

Document of
The World Bank

Report No: 34384

IMPLEMENTATION COMPLETION REPORT
(SCL-44920 IDA-32430)

ON A

CREDIT

IN THE AMOUNT OF SDR 36.9 MILLION (ORIGINALLY US\$50 MILLION EQUIVALENT)

AND A

LOAN

IN THE AMOUNT OF US\$85.0 MILLION

TO

GOVERNMENT OF INDIA

FOR THE

INTEGRATED WATERSHED DEVELOPMENT (HILLS -II) PROJECT

December 23, 2005

**Agriculture and Rural Development Unit
South Asia Region**

CURRENCY EQUIVALENTS

(Exchange Rate Effective November 2005)

Currency Unit = Indian Rupees (Rs.)
Rs. 35.6 = US\$ 1
US\$ 1 = 46.5

FISCAL YEAR

April 1 to March 31

ABBREVIATIONS AND ACRONYMS

CAS	Country Assistance Strategy	NPV	Net Present Value
ERR	Economic Rate of Return	PDO	Project Development Objective
ICR	Implementation Completion Report	SCF	Standard Conversion Factor
IGA	Income Generating Activity	SHG	Self Help Group
J&K	Jammu & Kashmir	VDC	Village Development Committee
LACI	Loan Administration Change Initiative	VLI	Village Level Institutions
MTR	Mid-Term Review	WP	With Project
NRM	Natural Resource Management	WOP	Without Project

Vice President:	Praful C. Patel
Country Director	Michael F. Carter
Sector Manager	Adolfo Brizzi
Task Manager:	Daniel Sellen

INDIA
INTEGRATED WATERSHED DEVELOPMENT PROJECT

CONTENTS

	Page No.
1. Project Data	1
2. Principal Performance Ratings	1
3. Assessment of Development Objective and Design, and of Quality at Entry	2
4. Achievement of Objective and Outputs	4
5. Major Factors Affecting Implementation and Outcome	7
6. Sustainability	8
7. Bank and Borrower Performance	9
8. Lessons Learned	11
9. Partner Comments	12
10. Additional Information	12
Annex 1. Key Performance Indicators/Log Frame Matrix	13
Annex 2. Project Costs and Financing	16
Annex 3. Economic Costs and Benefits	18
Annex 4. Bank Inputs	25
Annex 5. Ratings for Achievement of Objectives/Outputs of Components	28
Annex 6. Ratings of Bank and Borrower Performance	29
Annex 7. List of Supporting Documents	30
Annex 8. Comments from Ministry of Agriculture, Government of India (unedited)	31

<i>Project ID:</i> P041264	<i>Project Name:</i> INTEGRATED WATERSHED DEVELOPMENT PROJECT
<i>Team Leader:</i> Daniel M. Sellen	<i>TL Unit:</i> SASAR
<i>ICR Type:</i> Core ICR	<i>Report Date:</i> December 23, 2005

1. Project Data

Name: INTEGRATED WATERSHED DEVELOPMENT PROJECT

L/C/TF Number: SCL-44920; IDA-32430

Country/Department: INDIA

Region: South Asia Regional Office

Sector/subsector: General agriculture, fishing and forestry sector (67%); General public administration sector (16%); Other social services (11%); Roads and highways (3%); Water supply (3%)

Theme: Water resource management (P); Participation and civic engagement (P); Rural services and infrastructure (P); Other rural development (P); Rural markets (S)

KEY DATES

PCD: 07/31/1998

Effective: 09/15/1999

Revised/Actual: 09/15/1999

Appraisal: 02/01/1999

MTR: 04/23/2002

04/23/2002

Approval: 06/15/1999

Closing: 03/31/2005

09/30/2005

Borrower/Implementing Agency: GOI/Ministry of Agriculture and Governments of Haryana; GOI/Punjab; GOI/Himachal Pradesh; GOI/Uttaranchal; GOI/and Jammu & Kashmir

Other Partners:

STAFF	Current	At Appraisal
<i>Vice President:</i>	Praful C. Patel	Meiko Nishimizu
<i>Country Director:</i>	Michael F. Carter	Edwin R. Lim
<i>Sector Manager:</i>	Adolfo Brizzi	Michael Baxter
<i>Team Leader at ICR:</i>	Daniel M. Sellen	
<i>ICR Primary Author:</i>	Animesh Shrivastava (FAO/CP)	

2. Principal Performance Ratings

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HL=Highly Likely, L=Likely, UN=Unlikely, HUN=Highly Unlikely, HU=Highly Unsatisfactory, H=High, SU=Substantial, M=Modest, N=Negligible)

Outcome: S

Sustainability: L

Institutional Development Impact: SU

Bank Performance: S

Borrower Performance: S

QAG (if available)

ICR

Quality at Entry:

U

Project at Risk at Any Time: No

3. Assessment of Development Objective and Design, and of Quality at Entry

3.1 Original Objective:

The main Project Development Objective (PDO) was to improve the productive potential of the project area in the five participating states, using evolving watershed treatment technologies and community participatory approaches. An associated objective was to assist the states with institutional development and consolidate progress already made in harmonizing approaches to watershed development management among various programs in the Shivaliks (the foothills of the Himalayas). The Shivaliks constitute a contiguous region which lies within the borders of the five participating states of the Project, i.e. Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Punjab, and Haryana. Although the five states implemented the project semi-autonomously, tailoring interventions to local conditions and leaving room for innovation, the states shared identical project objectives, components, and guiding principles, and, for the greater part, project implementation experience was substantially similar across the states. For this reason, the present ICR reviews the performance of the five states in aggregate.

Assessment. The fragile natural ecology of the project area (inadequate vegetative cover, highly erodible soils, uncontrolled run-offs and soil erosion from heavy monsoon rains) is further imperiled by the livelihood pressures (deforestation, open grazing, declining soil fertility, and stresses from water shortage) of its often poor and marginalized communities. Hence any sustainable conservation strategy needs to include modification/expansion of livelihood choices and development options. By linking watershed treatment instrumentally to enhancement of productive potential, the PDO thus addressed both conservation and development issues. As such the PDO was clearly relevant to the development needs of the project area and development priorities in national plans and the Bank's Country Assistance Strategy (CAS). It strategically supported the government's Ninth Plan (1997-2002) and Tenth Plan (2003-2008) in which rural development, poverty reduction and environmental sustainability are over-arching objectives. It was also operationally aligned with Bank's CAS (1997) focus on accelerated poverty reduction through emphasis inter alia on rural development, including rain-fed agriculture, and on increased attention to environmental concerns.

The associated objective was in line with the increasing prominence accorded to institutional and policy reform in recent national Plans and CASs, and with prior project experience which emphasized the need to foster institutional arrangements to sustain and enhance investments made in watershed development.

The objectives were realistic, involving technical interventions and implementation arrangements which had been tried in earlier International Development Association (IDA) - and other-donor supported projects in the area, and drawing on skills and capacities available with concerned implementing agencies. Although multi-state because of the geographic spread of the agro-ecological area, the project was not intrinsically complex since it involved replication of a core approach with suitable local adaptations (the project often, called "Hills II" was itself a follow-on to an earlier operation). The project involved little substantive risk in terms of design or implementability of its technical interventions; implementation concerns principally related to efficacy of the participatory approach, the main innovation of the project, and of the institutional coordination required to produce a consolidated and replicable watershed management approach.

3.2 Revised Objective:

There was no revision of objectives during the course of the project. It was decided, however, to further emphasize community participation in project implementation.

3.3 Original Components:

The project had two components:

(i) Watershed Protection and Development (US\$139.2 million or 72% of base costs at Project Appraisal Document (PAD); US\$ 144.3 m or 78% of actual costs at closure): through (a) watershed treatments; (b) fodder and livestock development; and (c) rural infrastructure development

(ii) Institutional Strengthening (US\$53.8 million or 28% of base costs at PAD; US\$ 40.5 m or 22% of actual costs at closure): through support for (a) policy reforms, studies and human resource development; (b) beneficiary capacity building; (c) income generating activities for women; (d) information, management, monitoring and evaluation; and (e) project coordination.

Assessment. The two components were appropriately related to the PDOs, comprising both treatment activities to enhance soil and water conservation and support activities to address related development issues. Following an integrated approach, treatment activities were carried out on arable and non-arable land and along natural drainage lines as required. Support activities addressed production (agriculture, horticulture, livestock), complementary infrastructure (e.g., drinking water and rural roads), marketing and local institutional capacity. The design of these components successfully built on lessons from earlier projects in three areas: (i) demand-driven implementation mode – operationalized through stakeholder involvement in the choice of activities, locations and implementation modalities - which helped customize project interventions to local priorities and constraints and improve cost-efficiency; (ii) an incentive- rather than control-based Natural Resource Management (NRM) strategy – operationalized through community-based organizations sensitized to, involved in and eventually made responsible for addressing local watershed issues - which led to a more durable and sustainable system for addressing NRM concerns; and (iii) reaching out to marginalized and vulnerable groups (with particular focus on women and nomads), which increased the outreach and inclusiveness of the project within the local communities. The nature and scope of technical interventions was well within the capacity of implementing agencies, some of which had experience of previous projects of a similar nature.

3.4 Revised Components:

There was no formal revision of components at Mid-Term Review (MTR) although some reallocations across sub-components were made to bring allocations and disbursements more in line.

3.5 Quality at Entry:

Unsatisfactory. Although project design and preparation had a number of positive features, quality at entry is rated unsatisfactory because of weaknesses relating to: (i) preparedness for adequate and effective social mobilization required for the participatory mode of project implementation, which accounts partly for the slow start of the project; (ii) anticipation and resolution of challenges in ensuring effective operational coordination at the district level (required to consolidate fragmented interventions by multiple agencies - a cited reason for Bank involvement in the project), in order to implement the ridge-to-valley approach to watershed management aimed for in the PAD; (iii) framework for maintaining balance between conservation and development goals, especially when popular choice favored the latter in a demand-driven setting; and (iv) a uniform and systematic framework for evaluation of project experience and outcomes. The first weakness was overcome by diligent project and supervisory actions; still, a timely articulation of relevant strategy, processes and tools for social mobilization could have arguably reduced induction and learning time, mitigated slackness, avoided unnecessary mistakes, and introduced greater uniformity in the states' approaches. The last weakness regarding M&E persisted despite being a lesson noted in the PAD, and has compromised the ability to systematically capture and represent some innovations and achievements (about which only partial, non-uniform evidence is available).

There are, however, a number of noteworthy positive features. The project objectives were consistent with

national and state development policies and Bank CAS. They were pursued through an integrated set of components which, together, provided an appropriate mix of primary (treatment) and secondary (support) activities. The project also promoted important policy changes, especially with regard to cost-sharing with beneficiaries. These, along with the emphasis on community-centred participatory approach, have emerged as core elements of a consensual watershed management model which is increasingly being employed by the government and the wider development community.

An innovative institutional design feature was the establishment of a coordination committee to harmonize activities of Project Directorates in each of the five states. It worked well as a platform for sharing and learning, while protecting the space for experimentation and innovation within the various States. The project was in compliance with all applicable Bank safeguard policies throughout implementation.

4. Achievement of Objective and Outputs

4.1 Outcome/achievement of objective:

Satisfactory. The project interventions individually attained their specific outcomes, and thus helped in the overall realization of the main PDO. There was also a (demand-driven) change in the mix or balance between interventions with possible implications for the main PDO.

