Document of
The World Bank

Report No: 29529

IMPLEMENTATION COMPLETION REPORT
(PPFI-P9750 IDA-31060 SCL-43650)

ON A

CREDIT

IN THE AMOUNT OF SDR 37.2 MILLION (ORIGINALLY US$50 MILLION EQUIVALENT)

AND A

LOAN

IN THE AMOUNT OF US$79.9 MILLION

TO

INDIA

FOR THE

DIVERSIFIED AGRICULTURAL SUPPORT PROJECT (DASP)

SEPTEMBER 8, 2004

Agriculture and Rural Development Unit
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective June 2004)

Currency Unit	=	Rupee
Rs. 1.00	=	US$ 0.022
US$ 1.00	=	Rs. 45.84

FISCAL YEAR
April 1 to March 31

ABBREVIATIONS AND ACRONYMS

AI	-	Artificial Insemination
AMC	-	Agricultural Management Centre
APC	-	Agriculture Production Commissioner
ATMA	-	Agricultural Technology Management Agency
BCD	-	Breed Conservation and Development
CARP	-	Competitive Agricultural Research Program
CAS	-	Country Assistance Strategy
CFMS	-	Computerized Financial Management Software
ERR	-	Economic Rate of Return
FFS/FF	-	Farmer Field Schools/Farmer Federations
GOI	-	Government of India
GOUA	-	Government of Uttaranchal
GOUP	-	Government of Uttar Pradesh
IIM	-	Indian Institute of Management
IPM	-	Integrated Pest Management
IPNM	-	Integrated Plant Nutrient Management
LACI	-	Loan Administration Change Initiative
M&E	-	Monitoring and Evaluation
MTR	-	Mid Term Review
O&M	-	Operation and Maintenance
PAD	-	Project Appraisal Document
PCU	-	Project Coordination Unit
PDF	-	Project Development Facility
PDO	-	Project Development Objective
PPF	-	Project Preparation Facility
PWD	-	Public Works Department
SAU	-	State Agricultural University
SCF	-	Standard Conversion Factor
SHG	-	Self Help Group
SREP	-	Strategic Research and Extension Plan
UPCAR	-	Uttar Pradesh Council of Agricultural Research
VOC	-	Vehicle Operating Costs

Vice President:	Praful C. Patel
Country Director	Michael F. Carter
Sector Manager	Gajan Pathmanathan
Task Team Leader/Task Manager:	Deepak Ahluwalia

INDIA
Diversified Agricultural Support Project (DASP)

CONTENTS

Project ID: P035824	*Project Name:* Diversified Agricultural Support Project (DASP)
Team Leader: Deepak Ahluwalia	*TL Unit:* SASRD
ICR Type: Core ICR	*Report Date: September 8, 2004*

1. Project Data

Name: Diversified Agricultural Support Project (DASP) *L/C/TF Number:* PPFI-P9750; IDA-31060; SCL-43650

Country/Department: INDIA *Region:* South Asia Regional Office

Sector/subsector: Sub-national government administration (44%); Agricultural marketing and trade (24%); Roads and highways (21%); Agricultural extension and research (11%)

Theme: Other rural development (P); Infrastructure services for private sector development (P); Technology diffusion (P); Nutrition and food security (S); Biodiversity (S)

KEY DATES		*Original*	*Revised/Actual*
PCD:	06/21/1996	*Effective:*	09/30/1998	09/30/1998
Appraisal:	11/28/1997	*MTR:*	10/30/2001	12/07/2001
Approval:	06/30/1998	*Closing:*	03/31/2004	03/31/2004

Borrower/Implementing Agency: Government of India/Governments of Uttar Pradesh and Uttaranchal

Other Partners: NA

STAFF	Current	At Appraisal
Vice President:	Praful C. Patel	Meiko Nishimizu
Country Director:	Michael F. Carter	Edwin R. Lim
Sector Manager:	Gajan Pathmanathan	Michael Baxter
Team Leader at ICR:	Deepak Ahluwalia	Ashok K. Seth
ICR Primary Author:	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:		S
Project at Risk at Any Time:	Yes	

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

3.1 Original Objective:

The principal objectives of the project were: to increase agricultural productivity through support for UP's (Uttar Pradesh's) diversified agricultural production systems, promote private sector development, and improve rural infrastructure.

3.1.1 Assessment. The project development objectives (PDOs) were highly relevant to the development context of UP: high dependence on agriculture, with a farming system dominated by a few important crops (wheat, rice and sugarcane) and experiencing declining soil fertility. The Project Appraisal Document (PAD) rightly recognized that enhancement of agricultural productivity, leading to income growth and poverty reduction, would require intensification and diversification of farming systems to be complemented by increased private sector investment in agriculture, improved rural infrastructure and a more favorable policy environment. The PDOs, reflecting this, were also in line with Bank's Country Assistance Strategy (CAS) which aimed to support rural development at the state level through policy (e.g., cost recovery, privatization) and institutional (e.g., beneficiary participation, demand-driven funds, re-orientation of public sector functions) reforms.

3.1.2 The project was ambitious in scale and scope. It spread across 37 districts (of a total of 83 districts) representing the main agro-climatic regions of India's most populous state (population 166 million), and covered about 7,400 villages (7% of total). It involved policy, institutional and public expenditure reform; changes in planning and decision making processes; training and capacity building; and mobilization of user communities. Project activities involved coordination across seven line departments, several government and university institutions and NGOs. This necessarily led to a complex project which was consequently exposed to implementation risk from possible under-performance in any of the various critical areas. The risk was mitigated to some extent by a long and extensive preparation phase during which the Government of UP (GOUP) initiated key policy changes (listed in PAD Annex 2) and introduced institutional reforms to enhance inter-departmental coordination.

3.2 Revised Objective:

There was no revision of objectives during the course of the project.

3.3 Original Components:

The project had five components as stated in the PAD:

(i) Support for Technology Development (US$17.1 million – 11% of base cost): through (a) enhanced capacity for research coordination; (b) establishment of a competitive agricultural research program (CARP) to support time bound adaptive research on priority constraints in order to increase productivity of smallholder agriculture; and (c) strengthening of research support for technology dissemination activities.

(ii) Establishment of a Demand Driven Technology Dissemination System (US$55.3 million – 34%): through (a) rationalization, reorientation and strengthening of line departments to service a demand-driven system; (b) increased participation by the private sector in input supply and support services; (c) increased participation by the farming communities mobilized with the help of NGOs; and (d) support for human resource development and greater use of information technology in technology dissemination.

(iii) Support for Increased Private Sector Involvement and Public/Private Partnerships in Agri-Business Development (US$4.1 million – 3%): through (a) credit mobilization and facilitation; (b) provision for establishment of Project Development Facility to mobilize private sector initiatives and promote vertical

integration of smallholder agriculture with private investment in input supply and post-harvest value addition initiatives including agro-processing.

(iv) Support for Rural Infrastructure Development (US$67.5 million – 42%): through (a) improvement of up to 1,600 km of rural roads in the project districts; and (b) improvement of up to 145 rural markets (Haat Painths), 14 cattle markets owned by Panchayats/ Zilla Parishads and rehabilitation/ establishment of two model fruits and vegetable markets under Mandi Parishad in project districts; and (c) support for Directorate for Agricultural Marketing to improve its market information collection and dissemination systems to benefit marketing activities of producers.

(v) Support for Project Management and Enhanced Capacity for Economic Policy Analysis (US$ 15.5 million – 10%): through establishment of: (a) Project Steering, Management and District Level committees to ensure effective oversight, policy guidance and management of the project; (b) a unit to coordinate day-to-day implementation of project activities; (c) an independent M&E arrangement: and (d) an Economic Policy Analysis Unit to assist the Agriculture Production Commissioner (APC) branch in analyzing agricultural policies and public expenditures.

3.3.1 Assessment. The components were well related to the PDOs, spanning a range of relevant activities from research, extension, input supply and credit facilitation to changes in policies, public institutions, development planning/administration and private sector involvement. The activities under various components were adequately linked to form a coherent set of interventions. The components incorporated lessons from previous projects, especially the adoption of a decentralized management structure to ensure greater responsiveness to local conditions, the involvement of farmer/community groups in project implementation to achieve better client-focus; and the use of an independent agency to assist in M&E work.

3.4 Revised Components:

There was no formal revision of components. However, following the bifurcation of UP in November 2000 and at the government's request, the project legal documents were amended to: (i) include the new state of Uttaranchal (UA) as a separate legal entity under the project; and (ii) increase the size of the rural roads component from about 1600 kms to upto 3000 kms (in practice, implementation target was set at 2800 kms) using savings anticipated mainly in technology development, sericulture, and training. The latter change sought to reallocate resources from economically unviable activities (e.g., sericulture following sharp drop in silk prices around 2000), activities where original allocations were likely to remain unspent (e.g., technology development) or savings resulting from government policy changes during course of implementation (e.g., preference for local over international training) to a component with significant and demonstrated economic impact – confirmed by economic analysis at ICR.

3.5 Quality at Entry:

Satisfactory. The project objectives were consistent with State development policies and Bank CAS and were pursued through an integrated set of components. Project design was instrumental in introducing coordinated changes in policies, public institutions, planning and implementation processes, community organizations and individual skills and capacities. A pragmatic approach was adopted with respect to activity focus (e.g., horticultural crops rather than wheat and rice which are supported by politically complex programs) and breadth and depth of policy reforms. The project drew on and complemented the successful community driven agricultural development approach followed under the then ongoing Bank supported UP Sodic Lands Reclamation Project (Credit No. 2510). The project was in compliance with all applicable Bank safeguard policies. With regard to operationalization, important steps were taken in advance such as the establishment of a Project Coordination Unit (PCU); enhancement of institutional coordination (through, e.g., formation of CARP in June 1997 and transfer of Department of Sericulture to

the APC Branch); and selected policy reforms. In view of the innovative nature of the project, the implementation plans were drawn up to allow considerable flexibility and two MTRs were scheduled to enable mid-course corrections. In retrospect, both these features proved useful in ensuring successful project implementation. However, there were weaknesses in appraisal of, and hence preparations for, financial management of this large and complex project. (Since this project was appraised in November 1997 and became effective in September 1998, it preceded the introduction of the Bank's Loan Administration Change Initiative (LACI) guidelines. Therefore, no formal assessment of the implementing agencies' financial management systems and controls were conducted at the appraisal stage of the project). Also, the assessment of the implementation capacity of the Uttar Pradesh Council of Agricultural Research (UPCAR) – the lead implementing agency for the first component – underestimated its management weaknesses and lack of (effective) financial leverage over relevant research institutions. Although these factors did retard implementation, they were not, on the whole, responsible for slow implementation in the early stages.

4. Achievement of Objective and Outputs

4.1 Outcome/achievement of objective:

Satisfactory. Overall, key project development objectives have been achieved. Prospects for all-round productivity growth have been improved by encouraging a farming-system rather than commodity-specific approach to technology development and dissemination and by promoting applied research on user- and location-specific needs. There has been an increase in crop productivity (over 10%), milk productivity (25%), cropping intensity (from 169% at baseline to 203% at ICR), and significant diversification of area out of cereals into vegetables and other higher-value crops (details in Annex 1). Greater demand-orientation has been imparted to technology dissemination activities. At the ground level, where a functioning extension system had been lacking, a network of farmer-based groups has been formed, and used to propagate a blend of low-cost new and indigenous technologies and agronomic practices. Given its success during the project and its low recurrent public cost, this system constitutes an affordable and replicable extension model, if reliably back-stopped (technically) by line departments and relevant public research institutions. Substantially increased private sector participation has been catalyzed as a result of policy reforms and changes introduced in paravet services (over 1300 paravets trained and operational), input supply (costs being recovered across a range of publicly provided goods and services), on-farm seed multiplication, and establishment of 1095 private vegetable and fruit nurseries. Rural infrastructure has been significantly improved through the expanded rural roads program (connecting over 1100 villages with improved roads) as well through upgradation of 114 rural markets. Impact assessment studies suggest that these improvements have had a significant economic impact.

4.2 Outputs by components:

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

*4.2.1 Technology Development***. Unsatisfactory**. The component goal of augmenting on-going research to improve technological base for agricultural production systems has been only partly achieved. On the positive side, a strong implementation focus on time-bound adaptive research on priority constraints contributed to improvement in subject relevance and research prioritization: emphasis was placed on Intergrated Pest Management (IPM), Integrated Plant Nutrient Management (IPNM) and varietal improvement (especially for vegetables) as well as on animal reproduction, health and feed management. Around 181 new technologies were identified, 42 were released for dissemination, and 27 IPM modules were passed on to farmers' groups for replication. Research support for technology dissemination was strengthened by improving research-extension-farmer linkages through over 500 adaptive and validation trials in the fields, many of which yielded crop- and location-specific recommendations. CARP was

successful in opening up research to different organizations: of the 44 projects funded, 21 were awarded to State Agricultural Universities (SAUs), 8 to central institutes, 10 to other universities and colleges and 5 to NGOs. On the negative side, because of institutional difficulties little progress was made in research coordination and in the development of long-term agricultural research plans and agricultural information systems. Due to weaknesses at UPCAR, funds allocated for technology development were under-utilized despite an apparent chronic shortage of funds for agricultural research in the state. Although progress towards enhancing genetic animal stock has been made through the organization of breed conservation programs and the collection/importation of improved genetic material for fruits and vegetables, testing of the latter has begun for the first time only in the final year of the project. Its satisfactory outcome will be therefore contingent on continued funding of the facility and on early sharing of promising breeding lines and improved cultivars with private sector companies who are the main suppliers to farmers. The Technology Advisory Groups constituted under the project to strengthen development prospects for important commodities, through all stages from production to marketing, failed to make any concrete contribution.

