project level	Unit	WOP	WP
Irrigated area	Ha	8,070	13,430
Cropping Intensity	%	171%	173%
Paddy	%	75%	74%
Wheat	%	75%	64%
Potato	%	3%	5%
Vegetables	%	18%	30%
Adoption Rate	%	25%	65%

initiatives through rainwater harvesting and efficient recycling for improved high value crop cultivation in irrigated farm lands substantially enhanced the farm financial income by 75 percent over WOP. With project, per ha financial gross margin for major crops increased by 59 to 77 percent. Irrigated agriculture interventions generated incremental financial benefits of Rs. 374 million per year, at full development.

In the project area, 27 farmer federations (FFs) were formed with 690 FIGs to benefit 9,850 farmers. Out of this, 8,410 farmers through 589 FIGs were involved in agribusiness activities (e.g., product aggregation, processing and marketing), of whom 6,745 farmers from 410 FIGs were directly linked with FFs by the end of the project. Collectively, they marketed 41,475 MT of products consisting of vegetables (89 percent) and fruits (11 percent) produced by the project farmers, valued at Rs. 462 million (Table A3.6). About 5,040 farmers from 315 FIGs benefited due to value addition during Gramya I implementation, collectively producing 776 MT of processed products, valued at Rs 25 million. At constant 2013 prices, weighted average price realized varied from Rs 11.1 (vegetables) to 31.6 (value added products). Across products, about 35 percent of the sale price is accounted for FF/processing unit related costs. Average annual turnover is estimated at 500 MT, since (i) most of the FFs were formed during the later period of the project implementation with only three to four years of functioning; (ii) only one-fourth of FFs were fully functional by the end of the project; and (iii) many FFs suffered from inadequate working capital. If only fully functional FFs are considered, annual turnover is over 1,700 MT.

Table A3.6 Gramya I Agribusiness impacts during project period

Project	FIGs	Farmers	Products	Produce Marketed		
	No.	No.		MT	Rs M	Rs/Kg
Total	690	9,850	Total	41,475	487	11.7
Linked to						
Agribusiness	589	8,408	Vegetables	36,355	402	11.1
FFs	410	6,745	Fruits	4,343	60	13.8
Value addition	315	5,040	Value Added	776	25	31.6

Source: Gramya I Implementation Completion Report, Gramya I, Watershed Management Directorate, Uttarakhand, Dehradun, March 2012

In the project area, under WOP, the weighted average farm gate price for 70 percent of major vegetables (e.g., potato, tomato, pea, cabbage and cauliflower), was Rs 6.80 per kg, which was 54 percent of wholesale price and 31 percent of consumer retail price at constant 2013 prices. At the end of the project, only 20 percent of the major vegetables produced by FFs were sold through organized marketing. Organized marketing of vegetables generally fetches higher price for the producers by about 30 percent over unorganized marketing of their products. On an average, about 8,408 farmers in FFs realized higher producer prices,

which were 74 percent of whole sale price, as compared to 54 percent under WOP. Incremental financial benefits due to agribusiness support to 8,408 farmers are estimated at Rs 123 million per year. Incremental financial benefit per farmer is Rs 14,598 per year, which is 43 percent more than the WOP situation. In the absence of data on sustainability of agribusiness initiatives, the same adoption rate of 65 percent used for irrigated crop technology was applied since in the initial phase most of the beneficiaries due to agribusiness support are irrigated farmers.

iv. Income Generating Activities (IGAs):

The annual income increased by Rs 3,079 to Rs 7,849 for 11,289 vulnerable families due to group and individual income generating activities (Table A3.7). Average IGA investment came to Rs 20,109 for individual IGA and Rs 62,183 for group IGA at 2013 prices. The Gramya I impact assessment sampled 340 individual and 16 group IGAs in the project villages. Based on this sample, overall average annual income from IGA across diverse activities was Rs. 7,184 for individual and Rs. 19,892 for group IGA. These were realized at full development in the second or third year from the start of IGA. The final impact evaluation assessed that 80 percent of beneficiary households continued in their respective IGA. About one-half of beneficiary households are able to maintain the IGA to generate sustainable returns that supplement household incomes. Over time, it is projected that about two-thirds of the targeted vulnerable households will continue with the IGAs to generate sustainable returns to supplement their income levels. Incremental financial benefits from IGA are projected at Rs. 35 million per year, at full development.

Table A3.7 Impacts of Income generating activity Groups at 2013 prices

IGA Groups			**Inv. Funds**	**Income**	**IGA Individuals**		**Inv.**	**Income**
Activity	**No.**	**Members**	**Rs**	**Rs/year**	**Activity**	**No.**	**Rs**	**Rs/year**
Goats	201	1,410	96,517	23,088	Dairy	791	19,566	4,984
Tent House	257	2,062	68,292	15,210	Poultry	700	17,609	6,759
Dairy	62	434	85,399	32,286	Goats	625	24,348	8,223
Others	411	2,839	47,907	22,368	Others	1,703	19,833	9,491
Tailoring/Kniting	32	301	34,720	29,781				
Cement Casting	21	105	15,116	16,415				
Gharats	84	319	36,188	23,278				
Total	1,068[1]	7,470	62,183	21,537	Total	3,819	20,109	7,849

[1] Includes both Gramya I and SLEM IGAs

Source: Gramya I Implementation Completion Report, Gramya I, Watershed Management Directorate, Uttarakhand, Dehradun, March 2012; and Vulnerable Group Fund in Gramya I, Watershed Management Directorate, Dehradun, 2011/12

D. Economic and Financial Analysis:

Cost-benefit analysis is conducted for a project life of 30 years. Costs and benefits are estimated at 2013 prices over 30 years with 12 percent opportunity cost of capital. Present value of discounted project financial benefits over the project life, due to the project interventions are estimated at Rs 6.4 billion, contributed from watershed services (20 percent), plantations (40 percent), agriculture (33 percent), and enhanced livelihoods

(7 percent). Total project costs, including contingencies, are Rs 6.8 billion. Beyond the project implementation period annual recurrent costs and replacement costs for the assets like water harvesting infrastructures are provided for. Financial analysis is done at market prices. The estimated financial rate of return (FRR) for the project as a whole is 17.7 percent. Net Present Value at 12 percent opportunity cost of capital for 30-year project life is Rs 2.4 billion (Table A3.8).

Table A3.8 Gramya I: EFA Summary for 30-year project life and 12% opportunity cost of capital

Project Interventions	PVB	PVC	NPV	ERR	PVB	PVC	NPV	FRR
Project as a whole	5.4	3.6	1.8	16.7%	6.4	4.0	2.4	17.7%

Present value of benefits (PVB), Present value of costs (PVC), Net Present Value (NPV) are in Rs Billion.

Economic analysis is conducted after making appropriate adjustments to financial benefits and costs. Economic project costs are estimated at Rs 6.1 billion after adjusting for transfers, taxes, subsidies, and converting financial prices to economic prices. Economic prices for internationally traded commodities (e.g., fertilizer, paddy and wheat) are derived and used. While deviation between the parity prices and market prices for paddy and wheat is marginal (less than 8 percent), parity prices for fertilizer nutrient is two and half times that of market prices. This difference in economic and market prices for fertilizers and use of human labor by farmers in the project area has resulted in economic rate of return (ERR) marginally lower than financial rate of return. Present value of discounted project benefits over the project life, due to the project interventions, are estimated at Rs 5.4 billion, contributed by watershed services (21 percent), plantations (42 percent), agriculture (31 percent), and enhanced livelihoods (6 percent). The estimated ERR for the project as a whole is 16.7 percent. Net Present Value at 12 percent opportunity cost of capital for 30-year project life is Rs 1.8 billion.