Project interventions, comprising primary (treatment) and secondary (support) activities, succeeded in enhancing the productive use of arable land and slowing down/reversing the degradation of natural environment in the contiguous areas within the watershed. In the case of arable land, these interventions - involving a mix of physical/mechanical measures, on farm-production support, improved agronomic practices and associated infrastructure investments – have led to above-expected gains in crop productivity, cropping intensity and crop diversification (see Annex 1). In the case of non-arable land, substantial land areas have been saved/reclaimed, soil run-off has been checked and perennial vegetative cover increased. However, these Annex 1 indicators capture only partially the range of outcomes. For instance, evidence on the ground, verifiable by field missions, indicate overall hydrological regeneration (better soil moisture regimes and ground water augmentation), enhanced biodiversity and ecological restoration of forests (due to increase in density and variety of plants), and substantial increase in leaf litter on the forest floor, enhancing water holding capacity and soil fertility. The data however are not available in sufficient and systematic form to permit construction of project-wide summary indicators.

Interventions in fodder and livestock development have led to significant increases in numbers of improved cows and buffaloes, increased milk productivity and greater stall feeding of animals, with consequent reduction in grazing pressure. Productive potential of the population in the project area has also been enhanced through rural infrastructure investments which have improved access to input and output markets, reduced time and drudgery associated with fetching drinking water, and supported diversification of economic activities. Again, systematic evidence for assessing full impact is not available.

Beyond the efficacy of individual interventions is the issue of appropriate mix or balance between various interventions for achieving the main PDO. Project design rightly linked conservation-oriented interventions (which enhance the natural resource base) with investments in physical infrastructure and human capital (which serve to mainly improve the efficiency with which the natural resource base is exploited). In this scheme, infrastructure investment, especially, has largely an instrumental role, relating as it does more to exploitation than regeneration of natural resources. However, as Annex 2 shows, in course of project implementation the expenditure on the infrastructure component rose – uniquely among all sub-components – from an estimated 13% to an actual 33% of project cost. The conservation-oriented sub-watershed treatment sub-component though suffered the biggest decline in cost share, with expenditure falling from an

estimated 48% of total project costs to actual 37%. These allocational changes are complex to assess. On the one hand, these changes are the result of, and testimony to, the demand-driven nature of project implementation. Equally, on the other hand, the changing component mix affects the overall efficacy of the project with regard to the main PDO. In the absence of any project-provided framework for understanding and measuring the tradeoffs involved, the extent to which achievement of the main PDO may have been dominated by immediate development needs is unclear.

With regard to the associated PDO of institutional development and harmonization of approaches to watershed development management, the picture is mixed. On the one hand, good progress has been made in mainstreaming important elements of this project (cost sharing, community participation, and empowerment) into activities of other projects and departments with the various project States. On the other, issues and challenges still remain in (i) demonstrating effective coordination with other line departments to fully implement the ridge-to-valley vision underlying this project approach (e.g., more effective partnership with forest department to treat upper catchment areas); (ii) instituting better inter-linkage of project supported village institutions with publicly representative Panchayati Raj Institutions (PRIs) to ensure legitimacy, efficacy and sustainability; and (iii) developing less transaction intensive implementation modalities which bring management and support costs to affordable levels for replication within the national programme framework.

4.2 Outputs by components:

The overall rating is **Satisfactory**, based on the following assessments for the components:

4.2.1 Watershed Protection and Development (\$ 114.7 million PAD, \$ 144.3 million actual)

Satisfactory. Sub-watershed treatment for both arable and non-arable lands has been effective. Output targets for arable/non-arable land treatment and for agricultural production have generally been met or exceeded (Annex 1), despite a decline in expenditure on this component in both absolute and relative terms. However, progress has been less than the PAD target in silvipasture, farm forestry, afforestation and area under perennial vegetative cover. With regard to conservation, soil erosion and sediment outflow has been reduced, groundwater augmentation has occurred along with improved and increased availability of water in channels and wells, and substantial wasteland area has been reclaimed (over 26000 ha), of which over a quarter (7265 ha, see Annex 1) has been brought under additional cultivation. Forestry treatment has been undertaken through site specific models and participatory species selection, especially after the MTR. Survival rate is better in the treated areas. However, treatment of upper catchment areas has not been given the emphasis deserved in the ridge-to-valley approach (which aims to manage the health of the watershed or the overall ecology of the area) espoused in the PAD. Fodder and livestock related interventions have helped reduce livestock pressure on the fragile environment by reducing open grazing, increasing fodder supply and improving livestock productivity through better breeding, health and husbandry practices. Livestock-related income generating activities, promoted vigorously after the MTR, have helped expand livelihood options for the landless and economically weaker groups. Various improvements in rearing and husbandry practices have been instrumental in more than doubling the average increased milk yield. The rural infrastructure sub-component, increased in absolute terms to nearly three times the PAD estimate, has been successful in enhancing rural connectivity, market access, drinking water supply, water supply for cattle and off-season vegetables (through water storage and roof-water harvesting structures) and drainage line treatments.

4.2.2 Institutional Strengthening (\$ 47.3 million PAD, \$ 40.5 million actual)

Satisfactory. The sub-component on community capacity building has helped in the enhancement of social and community (productive) capacity. In line with the project strategy of placing the community at the heart of the watershed management, institutional and social investments have led to an expansion of village-level institutions and capacities, including empowerment of women. In all, 1343 Village Development Committees (VDCs) and 1491 Self-Help Groups (SHGs) were established which, through undertaking various tasks and responsibilities, formed important generic skills such as planning, accounting, record keeping, and negotiation. VDCs controlled and disbursed Rs 41.2 million of local development funds (handling between 17-62% of local development funds across the project states); VDCs, SHGs and User Groups (USs), organized around irrigation, water harvesting structures and value-generating assets, have built up their own funds; and participation of women and minorities has been significant, with 36% of VDC members being women and 32% belonging to disadvantaged groups (Annex 1). Empowerment (Exit) Plans have been prepared by 1245 VDCs. Overall, following project interventions, these groups are better placed to create and benefit from economic opportunities.

Income generation activities (IGAs) introduced in the project have served to expand livelihood opportunities. Popular IGAs included floriculture, vegetable cultivation, fish, backyard poultry, vermicompost, goat rearing and rearing of dairy animals. Analysis of a total of 68 IGA covering 16,620 beneficiaries in the project area shows that the rate of return over investment (including beneficiary contribution) varied from 18% to 58%. Finally, the information management and M&E component has shown mixed results. Although a large volume of diverse data has been collected in course of project implementation, the M&E system did not generate sufficient systematic data, comparable across the different project states, to a full assessment of project outcomes/impact and outputs.

4.3 Net Present Value/Economic rate of return:

Project economic analysis estimated two sets of benefits, termed Scenario 1 and Scenario 2 in the PAD. Scenario 1 supposedly referred to production related benefits only, arising from interventions in agriculture, horticulture, livestock, farm forestry, and afforestation, but in practice included quantifiable benefits from investments in rural infrastructure (roads, markets and potable water supply). Scenario 2 represented a wider notion, comprising production benefits and environmental and natural resource benefits from saved and reclaimed land and improved soil fertility. The Implementation Completion Report (ICR) estimate for project Economic Rate of Return (ERR) is 14.7% under Scenario 1 and 15.7% under Scenario 2. This is marginally lower than the PAD estimates of 16.6% and 17.2% respectively. In calculating the project ERRs, both PAD and ICR analysis included all project costs.

The divergence between ICR and PAD estimates can be traced mainly to differences between assumed and realized values of (i) production benefits from agriculture and (ii) area under silvipasture, farm forestry and afforestation. In agriculture, crop yield, cropping intensity and additional area under irrigation increased by more than PAD estimate. However, their positive effect was undermined by the continued dominance of paddy as a crop and by a greater-than-expected increase in “without project” (control) yields and crop intensities, which squeezed the incremental benefit attributable to the project. Next, evidence suggests that relative to PAD targets, the area covered under silvipasture was 29% less, under afforestation 25% less, under farm forestry 56% less, and under perennial vegetation 25% less, arguably as a consequence of the demand-driven implementation mode. Annex 3 gives further details.

4.4 Financial rate of return:

Following the PAD, the ICR financial analysis of the project focused on estimating: (i) financial returns to project-supported economic activities taken up by beneficiaries and (ii) changes in farm-level income.

Analysis shows that the financial rate of return on project-supported activities ranged from 34.8% for mango (PAD estimate, 39%), 33.5% for guava (PAD, 40%), 22.5% for farm forestry (PAD average, 26%), 17.8% for afforestation (PAD average, 17.3%), 15.9% for livestock and 16.8% for silvipasture. Further, farm level financial impact analysis suggests that, for a typical farm size of 1.2 ha considered in the PAD, estimated net increase in income is Rs. 7952 p.a. for rainfed farm and Rs 12873 p.a. for irrigated farm. The increase in income of rainfed farms is 79% higher than PAD estimated increase in income (Rs 4450 p.a.); and the estimated income from With Project (WP) rainfed farm is 94% more than in Without Project (WOP) rainfed farms. Similarly, the income of irrigated farms is 168% higher than PAD estimated increase in income (Rs 4800 p.a.); and the estimated income from WP irrigated farm is 152% more than in WOP irrigated rainfed farms. Annex 3 gives further details, especially about the likely poverty impact of the project.

4.5 Institutional development impact:

Substantial. At the ground level, the project has been instrumental in establishing mechanisms and processes of demand determination at the watershed/sub-watershed level which allowed users to contribute to the planning and implementation of various activities. The project has also fostered development of local organizations which are representative, empowered and accountable. Targeted support to women for IGAs and their extensive involvement in VDCs has enabled women to increasingly engage with the institutional and decision-making processes in their communities. Further, interventions involving marginalized tribal and transhumant groups have been largely successful. The project has supported, especially after MTR, a large variety of training, workshops, exposure/cross-learning visits covering social, technical and organizational issues, and involving project staff as well as beneficiaries. This has generated a wide range of skills, competencies and knowledge capital in the project villages and among project personnel, enhancing sustainability of interventions on the ground, and increasing the capacity and implementation potential of the government development machinery.

At the level of policy and institutional reform, the project has also been successfully in championing and mainstreaming good practices such as cost recovery (reduction in subsidies), beneficiary cost-sharing, community involvement (including “social fencing”) and community responsibility for operating and managing community assets. In some of the project states, these practices have been adopted in departmental programs and/or other externally-supported natural resource projects.

There are, however, two areas in which institutional progress has been less than anticipated: (i) achieving effective coordination with other line departments; and (ii) better linkage with of the VLIs with PRIs.

5. Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of government or implementing agency:

The most significant external factor affecting the project was the special security situation in the project state of Jammu and Kashmir (J&K). This had the effect of imposing additional logistical constraints on implementation, including the fact that direct, on-site supervision by Bank teams was not possible. (Bank supervision team and project staff therefore undertook desk supervision in locations outside the state.) Although this partly held up progress in J&K in the early years, many of the associated constraints were overcome through zealous implementation efforts during the later years of the project. Apart from this, in the final year of project implementation, appreciation of Rupee against the dollar led to some reduction in available funds. This inconvenienced, but did not cripple, some of the winding down activities. The situation was helped to some extent by offsetting financial assistance provided by the various project states.

5.2 Factors generally subject to government control:

Government support for the project has consistently been strong, creating a favorable operating

environment in which no significant adverse factor affected project implementation. The government supported the up-scaling of policies and practices adopted under the project. Issues relating to release of funds and staffing of project positions were satisfactorily handled.