4.2.2 Demand-Driven Technology Dissemination. **Highly Satisfactory**. Impressive progress has been made with regard to all sub-components. With regard to rationalization and reorientation of public extension service, the project-supported Agricultural Technology Management Agency or ATMA (scaled up, because of its success, from the initial two to *all* project districts) and Strategic Research and Extension Plan or SREP proved a remarkably effective institution and process, respectively, for ensuring decentralization, inter-departmental coordination and demand/user-focus by bringing together the district administration, line departments, NGOs and local farmer representatives. Capacity building has occurred within line departments through an extensive training and orientation program involving nearly 22,000 officials. Many line departments now plan to adopt some of the project initiatives for up-scaling and mainstreaming into their own program activities. With regard to enhanced private sector role in input supply and support services, a notable success is the paravet scheme that has been launched in all project districts under which project-trained paravets (over 1300 operational so far) have been providing door-to-door animal husbandry services (AI, first aid, vaccination), charging prices which cover full cost. With regard to enhancing participation by farmer communities, a very large number of farmer and community groups, involving women and different socio-economic classes, were formed (nearly 20,000 groups involving over 220,000 households and 200 farmer field schools/federations (FFS/FF)). Supported by line departments and NGOs, the farmer groups benefited from an extensive program of training and demonstrations on the main extension themes of IPM, IPNM, new varieties and management practices for horticultural crops, animal health, breed conservation, and clean milk production. The main immediate impacts of IPM (practiced in 27,000 ha in the project area) and IPNM (organic manure in use in 30% of the project area compared to 6% at baseline) were to reduce production costs through restraining excessive use of chemical fertilizers and chemical pesticides and to improve saleability of products, with observed productivity gains probably arising from better extension efforts - made possible by the project-introduced changes in institutions and processes - regarding new varieties and agronomic practices. These programs are also delivering environmental benefits (improved soil health, lower pesticide residues, better village animal waste management through composting, and assisting diversification out of water-intensive crops such as rice and sugarcane) which are likely to grow significantly over the longer term. A number of activities promoted under the project (e.g., paravets, organic manure, improved orchard management practices) have begun spreading to non-project areas too through their adoption in other government programs.

4.2.3 Private Sector Involvement and Public/Private Partnership. **Satisfactory**. Under the project nearly 20,000 self-help groups (SHGs) were formed, of which nearly 7,400 were women's groups. These groups have collected internal savings and, in the case of nearly 9,000 groups, also have access to

project-facilitated credit lines with banks. To date, these groups have given out loans to their members of approximately Rs 192 million (US$4.2 million) from their internal savings and have accessed credit worth Rs 212 million (US$4.6 million) from the banks. These loans have been used for short-cycle income-generation activities (by three-quarters of the groups) as well as to meet social, medical and critical consumption needs. SHGs have also become a main source of credit for livestock activities. A notable outcome is the positive impact of project activities on women. A large number of women's groups have undertaken income generating activities and there is clear evidence of improvement in their socio-economic status and decision-making role. The Project Development Facility, intended to mobilize private sector agro-business investment, failed to work as anticipated due to delays in recruitment and subsequent weak performance of consultants engaged to operate the facility, and was terminated. However, in the last two years the PCU increasingly turned its attention to agro-business promotion by facilitating contacts with input suppliers and wholesalers outside the project areas. By project closure, 125 food processing and sale licenses had been issued to agro-entrepreneurs and 110 MOUs had been signed between SHGs and commercial partners for marketing of SHG products.

4.2.4 Rural Infrastructure Development. **Satisfactory**. The initial target of improving 1600 kms of rural roads was revised in 2001 to 2800 kms. Despite initial delays in implementation, at project closure about 2728 kms of rural roads had been improved. Also, 114 rural (haath painths and cattle) markets, against a target of 159, had been upgraded. Surveys undertaken by the Agricultural Management Centre (AMC) show a significant impact: compared to the pre-project situation, traffic volume went up three-and-half times and the rupee-volume of daily market trade increased by 40%. With regard to institutional development, the rural roads sub-component has helped introduce new standards and practices which have been adopted by PWD in the ongoing nation-wide Prime Minister's rural roads program (PMGSY in Hindi). The good practices include use of technical examination consultants for independent quality monitoring and regular technical assistance; identification of a core network of rural roads to ensure basic access to each habitation; and use of a road condition index to assess road condition and plan road maintenance.

4.2.5 Project Management and Economic Policy Analysis. **Satisfactory**. The Project Coordination Unit (PCU) played a key role in managing the institutionally complex and geographically dispersed project and ensuring accomplishment of the main targets. Although suffering from lack of continuity at the Project Coordinator level, the PCU on the whole managed to respond flexibly to changing circumstances and took a pro-active role, in recent years, in development of market linkages. The use of an independent agency – the AMC of Indian Institute of Management, Lucknow – to assist in M&E led to the development of an effective system of monitoring, feedback, impact assessment and documentation. This proved helpful both in project management and dissemination of knowledge about the project and its activities to non-project communities and development practitioners. On the other hand, the work of the Economic Policy Analysis Unit did not lead to usable policy recommendations through review of the state's public programs and expenditures, partly because of lack of sufficient buy-in from concerned line departments.

4.3 Net Present Value/Economic rate of return:

The framework for financial and economic analysis at ICR follows the methodology and key assumptions at PAD, which are considered appropriate. The relevant models were updated using current (2003) prices, actual project costs (in 2003 prices) and latest reported beneficiary numbers and areas. In PAD, the Economic Rate of Return (ERR) was estimated as follows: overall project: 22%; agriculture (including horticulture), 49%; sericulture, 17%; livestock, 26%; and rural roads, 14%. The revised estimates at ICR are: overall project, 21%,: agriculture (including horticulture), 26%; livestock, 25%; and rural roads, 24%. (No separate analysis for sericulture was undertaken following its cancellation in UP at MTR). Differences between PAD and ICR estimates arise mainly due to the gap between assumed and realized values of key

parameters. In agriculture, actual average yield improvement was a little over 10% against a forecast of 30%. However, the actual numbers may be more realistic since some of the project technical interventions, like IPM and IPNM, focused more on improving agronomic practices and soil health management, than on direct yield enhancement. In the case of rural roads, the return is significantly higher because growth in traffic volumes following road improvement was much higher than forecast. For livestock, the PAD and ICR estimates are roughly in line: the parameters on yield conform to assumptions made in the PAD, although in the ICR attention is restricted to gains from increased milk production only. Finally, the ICR estimate of overall returns on project investment is slightly lower than that of the PAD: 21% instead of 22%. This is due to reduced returns on agriculture and the non-performance of sericulture. These negative effects were however offset by stronger returns on the roads sub-component, whose weight also increased from 37% of project costs at appraisal to 64% at completion.

4.4 Financial rate of return:

Financial analysis was undertaken for farm level production following adoption of the full technology packet and for breed improvement in case of livestock. ICR estimates suggest that compared to a non-project household in a neighboring (comparable) location, a project household with an average size holding of 0.8 ha would have increased its annual income by 63% (about Rs 6700) per annum by adopting the representative package of technologies/practices introduced by the project. The income increase is driven by three factors: cost saving (largely due to IPM/IPNM related changes), productivity increase, and diversification into higher-value crops. This increase is roughly in line with the financial analysis in the PAD which anticipated income increases of about 100% over 10 years. In the case of livestock, financial analysis of one-animal model shows that keeping a cross-bred cow instead of a local (non-descript breed) cow increases annual income by about 125% (Rs 1780). In case of buffalo, keeping an improved breed increases annual income by approximately the same amount (Rs 1790) but only by 22%.

4.5 Institutional development impact:

4.5.1 The project has been instrumental in introducing significant changes with regard to user communities, planning and implementation processes and public institutions as well as key reforms in policies and incentive frameworks. Farmers' groups and FFS/FF have succeeded, through adequate support and technical back-stopping by the project, in disseminating technologies and practices. As a platform for technology dissemination and convenient "entry point" for organizing other development activities, the group network constitute a low-cost model with wide replication potential. Formation of self-help groups has contributed strongly to the expansion of economic roles, especially for women from all socio-economic classes, and to diversification of income sources. Experience with ATMA and SREP have triggered changes in line departments with regard to formulation and implementation of plans; and there is a perceptible shift in staff attitudes in favor of client-focus and participatory approaches. On the other hand, in technology development the expected benefits of better institutional coordination and strategic long-term planning have not materialized as expected.

4.5.2 Some of the community level institutions piloted under the project are still maturing and need to be reinforced. At present FFS/FF largely rely on inter-personal linkages to obtain technical back-up from line departments and state research institutions. Given other work commitments and the typical under-funding of these departments, it will be useful to institutionally augment this arrangement to enable FFS/FF to obtain on demand technical support or back-up services on a reliable and secure basis. Similarly, SHGs need to be assisted to further develop their links to specific market segments. More generally, the changes introduced in institutions, processes and attitudes need continued support. In this regard, the GOUP decision to provide budget support of Rs. 170 million for fiscal year 2004/05 to continue all core project activities using processes and institutions (e.g., ATMA, FFS/FF, SHGs) piloted under the project is clearly helpful.

5. Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of government or implementing agency:

The bifurcation of Uttar Pradesh in November 2000 to create Uttaranchal necessitated the setting up of essentially a separate project with its own legal, administrative, implementational, cost and accounting structures. A sharp drop in silk prices around 2000, following large-scale cheap imports from China, further undermined the economic viability of sericulture activities in Uttar Pradesh, leading to its cancellation at MTR.

5.2 Factors generally subject to government control:

In UP there were frequent changes of senior staff at both the PCU (4 of the 8 Project Coordinators who oversaw implementation of this project served for less than two months each) and the line departments implementing the project. This significantly delayed implementation, especially in the early stages when pro-active leadership was required to implement agreed procurement and training plans and, in line with the flexible design approach of the project, adapt procedures to achieve more effective community participation and demand orientation. Implementation progress was consequently rated as unsatisfactory at the first MTR in June 2000. GOUP lagged behind agreed policy reforms in some areas/items (e.g., full cost recovery in soil testing and certain animal husbandry services) but there was full implementation by GOUA.

5.3 Factors generally subject to implementing agency control:

In financial management, only a rudimentary system of accounting and reporting was in place in the first two years. The financial management manual was prepared and the General Manager for finance appointed only two years after the project started. Insufficient oversight was exercised in the initial stages over emerging problem areas, especially sericulture and PDF. The cost-sharing principle, shown to contribute to greater ownership and acceptability among users, could have been employed earlier than during the last two years with regard to agricultural and horticultural demonstrations (e.g., onion storage, nursery development, truthful seed production) and upgradation of rural markets.

5.4 Costs and financing:

Project costs at appraisal were US$ 160.5 million or Rs 7 billion. Following a change in SDR-dollar rate, which reduced project costs to US$ 158.7 million, and in rupee-dollar rate (from Rs 36 per US dollar at PAD to Rs 46 at project closure), project resources in rupee terms increased by 6% to Rs 7.4 billion. Cost allocations with respect to components changed as follows: rural infrastructure increased from 42% to 64% and private sector involvement along with public-private partnership from 3% to 5%; on the other hand, technology development fell from 11% to 5%, technology dissemination from 34% to 20% and project management from 10% to 6%. The rural infrastructure program (specifically, rural roads) was expanded to absorb savings arising from other components, including physical and price contingencies which, at Rs 1.4 billion or 20% of total project cost, were rather high. The component on private sector development grew (up from US$ 4.1 million to US$ 7.3 million) chiefly because of increased allocations to the highly successful participative program of SHG formation. Important sources of savings were: downsizing of the sericulture component (from US$ 18.9 million to US$ 2.9 million) and of technology development; shift in policy favoring hire over purchase of vehicles and local over international training; and the scaling down of schemes like PDF and private clinics in animal husbandry. At closure, final project costs were US$ 159.6 million, and about 99% of the Credit/Loan amount had been disbursed.

6. Sustainability

6.1 Rationale for sustainability rating:

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

(i) The widespread appreciation of the project's benefits by farmers, rural communities, bureaucrats and the political leadership has created a sense of *ownership* and *commitment*, creating a shared interest in sustaining project achievements. In UP the government is keen on a follow-up project that would scale up project benefits to additional districts and in UA successful project features are being introduced into other rural development projects in the state. Also, both GOUP and GOUA intend to mainstream, where feasible, project interventions into line departments activities.

(ii) *Technical* innovations introduced by the project are sustainable because they are low-cost, not subsidy-driven and easily adopted and replicated by farmers using local or readily available materials.

(iii) Programs involving *privatization of input supplies* (e.g., paravets and private nurseries) are sustainable because consumers have shown willingness to pay the full-cost price for timely delivery of quality inputs and services, although existing weaknesses in input supply chains, especially liquid nitrogen and frozen semen for paravet services, would need to be rectified to ensure viability in the medium-term. However, instances of self-organization – through paravet associations who have established links with private input suppliers – are emerging in this regard.

(iv) Except in the case of roads, *financial* sustainability is not a major issue in this project since, by design, most project objectives have been pursued through investments in human resource development and community mobilization rather than in capital- and maintenance-intensive assets such as buildings and vehicles or new salaried staff with recurrent cost implications.