E. **Cost Effectiveness Analysis**:

Decentralized comprehensive watershed development approach adopted by the project is cost effective. Water harvesting structures and resource conservation investments under Gramya I and SLEM, covering irrigation tanks, drainage line treatment, irrigation channel, plantations, and village ponds were analyzed and compared with publicly-funded similar investments. Community-driven investments led to asset creation, with unit costs (at 2013 prices) higher by 2 to 57 percent in case of plantations, irrigation tanks, village ponds and drainage line treatment; and lesser in case of irrigation channel by 4 percent. Yet in terms of performance, plantations registered a 45 percent survival rate in the Gramya I/SLEM areas, as against no survival under control, necessitating repeat plantation. The economic life of these assets is therefore higher by 40 to 100 percent across diverse investments in the Gramya I/SLEM areas as compared to the control. Annual O & M costs in the Gramya I/SLEM areas are consequently less by 60 to 67 percent. At a 12 percent opportunity cost of capital, annual amortized investment costs and O&M costs together registered a 10 to 30 percent reduction as compared to the control across diverse water harvest and conservation structures.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit
Lending		
David J. Marsden	Consultant	MNSSD
Deborah Lee Ricks	Program Assistant	SASDO
Gayatri Acharya	Sr. Economist	SASDA
Jacqueline Julian	Operations Analyst	SASDA
James W. Smyle	Consultant	AFTEN
Madhavi M. Pillai	E T Consultant	ARD
ManvinderMamak	Sr. Financial Management Specialist	SARFM
Parameswaran Iyer	Sr. Water & Sanitation Spec.	MNSWA
Sarita Rana	Sr. Program Assistant	SASDO
Sonia Chand Sandhu	Sr. Environmental Specialist	SASDI
Talib B. K. Esmail	Operations Adviser	LCSDE
Supervision/ICR		
Aditi Sen	Consultant	ENVCF
Ai Chin Wee	Consultant	CSABI
Ananya Basu	Sr. Economist	SASEP
Annu Ratta	Consultant	ECSPE
Atul Bhalchandra Deshpande	Sr. Financial Management Specialist	SARFM
Biswajit Sen	Sr. Rural Development Specialist	SASDA
Edward Bresnyan	Sr. Rural Development Specialist	SASDA
Gaurav D. Joshi	Environmental Specialist	SASDI
Jacqueline Julian	Operations Analyst	SASDA
John Ivor Beazley	Lead Public Sector Specialist	ECSP4
Juan Bautista Morelli	Consultant	MNSSD
Kiran R. Baral	Sr. Procurement Officer	SARPS
Krishnamurthy Sankaranarayanan	Financial Management Specialist	SARFM
Kumar Amarendra Narayan Singh	Consultant	SASGP
M. P. G. Kurup	Consultant	SASDA
Manmohan Singh Bajaj	Sr. Procurement Specialist	SARPS
Manvinder Mamak	Sr. Financial Management Specialist	SARFM
Michele Bruni	Consultant	ECSHD
Miki Terasawa	Social Development Specialist	SASDS
Mio Takada	Rural Development Specialist	SASDA
Moho Chaturvedi	Consultant	TWISA
Mridula Singh	Sr. Social Development Specialist	SASDI
Norman Bentley Piccioni	Lead Rural Development Special	SASDA
Prachi Seth	Consultant	SASDA
Pradeep Khanduri	Consultant	SASDA
Ranjan Samantaray	Sr. Natural Resources Mgmt. Specialist	SASDA
S. Selvarajan	Consultant	SASDA
Sanjay Gupta	E T Consultant	SASDI
Shashidharan M. Enarth	Consultant	SASDA
Soma Ghosh Moulik	Sr. Water & Sanitation Spec.	TWIWA
Sonia Chand Sandhu	Senior Environmental Specialist	SASDI
T. C. Jain	Consultant	SASDA
Yuka Makino	Sr. Natural Resources Mgmt. Specialist	SASDI

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
2004	61.91	87,958.73
Total:	61.91	87,958.73
Supervision/ICR		
2005	18.51	27,694.55
2006	26.36	60,785.74
2007	20.41	42,041.66
2008	21.59	31,620.24
2009	43.81	129,639.00
2010	34.00	93,914.19
2011	32.72	30,314.12
2012	34.75	54,612.21
2013	5.09	20,235.71
2014	6.70	56,260.45
Total:	**243.94**	**547,117.87**
	Staff Time and Cost (Trust Fund Budget)	
2010	3.80	13,864.66
2013	3.80	14,644.64
Total:	**6.60**	**28,509.30**

Annex 5. Stakeholder Workshop Report and Results

Both Gramya I and SLEM organized exit workshops at division and cluster levels. Below is a summary of feedback from the participants of SLEM exit workshop held on August 29, 2013 in the Nainital Division.

1. Villagers were taken to G. B. Pant University of Agriculture & Technology, Pantnagar on Exposure visit to Kisan Melas; it was for the first time that the villagers were given information regarding the Budget and Works to be carried out in the Gram Panchayat. This was never done in any project before. Villagers were provided employment opportunities within the village itself, which helped them to carry out their livelihood well. Works done in the fields of Water Resource regeneration, water recharge by the way of contour trenches, dug-out ponds etc. was beneficial in improvement of water availability in the village. (**Account Assistant**)
2. All the works in the GP are carried out in a participatory mode and the works are first approved in the open meetings of the respective GP. (**Gram Pradhan**)
3. Keeping in view the safety of the environment, such projects should be given in the area again and again. The works done for the upliftment of vulnerable groups are commendable. Villagers were given training on the activities of their choice and were encouraged for self-employment. (**Gram Pradhan**)
4. This project had enormous possibilities of work. People were benefitted to a great extent. All the things were decided in the project through open meetings. Since the things were decided in the open meeting, no disputes took place. (**Gram Pradhan**);
5. Project was extremely beneficial for vulnerable groups, Labour class and women. Similar projects should be planned in future also. (**Gram Pradhan**);
6. Soil conservation, Water conservation works were the speciality of this project. This project should be implemented in the entire state. Employment was created in the Gram Panchayat. (**Gram Pradhan**);
7. This project was different from the other projects. The common man has a place in this project. Works are carried out with the consent of all the residents of the village. Budget is head wise discussed openly; transparency and participation are taken into account. (**Gram Pradhan**);
8. Villagers were taken to Kisan Melas in Pant Nagar University for exposure to improved agriculture techniques, and animal husbandry. For the first time, the Budget and works are discussed in the open meetings of the Gram Panchayat. Villagers were given ample employment during the project period, which was extremely helpful in improving their livelihood. Project was extremely beneficial for the people. (**GP member**);
9. Importance was given to women in both Gramya and SLEM projects. Works were decided through open general meetings in the village, every individual has benefited

from the project. High value crop seeds, High yielding varieties and Breed improvement programmes for cows and goats were an important feature of this project. We believe that more such projects will be implemented in our area in near future. (**Account Assistant**);

10. Works are planned by the villagers themselves through open meetings in the village and they are implemented in participatory manner. (**Gram Pradhan**).
11. This was a unique project where all the accounting and record keeping was done by Account assistant- an individual, appointed from the village itself to help the Gram Pradhan. All the works were implemented in transparent manner and plans were finalised in open meetings. (**Gram Pradhan);**
12. This was a very good project, people got employment within the village and vegetable production was promoted. People were given information regarding each and every work. (**Gram Pradhan**);
13. Gramya I has benefitted each and every family of our village. Production was improved through high yielding seeds; irrigation tanks improved the agricultural produce. Options for Self employment, especially for the women, were created within the village; village inhabitants were taken on exposure tours to various institutes which improved their vision regarding modern techniques of farming, which also improved the production. The support shown by the Gramya project in our village is commendable, our villages had immense development.(**Account Assistant);**
14. Every person was given due importance in these projects. Proposals were approved through the open meetings of the Gram Panchayat. Separate Mahila Aam Sabhas were also organised and their proposals were given place in the open general meetings of the Gram Panchayat. (**Gram Pradhan**);
15. People got self-employment through Gramya project. Gramya & SLEM projects were instrumental in improving the water availability in the village through the water recharge, contour trenches and dug-out pond related works. Women were motivated into forming self-Help groups which made them self-sufficient and improved their self-esteem and confidence. Each and every family was benefitted through the project. (**Gram Pradhan**);
16. Proposals for work were given in open, general meetings and priorities were set in the meetings, payments were also made in the Gram Panchayat. Project was transparent. (**Gram Pradhan**);
17. People were given an opportunity for planning of the project through open meetings in the Gram Panchayat. Each and every person was given the information of budget and expenses in the GP. We have never experienced such transparency as we witnessed in this project. People were taken for exposure trips to various universities and institutes which improved our knowledge regarding water source regeneration, water recharge etc. Opportunities for self-employment were created in the village

itself through financial assistance from the project. Gramya & SLEM projects were beneficial for each and every villager.(**Gram Pradhan**);