5.3 Factors generally subject to implementing agency control:

There were some difficulties and delays in the early years in setting up a financial management system. Some of the studies commissioned in the course of project implementation (e.g., identifying IGA options for women) did not provide practical, usable results and could have been more carefully managed.

5.4 Costs and financing:

Project costs at appraisal were US\$ 193 million or Rs 8.24 billion. Following a change in SDR-dollar rate, the project costs changed to US\$ 185 million. However, following changes in the rupee-dollar rate (from Rs. 42.7 per US dollar in May 1999 to Rs. 49 in June 2002 and finally Rs. 45 per at project closure), project resources in rupee terms increased by 3% to Rs. 8.49 billion. At closure, 100% of the project funds had been spent, amounting to US\$ 184.8 million, which was 96% of the PAD cost estimate. Cost allocations with respect to components changed as follows: watershed protection and development increased from 72% at appraisal to 78% at closure; and institutional strengthening fell from 28% at appraisal to 22% at closure. Annex 2 shows that actual expenditure on all sub-components was less than appraisal estimate with the sole exception of Rural Infrastructure Development. The expenditure on this grew to 287% of PAD estimate for it, and its share of total project cost rose from 13% to 33%. Of the major sub-components, the largest absolute decline was in the case of sub-watershed treatment (down US\$ 8.7 million from PAD estimate), seemingly linked to below-target activities with respect to silviculture, afforestation, farm forestry and area under perennial vegetation (see Annex 1). These changes appear largely to be a consequence of the project's demand-driven implementation mode, especially following the mid-term review which reinforced focus on community assets and investments.

With regard to financial management, the project provided for technical support at the outset, through consultants, to the project states in various aspects of financial management and disbursement. However, delays in the selection process led to a substantial backlog in data entry which took up to three years to clear. Consultant effort also remained somewhat narrowly focused on establishment and maintenance of a computerized financial management system (developed for this project in response to Bank's Loan Administration Change Initiative - LACI - guidelines). This system however turned out to be essentially a stand-alone system tailored to Bank's reporting requirements, and did not provide an integrated platform for the project administration to simultaneously meet the government's accounting and reporting requirements. Consequently, it was viewed at times more as an onerous addition to the existing accounting arrangements. Finally, fund flow arrangements worked smoothly, with no major problem being encountered during implementation.

6. Sustainability

6.1 Rationale for sustainability rating:

The overall rating for sustainability – the probability of maintaining project achievements - is **Likely**, based on the following considerations:

(i) **Asset Maintenance.** The project has typically invested in small-scale assets (water-harvesting structures, pipes, minor dams and so on) which have created immediate benefits for users, thereby providing a powerful incentive to maintain the asset. In most cases, user groups (or VDCs where appropriate) have also built up revolving funds through family-wise contributions, savings in contractual works undertaken, fees and cess. These funds vary in size, the average ranging from Rs. 5845 to Rs.

45300. Further, the assets have been built with local planning assistance and labor, thus creating somehow technical know-how about maintenance. In cases where more specialized assets are involved the project has also helped train a local person in relevant repair and maintenance know-how and provided simple tools.

(ii) Environmental. Use of site-specific models and local species has improved survival rate and overall sustainability of forestry interventions.

(iii) Technical. Improvements in agronomic and livestock management practices, introduced and supported by the project, have involved simple messages that have been spread through demonstrations in farmers' fields. As such, they are likely to be both retained and replicated.

(iv) Institutional. The picture here is mixed. On the one hand, the project has fostered representative and empowered organizations at the local village level which, in course of project implementation, have acquired generic skills of planning, demand representation, monitoring and book-keeping. Many of these organizations are likely to persist, providing a governance mechanism for maintaining community assets formed under the project. On the other hand, many of these Village Level Institutions (VLIs) are quite young (the average age being between 3 – 3.5 years). Some of these will also need technical back-up and support. Finally, the relationship between these “development organizations” and the PRIs, government's main conduit for development work at the local level, has not been fully worked out. However, new follow-on projects in Uttaranchal and Himachal Pradesh, supported by the Bank, are further developing the participatory approach to watershed management, giving a central role to representative public bodies at the local level, notably to Gram Panchayats.

(v) SHGs and IGAs. Again, the picture is mixed, with examples of both strong and weak groups. Income from IGAs is estimated to range between Rs. 2600 and Rs. 7000, and the average volume of funds available with SHGs varies from Rs. 1293 to Rs. 15453. The stronger groups appear to have found a niche in which their business can be sustained but the weaker ones are unlikely to survive without additional support.

6.2 Transition arrangement to regular operations:

Empowerment (Exit) Plans have been prepared by 93% of the VDCs (1245 out of 1343). These plans give a synoptic view of the existing resource base of the village (including resources created under the project), contain a maintenance plan with income sources and expenditure items defined, specify areas requiring further attention and action, and contain a list of resource agencies and sources that could be drawn upon to further realize the Empowerment Plan. Meanwhile, attempts continue to be made to network and integrate these VDCs into the governmental framework as well as with the local self-government bodies (PRIs). Continuation of the main project activities beyond the project period is not expected to require any significant financial support from the government.

7. Bank and Borrower Performance

Bank

7.1 Lending:

Unsatisfactory. While the Bank provided valuable assistance in helping develop the community-based watershed management approach at the heart of this project, and ensure that project design was consistent with national priorities and Bank CAS, the dialogue appears to have been weak in areas of: (i) community mobilization as part of project start-up activities; (ii) monitorable indicators of project performance and achievement of development objectives; and (iii) coordination and institutional arrangements at the local level to more effectively bring together different departments, local governments and village entities. The first two are listed in the PAD as lessons for project design, and the last was an on-going issue reflected,

e.g., in the Performance Audit Report (No. 20675) of the previous two IDA-supported watershed projects in the region.

7.2 Supervision:

Satisfactory. Despite a slow start to the project, Bank supervision teams worked closely and intensively with project directorates to eventually implement the project with resounding success. Among the strengths of supervision were: useful technical inputs and proactive resolution of problems, especially after MTR; flexibility in implementation, which helped to encourage and support innovations by different project states; joint supervisions involving the central Ministry of Agriculture as well as project directors from other project states, which helped inter-state learning and sharing; concerted push for linking project interventions to wider policy/institutional reforms; and sustained emphasis on participatory and gender-inclusive implementation processes. There were some initial safeguard-related problems with regard to improper use of pesticides (flagged at MTR). However, these were subsequently resolved satisfactorily. The project was never at risk during implementation. To consolidate project achievements and help ensure sustainability, the project was extended by six months. Finally, the project disbursed 100% of its funds, a notable fact in view of the regional experience and all the more remarkable given its reliance on demand-driven and participatory implementation mode.

7.3 Overall Bank performance:

Satisfactory. Although preparation weaknesses did impede progress in the initial years, overall quality of Bank involvement and support has certainly been noteworthy, and an important contributory factor to project success.

Borrower

7.4 Preparation:

This is rated **Satisfactory** on the margin. The Borrower appropriately designed the project to integrate conservation and development issues, with the local community playing a central role in planning and implementation of activities. A long process of consultation among line departments, government agencies and civil society, occurring across different states, produced a technically and environmentally sound development model which commanded general acceptance and also influenced government guidelines on watershed development. On the other hand, the preparation process could have been stronger in seeking to proactively address the issues of community mobilization and institutional coordination.

7.5 Government implementation performance:

Satisfactory. The government has consistently provided strong support for the project. An inter-Ministerial Coordination Committee, established at the national level and including the Ministries of Agriculture, Forestry, Water Resources and Rural Development, has worked to use project learning and experience to harmonize overall governmental policies and guidelines for watershed development. The Ministry of Agriculture has, unusually, participated in project supervision missions. The flow of funds from the government has been satisfactory. Implementing states have favorably responded to funding requests of the project, occasioned by Rupee-dollar exchange rate movements. States and line departments have been encouraged to adopt/upscale institutions and practices developed during the project.

7.6 Implementing Agency:

Highly Satisfactory. Overall, the implementing agencies have been dedicated, diligent and innovative in implementation of the project. Although initial design and capacity weaknesses and process-related ambiguities held up progress at the start, implementation effort has been generally strong, more noticeably so after MTR. A remarkable aspect of the implementation experience is the extent to which project personnel (largely, seconded line department staff) internalized the spirit, approach and methods of participatory development. The resulting attitudinal and behavioral change (e.g., mode of interaction with

beneficiaries) was no doubt a key factor in the success the project has achieved, especially with regard to community participation, beneficiary motivation, and acceptance of principles such as social forestry and cost-sharing. The implementing agencies had good working relationships with NGOs, facilitators and motivators. The project management structure provided effective oversight, guidance and support.

The only notable drawback in performance of the implementing agencies concerned several allegations of financial mismanagement received from Jammu and Kashmir, prompting a special review of procurement and financial management by the the Bank's task team and investigation unit, as well as a limited field verification of certain works. The investigation revealed some inefficiencies in financial management, but no major irregularities were found.

7.7 Overall Borrower performance:

Satisfactory.

8. Lessons Learned

- Natural Resource Management (NRM) interventions planned and implemented through local communities benefit from local knowledge, better integration of conservation goals with local livelihood concerns, cost-/quality-conscious execution and, as such, are more likely to be relevant, efficient, effective and sustainable.
- Since many conservation measures typically benefit land-holders, pro-poor interventions in watershed projects are helpful in creating a stake in the project for the weaker and marginal segments of the community as well. However, targeted priorities (e.g. pro-poor livelihood support) should be accompanied by more structured and explicit targeting mechanisms. Community-based allocation/targeting processes may prove inadequate for the task, especially if “captured” by articulate, resourceful or powerful local elements.
- An explicit focus – including regular measurement during implementation - on well-defined and relevant outcome and output indicators is essential for a project which (i) involves a composite development objective (“improve production potential”) which can be attained through interventions not necessarily connected with the project goal of conservation (e.g., technological upgrading alone); and (ii) has a demand-driven planning-and-implementation strategy which can cause short-term needs to dominate long-term development goals. These indicators should form part of an analytical framework that can better illustrate the trade-offs involved in large allocational changes across project components, and thus help the project and the beneficiaries make more informed choices consistent with the PDO.
- Facilitation (helping with the strengthening of relevant local institutions, processes and capacities) is at least as critical an input as external finance in helping communities sustainably address their conservation and development concerns. (Community-based projects are likely therefore to have a larger percentage of costs in the “services” - rather than “goods” and “works” - category than conventionally designed projects.)
- Project experience shows that social mobilization and community capacity building take time to start up but work powerfully when matured. Reflecting this, project planning should (i) emphasize preparedness to initiate social mobilization as early in the project cycle as possible; and (ii) refrain from taking up new project sites in the second half of the project where adequate time for consolidation and institutionalization of social changes is not likely to be available before the end of the project.

- Complexity in implementation of multi-state projects can be reduced significantly by a system of joint supervisions and a shared learning platform (the Project Coordination Committee) which, together, induce healthy competition and imitation of innovations experienced elsewhere.
- A significant “output” of this project is the upgradation of skills/capacities of project staff. As part of exit strategy, it would be helpful to also formulate plans to utilize this valuable resource stock for enhancing implementation efficiency of development programs.
- The specificities of different accounting and reporting systems that a project administration needs to follow (e.g., from government side and Bank side) must be taken on board in designing and implementing any (computerized) financial management system.
- In a multi-state project, greater uniformity in recording and reporting systems is needed to facilitate comparisons as well as project self-appraisal.

