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The World Bank

Report No: ICR0000653

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA-31520)

ON A

CREDIT IN THE AMOUNT OF SDR 141.7 MILLION

(US\$194.1 MILLION EQUIVALENT)

TO THE

REPUBLIC OF INDIA

FOR THE

UTTAR PRADESH SODIC LANDS RECLAMATION II PROJECT

March 20, 2008

Sustainable Development Department
Agriculture and Rural Development Unit
India Country Management Unit
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective September 2007)

Currency Unit = Indian Rupee (Rs.)

Rs. 1.00 = US\$ 0.03

US\$ 1.00 = Rs. 39.71

FISCAL YEAR

April 1 – March 31

ABBREVIATIONS AND ACRONYMS

ATMA	Agricultural Technology Management Agency	MCAR	Micro Credit Action Research
CAS	Country Assistance Strategy	M&E	Monitoring and Evaluation
CES	Consulting Engineering Services	MIS	Management Information System
DASP	Diversified Agriculture Support Project	MK	Mitra Kisan
DCA	Development Credit Agreement	MMK	Mahila Mitra Kisan
DICC	District Implementation and Coordination Committee	MTR	Mid-Term Review
DOA	Department of Agriculture	NGO	Non-Government Organization
ERR	Economic Rate of Return	OFD	On-Farm Development
FFS	Farmers Field School	PAD	Project Appraisal Document
FY	Financial Year	PDO	Project Development Objective
GIS	Geographic Information System	PRA	Participatory Rural Appraisal
GOUP	Government of Uttar Pradesh	PV	Present Value
GP	Gram Panchayat	PWD	Public Works Department
hh	Household	Rs.	Rupees
HRD	Human Resource Development	RSAC	Remote Sensing Application Centre
ICRR	Implementation Completion and Results Report	SAU	State Agricultural University
ID	Irrigation Department	SCF	Standard Conversion Factor
ISM	Implementation Support Mission	SHG	Self Help Group
ITK	Indigenous Technical Knowledge	SIC	Site Implementation Committee
Km	Kilometer	SREP	Strategic Research and Extension Plan
M	Million	t	Ton

UP	Uttar Pradesh	WOP	Without Project
UPBSN	Uttar Pradesh Bhumi Sudhar Nigam	WP	With Project
VOC	Vehicle Operating Cost	WSHG	Women Self Help Group
VOT	Value of Time Saved	WUGs	Water User Groups
WMC	Water Management Committee		

Vice President: Praful C. Patel
 Country Director: Isabel M. Guerrero
 Sector Manager: Adolfo Brizzi
 Project Team Leader: Paul Singh Sidhu
 ICR Team Leader: Paul Singh Sidhu

INDIA
UTTAR PRADESH LANDS RECLAMATION II PROJECT
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MAP IBRD No. 29956R

A. Basic Information			
Country:	India	Project Name:	UP Sodic Lands II
Project ID:	P050646	L/C/TF Number(s):	IDA-31520
ICR Date:	03/20/2008	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	GOVERNMENT OF INDIA
Original Total Commitment:	XDR 141.7M	Disbursed Amount:	XDR 141.7M
Environmental Category: B			
Implementing Agencies: Uttar Pradesh Bhumi Sudhar Nigam			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	02/19/1998	Effectiveness:	03/29/1999	03/29/1999
Appraisal:	06/30/1998	Restructuring(s):		
Approval:	12/15/1998	Mid-term Review:		04/29/2002
		Closing:	09/30/2005	09/30/2007

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Satisfactory
Risk to Development Outcome:	Moderate
Bank Performance:	Satisfactory
Borrower Performance:	Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	Ratings	Borrower	Ratings
Quality at Entry:	Satisfactory	Government:	Satisfactory
Quality of Supervision:	Highly Satisfactory	Implementing Agency/Agencies:	Satisfactory
Overall Bank Performance:	Satisfactory	Overall Borrower Performance:	Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None

Problem Project at any time (Yes/No):	Yes	Quality of Supervision (QSA):	Highly Satisfactory
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes		
	Original	Actual
Sector Code (as % of total Bank financing)		
Agricultural extension and research	1	1
Irrigation and drainage	60	71
Other social services	4	1
Roads and highways	15	12
Sub-national government administration	20	15
Theme Code (Primary/Secondary)		
Land administration and management	Primary	Primary
Other rural development	Primary	Primary
Participation and civic engagement	Secondary	Secondary
Rural services and infrastructure	Primary	Primary
Technology diffusion	Primary	Primary