18. Proposals were approved through general meetings in the Gram Panchayat and works were carried out in participatory mode.(**Gram Pradhan**);
19. Works like Afforestation, Assisted Natural Regeneration of Oak etc. were carried out through the projects. Digging of contour trenches, afforestation and fodder plantations were helpful in catering to the fodder needs of the village; Villagers got self-employment within the village. Project was extremely beneficial for the people.(**Gram Pradhan**);
20. Gramya I has benefitted the vulnerable group people a lot; funding given as grant for nurseries, Tent House, Knitting, weaving etc. were extremely helpful in upliftment of the poor. Women *Aam Sabhas* were important as they were able to build the confidence of village women; we witnessed such a project for the first time which gave such importance to the common man by providing those tanks, shelters, compost pits, energy conservation and self-employment within the village. (**Gram Pradhan**);
21. This project, besides being transparent, was acceptable to all. People had a wonderful experience related to these projects. I was from the village itself and was chosen as the account assistant, which was instrumental in maintaining the transparency. (**Account Assistant**);
22. This was the first project of its kind, in our area, in which importance is given to the each and every individual. (**Account Assistant**);
23. Works in both the projects were carried out in participatory mode; employment opportunities were created within the village, women were made self-reliant through formation of Self Help groups and by providing work-opportunities within the village. People were informed about the budget, and work plan through open meetings and beneficiary selection was transparent. (**Gram Pradhan);**
24. This is one such project wherein the concepts of holistic village development were realized. Water conservation, source rejuvenation, recharge and soil conservation were given due priority in the project. Employment was increased through the project interventions. Development was the keyword, during the project and even after the project. (**Gram Pradhan);**
25. All the works in the village were carried out through general consensus in the village, which was never seen in any other project. All the government schemes should be designed in this fashion only. Project is a mile stone in the development of Jal, *Jangal and zameen*, development was the keyword of this project.(**Account Assistant**)

Annex 6. Summary of Borrower's ICR

The Borrower submitted the Bank two separate ICRs for Gramya I (dated March 2012) and SLEM (dated August 2013), which are summarized below.

I. Summary of UDWDP Government ICR

World Bank funded Uttarakhand Decentralized Watershed Development Project (Gramya I) (Project ID: P078550, Credit No. 3907-IN) was implemented by Watershed Management Directorate, Uttarakhand. The project became effective from September 24, 2004 and closed on 31st March 2012.

PROJECT DEVELOPMENT OBJECTIVE

The Project was conceived with the objective to **improve the productive potential of natural resources and increase incomes of rural inhabitants in selected watersheds through socially inclusive, institutionally and environmentally sustainable approaches.**

PROJECT COST

The total project cost was US$ 89.35 million of which the International Development Association (IDA) share was US$ 69.62 million (47.4 million SDR), State share was US$ 16.62 million and Beneficiary share of US$ 3.11 million. Additional Financing (Credit No 4850- IN) for a total IDA Credit of US$ 7.98 million (5.1 million SDR) and state share of US$1.22 Million amounting to a total of US$ 9.20 million was availed w.e.f. 17th June, 2011.

PROJECT AREA

The project was spread over an area of around 2348 sq Km. in 76 selected MWS in Middle Himalayas. 468 identified Gram Panchayats in 18 Development Blocks of 11 Districts participated in this project. An estimated 258,000 population of the project area was proposed to be benefited from the project outcomes.

PROJECT IMPLEMENTATION STRATEGY

The project was community owned and demand driven and managed, planned and implemented by the community and the GPs. The village communities were the true owners of the project and the role of government and NGOs was as facilitators. The Gram Panchayat Watershed Development plans were need based and demand-driven keeping in view Environmental and Social safeguard Guidelines. Allocation of funds for watershed treatment to each GP was decided on the basis of area under GP's jurisdiction and population of the GP. Socio-economic equity was a cornerstone of this project. Women's participation in project interventions was sought to be enhanced by way of ensuring up to 50% representation of women in village level committees and inclusion of their concerns, needs and emerging issues in women Aam Sabhas into the GPWDPs. To

provide functional autonomy to local government, withdrawal and disbursement of funds from the watershed account for the project was vested with Gram Pradhan and one of the elected women ward members of the GP.

PROJECT COMPONENTS

1. Participatory Watershed Development and Management.

Promotion of social mobilization and community driven decision making: Social mobilization of the community was done with the help of field NGOs and village motivators placed at the village level. Through social mobilization the community was made aware of the project objectives, implementation and management.

Watershed treatments and village development: In GPWDP activities such as soil and moisture conservation, afforestation, water harvesting, agriculture terrace repair, agriculture interventions like introduction of high value crops and value addition of farm produce, horticulture, livestock management and breeding activities, fodder production, repair of roads and culverts, non-conventional energy programs etc. were included. The Environmental and Social Guidelines (ESG) were made an integral part of the GPWDP and sub-projects. Through these guidelines the objective was to minimize or mitigate the negative environmental and social impacts and to enhance the positive impacts.

2. Enhancing Livelihood Opportunities

Farming systems improvement: It focused on enhancing incomes and livelihood options by ensuring equitable participation by all groups like farmers, users groups and especially the landless and women who rely disproportionately on common-pool resources for fodder, fuel and other forest products. Farmer Interest Groups (FIGs) of progressive/ interested farmers keen on taking up innovative agribusiness activities were formed at GP level. Demonstrations of improved varieties of cultivated crops through FIGs were taken-up. Orchard development orchard rejuvenation, cultivation of off-season vegetables, use of poly house/ tunnels and bio/ vermi-compost demonstrations were carried out for better returns.

The objectives of livestock component were concerned with improvement of genetic potential of local indigenous livestock and to increase availability of feed and fodder. The thrust was on reducing the livestock pressure on farm land and forest for grazing and green fodder requirement. The improved livestock health care facilities were helpful in increasing the productivity of animals.

Under forestry component the farmers were motivated to establish forest nurseries (indigenous fuel wood, and small timber species) and fodder nurseries (Ginni, Hybrid Napier, Hybrid maize, Cenchrus) on community and private land to fulfill the requirement of seedlings in the project.

Value addition and marketing support: Under agribusiness interventions sub-component, main thrust was given to (i) dissemination of technologies and provision of advisory services; (ii) production and distribution of quality seeds and seedlings; and (iii) establishment of linkages between FIGs and suppliers for processing and marketing of off-season vegetables and high value crops. Formation of FIGs was introduced to facilitate the production, processing and marketing of high value crops. Six specialized agencies (Divisional Support Agencies for Agribusiness) were hired under the Project to provide support for value addition, marketing and to develop forward and backward linkages. Till March 2012 about 41,474 ton vegetables and value added products had been marketed from the project area. Total turnover through this activity was reported to the tune of about Rs.48.69 crores. For the value addition of the produce 19 processing centres' were established in the project area.