9. Partner Comments

(a) Borrower/implementing agency:

After reviewing the draft ICR, the Ministry of Agriculture communicated to the Bank on December 5, 2005 that, "Since the ICR report is in line of deliberations duly attended by the Ministry of Agriculture representatives, we have no further comments to offer."

(b) Cofinanciers:

NA

(c) Other partners (NGOs/private sector):

NA

10. Additional Information

Annex 1. Key Performance Indicators/Log Frame Matrix

Outcome/Impact Indicators

Outcome/Impact Indicator	Unit	Projected in SAR/PAD End of Project	Actual/ Latest Estimate
PDO : Improve Productive Potential of the Project Area			
A. Arable Lands			
(i) Productivity			
• Rain-fed Crops		1.62	1.90
Paddy	t/ha	1.75 a	2.18
Maize	t/ha	1.60	1.75
Wheat	t/ha	1.60	1.90
• Irrigated Crops		3.14	3.68
Paddy	t/ha	3.00	3.16
Maize	t/ha	2.50	2.62
Wheat	t/ha	2.50	3.12
<i>Cereals</i>	t/ha	2.53	3.10
<i>Vegetables</i>	t/ha	25.00	16.90
(ii) Cropping Intensity			
• Rain-fed Crops	%	147	171
Paddy	%	na	24
Maize	%	49	42
Wheat	%	62	72
<i>Cereals</i>	%	111	154
<i>Pulses</i>	%	36	6
<i>Oilseed</i>	%	na	7
<i>Fodder</i>	%	na	4
• Irrigated Crops	%	170	205
Paddy	%	8	64
Maize	%	60	10
Wheat	%	76	45
<i>Cereals</i>	%	144	119
<i>Pulses</i>	%	23	
<i>Vegetables</i>	%	4	58
<i>Spices</i>	%	na	4
<i>Fodder</i>	%	na	24
(iii) Crop Diversification (change in cropping pattern)			
<i>Cereals</i>	%	84	76
<i>Pulses</i>	%	13	3
<i>Oilseeds</i>	%	0	3
<i>High-value crops</i>	%	3	3
<i>Fruits</i>	%	0	7
<i>Medicinal plants</i>	%	0	3
<i>Fodder</i>	%	0	3
<i>Farm Forestry</i>	%	0	2
(iv) Supplementary Irrigation			
New Irrigated area	ha	12362	13489
% of new irrigated area under high value crops	%	33%	30%
(v) Improved Agronomic Practices			
Area under vermicompost and organic farming	ha	na	11554

Area under Integrated Pest Management	ha	na	16368
B. Non-Arable Lands			
(i) Conservation of Soils			
Land area saved	ha	11939	26073
Land area reclaimed for agriculture	ha	716	7265
Soil Run-off	%	36.2b	25.8
(ii) Conservation of Forests			
Area (new) under perennial vegetation	ha	111055	83718
Survival rate	%	na	60%
(iii) Productivity of Woodlots			
Fuel	t/ha	8.5	5
Fodder	t/ha	1.9	2
Timber	t/ha	49	38
C. Other			
(i) Livestock			
Improved Breed Cows and buffaloes	no	na	57890
Average milk productivity (cows and buffaloes)	l/day	1.8a	4.1
Stall-fed animals	no	na	11584 6
(ii) Community Productive Activities			
SHGs involved in Income Generation	no	na	817
Average Income generated from IGA	Rs/yr	na	18127
Savings available with village-level institutions	Rs Mn	na	7.4
(iii) Capacity Building of Village Level Institutions			
Resources disbursed through VDCs	Rs Mn	na	41.2
Proportion of women members in VDCs	%	na	36%
SHGs linked to formal credit institutions	no	na	132
Output Indicators			
Component 1: Watershed Protection and Development			
(i) Sub-watershed Treatment			
• Watershed Conservation			
Arable Lands Treated	ha	87922	14489 6
Non-Arable Lands Treated		111056	11986 7
Silvi-Pasture	ha	22939	16242
Forest Lands	ha	78161	60236
Area under farm forestry	ha	13270	5788
Area under fodder crops	ha	6950	7240
• Production			
Cereals	t/yr	72260	80420
Pulses	t/yr	3160	4590
Oilseeds	t/yr	0	7642
Vegetables	t/yr	131020	14877 8
Fruits	t/yr	282436	19567 9
Medicinal	t/yr	0	16040
Fodder	t/yr	0	24595 8
Fuel/Timber	t/yr	442310 0	35830 07

(ii) Fodder and Livestock Development			
Animals treated with AI	no	na	125110
Conception rate of AI	%	na	42%
Natural Breeding Centres for Cows and Buffaloes	no	na	231
Reduction in number of unproductive animals	no		25405
(iii) Rural Infrastructure			
• Rural Roads/Access			
Upgraded rural roads	km	875	784
Upgraded Footpaths	km	na	604
Footbridges	no	na	250
Culverts	no	na	902
Bridle paths/mule tracks	km	na	1657
• Potable Water Supply			
Villages served	no	na	3800
Households served	no	na	116265
Ponds	no	na	2281
Water storage tanks	no	na	319
Dug wells	no	na	289
Water Pipeline	km	na	351
Component 2: Institutional Strengthening			
(i) Community Capacity Building			
VDCs established	no	1205	1343
VDPs prepared	no	1205	1328
Empowerment plans prepared	no	na	1245
Women members in VDC	%	na	36%
SC/ST/OBC members in VDCs	%	na	32%
(ii) Provision of IGA for Women			
SHGs established	no	na	1491
Women provided training for IGA	no	na	468675
Proportion of women among those who have undertaken IGA & vocational training	%	na	57%
Proportion of of SC/ ST/ OBC among those who have undertaken IGA & VT	%	na	33%

a WOP estimate; b baseline data, not in PAD; N.A. = not available/not projected in PAD

Annex 2. Project Costs and Financing

Project Cost by Component (in US\$ million equivalent)

Component/Sub-component	Appraisal Estimate	Actual/Latest Estimate	Percentage of Appraisal
	US\$ million	US\$ million	(%)
I. Watershed Protection and Development	114.7	144.3	126
• Sub-Watershed Treatment	77.9	69.2	89
• Fodder and Livestock Development	15.2	13.2	87
• Rural Infrastructure Development	21.6	61.9	287
II. Institutional Strengthening	47.3	40.5	86
• Community Capacity Building	5.4	4.7	87
• Policy Reforms, Studies and Human Resource Development	3.8	2.3	61
• Income Generating Activities for Women	1.5	0.9	60
• Information Management, Monitoring and Evaluation	5.2	1.9	37
• Project Coordination and Management	31.4	30.8	98
Contingencies	31.0		
Total Project Costs	193.0	184.8	96

Project Costs by Procurement Arrangements (Appraisal Estimate) (US\$ million equivalent)

Expenditure Category	Procurement Method ¹			N.B.F.	Total Cost
	ICB	NCB	Other ²		
1. Works	0.00 (0.00)	33.10 (26.48)	109.25 (74.31)	0.00 (0.00)	142.35 (100.79)
2. Goods	0.50 (0.40)	1.00 (0.80)	2.65 (2.12)	0.00 (0.00)	4.15 (3.32)
3. Services	0.00 (0.00)	0.00 (0.00)	30.70 (15.80)	0.00 (0.00)	30.70 (15.80)
4. Technical Assistance & Training	0.00 (0.00)	0.00 (0.00)	15.80 (15.80)	0.00 (0.00)	15.80 (15.80)
Total	0.50 (0.40)	34.10 (27.28)	158.40 (108.03)	0.00 (0.00)	193.00 (135.71)

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (US\$ million equivalent)

Expenditure Category	ICB	Procurement Method ¹		N.B.F.	Total Cost
		NCB	Other ²		
1. Works	0.00 (0.00)	10.30 (7.30)	137.40 (97.90)	0.00 (0.00)	147.70 (105.20)
2. Goods	0.00 (0.00)	0.20 (0.10)	5.60 (4.10)	0.10 (0.00)	5.90 (4.20)
3. Services	0.00 (0.00)	7.30 (5.20)	10.40 (7.40)	0.00 (0.00)	17.70 (12.60)
4. Technical Assistance & Training	0.00 (0.00)	13.50 (9.60)	0.00 (0.00)	0.00 (0.00)	13.50 (9.60)
Total	0.00 (0.00)	31.30 (22.20)	153.40 (109.40)	0.10 (0.00)	184.80 (131.60)

^{1/} Figures in parenthesis are the amounts to be financed by the Bank Loan. All costs include contingencies.

^{2/} Includes civil works and goods to be procured through national shopping, consulting services, services of contracted staff of the project management office, training, technical assistance services, and incremental operating costs related to (i) managing the project, and (ii) re-lending project funds to local government units.

Project Financing by Component (in US\$ million equivalent)

Component	Appraisal Estimate			Actual/Latest Estimate			Percentage of Appraisal		
	Bank	Govt.	CoF.	Bank	Govt.	CoF.	Bank	Govt.	CoF.
(a) Watershed Protection and Development	98.20	31.82	9.10	105.40	20.30	18.60	107.3	63.8	204.4
(b) Institutional Strengthening	36.80	13.18	3.80	26.20	14.20	0.08	71.2	107.7	2.1
Total	135.00	45.00	13.00	131.60	34.50	18.70	97.5	76.7	143.8

COF is beneficiary contribution.

Annex 3. Economic Costs and Benefits

A. Project Benefits and Expected Returns in PAD

1. Project economic analysis estimated two sets of benefits, termed Scenario 1 and Scenario 2 in the PAD. Scenario 1 supposedly referred to production related benefits only, arising from interventions in agriculture, horticulture, livestock, farm forestry, and afforestation, but in practice included quantifiable benefits from investments in rural infrastructure (roads, markets and potable water supply). Scenario 2 represents a wider notion, comprising production benefits and environmental and natural resource benefits from saved and reclaimed land and improved soil fertility.

2. The Economic Rate of Return (ERR) for overall project was estimated at 16.6% under Scenario 1 and 17.2% under Scenario 2. In estimating these aggregate ERRs it was recognized that the “relative weight” of different activities may turn out different from the PAD assumptions due to the demand-driven implementation mode. Illustrative ERRs for selected project activities were as follows: (i) horticulture: mango 42%, guava 43%; (ii) farm forestry: poplar plantation 38%, eucalyptus plantation 16%; (iii) afforestation: private land – general afforestation 16%, private land – bamboo 17%; public land 20%; and (iv) rural infrastructure: upgraded roads 13.9%, marketing centres 12%, and potable water supply 12%.

3. Analysis in the PAD followed standard methodology. Benefits were grouped under four headings: (i) on-farm; (ii) off-farm; (iii) environment and natural resource related; and (iv) other. On-farm benefits arose from agriculture, horticulture, farm forestry and livestock related activities. The gains in agriculture were driven by improvements in productivity, cropping intensity and shift towards higher-value crops, and were captured by representative one-hectare crop models for rainfed-agriculture and for (supplemental) irrigated agriculture. Based on observed choices made by farmers, mango and guava were taken as representative alternative crops in case of horticulture, and poplar and eucalyptus as representative alternatives in case of farm forestry. Livestock benefits, arising from improvement in forage and feeding management and breed quality, were captured primarily through increase in milk production.