(v) In the case of *roads* the government commitment to improving the maintenance regime is shown through steps taken so far such as the establishment of a State Road Fund, with earmarked revenue from a cess on fuel, and preparation of a comprehensive maintenance plan for all rural roads. Still, funds currently allocated for annual maintenance fall well below the maintenance norms. However, chronic under-funding of road maintenance programs is part of a much larger problem affecting all road projects of the Bank and other donors which needs to be tackled to ensure long-term sustainability.

(vi) With regard to *institutional* sustainability, self-help groups which have been successful in expanding economic opportunities and promoting empowerment of its members are expected to continue their activities (especially those financially linked to the banking system). Sustainability of FFS/FF, which are internally well-organized and motivated, would however depend upon provision of continued public support - with modest budgetary implications - for technical back-stopping and market development. The line departments and district development administration, having experienced the advantages of ATMA, have expressed interest in continuing with it; however, its longer-term sustainability would depend upon whether the government will channel development funds from other programs through it to the district level. A proposal to do so, and also expand the ATMA model to 200 additional districts of the country with Government of India (GOI) funding, is under active consideration at the GOI level.

6.2 Transition arrangement to regular operations:

6.2.1 Following the closure of the Loan/Credit, GOUP has allocated Rs 170 million for the fiscal year 2004-05 to the PCU to continue all core project activities using processes and institutions established under the project. Tenures of all line department staff working with the project and contracts of all externally hired staff and NGOs have also been extended by one year. In addition, the DASP PCU has responsibility for coordinating all agricultural technology dissemination activites under the ongoing Bank supported UP

Water Sector Restructuring Project (Credit No. 3602), and is also assisting the UP Sodic Lands Reclamation Project - II (Credit No. 3152) with technology dissemination in about 60 project villages. In UA, project lessons have been incorporated in the recently approved Uttaranchal Watershed Project supported by the Bank.

6.2.2 In the future, greater focus on commercialization of agriculture and development of farmer-to-market linkages, would not only help sustain but also expand the benefits from the institutional innovations and investments made during the current project. This would also substantially enhance the flow of private capital and enterprise to the agricultural sector.

7. Bank and Borrower Performance

Bank

7.1 Lending:

Satisfactory. The Bank provided valuable assistance to the borrower and the implementing agency through frequent and detailed consultations over a period of four years. Apart from ensuring that the project was consistent with national and state priorities and the Bank CAS, the dialogue also resulted in relevant lessons from other Bank-funded projects being incorporated into the design. However, greater emphasis could have been placed on developing market linkages along with improvement in productivity of agricultural production systems.

7.2 Supervision:

Satisfactory. Bank supervisions played a key role in assisting the borrower and implementing agency in keeping the project on track. The project had a slow start with disbursement well below target in each of the first three years. Following an "unsatisfactory" rating for implementation progress in the first MTR in June 2000, funds were re-allocated across components and implementation arrangements were strengthened, resulting in a doubling of average monthly disbursements in the period between the two MTRs compared to the period before. The second MTR (November 2001) further helped to accelerate project implementation. Bank supervisions also provided valuable assistance in instituting an adequate financial management system; managing the complex administration arrangements surrounding bifurcation of the project; and sustaining the momentum for agreed policy reforms. Especially during the last two years, supervisions have also pro-actively assisted the implementing agency in shifting attention to commercialization of production and development of market linkages.

7.3 Overall Bank performance:

Satisfactory.

Borrower

7.4 Preparation:

Satisfactory. The Borrower appropriately designed the project to focus on the main policy and institutional issues relevant to enhancing agricultural productivity and diversification. A long process of consultation among numerous line departments and with consultants and Bank missions was satisfactorily undertaken. A number of advance steps were taken to prepare the project for implementation such as the establishment of the PCU with appropriate decision authority and accountability, institutional and administrative changes to improve line department cooperation, and initiation of policy reforms.

7.5 Government implementation performance:

Satisfactory. The government has consistently provided strong support to the project. The flow of funds from the state government to the PCU and from PCU to other implementing units has been remarkably smooth. As a signal of its continued commitment, GOUP has also released funds to maintain project

activities in 2004/05. In the difficult area of policy reform, GOUP has introduced key policy changes and has indicated its commitment to follow on remaining parts of the reform program. GOUA has fully implemented the agreed policy reform program. Line departments have been encouraged to adopt and upscale institutions and practices piloted within the project, and to take up activities (e.g., paravets, improved horticultural pactices, use of bio-fertilizers) in other government programs. On the operational side, frequent transfer of senior staff in UP, especially in the PCU and concerned line departments, had adverse impact on project implementation in the early years. For perspective, though, these transfers were neither unusual in the state context nor unique to this project. Greater stability in posting, which the government ensured following concerns about the harmful effects on implementation progress, contributed significantly to improved project performance especially in the final two years.

7.6 Implementing Agency:

Satisfactory. The implementation record in the first couple of years had a number of unsatisfactory aspects such as disbursement delays, weak financial management system and ineffective oversight of poorly performing activities such as sericulture and PDF. Subsequently, stability in PCU management and staff combined with a pro-active approach was critical in turning around the project during the last two years of implementation. The 24-month disbursement lag at the second MTR had been overcome by closure with about 99% of the funds having been spent and the main components satisfactorily implemented within the original loan closing date. Also, the bifurcation of UP was competently handled so that, despite tying up substantial managerial and supervisory time, its initially adverse implementation impact had been overcome by the end of the project in both states. In achieving this, the implementing agencies successfully coordinated activities across seven line departments, numerous other institutions and a large number of NGOs, leading to the formation of about 20,000 groups and a large-scale organization of participatory activities. In addition, the PCU also did a commendable job in sharing project experiences with stakeholders through regular newsletters and by publishing and disseminating a large number of publications/manuals/films addressing technical, environmental, social, institutional, human resource development, procurement, and financial issues.

7.6.1 Financial Management and Procurement. A rudimentary accounting and reporting system for financial management was initially in place, leading to weaknesses in account keeping, reporting and reconciliation. This resulted in instances of rejection of disbursement claims on account of incomplete documentation and some contract values being exceeded without prior authorization in the early years. Inadequate documentation was inherently a manifestation of weaknesses in financial management oversight and control systems of implementing line departments. Over time these were identified and compensated by additional levels of control and scrutiny at the PCU. Gaps in staffing and weaknesses in staff capacity, especially the limited accounting and computer skills, also delayed the implementation of the Computerized Financial Management Software (CFMS) across the more than 200 implementing offices of participating line departments/agencies in the project districts of UP. In Uttaranchal, though, with much fewer offices involved, the CFMS worked well. Following issues raised in successive supervision missions, a number of changes in practices and personnel were introduced which eventually led to a smooth and effective financial management system. Legal covenants related to financial management were complied with. Audits of project expenditures were carried out in a timely manner and there were no major pending audit issues or disallowances. The overall performance on procurement is considered satisfactory. Procurement plans were reviewed and revised from time to time as needed and procurement was carried out in accordance with the agreed procedures. No significant procurement issue arose in course of the project.

7.7 Overall Borrower performance:

Satisfactory.

8. Lessons Learned

- **Changing policies, processes, institutions and people's incentives and attitudes** is a pre-requisite for agricultural transformation: the project strategy, which focused on facilitating these changes rather than on narrowly promoting yield-enhancing technologies, not only led to increases in farm productivity and incomes but has also laid the foundation for a more sustained improvement in technology and agronomic practices. Equally importantly, by generating widespread ownership and commitment, the strategy has created a powerful incentive for continuing the reforms.
- **Commercialization and private sector involvement is necessary for raising rural incomes**: in project areas where markets and market access were well-developed, technical interventions had a magnified impact and higher outputs translated into higher incomes. Conversely, lack of adequate market linkages and of skills/capacity to produce for the market (e.g., through choice of appropriate varieties, post-harvest handling and quality control) have emerged as the biggest challenges to sustaining productivity enhancement and income diversification in SHGs assisted by the project. Therefore, any follow-on project should promote greater market orientation of production, improved product handling and stronger market linkages.
- **Stability in Project Coordinator and other senior staff,** together with appropriate decision making authority and accountability, contributes significantly towards success.
- **Administrative and financial decentralization need to occur together to be effective**: experience of the Agricultural Technology Management Agency shows that it was its financial autonomy -- afforded by channeling development funds directly to it at the district level -- that underpinned its operational autonomy and rendered demand-driven planning, institutional coordination and collective follow-up actions meaningful.
- **Use of beneficiary groups as entry points for project activities improves participation** and beneficiaries' capacity to absorb project-supported changes. Also, interventions based on beneficiary cost-sharing generate more "ownership", leading to improved design, complementary private investments and more responsible O&M.
- **Input and service supply based on full-cost recovery is feasible provided quality and timeliness are assured**: farmers have been willing and able to pay for timely delivery of quality inputs and services; and the private sector has found it commercially viable to supply inputs at full-cost prices.
- **Early and adequate training in financial management** for project staff, including concerned staff of implementing agencies/departments, is essential in view of the time required to absorb and apply these skills.
- **Use of an independent agency for M&E improves quality** and timeliness of reporting, contributing significantly to user-feedback and effective project monitoring and management.

9. Partner Comments

(a) Borrower/implementing agency:

Comments on the draft ICR were received from the Governments of Uttar Pradesh and Uttaranchal (reproduced unedited in Annex 9) and were incorporated in the final ICR. In summary, UP noted that the ICR had covered all points succintly and provided updated figures for some of the project performance indicators shown in Annex 1. Uttaranchal pointed out that the state had successfully implemented the Computerized Financial Management System.

(b) Cofinanciers:

NA

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

NA

10. Additional Information

See Annexes

Annex 1. Key Performance Indicators/Log Frame Matrix

Outcome/Impact Indicators

Indicator	Unit	Projected in PAD/SAR End of Project	Actual/Latest Estimate
Increase Productivity of Diversified Agricultural System			
Increase in Productivity		(*)	
Paddy	mt/ha	2.6	2.8
Wheat	mt/ha	3.0	3.3
Maize	mt/ha	1.8	2.0
Mustard	mt/ha	1.0	1.1
Arhar	mt/ha	1.2	1.4
Vegetables	mt/ha	16.2	17.6
Increase in Cropping Intensity	%	196 (*)	203
Diversification into higher-value crops (shift in gross cropped area)		(*)	
Cereals	% GCA	60.1	55.3
Pulses	% GCA	10.4	13.7
Oilseeds	% GCA	3.6	3.9
Vegetables	% GCA	8.2	13.2
Total Non-Foodgrains	% GCA	29.6	31
Total Horticulture	% GCA	11.6	16.4
Sericulture Output			
Raw Silk	mt	-	39
Increase in milk productivity		(**)	
Cross-Bred Cow	lt/day	3.5	4.4
Buffalo Improved	lt/day	4.4	6.2
Percentage of households practicing hygienic milk production	%	5 (*)	13
Reduction in percentage of households experiencing mastitis	%	2 (*)	6
Reduction in percentage of households experiencing calf mortality	%	1 (*)	7
Increase in household income in project areas	Rs/yr	26613 (**)	44256
Promote Private Investment in Agri-Business			
Cost Recovery: Price-cost ratio of inputs provided by the public sector (proxy for improved business environment for private sector)			UP UA
(i) Agriculture Soil Testing	%	100	36 100
Rhyzobium Culture (200g)	%	100	92 100
(ii) Horticulture Vegetable Seed	%	100	179 100
Grafted Fruit Plants	%	100	102 100
Fruits Seedlings	%	100	122 100
(iii) Sericulture Chawki reared worms	%	100	64 100
(iii) Animal Husbandry Deep Frozen Semen	%	100	92 100
Liquid Nitrogen	%	100	133 100
Fodder Seed	%	100	91 100
Artificial Insemination	%	100	92 100
Natural Service	%	100	85 100
Castration	%	100	61 100
Inoculation/Vaccination	%	100	88 100
Health Examination	%	100	26 100
Diagnostic Services	%	100	38 100
Group Credit Activity			
Total Value of Loans provided by Groups' own Savings	Rs Mn	-	192
Total Value of Credit Sanctioned by Banks	Rs Mn	-	212

SHG involved in Income Generating Activities	no.	-	15234
Improve Rural Infrastructure			
Increase in Traffic Density	no./hr	41 (**)	143
Villages connected with improved rural roads	no.	-	1112
Increase in Rural Market Activity		(**)	
Trading Volume ('000 Rs. per Market per day)	Rs/market/da	61000	85000
Traders (no. per market per day)	y	140	170
Buyers (no. per market per day)	no/market/day	426	490
	no/market/day		

* : Estimate from non-project areas, 2002-2003, based on AMC survey.
** : Baseline data, 1998-99, data based on AMC survey
N.B: Except for rural infrastructre, quantitative targets not specified in PAD.