Pine Briquetting: Pine forests are spread over throughout the Middle Himalayas. Pine needles are locally used for cattle bedding. The project demonstrated pine needle briquetting as alternate fuel for the local community. About 85% of the rural households are engaged in the collection of fuel wood. In each household annual consumption of fuel wood is 2.7 MT collection which requires 183 women labor days. 260 Pine needle briquette making facilities (machines) have been installed. 8,020 household of 337 revenue villages are benefitted by this program. 3 to 3.5 kg needles are required for each kilogram of briquette and about 40 kg briquettes per hour can be produced. The response from womenfolk is quite encouraging, as the frequency to visit forest for firewood has been significantly reduced and they can now spend more time in the household on other less manually demanding chores.

Income generating activities for vulnerable groups: The objective of vulnerable group fund was to enhance social equity in villages through the project and further assist those who either get left out or receive very little benefit from watershed development activities. Until March 2012, a total 754 vulnerable groups and 3,819 vulnerable individuals received grant for other livelihood investments (e.g., goat breed improvement and rearing, etc). A total of 8,819 vulnerable members (4,499 male and 4,320 female members) were benefitted by this program. The total fund disbursed for vulnerable activities is INR 85,383,228. This fund was allotted to 49% female and 51% male members.

3. Institutional Strengthening

Capacity building of Gram Panchayats and local community institutions: Capacity building of all the community based institutions was carried out in different aspects regularly throughout the project. The project also formulated the withdrawal plans for each GP. A copy of each of the management plan was provided to the RVC chairperson, Gram Pradhan, Block Pramukh, ZilaPanchayat President, Deputy Project Director, Project Director and Directorate. This would aid in developing coordination and convergence with other programmes.

Information, Education and Communication: IEC activities were undertaken for informing and shaping opinions within the community as regards participatory watershed

development and their roles in decision making, planning and management of project activities, transparency and accountability, dissemination of technical know-how and documentation of best practices.

All forms of media from the verbal to the visual were used. Wall paintings, writings, flyers, boards, puppet shows, folk theatre and audio visual shows were undertaken at GP level. Video GramyaDarpan (six monthly Video newsletter)–'GRAMYA DARPAN', GramyaDarpan (quarterly newsletter), HamaraAkhbar (Community newspaper), Thematic short Films were also produced on various interventions in the project.

Project Management and Information Management Monitoring and Evaluation (IMME): Monitoring Arrangements: Internal Monitoring: The progress of annual works plan was monitored on monthly basis through monthly progress report (MPR) generated at the divisional level and consolidated at WMD level.

External Monitoring (Baseline, MTR and Final Impact Assessment consultancy): The Energy and Resources Institute (TERI) New Delhi was the External M&E Consultant for Baseline, MTR and Final Impact Assessment consultancy for UDWDP.

Participatory Monitoring and Evaluation (PME): PME was introduced in project not only to gauge the performance of the project but, more importantly to make timely improvement in the working of all stakeholders. PME exercise was done on six monthly basis on the basis of nine broad objectives, i.e., Awareness, Inclusiveness and equity, Transparency and accountability, Financial management, Performance of committees and Group, Inputs by Multi disciplinary team, Grievance redress and Execution of withdrawal Strategy. The PME performed as a progress measuring and community feedback assessment tool.

The Final Impact Assessment (report of TERI study):

Improving the productive potential of natural of natural resources

- The productivity and irrigated area under almost all key crops show an increase. The increase in area (21%) and value (27%) are significantly higher than the target values. The key reasons for such increase are the increased availability of water (amounts and flows throughout the year) due to SLEM soil and water conservation activities.
- Poly houses and poly tunnels have been a major contributing factor to the growth of offseason vegetables.
- Wherever processing centers have been established, post harvesting operations have been successfully adopted in the grading and packing of vegetables, spices, pulses etc. Commercial packing with different trade names proved to be attractive for sale of these products in local markets, fairs and even in the outside market.
- Agribusiness ventures have been successful in several places and there exist several innovative cases. The agribusiness activity in Garsain deserves particular mention on account of its innovative arrangement of 'reverse profit'.

- The number of livestock belonging to improved breeds shows a notable increase. Members of Vulnerable Groups have been major beneficiaries. On the whole, there have been 19% and 191% increases in the holdings of improved breed cows and buffaloes respectively in the sampled GPs.
- There has been an overall 9.6 % increase in fodder availability over the baseline. The average fodder production ranged between 0.5 -5.67 q/ha/year across different land uses. The highest percentage change (24.18%) in availability of fodder was recorded for irrigated agriculture land suggesting that farmers in the project area have been motivated to grow fodder crops / trees on the bunds / risers of their agriculture resulting in increase in fodder availability.
- The percentage change in household dependency for fodder and grasses from private agricultural/barren land/other land is the highest (13%), while dependency on fodder from forests and feed purchased from market have declined by 8% and 5% respectively. On an average, there has been an 11% reduction in time spent on collecting fodder by a household.
- It was observed that the biomass of the treated areas has increased by 9.37% from 2004-05 to 2011-12 (across treated micro watersheds). These changes were on account of increase in vegetation cover due to new plantations under the project and natural regeneration of grasses, shrubs and tree seedlings because of the protection against grazing and over usage. The average survival percentage within the surveyed sites was around 45% in a range of 23% to 85%.
- The impact of soil and water conservation measures is seen in terms of increased amount of irrigated land (increase of 24.7%), an increase in crop yields and an increase in access to domestic water.
- The time spent in collecting water has significantly reduced with a sharp increase (48%) in the number of households taking < 1 hour to collect water and a similar decrease (39%) in the number of households taking between 1-2 hours.
- In terms of efficacy of impacts, it is seen that turbidity levels during monsoon months have reduced significantly in the case of successful catchment treatments.

Increase in incomes of rural inhabitants

- The total increase in income across all categories is 57%, but increase in farm income is overall higher (61.1%) than non-farm incomes (56.6%). The total increase in income of 57% translates to a real income increase of 17% when adjusted for inflation using the Consumer Price Index (CPI) for rural laborers, using agricultural year average values, and accounting for the impact of non-project interventions. There is almost a doubling in the ownership of consumer durables, indicating a general increase in living standards.
- The economic analysis of the project includes benefits from agriculture, livestock, horticulture, forestry, soil conservation, domestic water and employment. Following the approach used in the PAD, aggregate level economic analysis has been done. The Benefit Cost Ratio (r=8%, t=10 years) works out to 2.63 including the employment benefits. The Economic Rate of Return is estimated at 18.5%.
- Economic analysis has also been done for selected interventions as well as for selected IGAs. Irrigation channels and irrigation tanks return BCR values of 1.36 and

1.54 respectively over a 10 year horizon, indicating their economic viability even in the medium run.

- Participation in Gram Sabha and Gram Panchayat meetings show a sharp increase. For example, the attendance percentage in Gram Sabha meetings has doubled and the attendance percentage of women in Gram Sabha meetings has increased fivefold. The average number of GP meetings has increased from 5.28 in a year to 11.14 in a year.
- The assessment also points towards a high degree of transparency in various project processes. An average of 78.96% of total households in a Gram Panchayat has been involved in the preparation of GPWDP. An average of 48.7% of the community members was aware of GP budget and expenditure and 91% of households were aware of project objectives, activities and methodologies.
- Though the initial response to the process of FIG formation was low, as the produce of off-season vegetables and cash crops increased and farmers started selling the surplus, the response picked up and helped establish the necessary market linkages.
- The level of transparency in the project has been quite high largely on account of different levels of auditing (CA, internal and CAG) and regular Participatory Monitoring and Evaluation (PME).
- Most of the interventions undertaken under the agriculture and horticulture component have strong potential of sustainability. For instance, minikits have been effectively utilized by almost all the farmers and wherever the productivity has substantially increased, the farmers have retained the seeds to be used for the next agriculture season.
- The soil conservation structures that withstood the heavy rainfall in 2010 and 2011 have served their purpose to a large extent, and the formation of UGs for maintenance of these structures is a step towards ensuring post-project sustainability.
- In case of plantations, most of the activities have been taken up in Van Panchayats, managed by Van Panchayat committees with strict codes of conduct and usufruct sharing. It could be expected that these institutions would ensure adequate upkeep of the plantations.