E. Bank Staff		
Positions	At ICR	At Approval
Vice President:	Praful C. Patel	Mieko Nishimizu
Country Director:	Isabel M. Guerrero	Edwin R. Lim
Sector Manager:	Adolfo Brizzi	Ridwan Ali
Project Team Leader:	Paul Singh Sidhu	Jeeva A. Perumalpillai-Essex
ICR Team Leader:	Paul Singh Sidhu	
ICR Primary Author:	Jim Hancock	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

Sustainable reclamation of sodic lands and prevention of further increases in sodicity in selected districts with the highest concentration of sodic areas in Uttar Pradesh state. This would contribute significantly to poverty alleviation in these areas.

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

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Incremental farm income for 0.4 ha farm size at 1998 real prices, excluding horticulture (Rs.)			
Value quantitative or Qualitative)	0	4,909	No revision	5,947
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	Incremental farm income is 21% more than the PAD estimate.			
Indicator 2 :	Income distribution in sodic land reclamation beneficiary households (%)			
Value quantitative or Qualitative)	Bottom three deciles: 06 Top three deciles : 69	Not given	No revision	Bottom three deciles: 14 Top three deciles : 57
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	The share of poorer households in the aggregate income has more than doubled.			
Indicator 3 :	Poverty incidence in the sodic land households (%)			
Value quantitative or Qualitative)	72	Not given	No revision	48
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	By end-project, 24% of the poor households crossed poverty line threshold income level. For without project (WOP) poverty level is 65% at project closure.			
Indicator 4 :	Crop yields in reclaimed sodic lands (t/ha)			
Value quantitative or Qualitative)	Paddy: 0.9 Wheat: 0.4	Paddy: 3.5 Wheat: 2.7	No revision	Paddy: 3.5 Wheat: 3.0
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	Weighted average crop yield at project completion is 11% more than the PAD target for wheat and same as the target for paddy. WOP weighted paddy yield is 0.7 t/ha. Class C lands accounted for 67% of the reclaimed lands as compared with 55% in the PAD.			
Indicator 5 :	Cropping intensity (%)			
Value quantitative or Qualitative)	63	190	No revision	198
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007

Comments (incl. % achievement)	Cropping intensity is 3.2% more than the PAD target. The actual value in baseline survey is 43%. Green manure crop (not included in determining cropping intensity) covered 30% of the reclaimed lands, which would raise cropping intensity to 227%.			
Indicator 6 :	Additional rural employment generated (million person days/year)			
Value quantitative or Qualitative)	0	23.8	No revision	28.1
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	Additional rural employment generated is 18% more than the targeted value. This will have poverty alleviation impact on about 10% of the landless labor households in the project area.			
Indicator 7 :	Out migration of labour (person days per migrating household per year)			
Value quantitative or Qualitative)	Men laborer : 98 Women laborer : 38	Not given	No revision	Men laborer : 45 Women laborer : 05
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	No value is reported in the PAD. The data are from baseline survey and socio-economic impact assessment. By end-project, out migration of labor has decreased by 63%.			
Indicator 8 :	Adequacy of funding for maintenance of sodic main drains (Rs. million/year)			
Value quantitative or Qualitative)	0	Not given	No revision	48.3
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	A Corpus Fund has been established from the levy on gypsum distributed to farmers for providing 10% counterpart funds to GOUP allocated budget (90% share) for drain maintenance. Discussed in the main text.			
Indicator 9 :	Reduction in area of sodic lands and lands with shallow water table (ha)			
Value quantitative or Qualitative)	0	Sodic lands: 150,000 Critical shallow water table: 244,800 No water logging problem: 27,200	Sodic lands: 180,000 Critical shallow water table: No revision No water logging problem: No revision	Sodic lands: 189,715 Critical shallow water table: 385,600 No water logging problem: 136,400
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	The sodic lands reclaimed exceeded the PAD target by 26% and the revised target by 5.4%. The reduction in land area with shallow water table has exceeded the PAD target by 57% due to increased coverage of main drain rehabilitation.			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Annual incremental foodgrain production from the reclaimed sodic lands (thousand metric t)			
Value (quantitative or Qualitative)	0	664	No revision	959
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	Annual incremental foodgrain production is 44% more than the PAD target.			
Indicator 2 :	Area of sodic lands reclaimed and brought under cultivation (ha)			
Value (quantitative or Qualitative)	0	150,000	180,000	189,715
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	Area of sodic lands reclaimed and brought under cultivation is 26% higher than the PAD target and 5.4% more than the revised target.			
Indicator 3 :	Increased market value of land (Rs. thousand/ha)			
Value (quantitative or Qualitative)	C class: 58 B class: 122 B+ class: 167	Not given	No revision	C class: 224 B class: 264 B+ class: 352
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	The increase in market value of land is 3.9 folds for C class land and 2.1 folds for B and B+ class land against the PAD target of 4 folds.			
Indicator 4 :	Amount of savings by SICs and SHGs (Rs. million)			
Value (quantitative or Qualitative)	0	Not given	No revision	126
Date achieved	12/31/1998	09/30/2005	09/30/2007	09/30/2007
Comments (incl. % achievement)	No target was fixed in the PAD.			