Output Indicators

Indicator	**Unit**	**Projected in SAR/PAD End of Project**	**Actual/Latest Estimate**
Technology Development			
New technologies			
Research Proposals financed under CARP	no.	-	44
New technologies identified	no.	-	181
Technologies Released by Department for Dissemination	no.	-	42
IPM **(1)** modules introduced	no.	-	48
IPM modules Passed to Farmer Groups for Replication	no.	-	27
Adaptive/Validation Trials in the Field	no.	-	507
Demand-Driven Technology Dissemination			
Development of Need-Based District Plans – SREP **(1)**	no.	32	32
Area under organic manure	% GCA	2 (*)	30
Adoption of IPM Techniques	000 ha	-	27
Use of Bio-agents			
Neem oil	000 lt	-	17
Trichoderma	000 kg	-	39.6
NPV	000 LE	-	128
BT **(1)**	000 kg	-	42
Trichocards	000	-	31.1
Pheromone/Light Traps	000	-	54
Use of improved-variety seeds	000 mt	-	20.1
Orchard Rejuvenation	ha.	-	214
Demonstrations (no.)			
NADEP	no.	-	33666
Low-Tunnel Poly-House	no.	-	39885
Zero-Energy Cool-Chamber	no.	-	523
Onion Storage Structure	no.	-	225
Bovine **(1)** Sterility/Infertility Control Camps	no.	-	1322
HS **(1)** & FMD **(1)** Eradication Campaigns	no.	-	1209
Castration Camps	no.	-	302
Animal Nutrition	no.	-	40213
Introduction of new varieties in fruits and vegetables			
Papaya (Mayuri/Pusa Delite/Surya)	ha.	-	763
Banana (TC Grandnain vareity)	ha.	-	212
Mango High Density (Amrapali, Dasheri, Romani)	ha.	-	100
Onion (Agri. found # dark red and light red)	ha.	-	2359
Garlic (G 282)	ha.	-	1504
Marigold (P Narangi, P Basanti, Orange Bloom)	ha.	-	541
Apple	no.	-	9
Pear	no.	-	9

Litchi	ha.	-	376
Horticulture			
Area brought under horticulture crops	ha.	-	111236
Varietal demonstrations organized	no.	-	23542
Sericulture			
Area brought under sericulture	ha.	-	1800
Cocoons produced	000 kg	-	287
Raw silk produced	000 kg	-	33
Human resource development			
Capacity building for line department/other officials	no.	-	21615
Training of farmers in Agriculture/Horticulture	no.	-	263061
Training of Paravets	no.	-	1402
Training of farmers/trainers for Clean Milk Production	no.	-	163351
	no.	-	8398
Training of farmers for Indigenous Breed Conservation	no.	-	3643
Training of farmers in Sericulture			
Paravets Activities			
Paravets Working	no.	-	1338
Artificial Insemination	000	-	668
Vaccination	000	-	8451
Animal Health Care	000	-	623
Improved Progeny Born	000	-	119
Dairy Development			
Milk vendors trained in hygiene milk production/procurement	no.	-	6568
Framers trained in hygiene milk production	no.	-	151034
Hygiene Society developed	no.	-	2698
Animal registration	no.	-	24862
Farmer Participation Enhanced through new:			
Self-Help Groups	no.	-	19956
Farmer Field Schools/Farmer Federations	no.	-	200
Gender Participation Enhanced through new			
Women's Self-Help Groups	no.	-	7399
Private Sector in Agri-Business Development			
Development of Agri-business			
FPO licences to food producers	no.	-	125
MOUs between SHGs and commercial	no.	-	110
firms			
Establishment of Cash Credit Limit (CCL) for SHGs			
Groups CCL with banks	no.	-	8757
Total Value of CCL agreed	Rs mn	-	237
Private Sector Participation			
Establishment of New Private Nurseries	no.	-	1095
Veterinary clinics/ paravet centers	no.	-	1338
Rural Infrastructure			
Rural Roads Constructed	km	1600	2728
Rural Markets Upgraded	no.	159	114

(*) Estimate from non-project areas, 2002-2003, based on AMC survey.
** : Baseline data, 1998-99, data based on AMC survey
N.B: Except for rural infrastructure, quantitative targets not specified in PAD.

(1) Bovine: Includes Cow and Buffalo; BT: Bacillus Thruengensis; FMD: Foot and Mouth Disease; HS: Haemorrhagic Septicaemia; IPM: Integrated Pest Management; LENPV: Larvae Equivalent Nuclear Polyhedral Viruses; SREP: Strategic Research Extension Plan.

Annex 2. Project Costs and Financing

Project Cost by Component (in US$ million equivalent)

Component	Appraisal Estimate US$ million	Actual/Latest Estimate US$ million	Percentage of Appraisal
Technology Development	17.10	7.99	47
Demand Driven Technology Dissemination	55.30	31.57	57
Public/Private Partnership	4.10	7.52	183
Rural Infrastructure	67.50	102.50	152
Project Management and Economic Analysis	15.50	10.05	65
Total Baseline Cost	159.50	159.63	
Total Project Costs	159.50	159.63	
Total Financing Required	159.50	159.63	

PPF of US$ 1 million was cancelled in October 1998 and is not shown in above table.

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

Expenditure Category	Procurement Method[1] ICB	NCB	Other[2]	N.B.F.	Total Cost
1. Works	0.00 (0.00)	62.10 (49.70)	6.10 (4.90)	0.00 (0.00)	68.20 (54.60)
2. Goods	4.70 (3.80)	4.50 (3.60)	12.80 (10.20)	0.00 (0.00)	22.00 (17.60)
3. Services (Consultancies and Training)	0.00 (0.00)	0.00 (0.00)	31.75 (31.75)	0.00 (0.00)	31.75 (31.75)
4. Research Services	0.00 (0.00)	0.00 (0.00)	4.00 (4.00)	0.00 (0.00)	4.00 (4.00)
5. Recurrent Cost	0.00 (0.00)	0.00 (0.00)	32.30 (19.80)	0.00 (0.00)	32.30 (19.80)
6. Refunding of Project Preparation Advance	0.00 (0.00)	0.00 (0.00)	1.15 (1.15)	0.00 (0.00)	1.15 (1.15)
Total	4.70 (3.80)	66.60 (53.30)	88.10 (71.80)	0.00 (0.00)	159.40 (128.90)

PPF of US$ 1 million was cancelled in October 1998 and is not shown in above table.

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

Expenditure Category	Procurement Method[1]				Total Cost
	ICB	NCB	Other[2]	N.B.F.	
1. Works	0.00 (0.00)	100.68 (79.17)	3.06 (2.41)	0.00 (0.00)	103.74 (81.58)
2. Goods	1.57 (1.23)	7.36 (5.76)	2.74 (2.15)	0.00 (0.00)	11.67 (9.14)
3. Services (Consultancies and Training)	1.40 (1.39)	10.60 (10.52)	13.68 (13.58)	0.00 (0.00)	25.68 (25.49)
4. Research Services	0.00 (0.00)	0.00 (0.00)	1.86 (1.86)	0.00 (0.00)	1.86 (1.86)
5. Recurrent Cost	0.00 (0.00)	0.00 (0.00)	15.89 (8.50)	0.00 (0.00)	15.89 (8.50)
6. Refunding of Project Preparation Advance	0.00 (0.00)	0.00 (0.00)	0.76 (0.69)	0.00 (0.00)	0.76 (0.69)
Total	2.97 (2.62)	118.64 (95.45)	37.99 (29.19)	0.00 (0.00)	159.60 (127.26)

[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.
Technology Development	14.39	2.71		6.41	1.58		44.5	58.3	
Technology Dissemination	43.45	11.85		25.52	6.05		58.7	51.1	
Public/Private Partnership	4.10	0.00		7.47	0.05		182.2	0.0	
Rural Infrastructure	54.00	13.50		80.43	22.06		148.9	163.4	
Project Management	12.96	2.54		7.44	2.61		57.4	102.8	
Total	128.90	30.60		127.27	32.35		98.7	105.7	

Annex 3. Economic Costs and Benefits

Project Benefits and Expected Returns in PAD

1. Project economic analysis focused on estimating benefits relating to interventions in agriculture, horticulture, livestock and sericulture in the technology dissemination component, and to interventions relating to rural roads in the rural infrastructure component. Quantification of benefits arising from the technology generation, participatory, and overall institutional/ coordination components was not attempted owing to their diffuse nature and longer term impact.

2. The overall Economic Rate of Return (ERR) for the project and its various components was estimated as follows: overall project, 22%; agriculture/horticulture (combined within a farming system), 49%; sericulture, 17%; livestock, 26%; and rural roads, 14%. According to the PAD, the divergence between component ERRs was driven partly by the way benefits and costs have been attributed across components. For instance, value increments arising from village market and road improvements were included in agriculture/horticulture and not the roads component. Also, component returns are high relative to overall project ERR since the latter includes all overhead costs not directly attributable to any specific component.

3. Analysis in the PAD methodology followed standard methodology. In agriculture the source of benefits were the gains in the form of increased yields and shift into higher-value crops. Seven representative farm models were developed across four zones, comprising a small and a large farm model each from Eastern UP, Western UP and Bundelkand (South UP) zones and a single orchard model from Hills zone (North UP). Yield increases arising from improved technologies were assumed to be in the range of 20-40% and adoption rate for the full package of technologies was expected to be about 5% in terms of area and/or farmers by Year 6.

4. In case of livestock, separate models were built for activities related to AI and to improved natural breeding, which were both supported by improvements in dissemination of husbandry technologies and practices. Benefits generated related mainly to gains in the form of increased milk production from cross-breds and better selection of local breeds. In sericulture, analysis was based on the two major economic activities of cocoon rearing and raw silk production.

5. For rural roads, the measured benefits relate to savings in vehicle operating costs. Impact of improved road on agriculture and horticulture are assumed to be captured by the returns analysis for the agriculture/horticulture component. Economic analysis for roads assumed a 4% increase in traffic and a shift of 20% from pedestrian/bicycle traffic to light vehicles and of ten animal drawn vehicles per day to trucks.

6. The period of analysis in the PAD was 20 years. The analysis was done at 1997 prices using a standard conversion factor (SCF) of 0.9 and an opportunity cost of capital of 12%.

ICR Estimation Methodology

7. PAD methodology was applied to available data to the extent feasible in order to update expected project returns. The analysis was done at 2003 prices (the latest available). A majority of the data used was collected by a special sample survey conducted by the AMC in December 2003. This survey covered both project and non-project area/households to bring out the net effect of project activities, i.e. to facilitate with and without comparison of project. A total number of 497 sample households spread over 84 villages in 42

blocks in 14 districts (representing each region of the State) were covered. Out of this, the sample from the project area was 333 households from 56 villages in 28 project blocks. The control sample from the non-project area was 164 households, from 28 villages in 14 blocks. Secondary data on farm activities was taken from relevant publications of the Government of U.P. and Government of India. Data on road traffic for project and non-project areas was collected by an AMC survey undertaken in February 2004. Parity prices for relevant tradable goods have been calculated using World Bank Commodity Price Projections for 2003. Financial prices of non-traded goods and services have been adjusted using a standard conversion factor of 0.9. For comparability, cost and benefit flows have been calculated over a period of 20 years in line with the PAD analysis.

Agriculture/Horticulture

8. Returns for agriculture and horticulture were estimated using a single representative farm model. Although analysis in the PAD used representative models of different-sized farms from various agro-climatic zones, no system was set up for collection of disaggregated data at that level. The ICR analysis is conducted with respect to six main intervention crops - paddy, wheat, maize, pulses (arhar), mustard and vegetables - which together account for two-thirds of the gross cropped area on a representative farm in both project and non-project areas. For these crops, differences in yield, sown area and input costs (see Table 1) between representative project and non-project farms were used to estimate the incremental impact of the project. Project and non-project areas are contiguous blocks from same district; hence they have essentially the same baseline conditions.

Table 1: Project-related changes in Productivity, Crop Area and Net Income (Farm size = 0.8 ha)

Crop	Productivity (mt/ha)		Crop Area (ha)		Net Income (Rs/ha)	
	W	W/O	W	W/O	W	W/0
Paddy	2.8	2.6	0.23	0.29	14288	11630
Wheat	3.3	3.0	0.46	0.49	25744	21431
Maize	2.0	1.8	0.08	0.07	3821	2462
Arhar	1.4	1.2	0.03	0.02	20094	18153
Mustard	1.1	1.0	0.04	0.04	12049	10449
Vegetables	17.6	16.2	0.21	0.13	49755	43656

N.B: W = With Project; W/O = Without Project. "W/O" areas are development blocks in the same district in which blocks associated with project activities are located. Being in the same districts both "W" and "W/O" areas have essentially the same baseline conditions at the start of the project in 1998-99.

9. The number of beneficiaries has been calculated using data on training supplied by PCU and on adoption rates by the AMC survey. A total of 263,000 farmer were provided agriculture/horticulture related training. The number of farmers adopting the full range of project-supported technologies and practices – and who can therefore be associated with the representative farm model which shows yield and acreage expansion with respect to higher-value crops and vegetables - is estimated to be approximately 51,000 by using the average adoption rate of 19.4% (see Table 2). To the extent this estimate ignores farmers who have only partially adopted the changes (through uptake of only a few practices) or those outside the project area who have adopted these practices through dissipation effects, it conservatively captures the benefits of this component.

Table 2: Adoption Rates of Project-supported Technologies and Practices

Type of Technology/ Practice	Adoption by Farmers (%)
Agriculture	
NADEP	39
Vermicompost	19
CPP	19
Rhizobium	24
Azotobacter	10
Neem Oilcake	29
Tricoderma	19
Tricogamma	7
Horticulture	
Low Polytunnel	16
Bed Planter	12
Average Agriculture & Horticulture	19.4

10. It is assumed that, following investments in year one, technology take-up occurs over five years, i.e., one-fifth of the total 51,000 farmers adopt the package in each successive year. In line with the PAD, it is also assumed that any farmer realizes the full incremental income gain of Rs 6267 per farm - from productivity, relative cropping area and input-mix changes - over a period of five years, with one-fifth of the gain additionally accruing in each successive year following technology adoption. Project costs include various costs incurred for agriculture- and horticulture-related activities, including relevant overheads such as research and marketing support.