PROJECT LESSONS LEARNED: The learning's from the project were as follows:

- **Partnering with NGOs** for social mobilization, project implementation and support for Agribusiness was a successful initiative in the project. The human resource development by the project would be useful for central sponsored Integrated Watershed Management Program as well as for follow on projects. Such experience would also be replicated in other community-based programs.
- **Involvement of Women Social Mobilization Workers:** In the project a number of facilitators for a cluster of Gram Panchayats and village motivators at the village level were engaged. These village motivators and facilitators visited villages, assisted in PRA and organized women along with other stake holders into groups. These village motivators would prove to be resource persons for other programs.
- **Women Aam Sabha:** These Sabhas served as a platform for women to bring up issues of concern, identifying needs and redressing grievances. Women Aam Sabhas were held prior to finalization of Gram Panchayat plans to identify and prioritize

issues impacting the women locally. It helped in addressing gender issues in a transparent way.

- **Involvement of Women in Governance:** Woman Ward member was made a co-signatory with the Gram Pradhan for the operation of the dedicated watershed account of the project.
- **Livelihood Interventions:** The project was designed to target all the rural inhabitants of the project area thus sharing the benefits of the project. The poorest and the most vulnerable sections of the community were addressed through the support of vulnerable group fund.
- **Participatory Monitoring and Evaluation (PME)** were carried out in the project as a social audit process. PME proved to be an important feedback and learning mechanism for the community in the project area.
- **Pine briquetting:** The project introduced pine briquetting as a pioneer venture to meet the objective of reducing drudgery of women and forest fires. The pine briquette was also an income generating activity where the user groups could sell the briquettes in the village and in the nearby market.
- **Cost Sharing**: To ensure sustainability of activities that enhance productivity and incomes of the rural population, the project laid emphasis on sharing of costs by the individual beneficiaries, for this the cost sharing norms were clearly defined.
- **Enhancing the capacity of the GPs:** To ensure proper, effective and efficient management of the project funds the project funded for the appointment of Account Assistant in each Gram Panchayat. This Account Assistant was generally a local of the village having knowledge in accounting procedures. This experience would benefit to other Govt. programs such as MNEREGS, IWMP etc.
- **Sustainability through User Groups:** In the project for future sustenance and O&M of common assets user groups were formed. In the project user groups were especially for water based structures such as irrigation tanks, roof rain water harvesting tanks, irrigation channels/guls, naula and ponds. The members of user groups conducted regular meetings and generated fund for operation and maintenance of created common assets. The funds were collected on monthly basis or on crop basis depending on the rules and regulations of that particular user group.

BORROWER'S PERFORMANCE

Government of Uttarakhand- The performance of Govt. of Uttarakhand (GoUK) was highly satisfactory. GoUK extended full support to the project right through preparation, implementation to closure. The release of the counterpart funds was timely and adequate. The policy support as and when required was provided for. The continuity of staff both administrative and technical was maintained throughout the project with few exceptions towards the end. The GoUK allowed WMD substantial flexibility and authority for implementing the project activities.

Implementation Agency - The Watershed Management Directorate was the implementing agency for the project and the performance is rated as highly satisfactory. The project could be launched well in time due to timely preparedness and completion of pre-project activities. The financial targets for the original project were completely

achieved and the utilization of additional financing was also highly satisfactory. The highly satisfactory implementation of the project resulted in obtaining co-financing under GEF. All the activities envisages under the three sub components of the project were initiated and successfully completed. The project design and implementation arrangements were widely accepted by all the stakeholders and no major conflict related to implementation was reported. The project largely achieved/ exceeded outcome result indicators under various components.

The implementing agencies at all the levels reflected enormous commitment in achieving the project outputs and goals. Implementation of the project through the Gram Panchayat, the lowest administrative unit under the Panchayat Raj Institution and introduction of women ward member as a co signatory at WWMC level was a successful experience which is being mainstreamed in to the Integrated Watershed Management Program (IWMP) a CSS of Govt. India. The NGOs as project implementation agencies, social mobilizers and as supporting agencies for various interventions played key role in project implementation. The Financial management systems put in place at the community level were also satisfactory, as the annual Gram Panchayat audit reports were satisfactory. The concept of implementing the project through the Environment and Social guidelines helped mitigate any negative impacts of the project. The Project introduced the concept of women Aam Sabha and participatory monitoring and evaluation (PME) which ensured social equity, transparency and accountability at the village level. To ensure sustainability user groups and withdrawal plans were put in place. Through this project farmers were organized into farmer interest groups and farmer federations so that strong and sustainable forward and backward linkages could be developed and they started viewing agriculture as a viable business option.

BANK'S PERFORMANCE

Lending – Bank's performance is rated as satisfactory. The project preparation ensured adequate consultations with borrowers and other stakeholders. The preparation mission gave a lot of support in finalizing the projects objective, components and implementation arrangements. The subsequent missions were also of great help in prioritizing the activities, finalizing the various operations manuals and the institutions arrangements for implementation. The project design provided for a lot of flexibility, which allowed location specific interventions and some very good results were achieved. The PDO indicator and log frame were inadequately formulated and hence could not completely capture the project impact and outcomes.

Supervision-The Bank's performance is rated as satisfactory. Though in the initial phase there was a change in the team leaders but the task team more or less remained the same. There was a continued focus on social, equity, participatory, environmental, agriculture, financial and procurement issues by the Bank team. Any issues raised by the project regarding implementation, management and sustainability were effectively and efficiently addressed by the Bank team. The Bank fielded 11 missions, one MTR mission and supportive missions. The six monthly supervision mission's field visits and Aide-memoires provided guidance and suggestions to the implementing agency towards

achieving the project objectives and outputs. The MTR mission was very supportive and appreciative of the project team's view point and agreed to the changes sought in the result framework and allocation. Bank also highlighted the critical issues in meetings with the Chief Secretary, Forest and Rural Development Commissioner and Secretary Watershed, Govt. of Uttarakhand as well as in the Annual Portfolio Reviews with the Department of Economic Affairs, Govt. of India and Govt. of Uttarakhand.

II. Summary of SLEM Government ICR

The Government of Uttarakhand through the Watershed Management Directorate (WMD) has received a grant from Global Environment Facility (GEF) Trust Fund for 7.49 million US$ for implementing the project on **Sustainable Land, Water And Biodiversity Conservation and Management For Improved Livelihood In Uttarakhand Watershed Sector (SLEM).** This project is an additional financing to the World Bank aided Uttarakhand Decentralized Watershed Development Project (UDWDP) which was implemented from 2006 to 2012 in 76 MWS covering 468 Gram Panchayat in 11 hilly district of the State at a project cost of 106.89 Million US$ (consisting of 75.44 million US$ IDA financing, 21.99 million US$ state govt. share and 9.46 million US$ beneficiary share).

The global environment objective (GEO) is : ***To restore and sustain ecosystem functions and biodiversity while simultaneously enhancing income and livelihood functions, and generating lessons learned in these respects that can be up-scaled and mainstreamed at state and national levels.***

The GEF additional financing has been utilized for sustainable bio-diversity management, land and water source protection and creation of sustainable livelihoods through community participation. The Project specifically aims at assisting the vulnerable regions to cope with the projected impacts of climate change.

Out of the 76 micro-watersheds covered in the parent project (Gramya I), the SLEM Project was implemented in 20 selected MWS covering 60,823 ha in 126 GPs in the middle Himalayan region between 700-2000 m in the hill districts of Rudraprayag, Bageshwar, Uttarkashi (Chinyalisaur), and Nainital. About 74,000 population has benefited from project interventions. Micro-watersheds included in this project were identified based upon the severity of erosion, poverty and lack of infrastructure facilities.

PROJECT COMPONENTS

1. Watershed planning through community participation.
2. Controlling land degradation through the SLEM approach at watershed level.
3. Reduce pressure and dependence on the natural resource base through Fostering markets for NTFP
4. Enhance Bio-diversity conservation & management through watershed planning & community participation.
5. Improve adaptation to climate change in natural resource based production systems.