4. The second category of off-farm benefits comprised benefits arising from afforestation and from investments in rural infrastructure. In case of afforestation, different representative models were constructed for private (including communal) land and public land. The private-land afforestation model focused on fuelwood, fodder and other small products whereas the public-land afforestation model was timber oriented. Apart from the general afforestation model, a separate bamboo model was also prepared to represent the choice range in the case of private lands. With regard to rural infrastructure, the benefit from upgrading rural link roads has been captured in the form of savings on vehicle operating costs, from marketing centers in the form of reduction in post-harvest losses, and from potable water supply improvements in the form of the economic value of time saved with regard to water collection.

5. In case of the third category of environment and natural resource related gains, project economic analysis sought to quantify only the benefits due to land area saved/reclaimed and to soil fertility improvement (as a result of leaf litter and other organic matter brought into the eco-system following land treatment). With regard to the final category, it was recognized that the project would generate other environment and social benefits within and outside the project area, but these were excluded from economic analysis. In that sense, the computed benefits represented a conservative estimate of the overall social benefits attributable to project interventions.

6. Benefit flows were computed over a 30-year period. The analysis was done at 1998 prices using a standard conversion factor (SCF) of 0.9 and an opportunity cost of capital of 12%. Import/export parity

prices were estimated for internationally traded farm inputs/commodities.

7. The PAD also assessed the financial impacts of the project for an average farm size of 1.2 ha with an average holding of 1.4 head of cattle. It was estimated that in rainfed areas project interventions would increase average farm income by 49% and in (supplemental) irrigated areas by 64%.

B. ICR Estimation

8. PAD methodology was applied to the extent feasible in order to update estimated project returns. The analysis was done at 2005 prices. Weaknesses and gaps in systematic collection of outcome/impact and output data, as part of project M&E, hindered somewhat the estimation of project returns. A majority of the data used for ICR estimation has been collected from impact assessment studies undertaken (separately) in the five project States by external agencies hired under contract. Altogether, these studies covered a total of 3857 households from 267 villages across the five project States. Of these, the sample from the project area comprised 2858 beneficiary households from 183 villages. The “control” sample from adjoining non-project areas consisted of 999 households from 84 villages. There were variations in the design and quality of implementation of these studies, including the use of “controls” (in two states, before/after- rather than with / without-project comparisons were used). In re-estimating returns for the ICR, attempts were made to overcome some of these limitations through use of information derived from other sources such as published statistics and triangulation from discussions and field visits during the ICR mission. Parity prices for relevant tradable goods have been estimated using World Bank Commodity Price Projections. Financial prices of non-traded goods and services have been adjusted using SCF of 0.9. For comparability, cost and benefit flows have been calculated with 12% opportunity cost of capital over a period of 30 years in line with the PAD analysis.

On-Farm Benefits

9. Returns to agriculture were estimated using a representative model for rainfed and for irrigated areas. For rainfed areas the ICR analysis has been conducted with respect to three main crops – paddy, maize and wheat – which together account for 80% of the gross cropped area on a representative farm. In irrigated areas, the analysis focused on four main crops - paddy, maize, wheat and vegetables/spices (tomatoes, chillies, cabbage, brinjal) - which together accounted for 78% of the gross cropped area. For these crops, differences in yield, cropping intensity, crop mix and input costs (see Table 1) between representative project and non-project farms were used to estimate the incremental benefit from the project. Project and non-project areas are in adjoining geographic locations and hence would have typically the same baseline conditions. For horticulture, production models for mango, guava “aonla” and citrus, which cover 60% of the area under horticulture crops, have been used for assessing the benefits from horticulture development. Fodder and fuel wood have been used for quantifying the benefits from farm forestry areas.

Table 1: Project - related changes in crop area, yield and net income

Crop	% of Net Area Sown			Crop Yield (t/ha)			Net Income (Rs/ha)		
	WOP	WP-RF	WP-IR	WOP	WP-RF	WP-IR	WOP	WP-RF	WP-IR
<i>Rainfed</i>									
Paddy	27	24	64	1.75	2.18	3.16	3438	5171	7037
Maize	45	41	10	1.20	1.75	32.62	2331	4399	6486
Wheat	78	72	45	1.33	1.90	3.12	3018	4904	10022
Veg/Spices ^a	N.A.	N.A.	62	N.A.	N.A.	16.0	N.A.	N.A.	35287
Cropping Intensity	160	171	205	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

WOP: Without Project; WP-RF: With Project – Rainfed Area; WP: With Project – Irrigated Area; a Veg/Spices: includes tomatoes, chillies, cabbage and brinjal.

10. In the case of livestock-related activity, the project area had 231 natural breeding centers and 126 paravets. Approximately 125,000 AI operations were performed, and it is estimated that the project area has 57890 improved cattle / buffaloes. Following breed improvement and better feed and health management, weighted average milk productivity (litre/day/milch animal) in the project area increased by 127% to 4.1 compared to 1.8 for local non-descript animals. For ICR analysis activity models for cross-bred animal and milch animal under with and without project situations have been formulated. In line with field data mortality rates of 15% for calf and 5% for adult animals have been assumed. The number of AIs p.a. beyond project implementation period is assumed to be the same as in the final project year. The difference in maintenance costs, based on survey data, is as follows (i) cross-bred cattle: Rs. 9722 p.a.; (ii) milch animal in “with project” situation: Rs. 3502 p.a.; and (iii) milch animal in “without project” setting: Rs. 2080 p.a. The maintenance cost for a cross-bred calf is assumed to be one-fourth of maintenance cost for an adult cross-bred animal. It is estimated that net income from a cross-bred animal is Rs 6998 p.a., and for milch animal in with project situation is Rs 3955 and in without project situation is Rs. 2454.

Off-Farm Benefits

11. Afforestation - Under the project’s watershed protection and development component 119867 ha of non-arable lands have been treated through mechanical and/or vegetative measures depending on site-specific needs. In case of non-arable lands, afforestation has been undertaken on 60236 ha and 16242 ha have been brought under silvipasture to produce fuel, timber and fodder. For economic analysis, one-hectare models for silvipasture and for afforestation have been used to quantify the benefits from fuel, timber and fodder produced. According to available figures, productivity of non-arable lands is estimated to be 2 t/ha for fodder; 5 t/ha for fuel and between 20 to 42.5 m³/ha for timber.

12. Rural Roads - For providing rural connectivity the project has upgraded 784 km of rural roads, besides providing foot bridges and culverts, and improving footpaths as well as bridle paths/mule tracks. Benefit estimation in PAD analysis was limited to savings in vehicle operating costs only although numerous other benefits such as better access to markets, health and education facilities as well as reduced travel time were expected to accrue. Analysis at ICR has been hindered by the fact that no systematic survey was undertaken during project implementation to quantify the benefits of improved roads and other access infrastructure. Experience from similar rural roads investments in recent IDA-supported projects in the country suggest that savings in vehicle operating costs are likely to be Rs 0.48 million per km at 2005 prices. This has been used to estimate benefit from upgradation of rural roads, in line with the PAD analysis.

13. Drinking Water - It is estimated that project investments in drinking water supply (see Annex 1) benefited through improved access to water a total of 3800 villages with a population of 116265 households with a population of 693,380. Field surveys during the mission's visit as well as experience in similar projects elsewhere in south Asia suggest that an average of 1-2 hours per day per beneficiary family is saved due to improved access to drinking water for around 180 days in a year. For purposes of analysis, the time saved per beneficiary was taken to be 1.5 hrs per day (for 180 days of the year) and the opportunity cost of time – an average of peak and off-season wage rates in agriculture – was considered to be Rs 4 per hour. The annual economic benefit due to drinking water-related investments is estimated to be not less than Rs 80 million.

14. IGA - Income generation activities were introduced in the project to improve livelihood prospects of landless and resource poor households. Popular IGAs included floriculture, vegetable cultivation, fish, backyard poultry, vermicompost, goat rearing and rearing of dairy animals. Based on a total of 68 IGA activities covering 16620 beneficiaries in the project area, ICR analysis shows that the rate of return over investment (including beneficiary contribution) varied from 18% to 58%. Assuming an average rate of return of 38%, the returns to investment in IGA activities have been included in the estimate of overall project benefits.

Environmental and Natural Resource Benefits

15. Following PAD, the additional benefits estimated in this category – which are included in Scenario 2 only – are assumed to arise from land area saved; land area reclaimed; and soil fertility improvement. Rainfed cropping models have been used to quantify benefits from land area saved and reclaimed. (In the PAD it is assumed that land area reclaimed would be used for pasture but evidence suggests that it has largely been put under rainfed cultivation.) Analysis of benefits from improvements in soil fertility is hampered by lack of data. To obtain a benefit estimate comparable to PAD's Scenario 2, parameters for PAD-estimated incremental benefits from soil improvement have been used, after adjusting them for change in area under afforestation and updating them to 2005 prices. These benefits are estimated at Rs 19 million p.a.

C. Economic Rate of Return

16. The ICR estimate for project ERR is 14.7% under Scenario 1 and 15.7% under Scenario 2. This is marginally lower than the PAD estimates of 16.6% and 17.2% respectively. In calculating the project ERR, all project costs were included, and set against the incremental benefits arising from arable lands, non-arable lands, livestock, income generating activities, roads and drinking water. In arable lands, incremental benefits from rainfed crops, horticulture crops, supplemental irrigated area and farm forestry were included. In non-arable lands, incremental benefits from afforestation and silvipasture have been included.

17. The divergence between ICR and PAD estimates can be traced mainly to differences between assumed and realized values of (i) production benefits from agriculture and (ii) area under silvipasture, farm forestry and afforestation. Table 2 shows over- and under-achievement with respect to PAD targets in specific areas of agricultural production.

Table 2: Realized Values and PAD Targets – Agriculture Production

	Yield –RF	Yield – IR	Crop Intensity – RF	Crop Intensity – IR	Area under new Irrigation	Proportion of New Irrigated Area under HVC
Realized Value/ Pad Target (%)	118	125	116	121	109	91

RF = Rain-fed Areas; IR = Irrigated Areas; HVC = High Value Crops

18. However, the incremental benefit arising from these positive production effects were undermined to some extent by the fact that yield and crop intensity in the WOP (control) situation also increased by more than expected. Actual WOP crop yields were 20% higher than the WOP projection in the PAD, and actual WOP irrigation intensity was 9% higher than the PAD projection. Lastly, agricultural returns were depressed by the unexpected dominance of paddy as a crop. In irrigated areas, for example, paddy accounted for 64% of the net cropped land as against a projection of 8% in the PAD. The benefit contribution from paddy production was further dragged down by the fact that the international price of paddy, a tradeable commodity, turned out to be 21% less than the PAD estimate.

19. The second reason for divergence between PAD and ICR project returns estimate lies in the altered relative weight of different sub-components/activities, arguably as a consequence of the demand-driven implementation mode. Available evidence suggests that relative to PAD targets, the area covered under silvipasture was 29% less, under afforestation 25% less, under farm forestry 56% less, and under perennial vegetation 25% less.