11. The PAD also estimated returns from sericulture, partly because of the ambitious production targets included in the project. However, due to various difficulties, the sericulture component was drastically scaled down during project implementation. Activities were started in nine districts but were reduced at MTR to three districts of present-day Uttaranchal. An important problem was the uneconomic nature of the initial bush-type mulberry plantation approach in which no income was forthcoming during the long gestation period. From 2001-02 the approach of planting trees on bunds was adopted. To date, over 380 sericulture groups have been formed, some of which have specialized into spun silk making and cocoon reeling. In view of difficulties of implementation and minor quantitative significance of sericulture activities at completion, no separate analysis was undertaken for the sericulture component.

Livestock

12. Following the PAD analysis, separate models were constructed for artificial insemination (AI) and for breed conservation and development (BCD) for cow and for buffalo herds. Measured benefits consisted of the gains relating to milk production. With respect to estimation of benefits from AI, the actual number of inseminations of cows and buffaloes, undertaken in years 1-5 of project implementation, were taken from PCU reports. Number of inseminations per annum in years 6-20 were expected to be the same as in year 5, based on the conservative assumption that number of paravets and level of AI services would be maintained rather than expanded in the years to come. With AI, the conception rate for cows is shown as improving from 35% to 45% and for buffaloes from 35% to 40% in five years. This is in line with national averages. In the without project situation, the number of inseminations is assumed to remain the same; however, the conception rate also remains unchanged at 35%. For both cows and buffaloes, a 10% loss in herd numbers p.a. is assumed, of which 5% is due to mortality and 5% due to culling.

13. Milk production gains following breed improvement and training in better animal nutrition and

husbandry practices is as follows. In the unimproved "without project" situation the average yield from a cow is 900 litres p.a and from buffalo is 1250 litres p.a. In improved herds the base year is 1100 litres p.a. for cow and 1430 litres p.a. for buffalo. The yield figures have been worked out on basis of AMC survey. In both cases the yield is assumed to grow by 3.5% p.a. over the lifetime of the project. The difference in maintenance costs, based on survey data, is as follows. For cows, the per year maintenance cost in project and non-project areas is reported to be Rs 9240 and Rs 5700 respectively. For buffalo, the respective maintenance costs are Rs 10870 and Rs 8300. Maintenance cost of calf is assumed to be 20% of the cost of an adult animal. The price of cow's milk is Rs 10 per litre and of buffalo's milk is Rs 12 per litre and both are treated as (internationally) non-tradable products.

14. In estimating the gains from breed conservation and development structurally similar models are used. The main difference in parameters are that the conception rate in both with and without project situations is assumed to be 35%; and the base year milk production is also the same for cows (900 litres p.a.) and buffaloes (1250 litres p.a.) in with and without project situations except that in the former case it then rises by 3.5% p.a.

Roads

15. The measured benefit with respect to road components is saving in vehicle operating costs (VOC). Since this essentially entails a downward shift in the cost curve and resulting movement along the demand curve the benefit comprises two parts: (i) VOC savings on traffic volume carried on existing/unimproved non-project roads; and (ii) the "consumer surplus" relating to additional traffic carried by the improved road. Assuming linear relationships between relevant demand and cost variables, the latter equals VOC savings on *half* the incremental traffic volume. In Figure 1 below, (i) and (ii) correspond to the rectangle given by the points [C1, C2, B, A] and the triangle given by [A, B, D] respectively.

16. The number of vehicles per day of different types on rural roads in project and non-project areas were obtained from a survey undertaken by AMC in February 2004. The survey took place in four districts of UP and covered a road length of about 107 kms. The per km VOC for different types of vehicles on improved ("project") roads and unimproved existing roads were obtained from a study commissioned for this purpose. Table 3 summarizes the relevant information in this regard.

Figure 1: Incremental Benefits from Reduced Vehicle Operating Costs

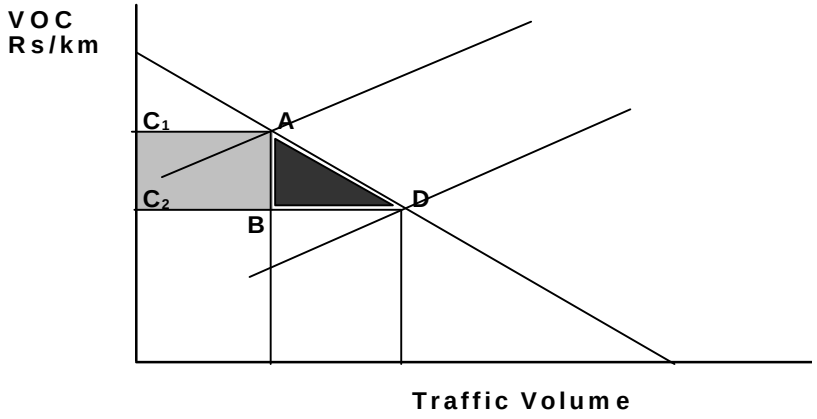

Table 3: Number and Operating Costs of Different Types of Vehicles on Rural Roads

	Number Per day (per Km of Road)		**VOC (Rs per km)**	
	Project Rd	Existing Rd	Project Rd	Existing Rd
Cart	69.5	13.6	23	29
Cycle/Rickshaw	1148.1	692.7	0.3	0.3
Bus	13	0.2	8.47	10.34
Truck	54.7	10.9	8.44	10.18
Tractor/Trailer	141.3	62.8	8.64	10.08
4-/3-wheel motorised	171.9	74.6	3.86	6.49
Light Comm. Veh.	49.9	32.2	8.64	10.08
2-wheel motorized	523.1	207.7	0.96	1.71

17. In estimating the benefits it has been assumed that on the project roads there will a shift in traffic composition as well as growth in traffic density. Specifically, the number of carts and cycle/rickshaw is expected to decline by 4% p.a. for ten years while the number of vehicles in other categories is expected to increase by 4% p.a. (in line with PAD to ensure comparability) for the next ten years. Growth is forecast only over the ten-year period because of both possible congestion considerations and the need to undertake major road repair/rehabilitation after that period. For both project-improved and existing roads vehicle operating costs are expected to grow from their base-year levels by 5% p.a. for ten years (except for carts and cycle/rickshaw), after which major repairs bring down the costs to the base-year levels. With regard to annual maintenance, it is assumed that project-improved roads would require an expenditure of Rs 25000 per km p.a. whereas maintenance expenditure on other existing roads will average Rs 8000 per km p.a. The latter is in line with current budgetary allocations for rural road maintenance.

Economic Returns

18. At ICR, the returns have been re-estimated as follows: overall project, 21%; agriculture (including horticulture), 26%; livestock, 25%; and rural roads, 24%. In agriculture the difference between PAD and ICR estimates appears related to the gap between projections and realized values for yield improvement. In PAD the yield increases from improved technologies were typically assumed to be in the range of 20 - 40% over a five-year period. Actual numbers, however, show an average yield improvement of 10.3% over the set of intervention crops considered, with the range being 7.7 – 16.7%. These numbers may be more realistic since some of the project technical interventions, like IPM and IPNM focused more on improving agronomic practices and soil health management, than on direct productivity enhancement.

19. Further, in the PAD it was also assumed that some 5% of farmers (nearly 100,000) would adopt the full technology package by end of project. However, estimates suggest that that number is likely to be closer to 51,000. Of course this underestimates the project impact by excluding those farmers who have selectively adopted some technologies in the project areas as well as those outside the project areas who have picked up technologies through dissipation effects. Overall, though, the estimated return of 26% shows the significant impact that agriculture and horticulture related interventions have had on farm outputs and incomes.

20. In the case of livestock the PAD and ICR estimates are roughly in line. The parameters on yield conform to assumptions made in the PAD, although in the ICR attention is restricted to gains from increased milk production only.

21. The ICR estimate for return on roads investment turns out to be significantly higher than that in the PAD (24% against 14%). The main reason is the difference between assumptions and actual numbers with respect to growth in traffic volume. For example, in the category of trucks/buses/ tractors, the PAD assumes - on the basis of traffic flow analysis for two stretches of roads - that in moving from unimproved roads to improved roads, traffic volume would go up from 87.5 to 89.5 per day (2%). However, survey data shows the number of vehicles in this category on unimproved roads is 73.9 but goes up to 209 per day with road improvement , implying an increase of 280%. In other categories of vehicles as well the actual growth in traffic volume is much greater than projected increase

22. The ICR estimate of overall returns on project investment is marginally lower than that of the PAD: 21% instead of 22%. The most important reason for this is the difference between the forecast and actual return on agriculture (down from 49% to 26%). Another important reason is the non-performance of the sericulture component which was forecast to yield a return of 17%. These were however offset by stronger returns on the roads sub-component (24% instead of 14% forecast) and by the increase in the weight of this component. At appraisal, expenditure on roads was expected to be 37% of project costs but, following changes introduced at MTR, at completion it accounted for 64% of the project costs.

Financial Returns

23. Analysis of farm incomes suggests that compared to a non-project household in neighboring (comparable) location, a project household with an average size holding of 0.8 ha would have increased its annual income by 63% (about Rs 6700) p.a by adopting the representative package of technologies/practices introduced by the project. The income increase is driven by three factors: cost savings (largely due to IPM/IPNM related changes), productivity increase and diversification into higher value crops. The increase appears to be roughly in line with financial analysis in the PAD which anticipated income increases of about 100% over 10 years, although further details of the calculation are not available.

24. In the case of livestock, the project promoted breed improvement as well better animal health and husbandry practices. Financial analysis of one-animal model shows that keeping a cross-bred cow instead of a local (non-descript breed) cow increases income by about 125% (Rs 1780) p.a. In case of buffalo, keeping an improved breed increases annual income by approximately the same amount (Rs 1790) but only by 22%.

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	Development Objective
Identification/Preparation				
1994	*8*	Fin Mgt (2); Irr (1); Agri (2); Econ (2); Unid (1)		
1995	*23*	Econ (5); Fin Mgt (2); Irr (4); Agri (5); Fishery Exp. (1); Agro Processing Ind. Spl. (1); Extension Spl. (1); Credit Spl. (1); Rural Mktg. Spl. (1); Livestock Spl.. (1); Unid (1)		
1996	*19*	Econ (2); Agri (7); Irr (1); Fin Mgt (2); Envir Spl (2); Extension Spl. (1); Credit Spl. (1); Rural Mktg. Spl. (1); Livestock Expert (1); Unid (1)		
1997	*12*	Agri (6); Rds Spl (1); Econ (3); Envir Spl (1); Fin Mgt (1)		
1998	*11*	Econ (4); Rds Spl (1); Irr (1); Agri (3); Extension Spl. (1); Fin Mgt (1)		
Appraisal/Negotiation				
1998	*12*	Proc Spl (1); Fin Mgt (1); Agri (3); Rds Spl (1); Econ (4); Credit Spl (1); Extension Spl (1)		
Supervision				
05/26/1999	*6*	Task Ldr (1); Agri (2); Soc Dev (1); Fin Mgt (1); Proc Spl (1)	S	S
12/16/1999	*5*	Agri (1); Task Ldr (1); Soc Dev (1); Proc Spl (1); Fin Mgt. Ana (1)	S	S
07/03/2000	*9*	Task Ldr (1); Agri (2); Seri Spl (1); Soc Dev (1); Proj Ana (1); Proc Spl (1); Rds Spl (1); Disb Ana (1)	U	S
12/08/2000	*6*	Task Ldr (1); Agri (1); Soc Dev (1); Fin Mgt (1); Rds Spl (1); Proc Spl (1)	S	S
05/11/2001	*9*	Task Ldr (1); Soc Dev (1); Agri (2); Rds Spl (1); Fin Mgt (1); Envir Spl (1); Proc Spl (1); Live Spl (1)	S	S
12/07/2001	*9*	Task Ldr (1); Soc Dev (1); Agri	S	S

		(1); Rds Spl (1); Proc Spl (1); Fin Mgt (1); Envir Spl (1); Agri (1); Live Spl (1)		
06/07/2002	*7*	Task Ldr (1); Soc Dev (1); Proc Spl (1); Fin Mgt (1); Agri (1); Envir Spl (1); Rds Spl (1)	S	S
11/30/2002	*9*	Task Ldr (1); Agri (1); Agr Mkt (1); Rds Spl (1); Envir Spl (1); Live Spl (1); Proc Spl (1); Fin Mgt (1); Soc Dev (1)	S	S
05/15/2003	*6*	Task Ldr (1); Agri (1); Rds Spl (1); Envir Spl (1); Fin Mgt (1); Soc Dev (1)	S	S
11/14/2003	*6*	Task Ldr (1); Agri (1); Rds Spl (1); Soc Dev (1); Fin Mgt (1); Proc Spl (1)	S	S
ICR				

Agri = Agriculturist; Agri Mktg = Agricultural Marketing Specialist; Disb Ana = Disbursement Analyst; Econ = Economist; Envir Spl = Environmental Specialist; Fin Mgt = Financial Management Specialist; Irr = Irrigation Engineer; Live Spl = Livestock Specialist; Proc Spl = Procurement Specialist; Proj Ana = Project Analyst; Rds Spl = Roads Specialist; Seri Spl = Sericulture Specialist; Soc Dev = Social Development Specialist; Task Ldr = Mission Leader; Unid = Unidentified;

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US$ ('000)
Identification/Preparation	455.3	1335.9
Appraisal/Negotiation	37.0	125.5
Supervision	228.0	370.8
ICR	11.0	55.0
Total	731.3	1887.2

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

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

	Rating
☐ *Macro policies*	○ *H* ○ *SU* ○ *M* ○ *N* ● *NA*
☐ *Sector Policies*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☐ *Physical*	○ *H* ● *SU* ○ *M* ○ *N* ○ *NA*
☐ *Financial*	○ *H* ○ *SU* ○ *M* ○ *N* ● *NA*
☐ *Institutional Development*	○ *H* ● *SU* ○ *M* ○ *N* ○ *NA*
☐ *Environmental*	○ *H* ● *SU* ○ *M* ○ *N* ○ *NA*
Social	
☐ *Poverty Reduction*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☐ *Gender*	○ *H* ● *SU* ○ *M* ○ *N* ○ *NA*
☐ *Other (Please specify)*	○ *H* ○ *SU* ○ *M* ○ *N* ● *NA*
☐ *Private sector development*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☐ *Public sector management*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☐ *Other (Please specify)*	○ *H* ○ *SU* ○ *M* ○ *N* ● *NA*

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

Annex 6. Ratings of Bank and Borrower Performance

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

6.1 Bank performance	*Rating*			
☐ *Lending*	○ *HS*	● *S*	○ *U*	○ *HU*
☐ *Supervision*	○ *HS*	● *S*	○ *U*	○ *HU*
☐ *Overall*	○ *HS*	● *S*	○ *U*	○ *HU*

6.2 Borrower performance	*Rating*			
☐ *Preparation*	○ *HS*	● *S*	○ *U*	○ *HU*
☐ *Government implementation performance*	○ *HS*	● *S*	○ *U*	○ *HU*
☐ *Implementation agency performance*	○ *HS*	● *S*	○ *U*	○ *HU*
☐ *Overall*	○ *HS*	● *S*	○ *U*	○ *HU*

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

Annex 7. List of Supporting Documents

The following supporting documents are available in project files.