6. Documentation of best (worst) practices to share them within the state as well as through the SLEM Partnership.
7. Information Management and Monitoring Evaluation
8. Project Management and capacity building of project staff

FINANCIAL PROGRESS

Till closure of project in August 2013, an expenditure of INR 3760 hundred thousand has been incurred. The final reimbursement received till the closure of project is 7.49 million US$.

FOCUS AREAS AND COMMUNITY PARTICIPATION

The conservation and sustainable use of biodiversity and poverty eradication are two of the major global challenges of our time. Our watersheds are repositories of rich biodiversity and support a variety of forest eco systems. Further watersheds in general and hilly areas in particular, constitute a major source of livelihood and income for people living in and around them. Over the years, these watersheds have become degraded due to increased anthropogenic interventions which are seriously impacting the sustenance of people living in these watersheds.

The parent project Gramya I focused on improving the productive potential of natural resources and increasing incomes of rural inhabitants in selected watersheds through socially inclusive, institutionally and environmentally sustainable approaches. Participatory planning resulted in the formulation of Gram Panchayat watershed development plans (GPWDP) at the GP level. The GPWDP comprised of activities prioritized by the community for soil conservation works on arable & non arable land, drainage line treatment, afforestation, improving irrigation facilities and improved horticulture and agriculture practices in the Gram Panchayat area only. The inter GP areas which are the reserve forest areas under control of forest department could not be taken up for treatment works for water source sustainability, drainage line treatment, water recharge, plantation and other such interventions. As an additional financing the SLEM project was implemented in the selected 20 MWS of Gramya I. The focus of the SLEM project was on biodiversity conservation through land and water source protection, sustainable livelihood development, use of alternative energy resources and capacity building of communities on biodiversity issues through demonstration, documentation and dissemination of good practices. The SLEM project followed an integrated approach to watershed management where by all the GPWDPs were integrated at the MWS level. MWS level watershed development plans where formulated in which interventions were proposed by the community for both inter GP areas (RF) and GP areas. With a focus on biodiversity conservation, the community with the technical and social facilitation of project team carried out soil conservation works on arable & non arable land, drainage line treatment, afforestation, assisted natural regeneration, fire management, water recharge and harvesting activities and water source sustainability works. The project also successfully promoted the use of alternative energy through Pine Briquette, Bio gas, Solar energy. Special emphasis

was placed on capacity development of community on bio diversity issues, land and water source protection and livelihood issues through a dedicated capacity building program.

Community participation in all project intervention was achieved through Gram Panchayat (GP), revenue village committee (RVC), Van Panchayat (VP), Self-help groups (SHG) and user groups. In addition to above, the project has been successful in bringing about policy change in the paradigm of forest management in the state whereby the Van Panchayat which are the oldest people's institution involved in local management of natural resources have been authorized by the State Govt. (Vide GO Dated 2nd December, 2009) to treat the reserve forest area, under any project, within a prescribed plan, so that the holistic treatment of any micro watershed can be achieved.

PROJECT ACHIEVEMENT

- 20 Micro Watershed plans were finalized and implemented through community participation with the technical and social facilitation by the project team.
- Under forestry activity 830 ha. of afforestation (in civil and reserve forest area) has been carried out.
- Assisted Natural Regeneration (ANR) of oak has been done in 115 ha of natural forest.
- Under drainage line treatment and soil conservation activities, 50,875.50 cum crate wire check dams, 21,569.66 cum dry stone check dams, 91,711 construction of contour bunds and trenches, 22,613.05 cum river bank protection works, retaining wall 12,819.2 cum, road side erosion control work of 4,682.44 cum and 10,755.1 m diversion drain have been constructed.
- Under water recharge and harvesting activities, 318village ponds, 125 roof water harvesting tanks have been constructed and 423 water sources have been treated. About 1,087 water recharge pits (rainfall runoff capture and infiltration ponds)and 18 irrigation tanks with delivery systems have been constructed.
- Forest fire management works have been done in 186.9 ha in RF areas.
- 17 decentralized forest and 19 MAP nurseries have been raised.
- 203 Pine Briquette making machines have been demonstrated and regular briquette productions have begun.
- 4,984 Pine Briquette stoves have been distributed to the Villagers.
- 3,378 solar lanterns have been distributed and 190 solar street lights have been installed.
- 66 biogas plants have been installed.
- 179 Farmer Interest Groups (FIGs) have been formed for cultivation of medicinal and aromatic plants such as Aloe vera, Large cardamom, Satavar, Sarpgandha, Anwala, Stevia, Rosemary, Turmeric, Ginger, Lemon grass, Chamomile etc.
- 581.5 ha have been planted with medicinal and aromatic plants the Farmer Groups.
- 247poly houses have been installed for protective cultivation.
- Under capacity building 3038 staff members, 28,171 SHGs / User Groups/ Farmer Groups members, have participated in training and workshops.

- Internal Audit for the years 2009-10, 2010-11, and 2011-12 has been completed & Annual Financial statement submitted to World Bank and DEA (Govt. of India). Internal Audit for year 2012-13 upto second quarter has been completed.
- AG Audit for the year 2009-10, 2010-11 and 2012-13 has been done and audit report submitted to World Bank and DEA (Govt. of India).

MONITORING AND EVALUATION

Baseline survey and impact assessment of the project was conducted by The Energy and Resources Institute (TERI) New Delhi. Participatory Monitoring and Evaluation (PME) was carried out in all project GPs by a GP level PME team representing all stake holders.

IMPACT ASSESSMENT BY TERI - HIGHLIGHTS

- Use of a truly participatory approach from planning to implementation stage has been a hallmark of the project.
- About 21% of eligible area under the selected MWS has been brought under SLEM techniques involving soil moisture conservation works, drainage line treatment works, afforestation, medicinal and aromatic plant cultivation, water augmentation and water source sustainability works.
- 82.34% of households spend less than 1 hour to access water in dry season as against 68.37% at the start of the project.
- 7% increase in house hold income in real terms due to promotion of livelihood activities
- Reduction of fuel wood dependence on forest has been a major impact largely on account of promotion of alternative energy sources such as pine briquettes, biogas and solar energy devices. About 19% of households have partially shifted to alternated energy use viz pine briquettes, biogas and solar energy.
- 31% of SHGs making pine briquettes are marketing them and earning incomes.
- Increase in bio mass production due to afforestation activities
- The revival of traditional water mills (Gharat) has also been a major success and has yielded high economic return.
- Capacities of local level institutions viz GP, VP, RVC, SHG and User groups have been strengthened due to their participation from the planning stage to O&M.
- State Govt. initiative in authorizing Van panchayat as work agency in reserve forest area through govt. order is a progressive step toward involvement of community institutions in natural resources management.

PROJECT LESSONS LEARNED

- SLEM project focused on biodiversity conservation and sustaining of ecosystem functions while simultaneously enhancing livelihood opportunities for the rural inhabitants. All project interventions directly and indirectly resulted in conservation of biodiversity at the MWS level in the project area.
- Watershed development planning with community participation was done at the MWS level and interventions were proposed by the community for both inter GP

areas (RF) and GP areas. This integrated approach has resulted in comprehensive watershed treatment at the MWS level. The MWS plans also provide for convergence with other departments at the MWS level.