20. The overall comparative picture of project benefits, costs and returns estimated at PAD and ICR is given in Table 3.

Table 3: PAD and ICR Estimates of Project Benefits, Costs and Returns (2005 Prices)

	SCENARIO 1				SCENARIO 2			
	PV Benefits (\$ Mn)	PV Costs (\$ Mn)	NPV (\$ Mn)	ERR (%)	PV Benefits (\$ Mn)	PV Costs (\$ Mn)	NPV (\$ Mn)	ERR (%)
PAD	312.4	229.9	82.5	16.6	326.5	229.9	96.6	17.2
ICR	206.1	150.3	55.8	14.7	226.2	150.3	75.9	15.7

PV = Present Value; NPV = Net Present Value

D. Financial Rate of Return

21. Following the PAD, the ICR financial analysis of the project focused on estimating: (i) financial returns to project-supported economic activities taken up by beneficiaries and (ii) changes in farm-level income. Analysis shows that the financial rate of return on project-supported activities ranged from 34.8% for mango (PAD estimate, 39%), 33.5% for guava (PAD, 40%), 22.5% for farm forestry (PAD average, 26%), 17.8% for afforestation (PAD average, 17.3%), 15.9% for livestock and 16.8% for silvipasture.

22. Farm level financial impact has been undertaken for rainfed and irrigated farms and the analysis is

presented in Table 4. It shows that rainfed farms realized 94% more net benefits/income and irrigated farms realized 152% more net benefits than WOP (control) areas as a result of project interventions. Livestock improvement, watershed protection treatments in arable lands and provision of irrigation appear to have contributed significantly in improving the farm financial income in project areas.

Table 4: Farm Level Financial Impact

	Unit	WOP	WP	Change, %	
RF Farm area	Ha	1.2	1.2	0%	
Cropping intensity	%	160	171	7%	
Gross area- RF crops	Ha	1.92	2.06	7%	
Number of Livestock	No.	1.2	1.2	0%	
Net Benefits from					
	RF crops	Rs	5537	9862	78%
	Livestock	Rs	2945	6572	123%
	Total	Rs	8482	16434	94%
Irrigated Farm area	Ha	1.2	1.2	0%	
	Rainfed lands	Ha	1.2	1	
	Irrigated lands	Ha		0.2	
Cropping intensity					
	Rainfed lands		160	171	7%
	Irrigated lands			205	
Gross area	Ha	1.92	2.12	11%	
	Rainfed crops	Ha	1.92	1.71	
	Irrigated crops	Ha		0.41	
Number of Livestock	No.	1.2	1.2	0%	
Net Benefits from					
	RF crops	Rs	5537	8219	48%
	Irrigated crops			6564	
	Livestock	Rs	2945	6572	123%
	Total	Rs	8482	21355	152%

23. **Poverty impact.** Poverty impact can be assessed at a general level in terms of benefits generated in the project area of degraded watersheds which are inhabited by some of the poorest populations in the country. More specifically, it can also be assessed in terms of project-induced benefits that accrued to the marginal and vulnerable sections of the population within the project area. At the general level, project impact seems to be substantial. Focusing on farm-related benefits alone, given an average holding size of 1.58 ha, the project interventions in arable lands would have helped at least 91706 farm families. Small and marginal holdings typically account for 73% of the farms in the project area. Although the actual proportion of small and marginal farms benefiting from the project may be less than this due to location advantages of better-off farms, the percentage is still likely to be substantial. ICR analysis further suggests that, for a typical farm size of 1.2 ha considered in the PAD, estimated net increase in income p.a. is Rs. 7952 for rainfed farm to Rs 12873 for irrigated farm. This is 79% higher than PAD estimate for rainfed farms (Rs 4450) and 168% higher than irrigated farms (Rs 4800). According to government statistics, the per capita income level for rural poverty in the project area is Rs 5514 per annum in 2005 prices. This

implies that project generated increases have the potential to raise at least one member of the rainfed farm family and two members of the partially irrigated farm family above the poverty line by the end of the project.

24. With regard to specific poverty impact in terms of accrual of project benefits to the marginal and vulnerable sections within the project area, the project by its nature was constrained by the fact that its main interventions with regard to water, soil, and natural resources were biased in favor of those possessing the complementary input of land. Project design attempted to offset this by promotion of income generating activities. However, evaluation of its impact is hampered by lack of socioeconomic characterization of the beneficiaries covered by these activities. Restricting attention therefore to only the financial aspects of IGA, analysis suggests that these activities typically generated net incomes ranging between Rs 2600 to Rs 7000 p.a. (after deducting for beneficiary contribution as well). While clearly a significant income increment, their long term impact is limited to some extent by problems of sustainability, especially at the lower end of the income scale. Also, implementation of cost-sharing norms which varied by type of activity rather than economic status of the beneficiary may have, on the margin, excluded some of the more poor/vulnerable elements.

25. Overall poverty alleviation impact of the project is of course likely to have been greater than the direct gains above due to benefits arising from non-arable lands, and greater employment opportunities arising from enhanced cropping intensity and productivity in arable lands.

Annex 4. Bank Inputs

(a) Missions:

Stage of Project Cycle	No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.)		Performance Rating	
	Month/Year	Count	Specialty	Implementation Progress
Identification/Preparation 11/16/1998	14	Mission Leader; FAO-Sr. Economist/Institutional Spc; Economist; Agricultural Spc; Livestock Adviser; Forestry Spc; Social Forestry Spc; Sociologist (2); Environmental Spc (2); Financial Analyst; Rural Roads Spc; Staff Assistant	S	S
Appraisal/Negotiation 2/12/1999	10	Mission Leader; Economist; Agricultural Spc; Livestock Adviser; Sr. Sociologist; FAO- Sr. Economist/ Institutional Spc; Environmental Spc; Financial Analyst; Rural Roads Spc; Staff Assistant	S	S
Supervision 11/15/1999	9	Mission Leader; Co-Mission Leader; Economist; Livestock Adviser; Sociologist (2); Environmental Spc/GIS; Financial Analyst; Procurement Spc	S	S
05/22/2000	9	Mission Leader; Co-Mission Leader; Agriculturist; Financial Analyst; Environmentalist (2); Social Development Spc; Procurement; Highway Engineer	S	S
09/27/2000	7	Mission Leader; Co-Mission Leader; NRM Economist; Social Scientist; Rural Infrastructure Spc; Financial Management Spc; Livestock Spc	S	S
05/29/2001	9	Mission Leader/ NRM Spc; Co-Mission Leader/NRM Economist; Social Scientist (2); Infrastructure; Livestock Spc; Forestry Spc; Agriculture Spc; Financial Management	S	S
09/29/2001	7	Team Leader - NRM Spc; Agriculturist; Livestock Spc; Financial Management; Social Scientist; Procurement;	S	S

	11/30/2001	7	Environment Mission Leader/NRM Spc; Agriculturist; Livestock Spc; Financial Management Spc; Social Scientist; Procurement Spc; Environmental Spc	S	S
	4/23/2002	10	MTR Leader; Procurement Spc; Forestry Spc; Economist; Agriculturist; Highway Engineer; Livestock Spc; Financial Management Spc; Environmental Spc; Social Scientist	S	S
	10/1/2002	6	Mission Leader; Agriculturist; Livestock Spc; Financial Management Spc; Social Scientist; Procurement Spc; Staff Assistant	S	S
	04/24/2003	4	Agriculturist; Social Scientist; Livestock Spc; Financial Management	S	S
	10/17/2003	3	Task Team Leader/NRM Spc; Agricultural Economist; Agriculturist	S	S
	02/13/2004	10	Agricultural Economist; Agriculturist; Social Scientist (2); Procurement Spc; Financial Management Spc; Institutional Spc; Forestry Spc; Livestock Spc; Roads Spc	S	S
	10/26/2004	10	Agricultural Economist; Agriculturist; Livestock Spc; Financial Management Spc; Forestry Spc; Social Scientist; Procurement Spc; CDD Spc; Sr. Rural Roads Spc Team Assistant	S	S
	05/23/2005	4	Agricultural Economist; Agriculturist; Financial Management Spc; CDD Spc		
ICR	05/23/2005	6	Mission Leader; Watershed Management Spc; Natural Resource Management Spc; Economist - Consultant; Economist - FAO; Livestock Spc	S	S

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US\$ ('000)
Identification/Preparation	107	340
Appraisal/Negotiation	50	132
Supervision	231	588
ICR	12	56
Total	400	1116

Annex 5. Ratings for Achievement of Objectives/Outputs of Components

(H=High, SU=Substantial, M=Modest, N=Negligible, NA=Not Applicable)

	<u>Rating</u>				
<input type="checkbox"/> <i>Macro policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input type="checkbox"/> <i>Sector Policies</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Physical</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Financial</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input type="checkbox"/> <i>Institutional Development</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Environmental</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<i>Social</i>					
<input type="checkbox"/> <i>Poverty Reduction</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Gender</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input type="checkbox"/> <i>Private sector development</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Public sector management</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA

Annex 6. Ratings of Bank and Borrower Performance

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HU=Highly Unsatisfactory)

6.1 Bank performance

Rating

- | | | | | |
|--------------------------------------|--------------------------|------------------------------------|------------------------------------|--------------------------|
| <input type="checkbox"/> Lending | <input type="radio"/> HS | <input type="radio"/> S | <input checked="" type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Supervision | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Overall | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

6.2 Borrower performance

Rating

- | | | | | |
|--|-------------------------------------|------------------------------------|-------------------------|--------------------------|
| <input type="checkbox"/> Preparation | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Government implementation performance | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Implementation agency performance | <input checked="" type="radio"/> HS | <input type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Overall | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

Annex 7. List of Supporting Documents

1. Economic Analysis Files (Digital)
2. Aide Memoire of the ICR Mission, May 23- June 10, 2005
3. Overall Impact Evaluation Study of the World-Bank assisted IWDP, Ministry of Agriculture/TERI, August 2005
4. Integrated Watershed Development Project (Hills-II) in Himachal Pradesh, Final Impact Evaluation Report, Consulting Engineering Services (India) Private Limited, February, 2005.
5. Integrated Watershed Development Project (Hills-II) in Punjab, Final Impact Evaluation Report, Consulting Engineering Services (India) Private Limited, December, 2004.
6. Integrated Watershed Development Project (Hills-II) in Uttaranchal, Final Impact Evaluation Report, Consulting Engineering Services (India) Private Limited, January, 2005.
7. Integrated Watershed Development Project (Hills-II) in Jammu and Kashmir, Final Impact Evaluation Report, DHV consultant Private Limited, March, 2005.
8. Integrated Watershed Development Project (Hills-II) in Haryana, Final Impact Evaluation Report, Chaudhary Charan Singh Haryana Agricultural University, September, 2004

Additional Annex 8. Comments from Ministry of Agriculture, Government of India (unedited)

In 1990 the World Bank extended their support to a multi-state project titled Integrated Watershed Development Project (IWDP Hills - I) in the states of Jammu & Kashmir, Punjab, Himachal Pradesh and Haryana, which was completed in 1999. The follow on World Bank Assisted Integrated Watershed Project (IWDP – Hills-II) was launched in the states of Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab and Uttaranchal since 15th September 1999 for a period of 5 years, which was subsequently extended till 30th September,2005.