1. Economic Analysis Files (Excel files)

   a) Agriculture.xls
   b) Costs.xls
   c) Livestock.xls
   d) One Animal Model.xls
   e) Roads.xls
   f) Overall.xls

2. Review Mission - Implementation Completion Report (6 Volumes), Project Coordination Unit, Uttar Pradesh, March 2004.

3. Review Mission - Status Report, Project Coordination Unit, Uttaranchal, March 2004.

4. An Impact Assessment of Rural Households of Uttranchal, Agriculture Management Centre, Indian Institute of Management (IIM), Lucknow, March 2004.

5. An Impact Assessment of Rural Households of Uttar Pradesh, Agriculture Management Centre, Indian Institute of Management (IIM), Lucknow, March 2004.

6. Aide Memoire of the ICR/Final Supervision Mission, March 16-31, 2004

Additional Annex 8. Borrower's Evaluation Report (Unedited)

A. INTRODUCTION

Prelude: Raison D'etre for DASP

1. The post-green revolution phase of agriculture in Uttar Pradesh witnessed emerging trends of diversification and commercialization of agriculture. This scenario got increasingly reflected in (i) changing cropping patterns from traditional cereal crops to high value cash crops, basically, horticultural and non-cereal agricultural crops (ii) expansion of the activities characteristically related to allied agricultural sector and (iii) rural off-farm employment opportunities impregnated with and subsisted by agriculture led growth.

2. Diversified Agriculture Support Project (DASP) was conceived with an objective of harnessing and promoting the upcoming trends of diversification in agriculture and providing the farmers an institutional support. It went to help the state government to affect changes in its policies with respect to the agriculture sector and also to endeavor to take stock of various operations relating to production and marketing for ensuring better and remunerative prices to the producers.

3. The project that started in UP from September 1998 has been implemented in Uttaranchal also after the bifurcation of the state in November 2000.

Project Objectives and Components

4. The principal objectives of the project were to increase agricultural productivity through support for UP's diversified agricultural production systems, promote private investment in agri-business, and improve rural infrastructure in the form of rural roads and rural markets.

5. To achieve these objectives the project supported a number of policy and institutional changes and financing investments in (a) technology development; (b) technology dissemination in agriculture, horticulture, livestock and sericulture; (c) promoting public-private partnerships through formation of self-help groups and credit facilitation; (d) rural roads and markets; and (e) project management, monitoring and evaluation, and economic and policy analysis.

Project Cost and Expenditure

6. The project cost of DASP was worked out to be US$ 160.5 million (IDA credit SDR 37.2 million equivalent to US$ 50 million and IBRD loan of US$ 79.9 million. The remaining amount i.e. US$ 30.6 million was the GOUP share) equivalent to Rs. 699.00 crores. However, due to change in the value of rupee vis-à-vis US$ the cost was further revised to Rs. 781.38 crores. Another important development was seen in the change in value of SDR vis-à-vis US$ and SDR 37.2 million which were initially equivalent to US$ 50 million came down to US$ 48.25 million. This change and appreciation in the value of rupee necessitated the revision in project cost twice during the project period, which finally stood at Rs. 755 crore. It was higher by 8% of the initial project cost of Rs. 699 crore in Indian currency. After the bifurcation of the State into UP and Uttaranchal, the Project cost was proportionally divided and shares of UP and Uttaranchal were worked out as US$ 145.079 million and US$ 15.069 million respectively.

7. The expenditure against revised estimated cost of Rs. 755 Crore (Rs. 683 Crore in UP and Rs. 72 Crore in Uttaranchal) is Rs. 747.00 Crore (Rs. 675.00 Crore in UP and Rs.72.0 Crore in Uttaranchal) by 31st March 2004. The details of Project cost both that was originally worked out and subsequently revised for the reasons stated above are as below:

Table: Project Cost – Original and Revised: UP and Uttaranchal

Source	Original		Revised	
	US$ m	**INR m**	**US$ m**	**INR m**
Credit	50.00	2177.5	48.25	2294.7
Loan	79.90	3479.8	79.90	3800.0
Share of Govt. (GOUP/GOUA)	30.60	1332.7	30.60	1455.3
TOTAL	**160.50**	**6990.0**	**158.75**	**7550.0**

Design of Presentation

8. Subsequent to this section Borrower's Evaluation contains nine major sections viz., Project Coverage and Benefits, Implementation Methodology, Institutional Framework and Operational Arrangements, Project Achievements, Project Constraints and Areas of Concern, Bank Performance, Borrower's Performance, Lesson's Learnt and Looking Forward – Next Step.

B. PROJECT COVERAGE AND BENEFITS

9. The Diversified Agriculture Support Project (DASP) was conceived and started on a pilot basis in the year 1997-98 in 5 districts of the U.P. Gradually, after its formal launch in September 1998, it extended its activities to 157 blocks of 32 districts of U.P. and 6178 villages benefiting 2.25 lacs households.

10. In Uttaranchal focused project interventions were made in 5 project districts identifying 27 blocks covering 24000 households in 1218 villages (8% villages of state; 1991 data) thus, benefiting 19,917 farmers/ women.

The project has been successful in spearheading important policy changes and creating enabling rural infrastructure. As reflected in Impact Report of independent M&E agency (AMC, IIM Lucknow) farm incomes have increased, adoption of new technologies and increased productivity levels, and community has become aware and sensitized towards adopting environment friendly farming practices. In addition capacity of all stakeholders to manage diversified agriculture production system has been enhanced through various training programs. Project has also generated rural employment opportunities for resource persons, women, NGOs/rural youth.

C. IMPLEMENTATION METHODOLOGY

11. The thrust was to devise methodologies that would result in meeting the project objectives. People's participation and their empowerment has been one of the important themes. Implementation of project interventions through self-help groups facilitated by NGOs has proved to be remarkably successful in effective technology dissemination and adoption of practices introduced under the Project. Two significant innovations - the establishment of Agriculture Technology Management Agency (ATMA) for facilitating decentralization planning and implementation, and Farmers Field Schools were also a success in the project.

12. In Uttaranchal same methodology was adopted excepting instead of ATMA the district level implementation unit was called as Agricultural Diversification Management Society (ADMS).

D. INSTITUTIONAL FRAME WORK AND OPERATIONAL ARRANGEMENTS

13. The implementation design of the DASP necessitated the need to develop a complex but organically coordinated system of implementation and monitoring. A Project Coordination Unit (PCU) was setup as an autonomous society by the GOUP in order to coordinate with the different implementing agencies/departments and monitor the performance of the project. Additional Chief Secretary and Agriculture Production Commissioner, GOUP was designated the Chairman of the Project. That apart a dedicated cell viz. Project Implementation Unit (PIU) was also setup in each of the departments, and agencies and dedicated staff was placed in them.

14. At the state level PCU had its Executive Committee and the Governing Board both having the Additional Chief Secretary and the Agriculture Production Commissioner (APC), Govt. of UP as their Chairperson. The Govt. under the Chairmanship of the Chief Secretary, Govt. of UP also constituted a high power Steering Committee with an objective to provide necessary guidance and take relevant policy decisions. A Project Management Committee undertook the regular review of the project. A Gender Task force established by the Govt. addressed the gender specific issues in the form of women empowerment both on social and economic parameters.

15. The project implementation design involved active participation of the related line department viz., Agriculture, Animal Husbandry, Horticulture, Panchayati Raj, Dairy, PWD, Sericulture, SAU, and Agriculture Management Centre, IIM Lucknow as independent monitoring & evaluation consultant.

16. In Uttaranchal Project Coordination Unit (PCU) was established in May 2001 with the bifurcation of the state, and two additional district project coordination units (DPCUs) were established in district Almora and Uttarkashi in May 2002. For demand driven decentralized planning and implementation systems ADMS represented by officers of line departments, farmers federations etc. were established at each of the project districts for effective coordination, planning, implementation of the project.

E. PROJECT ACHIEVEMENTS

17. A meaningful investment and successful intervention in agriculture has been the verdict about the project even in the most critical and analytical evaluations. The overall performance of the project is satisfactory against the project development objectives. Project initiatives not only significantly contributed to the increase in the productivity of major crops but also empowered and enabled the masses to search for the solutions of their problems.

18. In comparison to the baseline year of 1997-98, the productivity of the major crops affected an increase of about 10% and more than 1,11,236 hectares of agricultural area was brought under vegetables and other high value horticultural crops. Similarly promotion of the use of organic manures and bio-fertilizers replaced and supplemented the use of chemical fertilizers in about 50,000 hectare and brought down the cost of cultivation by 6%. Paravet and breed improvement programmes of the AH department affected the increase in milk yield by 3 to 9% in local cow, crossbred and buffalos. Technology dissemination component realized the organization of 10,158 field days for different crops. Introduction of the Best Farmers' Award, publication of periodicals – Kisan *Bhai Dhyan Dein* and the Project Newsletter went to a great extent to disseminate the latest technologies. Rate of adoption of new practices and technologies amongst the farmers of the project area vis-à-vis those of non-project area also show a substantial difference, which on visible parameters manifested in an increase in productivity by 10%, 17% and 10% in cereals, pulses and oil seeds over the base year. Fruit and vegetable crops also registered an increase of 15% and 85% respectively over the base year data.

19. In Uttaranchal, due to project's focused interventions around 390 ha has been brought under horticulture, mainly off-season vegetable production, and 140 ha old orchards were rejuvenated.

Bio-composting production has increased substituting chemical fertilizers in 8.4% of gross cropped area thus reducing the cost of cultivation. Breed improvement through para-vets aiming for milk production (lts per day) has resulted in increase of 8.2%. Through the project state has taken a lead from silk production to weaving and fabric. Product with brand name "*Prakirti Silk*" has been launched. Technology dissemination has been facilitated by organizing 426 field days for crop demonstrations. Overall adoption of new technologies taken to farmers has been encouraging ranging from 4% to 30% as compared with non-project village/ beneficiaries. This adoption has resulted in increase in cropping intensity by 28% whereas productivity of paddy and wheat also showed a substantial increase.

Policy Reform-Uttar Pradesh

20. The overall progress under this has been satisfactory. Some major policy decisions have been taken including: (a) Amendment in the UP Cold Storage Act, 1976 and de-regularization of the rates for storing the commodities, (b) Increase in the limit of exemption from stamp duty and collateral security for the priority sector lending (c) Abolition of dual pricing mechanism for sugarcane molasses, (d) Relaxation in the UP Land Ceiling Act for determining the limit for purchasing/holding land for agricultural purposes, (e) Doing away with the state monopoly for the purchase of cocoon, (f) Increasing the role of PRIs in the operation and maintenance of community assets, (g) Bring in the DOS under the administrative umbrella of the APC for better and effective coordination that was earlier with the industry portfolio, (h) Elimination of restrictive provision in licencing for private nurseries (i) Creation of Livestock Development Board for the sustainability of the paravet programme.

21. **Cost Recovery:** User charges for services relating to Animal Husbandry, Horticulture and Agriculture and the input costs have been raised to bring them at par with the investment cost. Cost recovery percentage is 100% or even more in some or all such items. Only a few items viz. charges for AI in animal husbandry, soil testing in agriculture fell marginally short of full cost realization.

22. **Agriculture Wholesale Market:** The matter to hold elections of the Agriculture Produce Mandi Committees has been referred to the Government and is under review. GOUP is considering appropriate amendments in the Mandi Samiti Act to give scope for greater involvement and participation of private sector.

Policy Reform-Uttaranchal

23. **Cost Recovery -** Uttaranchal has performed well in meeting the policy reforms agreed under the project. User charges have been revised to cover updated full costs for all the agreed items in agriculture, horticulture, livestock and sericulture, and cost recovery percentages are 100% or more in all agreed goods and services.