- Involvement of community institutions such as Van panchayat and Biodiversity groups constituted under Biodiversity act 2002 in natural resources management activities at the local level is a progressive step resulting in greater ownership at the community level.
- Drying up of the traditional water sources such as Naula, Dhara is a major concern in the state of Uttarakhand with some of the areas facing drought conditions in summer months. SLEM project focused on improving water source sustainability in MWS areas where the discharge in the traditional water sources had been reduced or had dried up. About 423 such sources were treated and water availability was improved. Interventions for waters source sustainability should be an important component related to land development in the hill state in future projects.
- Decentralized approach to watershed management with the local institutions as *de facto* planners and implementers resulted in greater ownership of project at local level.
- Capacity development of Gram panchayat and other local institutions (viz RVC, User Groups, SHGs, Van panchayat) has resulted in strengthening of these institutions vis a vis administrative capacity, financial working and skill development. This has resulted in improvement in governance.
- The project had a definite focus on women related issues. SLEM project provided mandatory 50% representation of women in project committees, separate Mahila Aam Sabha for integrating women concerns in MWS plans, women ward member as cosignatory for operating project account, drudgery reducing interventions, local level employment generation and financial assistance for taking up income generating activity. All these interventions have led to capacity building of women in the project area.
- SLEM project successfully promoted the use of alternative energy fuels like pine needle briquettes, biogas and solar cookers. This has resulted in reducing dependence on forest based fuel wood to some extent. Due to high adoption rate, these activities can be scaled up in future projects.
- Pine briquetting can become a major livelihood activity with an efficient marketing system. The marketing system should be strengthened to attract enough people to scale up pine briquette production as a viable IGA.
- Project has resulted in the revival of traditional water mills (Gharat) which has been a major success and has also yielded high economic return. Convergence with the state agency for renewable energy development (UREDA) was successful in conversion of traditional Gharats for micro hydro electricity production at the village level which has helped in rural electrification and reduced GHG emissions via substitution of diesel and fuel wood .
- Uttarakhand has tremendous potential for cultivation of medicinal and aromatic plants while simultaneously contributing to the conservation of wild germ plasm of these plants that had been depleted in recent years by predatory harvesting practices. Cultivation and marketing of medicinal and aromatic plants (MAP) was promoted in the project through package of practices, marketing support and linkage with State

Medicinal Plant Board (SMPB). All these interventions will go a long way in enabling the MAP growers and FIGs to get technical support, extension facilities, quality planting material and viable market linkages.

- Under the SLEM project, the importance of post project sustainability of project interventions was duly recognized and the sustainability issues were addressed right from the project conceptualization and design stage to project implementation at field level. The state government order vide letter no. 251/XIII (II)/2011-31(05)/2011 dated 08 Dec. 2011 regarding the utilization and maintenance of the various assets created during the project period has resulted in convergence with line departments for Operation and maintenance of assets.

Annex 7. Comments of Cofinanciers and Other Partners/Stakeholders

Comments - State of Uttarakhand/ WMD:

1. The hill state of Uttarakhand is prone to natural disasters like- flash floods, landslides, cloud bursts etc. which leads to soil erosion, loss of productive land and availability of water. There is a need to continuously address the issues of sustainable management of the eco-system and livelihood of the local inhabitants. In the above perspective, projects like Uttarakhand Decentralized Watershed Development Project-1 and GEF funded SLEM project have proved to be a boon for the sustainable management of natural resources and inhabitants of the project areas. The implementation strategies and decentralized approach in which community is involved and sensitized to plan, implement and manage the project assets built the administrative and financial management capacity with social accountability of the community and PRIs. Initiatives at integrating gender issues in project implementation and management through involvement of female social workers, women specific Aam Sabhas, mandatory 50% participation of the women and focus on livelihood issues addressed inclusiveness and equity issues in the project.

2. The Borrower i.e. the state government also proactively contributed to successful and smooth functioning of the project by issuing government orders for the decentralized and participatory approach in the management of the state owned reserve forests.

3. With the objective of ensuring the sustainable maintenance and operation of the community assets created in the project the state issued govt. orders for the sustenance of all these community assets through various government programmes.

4. The implementation agency i.e. the Watershed Development Department (WDD) through its multidisciplinary approach wherein the issues of participation, sensitization, orientation and social mobilization of the communities were addressed with the support of various field based NGOs, the panorama of issues related to watershed management were dealt by project staff of various disciplines like forestry, agriculture, horticulture, animal husbandry, minor irrigation, alternate energy etc.

5. The objective of promoting and assuring agriculture as a viable business option in the project was a success. The project engaged NGOs as divisional support agencies in the project areas for this purpose. Sustainable livelihood options for the landless and the poor were also provided for in the project. The implementation agency i.e. the WDD also took an initiative of partnering with NGOs as implementation agency in two project areas. The results were satisfactory and will be continued in the up-coming UDWDP Phase-II project.

6. The ridge to valley concept of treatment of micro watersheds was piloted in the SLEM project with preparation of comprehensive MWS treatment plans. This scientific, technical, and community need based approach will be up-scaled in the UDWDP Phase-II project. The sustainable and judicious management of water resources is a key to ensuring sustainability of the fragile eco-system.

7. Participatory monitoring and evaluation as a mechanism of social audit and grievance redressal emerged as best practices and helped in ensuring greater transparency and accountability in project implementation.

8. The UDWDP phase-I and SLEM project achieved most of the project development objectives and it proved to be a platform for introducing various new initiatives like involving Van Panchayats for treatment of watershed in reserve forest areas, gram panchayats as PIAs at the gram panchayat level, financial autonomy to the community, greater participation of women, involvement of NGOs at various level of project implementation, capacity development of local institutions, focus on increasing productivity in rain-fed agriculture areas, revival of traditional water sources and water mills (Gharats) and promotion of alternative energy sources like pine briquetting, bio-gas and solar energy devices to address climate change issues, government order for sustainability and convergence arrangements with line department for future O&M. The satisfactory completion of these projects was widely acclaimed at various levels and was instrumental in getting the second phase of Uttarakhand Decentralized Watershed Development Project and a participatory watershed development component in the IFAD funded Integrated Livelihood Support Project (ILSP).

9. The Bank supported the project management team through their regular supervision, appraisal and technical missions throughout the project period.

Comments – Global Environment Facility Secretariat, GEF:

10. From the 12 to the 25 of November, 2013, a team from the Global Environment Facility (GEF) Secretariat undertook a learning mission to the India Sustainable Land and Ecosystem Management Country Partnership Program (SLEM-CPP). The team was composed of Mohamed Bakarr (Coordinator for the Land Degradation Focal Area), Jean-Marc Sinnassamy (Program Manager, Land and Forests), Andrew Chilombo (Program Associate, Land and Forests), Patrizia Cocca (Communications and Knowledge Management), and Omid Parhizkar (Results-Based Management). The mission was jointly organized with the World Bank as lead GEF Agency for the program and with full support of the Ministry of Environment and Forests and State Government Agencies involved in the Program.

11. The considered project, "Sustainable Land Water and Biodiversity Conservation and Management for Improved Livelihoods in Uttarakhand Watershed Sector" (Uttarakhand-SLEM), was one of the six projects financed by the GEF in India as part of a programmatic approach developed at national level – the **Sustainable Land and Ecosystem Management Country Partnership Program** (SLEM-CPP). This project was financed under three main strategic objectives related to land degradation, biodiversity, and climate change adaptation[39].

[39] These objectives were: Land Degradation Strategic Objective 2 that supports sustainable forest management in production landscapes; Biodiversity Strategic Objective 4 that strengthens the policy and

12. This Uttarakhand-SLEM project provided an important learning opportunity **to highlight the added value of the GEF in generating global environmental benefits, its catalytic effect,** and how GEF resources are programmed to complement development-focused projects such as the Gramya I. The World Bank financed projects on decentralization and agriculture with the Rural Water and Sanitation Project and the Diversified Agriculture Support Project prepared the context for the Uttarakhand-SLEM project. The baseline scenario was provided by the Gramya I (US$70 million) supporting 75 watersheds and additional government contribution (around US$22 million). The GEF support of $7.49 million focused on 20 sub-watersheds, demonstrating an incremental reasoning by linking development priorities to global environmental benefits. Additionally, the project employed an **integrated ecosystem management approach** with climate change adaptation as an entry point, and involved local stakeholders and local communities as beneficiaries. The GEF catalytic role was reflected in specific activities related to the protection and management of agro-ecosystem services such as surface water harvesting, groundwater recharge, forest landscape restoration and management. Lastly, interventions were defined through participatory processes and were **multidisciplinary**, targeting drivers of ecosystem degradation. The diversity of interventions reflected the dependence of livelihoods with the quality of natural resources and inspired opportunities for the GEF to support local livelihoods while generating global environmental benefits.