The IWDP Hills-II project has been implemented in the Shiwalik region of Project States. The project period is ending in September, 2005 with a total outlay of Rs.954.60Crores(US\$ 193.00 M) which was revised after MTR to Rs. 902.84 Crores . The project area covers an area of 5.19lakh ha (72 watersheds) having net treatable area of 2 lakh ha at a cost of Rs 954.60 crores. While going for IWDP (Hills - Phase II), which is a follow-up of IWDP (Hills-I), Shiwalik area of Uttaranchal was also included for implementation. The project has been supervised by the Watershed Development Council of the Ministry of Agriculture. This project is different from the earlier project in terms of having a larger geographical coverage, adopting a more participatory and integrated approach and in having some additional components such as rural road rehabilitation. There is more emphasis on participatory approaches and institutional development in order to achieve sustainability

In Uttaranchal the geographical area of the project is 157304 ha. It is drained by 8 sub-watersheds and comprises 493 villages. Accelerated soil erosion and increased rate of siltation due to run off is the cause of woe and miseries to the area. The Integrated Watershed Development Project–IWDP (Hills-II) in Punjab covers 17 sub-watersheds (SWS) in the ecologically fragile Kandi area. The total geographical area is 93,938 ha in 282 project villages. The Integrated Watershed Development Project (Hills-II) in Himachal Pradesh covers the ecologically fragile areas of the lower Shivaliks. The geographical area of the project is 103652 ha. covering 36 sub-watersheds in 835 villages. The Shiwalik foothills of Haryana were completely denuded during last century. The problematic area of the Shiwalik belt is covered under the project comprising an area of 70742 hectares falling in the spread over of 219 villages. In J&K, the IWDP Hills II project area includes two sub-watersheds in sub–tropical belt of Shiwaliks of Jammu region and two in temperate Karewas of Kashmir region, covering an area of 1, 11,080 ha in 187 villages.

Assessment of Project Objective, Design and Scope

Original Objective:

At the time of negotiations, the main development objective of the project was ‘to improve the productive potential of project area in five States using/evolving Watershed treatment technologies and community participatory approaches. An associated objective was to assist the states with institutional development and consolidate progress already made in harmonizing approaches to watershed development among various programs operating in the Shiwalik Hills’. Reversing the process of degradation in the degraded watershed inhabited mostly by the poor and women, poverty alleviation and sustainability are the main focus areas of the project

A bottom up Integrated Multi-sect oral watershed bottom up approach has been followed in this project. The project emphasizes on better cost recovery, reduction of input subsidies, and greater community participation in the context of watershed development by enhancing the capacity of the resource users to manage their resources in a sustainable manner. Sustainability is being ensured through active participation of the stakeholder in planning, execution and monitoring.

Assessment: The project development objectives were highly relevant to the development context of Shiwalik region. Subsistence rain-fed agriculture is the prevalent production system in the project area. Over Grazing, Fuel-wood & Fodder scarcity, Faulty Land use Practices, Forest Fire, Insufficient Community Participation in NRM, Increasing depletion of natural resources and degradation of rain-fed agro-eco system are the major problems of the area.

Project Components:

I. Watershed protection and Development:

The objective of the component is to: (a) promote proven locally adopted vegetative technologies and mechanical structures through active participation of beneficiaries to conserve water and reduce soil erosion; (b) consolidate achievements of the first phase of the project (IWDP-I) and use its interventions to demonstrate and train beneficiaries in newly covered areas using appropriate farming system (crops and livestock); (c) improved rural infrastructure particularly upgrading of existing rural roads to facilitate the marketing of increased agricultural production (rural roads and markets) and water harvesting structures for irrigation; and (d) promote diversification to high value commodities, such as horticulture and milk production.

(i) Sub-Watershed Treatment:

The project places greater emphasis on the participatory planning and implementation, VDCs has played an important role in the selection of activities and treatments in a particular area.

Following activities were carried out under sub-watershed treatment:

- Vegetative barriers/field boundaries
- Terrace repair and vegetative reinforcement
- Improved cropping system
- Diversification to high value crops mainly off season vegetables and, medicinal and aromatic plants, and spices.
- Organic farming and IPM (concept of bio villages)
- Rainfed horticulture promotion programme
- Low cost pre and post harvest innovative technologies
- Agro-forestry
- On-farm fodder production
- Non-arable land treatment
- Pasture development
- Silvi-pasture
- Forest regeneration

(ii) Fodder and Livestock Development program

The objective of the fodder and livestock development component was to reduce livestock pressure on the fragile lands by scaling down the extent of open grazing and improving the contribution of the animal husbandry sector to better natural resource management in the project area. This has been achieved through the introduction of proven fodder and animal husbandry technologies and supported by policy changes. The major contribution is increase in milk production. Breed improvement are major component of livestock and forage development.

(iii) **Rural Infrastructure Development**

The main objective of the rural infrastructure development component is to improve access to potential production and marketing areas, facilitate the communication of the rural population under the project, improve drinking and irrigation facilities and improve marketing and storage mechanism. To ensure sustainability of the assets created, the communities has been made responsible for the maintenance of rural infrastructure (such as, culverts/bridges, bridle paths/ mule tracks, etc.). Support for infrastructure includes Rural roads, Potable water supply, Drainage line treatment, Water harvesting structures, Marketing and Post Harvesting Infrastructures.

(iv) **Project Coordination**

The important objective of the project is to build the institutional capacity of project implementing units. This sub-component strengthened watershed implementing agency (WPIO). On job trainings, workshops and study tours, locally and nationally were organized by the project. Due importance was also given to various line department functionaries in enhancing their capacity for implementation of various activities involving participatory approaches. Financial Management System and Management of Information System has been developed in the project as decision support system.

II. Institutional Strengthening

The objective of the institutional strengthening component is to: (a) support beneficiary capacity building in planning and implementing project activities and taking responsibility of assets created by sensitizing beneficiaries to the maintenance of project assets and interventions; (b) strengthen capacity of implementing agencies through research and extension and by strengthening human resource development through training, field exposure and better incentives; (c) support the effort to increase awareness of sustainability measures and project development; and (d) support project states to implement policy and institutional reforms that are considered essential for the sustainability of project activities through studies and building partnerships with other local level institutions.

III. Empowerment Plan and withdrawal strategy

In all the VDCs the process of preparation of Empowerment plans was taken up. Appropriate forward and backward linkages of local institutions to established private organizations/NGOs, business houses and government department is another way of attaining and ensuring institutional sustainability. Recognizable efforts were made towards establishing certain linkages between producer associations like vegetable growers, vermin-composting producers and other common interest groups. Links were established with the different organizations, Line Departments, PRIs, Khadi Board, Local NGOs, Banks and Agriculture Marketing Parishad/Committees etc. for sustainability.

IV. Monitoring and Evaluation

An IMME Unit was established at the WPIO level with the aim to facilitate interaction of staff in different project implementation units and also to independently evaluate project performance through agreed performance indicators that were collected and monitored regularly.

Assessment:

The components were well related to achieve the project objective. The activities under various components were adequately linked to form a coherent set of interventions. The components incorporated lessons from

previous projects (IWDP-I), especially focus on better cost recovery, reduction of input subsidies, and greater community participation in the context of watershed development by enhancing the capacity of the resource users to manage their resources in a sustainable manner. The adoption of a decentralized management structure to ensure greater responsiveness to local conditions, the involvement of VDCs, SHGs and UGs in project implementation to achieve better results and the use of participatory monitoring and learning tools, simplify the implementation of various project interventions.

BANK AND BORROWER PERFORMANCE

I. PERFORMANCE OF BANK

The performance of the Bank has been very satisfactory during the implementation of the project involving high level of supervision and monitoring. In all 10 Supervision Missions, one Mid-term review, one ICR Mission were undertaken during the project implementation. Besides this, six Coordination Committee meetings and one pre-ICR Desk Review were undertaken for effective monitoring and supervision of the project. The deficiency in the implementation indicated in the Mission's report based on the detailed review and mutually decided agreed actions provided helpful constructive advice to work on the problem and improvements for successful implementation of the project. The suggested proposals for policy reforms at the state level have added sustainability to the project interventions. The component/activity-wise withdrawal strategy/empowerment plan adopted as per the Missions' advice have resulted in better empowerment of local community and owning the responsibility for post project maintenance of the assets created under the project. The Bank has also shown fairly good amount of flexibility in agreeing to extend investment to new areas and reallocated fund into additional activities which were required for empowerment of community especially after the mid-term review.

II. BORROWERS PERFORMANCE

The project implementation units in each state have satisfactorily implemented the projects. All the states have mostly achieved and even exceeded the implementation targets in the watershed development works and the quality of establishment and construction has been quite good. Initially under some components the progress was slow due to requirement of some policy reforms at the state level. However, after the mid-term review the implementation got accelerated in achieving the desired targets in the required time frame. Though the states have mainly performed on a target oriented approach, yet they have shown commendable level of flexibility in refinement of certain activities.

III. PROJECT RESULTS

The Watershed Development Council (WDC), Ministry of Agriculture assigned The Energy and Resources Institute(TERI) New Delhi for conducting the overall impact evaluation in the 5 states. Besides, the services of Agricultural Management Centre of Indian Institute Management, Lucknow was engaged as consultant by WDC for a period of 3 years for independent monitoring of the project performance in J&K. The major achievements of IWDP Hills-II as per Evaluation Reports are as under:

A. INSTITUTIONAL DEVELOPMENT:

The participatory approach is the main strategy of integrated watershed development Project of Haryana, Jammu & Kashmir, Punjab and Uttaranchal and Himachal Pradesh. This approach ensures the sustainability of the project and empowers the local communities to optimize advantage through the collective ownership by the stakeholders. The main institutions that were developed in the five states

include – Village Development Councils, Self Help Groups and User Groups. Strong and proactive village institutions are the main hinge around which the success of all future strategies and interventions of this project will depend.

In the project states, in all the MWS areas, VDCs were formed, which served as the institutions for the project implementation. The number of VDCs formed varies from state to state. In Punjab 270 groups, in Uttaranchal 505 groups, in Himachal Pradesh 143 in Jammu and Kashmir 200 and in Haryana 174 VDCs were formed. The gender composition in the Executive Committees is encouraging as women membership is ranging between 25-40%. The representation of marginalized sections (SC,ST,OBCs) is satisfactory with their membership varying between 19-30% in the executive committees. The contribution to the VDC differs from state to state. The membership fee was decided in the general body meeting, which was affordable and contributed by house holds on annual basis. The source of VDC revolving fund includes Membership fee, Cost sharing in project interventions, Savings in works through VDCs, Bank interest, and interest on loans given by the VDCs.

Usually, VDCs had their two general house meetings each year, but in few VDCs the monthly meetings or special meetings were also treated as general house because most of the community members attend these meetings. The monthly meeting agenda primarily focused on interventions related to project works, identification of beneficiaries, income generation activities, capacity building, etc. Village Development Plan became critical for review and taking things forward, more so, when focus was on impact assessment and sustainability.

The cost sharing helped in better prioritization of the project interventions and focusing more on the disadvantaged sections of the VDCs. The cost sharing ranged between 10% to 50% in the form of cash, labour, carriage and material like sand and stone. Inter loaning among the VDCs members was observed in all states, except Haryana where information is not available.

Self Help Groups in all states are very active and they have participation from the needy sections of the community. Punjab has 329, Himachal has 254, Uttaranchal has 497, Jammu and Kashmir has 195 and Haryana has 129 self help groups. The average membership of SHGs ranges from 7-20 and their monthly average savings varies from state to state ranging between Rs10-100/-. Attendance in meetings of VDCs in all the states was regular. A comparison across three states shows that inter loaning is highest among Punjab (68%), closely followed by Uttaranchal (67%), and Himachal Pradesh (55%). The SHGs in Jammu and Kashmir also started with inter loaning.

In Uttaranchal the user groups in majority cases were of water users. The Facility User Groups (FUGs) in Punjab were formed for the effective management of traditional springs, fisheries and sericulture. In Himachal Pradesh initially, the User groups formed under the project were component specific groups, To increase involvement of more people from the community, the project now has user groups for the services or activities being undertaken by the project or VDCs. In J& K the user groups are of mainly three types-Fodder User Groups, Water User groups and Transhumance User Groups.