24. **State Farms -** Actions have been taken to deal with loss making government farms. In sericulture 31 state farms were handed over to silk producing cooperative societies. In horticulture of the 77 farms identified for privatization, leased out to the private sector and action has been taken to lease out another 55 farms. In animal husbandry of the two farms with DOAH, one farm has been transferred to the Uttaranchal Livestock Development Board (ULDB).

25. **Agricultural Wholesale Markets -** Action has been initiated to conduct elections in all 20 market committees in the state. A Director Elections has been appointed and work for delimitation of constituencies and preparation of voter lists is in progress.

Technology Development

26. The objectives for technology development were to (a) enhance research coordination by

strengthening SAUs and linking with national research system, (b) enhance efficiency and effectiveness of research through competitive allocation of funds to multi-disciplinary systems oriented research including IPM and IPNM research, and (c) strengthen research-extension-farmer linkages by supporting interactions between KVKs, ZRS, and SAUs and line department.

27. In Uttar Pradesh, an ambitious but achievable mandate was proposed for the technology development component under DASP. It consisted of validation trials of different packages of practices developed by various research institutions by the farmers on their fields particularly relating to IPM and IPNM modules. Now after their success, the Departments of Agriculture and Horticulture have mainstreamed the programme and included it in their recommended package of practices.

28. In Uttaranchal, on-farm validation trials were undertaken for the identified problems by the community and package of practices were developed in respect of agricultural crops mainly on IPM, mulching practices, varietal, bio-fertilizer and published as '*Uttaranchal Krishi Nirdeshika*'. IPM modules detailing time profiles of different pests for crops (wheat, rice and maize), and Integrated Crop Management Modules for normal & aromatic rice cultivars were also developed. Besides, to combat diseases of vegetable crops composting mixture '*Rani* Mixture' has also been developed. Sixteen new technologies have also been developed for mass multiplication of bio-control agents.

29. Pantnagar Centre for Plant Genetic Resource established to broaden the genetic base of agriculture and horticulture crops is maintaining 1590 germplasm from other countries, 1270 from with country, and 2487 through exploration besides 7805 existing collection.

Technology Dissemination

Agriculture:

30. The major objective of the technology dissemination component was to spread the latest technologies originated and developed in the research laboratories. Sensitization of the farmers on the issues of environmental protection, hazardous effects of chemical pesticides and fertilizers were the other issues relating to this component. Its operational part consisted of broad-basing extension activities by conducting demonstrations on IPM, IPNM, and bio composting. The impact evaluation study done by the Agriculture Management Centre, IIM (Lucknow) has mentioned the following statistics in its report – (a) Cropping intensity of the main agricultural crops increased from 169% to 203% over the base year (1997-98), (b) application of organic manure went up from 13.2% to 44.1% over the base year (1997-98), (c) Productivity of wheat, paddy and potato increased by 10%,27% and 59% respectively over the base year, (d) Extent of adoption of soil testing practice was found to be 51% in DASP area against 5% in non-DASP area over the base year (1997-98), (e) Extent of adoption of organic manure practices was found to be 44% of the gross cropped area against 5% with non-DASP area, (f) Extent of adopting bio-control methodologies was estimated to be 35% in project area against 3% in non-DASP area, (g) Use of Zero-till seed drill in 44000 hectare. Further in order to provide easy access to information relating to various agronomical practices and market trends to the farmers at their doorsteps, the project collaborated with M/s ITC Limited for the start of e-chaupal.

31. ***Sustainability Measures***- GOUP has ensured the sustainability of these programmes through mainstreaming them in the regular annual plans of the agriculture department and also making them a part of the Agriculture Policy.

32. In Uttaranchal, focus was also on IPNM, IPM, bio-composting besides establishing bio-villages and seed villages. The cropping intensity has increased from 177 to 213% over base period 1997/98. Use of Organic manure increased from 4 to 8% of farmers. Area under oil seeds has improved by 5% of GCA in project area, as compared to 2% in non-project area. Seed replacement in cereal crops was found 14% in

project area as compared to 2% in non-project area. The adoption of soil testing practice was found by 41% as against 16% in non-project area. Adoption of organic manure was found by 25% farmers in project area as compared to only 10% in non-project area. Adoption of bio-control methodologies was found by 24% of farmer in project area as compared to 13% in non-project area. Productivity of paddy and wheat were found 12 & 8% higher than the non-project area.

33. GOUA through its funds has ensured continuing the programmes/activities taken up by the NGOs under privatization of extension services, organic farming taken-up by UOCB, and activities taken-up through Agri Export Zone (*Basmati*).

34. Organic Farming: Impressed with the successful initiatives for bio-farming under the project Uttaranchal has become the first state where 'organic' farming is on state's agenda. The state has set an example by establishing 'Uttaranchal Organic Commodity Board' with a mandate to promote organic farming practices, train farmers and functionaries, establish quality management and certification systems, and facilitate marketing of organically grown produce, now being followed by Sikkim and Karnataka. Center of Excellence for organic farming and training center has been established at one of the state's agriculture farm at Dhakrani, Dehradun.

Horticulture:

35. The focus of project interventions was on (i) promoting varietal cropping, (ii) establishment of private and government nurseries for supply of quality planting material and improving nursery-raising techniques, (iii) rejuvenation of old orchards to increase the productivity, and (iv) strengthening and developing post harvest facilities. The major highlights under the horticulture component are – (a) 1,11,236 hectares (increased by 18% of the GCA) has been diversified in horticultural crops, (b) 39,500 nos. of low tunnel poly houses were constructed by the farmers to grow disease free saplings especially off-season vegetable and tissue culture fruit crops, (c) 2,07,893 nos. of farmers were trained on different aspects of horticulture, (d) Productivity of most of the horticultural crops increased by 10% to 20% over non-DASP area,(e) 1054 nos. of private nurseries are established to meet the requirement of quality planting material,(f) 255 nos. of onion storage structures have been constructed to ensure storage capacity for 1530 mt. of onion,(g) 521 nos. of Zero Energy Cool Chambers enabled the farmers to increase shelf life of the perishable commodities.

36. ***Sustainability Measures*-** For sustaining the activities of the horticulture component following steps are undertaken – (a) One model nursery is setup in Saharanpur with the capacity to produce 5.7 lac plant saplings per annum (b) three Agri-Export Zones (Lucknow, Saharanpur, Agra) setup to explore the export possibilities for Mango from Lucknow and Saharanpur and potato from Agra, (c) Agreements with private entrepreneurs finalized for contract farming in Saharanpur for bee-keeping and honey production, and (d) Three Horticulture Development Zones, one each in Pratapgarh for Aonla, Gorakhpur and adjoining area for Banana and Saharanpur for honey production finalized.

37. In Uttaranchal 13% to 19% of GCA has been diversified to various vegetables and other cash crops by way of carrying varietal demonstrations. Farmers are now growing disease free and healthy saplings by using poly tunnels/poly house, and have synchronized harvest by market demand and prices. About 91% of group members have been benefited with training programmes. About 24% farmers adopted bio-control agents as compared to 13% in non-project area. Productivity of most of the horticultural crops increased from 10 to 20% than non-project area. Project facilitated procurement of elite planting material of apple and pear from New Zealand. Three Agri Export Zone for *Litchi*, Floriculture and Medicinal & Aromatic Plants have come-up through project's initiatives.

38. For sustaining the initiatives under Agri Export Zone (*Lithci*) MOU have been signed with seven exporters to carry export activities, model nursery has been set up at Patharchatta, Pantnagar, four Post

Harvest Training Centres and one Technology Dissemination Centres have been established, four farmer federations have been formed, Govt. Food Processing Factory, Ramgarh has been leased out to Mother Dairy to continue food-processing activities, Govt. cold storage at Matela has been leased out to a private company for its operation & management, Horticulture Development Society has been created for development of Horticulture.

Animal Husbandry and Dairy

39. Through Project interventions animal health services - artificial insemination, vaccination and first aid etc. were made available at the door step of the cattle rearer by paravets who earn a net income of around Rs. 5000/- a month in U.P. Other achievements under this component are – (a) Demonstrations of fodder and urea treatment supported by necessary training input brought about significant improvement in animal health, (b) Awareness about clean and hygienic milk production led to decreased percentage of sourage and curdling, improvement in the keeping quality of milk with decrease in microbial count, and lessened the incidence of mastitis. Payment of premium price was also introduced in the project for such producers, (c) 1308 paravets developed under the project did 5.93 lac AI in the project area, which resulted in the birth of 1.04 lac calves, (d) 82.06 lac vaccinations are done by paravets, (e) Increase in milk yield & average no. of livestock per family have gone up, (f) 2404 dairies have been turned into hygienic milk societies. 143481 dairy owners and 6531 secretaries were trained in hygienic milk production, (g) 24012 animals are registered under MRCB (Milk Recording and Conservation of Breed) programme and their rearers are provided Farmer support package (including breeding facility, vaccination, De-worming mineral mixture supplement and insurance).

40. ***Sustainability Measures***- (a) Livestock Development Board has been setup in both States as an autonomous body by the government to sustain the project initiatives especially with regard to paravet and breed improvement/ conservation programme. The Board will arrange uninterrupted input supply to paravets on actual cost basis. Department of Animal Husbandry has adopted the paravet programme as its policy for extending the AI coverage, (b) 100 breeders associations have been established, (c) PCDF has included the production of hygienic milk as an item in its quality control policy declared recently.

41. In Uttaranchal, only after bifurcation of the state paravet program and clean/ hygienic milk production activities were in focus. Currently 86 paravets (out of 94 trained) are working of which larger number are in plains of Uttaranchal where animal density is also high. During the project life paravets have performed 9797 AI, and provided vaccination cover to 124409 animals besides attending 16662 first aid and 2603 castration cases. Paravet performance have been better in terms of conception rate as reflected by households preference and as a result paravets are able to generate around Rs.3000 per month in plain areas. Specially, for hilly tracts initiative to provide animal health care services through mobile veterinary vans has helped in providing timely and quality service.

Sericulture

42. Despite the fact the state is one of the biggest consumer of silk yarn, sericulture remains a non-traditional activity in the state. Assessing a huge gap in production and demand, this component was considered for financing by the project. To cater the demand of silk weaving areas, it was planned to increase the production of high quality bivoltine raw silk to 750 Mt (490 MT UP & 290 MT UA) by raising mulberry plantations of 8500 Ha (5500 Ha UP & 3000 Ha UA) on private lands, strengthening silkworm seed production infrastructure, supporting post cocoon sector, providing market linkages through effective technology dissemination system. During MTR the PAD target of raw silk production was revised from 750 MT to 195 MT (120 MT UP and 75 UA) and mulberry plantation from 8500 Ha to 2208 ha (1356 Ha UP and 852 Ha UA). After the bifurcation of Uttar Pradesh and creation of a separate

Uttaranchal State the sericulture components is limited to the 3 districts of the North-East Tarai region.

43. In Uttaranchal, the bush plantation system originally inbuilt in the project design was not technically viable, and thus has fewer acceptances among farmers. Later following the recommendation of a consultant hired through project a system of tree plantation on the bunds of fields and around dwellings was introduced from July 2001 onwards. Accordingly mulberry plants have been raised in 734.5 Ha in three project districts with about 70-75% survival, and 118.3 Ha bush plantation with 15% survival has resulted in 45 MT cocoon production and 6 MT of raw silk. The sericulture is now practiced in 462 villages by 2764 farmers belonging to 222 Primary Sericulture Groups.

44. Lesson's in sericulture are – (a) Bush type of mulberry plantation is not feasible in Uttaranchal due to scattered land holding size; (b) Only two commercial rearing – spring and autumn along with intercropping models to be promoted; (c) saplings to be raised and distributed having maturity of at least 9 months; (d) efforts for value addition in form of finished silk products and branding of product.

45. For sustaining the efforts following steps have been taken in Uttaranchal – (a) silkworm seed production activities have now been entrusted with Central Silk Board; (b) silk rearers have been brought under one umbrella viz. Uttaranchal Co-operative Resham Federation (UCRF) to attend developmental as well as market issues; (c) management of 32 government sericulture farms have been handed over to Primary Silk Co-operative Societies; (d) Silk weaving has been introduced for product development, 28 looms upgraded; (e) Group chawki rearing concept introduced, and (f) Road map has been drawn on the suggestion of Chinese Experts and inline with the Tenth Five Year Plan following integrated approach of silk production.

Participatory Management, Capacity Building, Credit and Marketing

46. Participative approaches in planning, implementation, monitoring and evaluation has led to accountability and a sense of ownership in the community, through the formation of self help groups. Women, for the first time, were given a platform to come forward and participate in large numbers. Credit facilitation to the groups has freed them from the clutches of the moneylender and made available easy flow of credit to meet their needs. Women especially, are taking decisions on how to prioritize on availing of loans. In U.P. Social mobilization efforts undertaken through 33 NGOs materialized in the formation of 17,906 SHGs including 6,247 Womens SHGs in 6178 project villages thereby benefiting 2,17,168 households. Total amount that was saved by these group members was Rs. 170 million (Approx. 50 million for women SHGs) till the end of Feb.'04 and Rs. 85.00 million were advanced to these groups as credit through various banks.

47. ***Capacity Building and Marketing*** **–** (a) Detailed training programmes were prepared and implemented for the different stakeholders after conducting training needs assessment. The nature of training included skill up-gradation training, motivational and managerial training, exposure visits, subject matter training and workshops. Regular training sessions were conducted during the project period and 4.27 lacs farmers and 9838 staff persons were trained through them, and (b) Marketing of agricultural produce was facilitated through fostering linkages with the private sector. Some groups have exclusively become the trading groups and are supporting the trading activities in the villages as non-formal marketing channels.