13. The **leadership** of the State government, the Watershed Management Directorate, and the local stakeholders were a cornerstone in the reinforcement of capacities in the Gramya I and Uttarakhand-SLEM Project. Noteworthy also during the learning mission were best practices related to capacity development: the secondments of staff from line departments to the watershed authorities created a favorable environment for multidisciplinarity and integrated decisions. Gender issues were seriously considered from various angles: including women in decision-making processes and equity concerns, highlighting women's specific roles and activities, as well as social mobilization. Lastly, the Uttarakhand-SLEM project used various participatory approaches for planning, implementation and monitoring. The project empowered traditional authorities to manage forest reserves, engaged NGOs on some project sub-components, and empowered local stakeholder groups, especially women.

14. From a GEF perspective, the project has demonstrated great potential to generate multiple global environment benefits and increase the sustainability and resilience of agro-ecosystems. The activities undertaken in the project are related to land rehabilitation, forest management, water works recharging systems, and the uptake of alternative energies. Given the variability of ecosystems in the catchment area and the project life span, **the monitoring and quantification of generated global environmental benefits remains challenging**. However, it is hoped that future

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regulatory framework for mainstreaming biodiversity; and the Climate Change Strategic Program for Adaptation.

investments in the region will take into account this challenge for improvement and innovation.

15. **Sustainability of interventions** was recognized and addressed right from the project conceptualization and design stage to project implementation at field level. Knowledge sharing, documentation, and communication were important attributes of the project approach, providing the foundation for sustainability, increased awareness and potential of scaling-up integrated ecosystem management at state as well as national levels. Coupled with the satisfactory completion of the Uttarakhand-SLEM project and the success of the approach, conditions are gathered for another phase of Decentralized Watershed Development in Uttarakhand.

Annex 8. List of Supporting Documents

1. Project Appraisal Document (PAD)
2. SLEM Project Paper
3. Additional Financing Project Paper
4. Aide Memoires and ISRs following supervision missions
5. Management Letters
6. India Country Assistance Strategy (CAS) FY2001-04, FY05-08 and FY09-12
7. India Country Partnership Strategy (CPS) FY2013-2017
8. Operation Manual
9. Financial Management Manual
10. Study of Accounting and Accountability Arrangements in PRIs in Uttaranchal, February 2004
11. Community Procurement Manual, February 2004
12. Capacity Building Strategy, February 2004
13. Income Generation Activity Strategy for Vulnerable Groups, February 2004
14. Environmental and Social Management Framework (ESMF), February 2004
15. Integrated Pest Management Strategy, February 2004
16. Integrated Livestock Pest Management Strategy, February 2004
17. Transhumant Action Plan, February 2004
18. Communication Strategy, February 2004
19. Participatory Monitoring and Evaluation (PME) Action Plan, August 2006
20. WMD Progress Reports
21. GoUK, Perspective and Strategic Plan 2009-2027 (2009)
22. Institute of Himalayan Environmental Research and Education (INHERE), "Conflict and Conflict Management in a Community Based Project", 2010
23. The Energy and Resources Institute (TERI), "Baseline Survey Report of 20% sampled GPson Uttarakhand Decentralized WatershedDevelopment Project (UDWDP) – ConsultancyServices for Baseline Survey and Mid-TermImpact Assessment", March 2008
24. TERI, "Mid Term Impact Assessment of Uttarakhand Decentralized Watershed Development Project", November 2008
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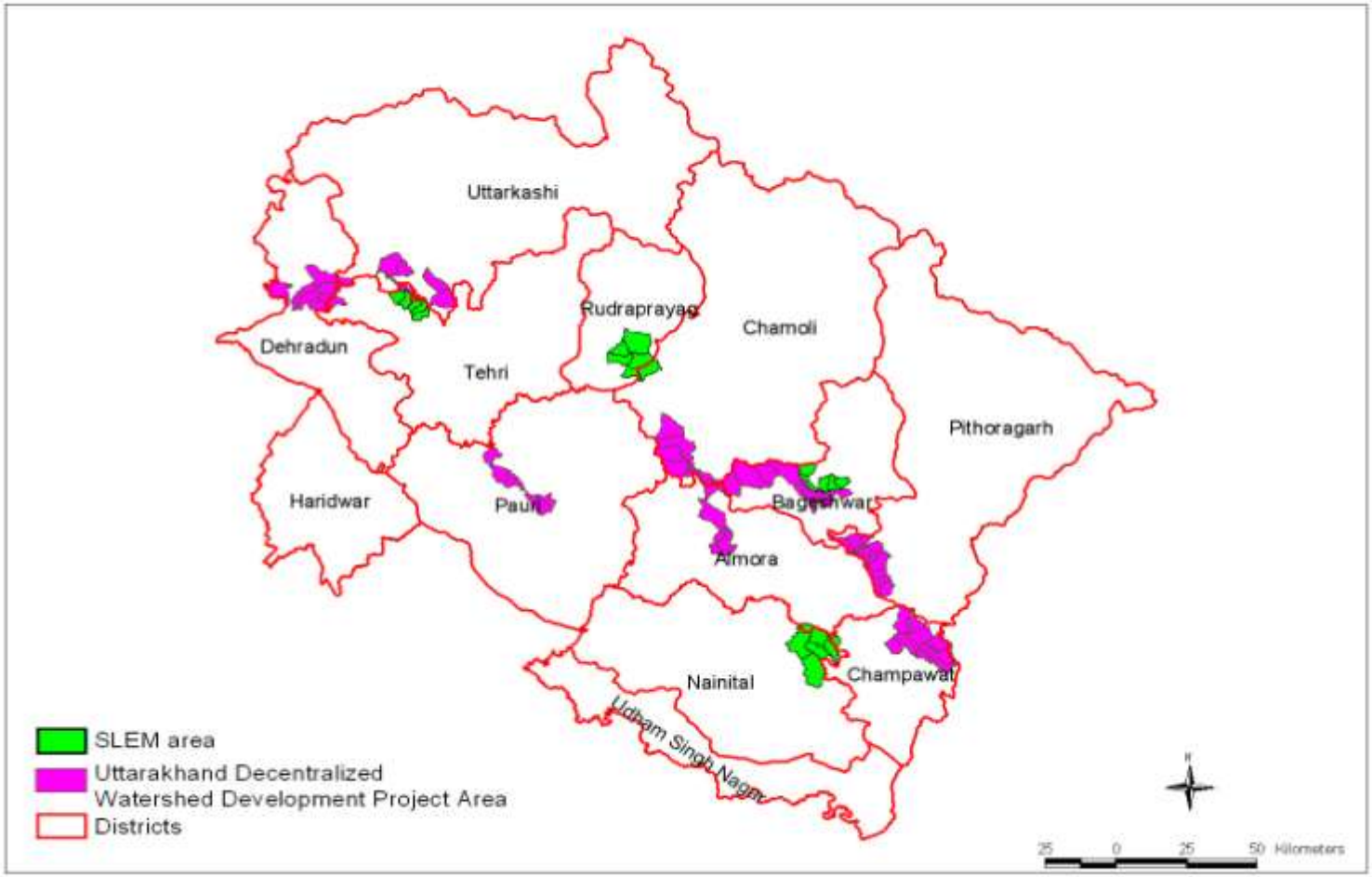
MAP


Uttarkashi
Rudraprayag
Chamoli
Dehradun
Tehri
Pithoragarh
Haridwar
Pauri
Bageshwar
Almora
Nainital
Champawat
Udham Singh Nagar
SLEM area
Uttarakhand Decentralized
Watershed Development Project Area
Districts
N
25 0 25 50 Kilometers