The village level institutions be it SHGs, UGs or VDCs were brought together in the form of federations. The federation of these institutions was needed to sustain the developmental initiatives even after the withdrawal of the Project. Capacity building of these groups was taken care through trainings and exposure visits of the stake holders and project staff. Linkages among village institutions and with the line departments were found essential for convergence and complementarily of development initiatives at the grassroots.

B. DEVELOPMENT OF WATERSHED AREAS:

Though each participating state has a different approach or variance in methods of watershed development, all of them emphasized on the two main components in the development of watershed areas. These are - Development of local institutions and Watershed treatment. The development of watershed areas comprises of three sets of interventions. The first set of interventions are for conservation, development and management of natural endowments, second set includes all inputs to various biomass production systems and the third set comprises the interventions and activities, which strengthen and develop user/ beneficiary organizations/ institutions, capacity building etc. Sector wise analysis for the water shed areas development suggests the improvements made in the fields of Agriculture and Horticulture, Livestock and fodder development, Forestry and Soil conservation, Water resources development and Infrastructure development.

Agriculture and horticulture development in the project was assessed based on important parameters- Cropping intensity, irrigation intensity, conservation practices, improved inputs, organic farming ,integrated pest management and no. of fruit plants planted by farmers. The cropping intensity increased due to project interventions in all the five states. More number of farmers had opted for a number of soil conservation practices such as terracing and bunding. In Punjab in the project area as a whole 81.50 percent farming families had adopted terracing and 100% families had practiced bunding. In Himachal Pradesh 58.1 percent adopted terracing and bunding work was taken up by 72.9 percent of farmers, whereas 64.8 percent had taken up works of vegetative measures. In Jammu and Kashmir project villages 100% families were using improved seeds and terrace repair and bunding was practiced by majority of farmers. In Uttaranchal the adoption level ranged from 32% - 50%. It is very encouraging to find in Uttaranchal that the target achievement in respect of terrace repair was around 100% in the majority of the villages whereas in some cases the achievement overshoot even 200%. Haryana also laid lot of emphasis on improved farm practices.

The farm machinery and pump engines, which are being used by the farmers of sample villages, are various-diesel engines, petrol engines, tractors, trolleys, tractor tiller, disc harrows thresher, maize Sheller, bullock driven plough and cane crushers etc. In Punjab majority of farmers possess advanced machinery and in Himachal Pradesh better farm inputs were utilized. In Uttaranchal field Demonstrations (FD) were conducted by WMD on a fairly wide scale across the project villages in all the divisions. Most of the FDs focused on the introduction of High Value crops including hybrids and High Yielding Varieties. This was often done in conjunction with the distribution of Mini kits. In Jammu and Kashmir the project had shown 100% usage of High Yielding Varieties of seeds by the farmers in all SWS.

Water harvesting structures, tanks, *pucca gul*, etc. were constructed and expanded in many villages, and the farmers were tapping this additional water for growing vegetables and high value crops as well as for irrigating traditional crops like wheat and paddy. As a result, the area under irrigation and the irrigation intensity have improved and this is reflected in crop yields and production in the project area.

Cropping Pattern had undergone changes in the participating states with diversification of crops and cultivation of vegetables and high value crops in Punjab, Himachal Pradesh, Harayana, Uttaranchal and Jammu and Kashmir with variations in the levels of cultivation. There is a gradual and positive response to high value crops. An increase in cropping intensity and usage of high yielding varieties of seeds by farmers led to socio-economic development. Organic farming is one of the innovative initiatives of the watershed project. Because of the increasing realization that accumulation of chemical residues in soil, water and plants can result in severe human and animal health problems, farmers started to opt for organic farming. Use of bio-fertilizers, bio-pesticides, bio-fungicides was popularized through demonstrations.

Considering the ill effects caused by excessive use of pesticides on human being and environment, a strategy to manage the pests was formulated as integrated pest management (IPM). This is one of the important strategies in development of watershed areas adopted by the participating states. Another significant innovation of the IWDP is advocacy of vermin compost. Among such sources of organic manures, vermi-compost is found to be one of the best alternatives having the potential to sustain soil productivity, health and yields.

Horticulture component of the project in Haryana had laid out the fruit plant demonstrations mainly on the marginal arable lands, where production of other crops was not much remunerative. Enterprising farmers were motivated to raise private nurseries of fruit plants with assurance of buy back mechanism. Orchard Development and Homestead Plantation were identified as the two most important components for progress in fruit cultivation in the project area, and major emphasis was on success in these fronts. A variety of fruits like apple, cherry, guava, plum, apricot, walnut and almond were grown all over. It was noticed that there is an increase in survival rate of plants in the project states.

Most of the cattle and buffalo in the project area were of indigenous breed, which survive on low nutrition level, and were comparatively disease resistant and produced small quantity of milk. The strategies and project interventions followed included upgrading of local livestock and increasing milk yield, promoting stall feeding, rendering improved healthcare, increasing nutrient availability of animals by fodder mini kits, silvi pasture, fodder grass, etc.; diversifying livelihood through other income generating activities like goatery, sheep, piggery, poultry, integrated fishery-cum-piggery-cum-poultry, integrated fishery-cum-duckery. These initiatives helped in improving economic conditions of the population in the project area.

The quality of livestock is upgraded by breed improvement through NBC services, artificial insemination and reduction of poor quality unproductive heads through castration. There was noticeable increase in milk yield for local cows and buffalos. Paravets for providing services to livestock at farmer's doorstep were introduced as a viable mode to mitigate the problems of livestock owners. The nomads/migratory grazers were helped in all the states in maintaining their livestock etc. by extending services like de worming, health camps, dipping flock, providing health care and fodder kits, etc and bring them close to village community.

The forest plantation activity in the project area had four components- Afforestation, Silviculture, Replenishment of old plantations and rehabilitation of degraded forests, and creation of vegetative/shrub barriers. Afforestation work substantially removed the ecological imbalance. Survival percentage of the plants was about 60% ranging from 53.9 % to 64.1 % in different plantation models. The production of fodder from the newly introduced Napier grass was very high. There was substantial reduction in the population of thorny shrubs like Lantana, Karonda, Berberies. The pre project situation indicated serious environment degradation that has been gradually reduced due to project interventions.

A variety of soil conservation measures over extensive areas to counter the inherent as well as induced hazards of erosion and land degradation were taken up by the IWDP II. Severe problem of drainage systems were addressed substantially by drainage line treatment structures for both gully stabilization as well as stream bank protection in the villages. Design, construction and site location of engineering (stone based) structures were found physically and functionally in good condition. Perenniality of water channels increased on an average. Many village tanks/ponds, and water harvesting structures were constructed. Major focus of the project was to conserve water resources through watershed conservation measures. In the project states development of water sources and utilization of increased volume of water available through various structures and systems has been observed. The systems developed have provided water to

meet domestic requirements benefiting about 77883 families and many animal heads.

The infrastructural facilities were provided for better communication facilities for rural people in order to reduce their drudgery and promoting marketing of the agricultural/horticultural produces after developing better road network and cross network of existing roads. The infrastructure development in the hill areas was greatly appreciated by the people.

Many of village roads were upgraded which have benefited approximately 14.50 lakh families and facilitated as focal points of the project. The rural connectivity has tremendously improved. As result farmers could more easily transport their produce to the nearby market by using draught animals like Camels, Mule and Donkeys.

C. SUSTAINABILITY

In different states the project has prepared a comprehensive withdrawal strategy and empowerment plan for the VDCs and the village communities. Emphasis was laid on capacity building, linkage with Panchayat and financial institutions, networking of VDCs, gender issues and empowerment of communities.

Withdrawal strategy with evolved arrangements for maintenance of assets after the project is withdrawn, and capacity building of the institutions ensures successful continuation of benefits of the project in future. The withdrawal strategy of project states emphasizes on facilitating stronger and more formal operational linkage and understanding between the VDCs and the Panchayats.

The project initiatives endeavor is to create substantial income generating activities directly through project assets or indirectly through various initiatives taken as a part of the Project.

PROJECT ASESSMENT:

The broad focus of IWDP programme in the five states was on initiating an integrated overall village development package that leads to socio-economic development of the entire region. The intervention strategy followed in the five states was more or less similar in line with the IWDP guidelines that enunciate participatory approach to initiate wasteland development by following the strategy of watershed development. This involves participatory planning and capacity-building to ensure that communities make their own decisions for governing the use of natural resources in the area, understand the value of conserving forests, soil and water.

The approach recognizes the importance of linking watershed development with income-generating activities, such as irrigated agriculture, non-timber forest products and adding value in crop and livestock production. In addition, the approach includes [at times] financing critical economic infrastructure such as rural footpaths, roads, and water supply.

The monitoring and evaluation reports of the Project revealed that the IWDP Hills-II Project has been successful in achieving its objectives. The overall impact evaluation study has strengthened this assessment.

LESSONS LEARNT AND FUTURE PROSPECTS

Several learnings came from the Integrated Watershed Development Programme implementation in the five project states, which needs to be adequately disseminated. For instance, the Para-vet model has been successful not only in ensuring veterinary health care benefits to remotely located villages, but has also

ensured livelihood for members of the village committees. Similarly, the Punjab model of IGAs is quite comprehensive. Several IGAs like motor repair, tube light choke making, mini tent house etc. have direct and ready market linkages and are thus more likely to succeed than other conventional IGAs. Some other important findings of the project that can be extended to other watershed programmes are:

- Organic farming has emerged as an innovative initiative of the IWDP project, and needs to be dispersed to other regions. A long-term strategy to integrate the organic farming practices into he agronomic practices in these areas/regions should be devised to realize its full potential; given its benefits for the humans and animals.
- Vermi composting is an innovative technology that should be looked at from future growth potential and accordingly a strategy needs to be devised to spread its usefulness and adaptability to the local environment.
- Horticulture is a nascent field, with immense potential if the support services and infrastructure is in place to promote horticultural activities. Horticultural development promises immense potential for future growth in the watershed region, therefore, a strategy could be devised to reach the full potential for overall development in the region.
- From the watershed development perspective, emphasis be given for conserving the water resources or dwell into a detailed analysis that helps to understand the need and demand of the area vis-à-vis management of water resources. This is a crucial aspect to undertake relevant water management measures.
- The withdrawal strategy of project emphasizes facilitating a stronger and more formal operational “linkage between the VDCs and the panchayats, detailed modalities of the same need to be formulated. Also, capacity building ought not to be understood in terms of a one way process flowing from the project implementing agency to the community but as a two way process. One could think of forming learning and teaching centres’(LTCs) at he lowest level say panchayats to capitalize on the knowledge at the grassroots and also provide inputs on the latest breakthroughs in the relevant fields.
- Subsequent follow on activities of the project could consider devising modalities for linking up with grass root institutions –PRIs as part of the withdrawal strategy to ensure sustainable management of resources after the project period is over.
- A question that the project authorities of watershed programme may want to ponder given that the objective of the watershed approach is to ensure overall village development: ”is watershed development approach is the only answer to ‘overall village development’ or is the approach too concentrated on land based activities – natural resource management; neglecting social aspects like health, hygiene, drinking water supply and sanitation, education, dwelling more into the questions of rights, responsibilities and governance. In the above context, revisiting the programme objectives and what it entails may be considered if it enunciates overall village development.