48. In Uttaranchal, social mobilization efforts initiated through 20 NGOs have resulted in formation of 2050 SHGs, including 1143 women SHGs across 1218 villages thus directly benefiting some 20,000 households having total savings as Rs.14.9 million (Rs.7.28 million for Women SHGs) with credit support of around Rs.5.4 million extended through formal institutions to 497 groups for some income generating activities. Sensitization and awareness program for bankers were organized for ensuring credit linkage.

Increased Private Sector Involvement and Public/ Private Partnership in Agri-business

49. An experiment with the privatization of extension services through NGOs was introduced to identify the potential areas where private entrepreneurs (in lieu of government departments) may deliver effective services to the farming community. The assignment was entrusted to two NGOs. Another break through in the project has come through the establishment of 167 Farmers' Field Schools. The involvement of the private sector is in agro-processing, contract farming and bio-agents production. One hundred sixteen fruit processing units have been established in the private sector through project facilitation to process horticultural produce. Besides, MOUs are also signed with M/s Indian Tobacco Company (ITC), M/s Mahindra & Mahindra, M/s Nestle India, M/s Cargil etc. for contract farming for various crops in different districts.

50. In Uttaranchal, to encourage greater private sector involvement concept of 'Privatization of Extension Services' was implemented in three project blocks viz., Kotabagh (since 1999), Naugaon and Salt (since 2002) that has helped in providing quality and cost-effective extension services in timely manner. Successful involvement of NGOs in sericulture extension services and farming community in chawki rearing has resulted in issuance of govt. order for continuing such model in all other districts where sericulture activities are taken up. Private investments totaling Rs. 31.85 million has also come up to establish agro-processing units in the state. GBPUAT, Pantnagar has signed an MOU with private firm that shall invest Rs.10 million for commercial production of bio-control agents.

Rural Infrastructure Development

51. All weather roads of 2625 km. were constructed/up-graded in the project villages. These roads were constructed/up-graded according to the specifications of the Indian Road Congress. An independent agency- M/s SMEC International Pvt. Ltd. checked the quality of roads at different stages of their construction. These roads ensured connectivity to 816 villages.

52. The project financially supported the construction/up-gradation of rural markets (haat painth) and cattle markets. Those regulated markets that had an estimated annual turnover in the range of 1000 mt.of traded and trade-able commodities were considered for support. After construction these markets are handed over to the concerned village panchayats and are managed by them. A total of 103 rural markets and 02 cattle markets were constructed/upgraded under the project.

53. Impact study conducted by the AMC, IIM, Lucknow has mentioned the following points – **RURAL ROADS –** (a) Construction of roads has benefited about 5.5 lacs farmers of the project area, (b) Number of benefited population per road comes to about 19000, (c) Traffic density increased by 14% after the road construction, (d) Value of land in the connected villages went up by 25%, (e) About 40% of the area along both sides of the road got diversified to vegetables and other horticultural crops; **RURAL MARKETS –** (a) Value of transaction went up by 39% after construction of a market, (b) Annual contract value of the market after up-gradation scaled up by 34%, (c) Participation of women traders increased by 18%, (d) Apart from the village where market was constructed, 30 other adjoining villages also received indirect benefits.

54. ***Sustainability Measures-*** (a) Rural Road Maintenance Policy has been prepared by the Govt. to maintain these roads, (b) The State Government has created a road maintenance fund for the said purpose, (c) Rural markets constructed under the project are handed over to the concerned village panchayats for their maintenance, (d) Income proceeds of the markets are kept in a bank account managed by a committee and is earmarked for the use in maintenance purposes only.

55. In Uttaranchal, a total of 102 kms all weather roads have been constructed/ upgraded, thus directly benefiting 107 villages. Three bridges constructed over natural drainage that were flooded during rains thus

restricting frequent mobility of villagers/ vehicles. Looking into hill specific requirements and need of the farmers engaged in horticulture activities, construction of collection centers (16 nos.) with a design to store 8000 MT volume of fruits and vegetables, and a platform for sorting and grading were constructed in project districts. These collection centers shall be operated and maintained by village community. As a part of strengthening Civil works of training centres etc. were also taken-up with the line departments.

Project Management and Enhanced Capacity for Economic Policy Analysis

56. **Economic and Policy Analysis Unit (EPAU)** established in the PCU to analyze the maladies of agriculture sector and suggest long term policy measures to be adopted to improve its performance. This unit conducted 9 studies and the important amongst them include (i) Fiscal analysis of the investment pattern in agriculture sector (ii) Status and management of state owned farms, (iii) Public private partnership under DASP (iv) Finances of Mandi Samiti and their sustainability. Besides the above, this unit facilitated many other consultancies (21 nos.) on the issues having relevance to the project. Some of those studies done by the consultants are (i) Feasibility study of rural markets/cattle markets, (ii) Post harvest technology infrastructure establishment and training in Horticultural crops (iv) An assessment of participatory management processes (v) Review of IPM and IPNM demonstrations (vi) A study on technical and economic analysis of organic manures etc.

57. **Establishment of Agriculture Management Centre (AMC) at the Indian Institute of Management, Lucknow:** It was considered that an independent agency should periodically monitor and evaluate the performance of the project. The project funded the establishment of an Agriculture Management Centre (AMC) at the Indian Institute of Management, Lucknow. This centre submitted its monitoring reports on regular intervals and also evaluated the project after every 18 months. AMC provided 33 monthly monitoring reports and 03 evaluation/impact assessment reports during the project life and the necessary redemptive actions/measures were taken on their basis with respect to project design, implementation methodology and policy initiations.

58. **Project Development Facility (PDF)** was set up with the objective of encouraging private participation and investment in agriculture by way of helping farmers identify suitable projects, prepare bankable project profiles and facilitate finances if required from lending institutions. However, it was noticed that perform of consultants engaged was not satisfactory. The project therefore, terminated the consultancy of the firm engaged for the purpose and thereafter its own staff ensured the marketing linkages and processing tie-ups with the private enterprises.

59. Uttaranchal has successfully operationalized accounting and procurement (for prior review road contracts) modules through enhanced capacity of account personnel using Computerized Financial Management System that has helped the project in timely generation of SOEs/ Summary Sheet Claims and completion of accounting/fixed assets records. Development of agriculture portal and establishment of information kiosks in project areas for farmers to facilitate access agriculture and market related information at doorstep has been an innovative initiative under the project. Geographical Information System (GIS) and integrating MIS data for spatial analysis was also piloted under the project.

F. PROJECT CONSTRAINTS AND AREAS OF CONCERN

60. ***Uttar Pradesh*** **-** Though the project accomplished its targets in time, a few constraints listed below impeded its performance off and on, (a) Understanding and internalizing the project concept by all the stakeholders took some time initially, (b) The success of the project lay in the symbiotic coordination amongst all the line departments, which appeared hard to achieve in the structured bureaucracy. Initial period of the project was consumed to develop a sense of ownership in the line departments, (c) Lack of field level extension and paucity of reliable NGOs impeded the progress, (d) Capacity building of M&E staff from AMC also consumed substantial time.

61. ***Uttaranchal-*** (a) The creation of Uttaranchal and subsequent bifurcation of the project costs greatly affected pace of implementation. Significant time was consumed in establishing PCU, (b) Modification were required to suit Uttaranchal conditions and priorities. It had been difficult for the line departments specially Agriculture, Dairy and Animal Husbandry to plan and implement activities besides the horticulture and sericulture activities, which were initially in focus, (c) A lot of time and efforts had gone in for orienting and training and internalize the concept of the project implementation at all levels. Instability at PCU and PIU level caused due to frequent transfers, especially in UP has hampered implementation progress to a great extent.

G. BANK PERFORMANCE

62. Six monthly supervision/ review missions have always helped in providing guidance and directions to achieve project objectives. Field visits by mission members and aide memoires have provided objective and useful feedback to track the project progress and initiate corrective actions. Task Managers and team members have been very cooperative, and always impressed upon the state government in wrap-up with Chief Secretary, Agriculture Production Commissioner/ FRDC and Principal Secretaries/ Secretaries to support project philosophy and highlighted concerns and points of immediate action to expedite project implementation. Task Manager has been following the progress through emails/ phone, and has expeditiously provided concurrence to proposals forwarded to the bank. Overall performance in project identification, preparation assistance, appraisal, and supervision has been highly satisfactory.

H. BORROWER'S PERFORMANCE

63. Performance of the borrower and implementing agencies has been satisfactory. Project Coordination Units has played an important and meaningful role in coordinating with the government and line departments, and also ensured smooth fund flow across all the project locations.

I. LESSONS LEARNT

64. (a) Farmers are responsive to change and prepared for diversifying their agricultural practices, provided they are given assurance of remunerative marketing and buying tie-ups, (b) Endeavours at group level enhance the bargaining power of each group member, (c) Continuous attention is to be paid for motivating and training the farmers in latest technologies. (d) Capacity building of the line departments and NGOs officials are also equally important and necessary, (e) Agenda for technology development and dissemination should be set according to farmers' requirements and must have a market focus in its mandate, (f) The promotion and success of organic farming will mitigate environmental degradation, (f) A gender sensitive approach is to be adopted in regard to various developmental programmes to ensure their sustainability, (g) Farmers led extension models i.e., Farmers Field Schools proved to be a high success, (h) More broad-basing in required at the ATMA level to involve farmers, women group members, private stakeholders and NGO representatives, and (i) Exit Policy should start from beginning, (j) Farmers and other stakeholders associations be upward federated empowered to ensure uninterrupted supply of inputs,

(k) Use of IT for extension is essential, (l) Financial Management especially at the SAUs needs further streamlining, (m) Engagement of an external monitoring and evaluation agency lends credibility to project achievements.

J. LOOKING FORWARD – NEXT STEP

Uttar Pradesh

65. Appreciating the success of the project and its significant contribution to rural economy, the GOUP has sanctioned Rs. 170 million (US$ 3.752 million) from its budget for the year 2004-2005 to carryout the requisite follow-up activities and prepare a follow-on project of DASP. Future strategy would be evolved on the following lines:-

- Backward and forward linkages particularly in the areas of post harvest facilities including packaging and processing etc.
- Substitute present crop cycles that keep farmers at subsistence level by high value crops.
- Promote the use of organic manure and bio pesticides instead of chemical fertilizers and toxic pesticides.
- Put issues of environment conservation at the centre of programme planning.
- Promote production of off-season varieties of fruits, flowers, vegetables, medicinal and aromatic plants.
- Develop requisite infrastructure in the area of agro-processing and marketing.
- Improve the production potential of the breedable bovine animals by effectively managing the A.I. and crossbred production programme.

Uttaranchal

66. The Government of Uttaranchal (GOUA) has identified key GDP drivers for Uttaranchal as – tourism diversified agriculture, horticulture, power generation, information technology, biotechnology, and medicinal/ herbal & aromatic plants. The government realizes that it would be much better to facilitate creation of jobs rather than provide jobs directly.

- In Tarai region the strategy envisages to introduction of high yielding varieties with change in cropping patterns for higher returns to farmers.
- In hilly areas, it is proposed to leverage the popular mountain produce. The focus would be on to develop newer varieties, which need less water, and at the same time improve upon the existing irrigation systems and increasing seasonal (off-season in terms of plains) vegetable production.
- To provide required forward and backward linkages, particularly in areas of packaging, quality control and marketing.
- To progressively change the rootstocks of fruit and flower plants and bring in modern and proven cultivars, and to lay more emphasis on processing and value addition in the agro-horticulture sector.
- Prepare infrastructure development projects for post harvest management of fruits and vegetables to assist individuals and groups of farmers in marketing their produce.
- Income generation through production of medicinal & aromatic plants without affecting the bio-diversity
- Improving the productive potential of livestock by effecting improvement in Animal Husbandry Services.

Additional Annex 9. Borrower's Comments on the Draft ICR (Unedited)

Comments from the Government of Uttar Pradesh

We thankfully acknowledge the receipt of your Draft Implementation Completion Report for our comments. We have reviewed the draft report thoroughly. Although the above report has covered all points very succinctly, we have some observations as given below:-

1. 4.2.3. (Page 5): Private sector involvement and public/private partnership: Till project closure 125 food processing licenses have been issued (in report 116 is mentioned).

2. (Page 15):

Components	Mentioned in Report	Actual
a. Human Resource Development		
Training of farmers/master trainers (Horticulture)	228197	228197
Training in Agriculture	34864	34864
b. Paravet Activities		
Artificial Insemination (000)	614	668
Vaccination (000)	8430	8451
Animal Health Care (000)	609	623
Improved progeny born (000)	109	119
c. Dairy Development		
Milk vendors trained in hygienic milk production/procurement	6531	6568
Farmers trained in hygienic milk production	143493	151034
Hygiene Society Developed	2404	2698
Animal registration	21220	24862

3. (Page 19): A total of 263061 farmers were provided training in Agriculture/Horticulture (in report only 228000 is mentioned).

Thanking you,

Dr. Surya Pratap Singh
Project Coordinator

Comments from the Government of Uttaranchal

With reference to your letter dated July 19, 2004 our comments are being attached for your reference and records.

Remark 1: Para 7.6.1 Financial Management and Procurement

The project has successfully implemented the Computerized Financial Management System (CFMS) at all

accounting locations generating SOEs. Summary Sheet for Post-Review items, PMR etc. This has also reflected in Aide Memoires of the Bank Missions.

With warm regards,

Yours sincerely,

C. Bhaskar
Additional Project Coordinator
DASP