G. Ratings of Project Performance in ISRs

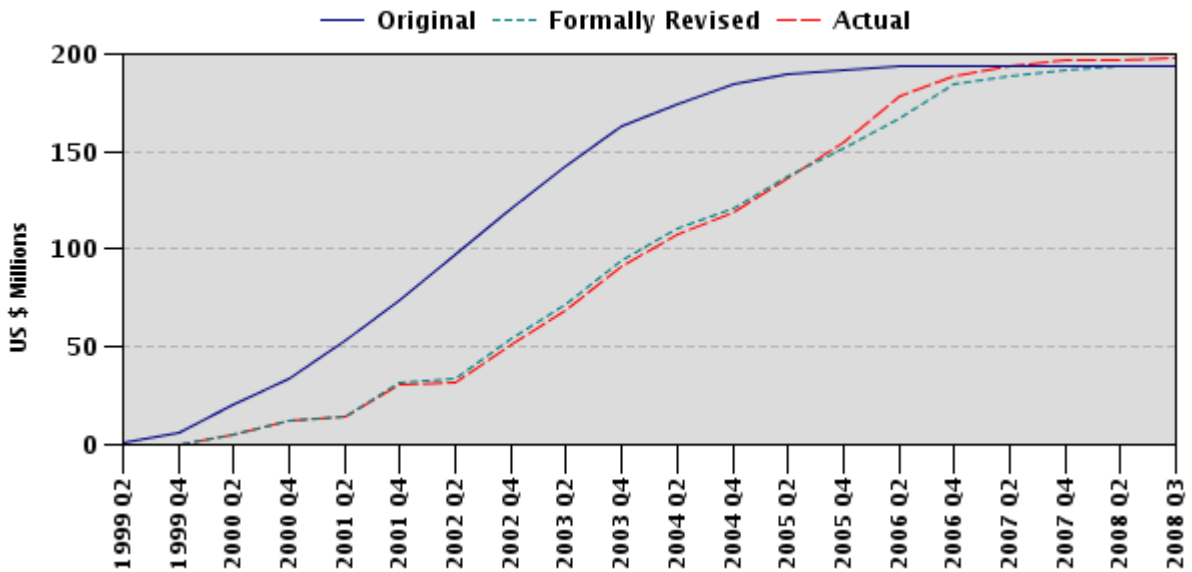
No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	05/21/1999	Satisfactory	Satisfactory	0.00
2	05/25/1999	Satisfactory	Satisfactory	0.00
3	11/29/1999	Satisfactory	Satisfactory	5.00

4	05/10/2000	Satisfactory	Satisfactory	7.55
5	06/23/2000	Satisfactory	Satisfactory	12.30
6	12/26/2000	Satisfactory	Satisfactory	13.84
7	06/19/2001	Satisfactory	Satisfactory	27.27
8	11/15/2001	Satisfactory	Satisfactory	30.62
9	04/17/2002	Satisfactory	Satisfactory	50.95
10	06/27/2002	Satisfactory	Unsatisfactory	50.95
11	12/03/2002	Satisfactory	Satisfactory	68.25
12	06/05/2003	Satisfactory	Satisfactory	83.71
13	12/24/2003	Satisfactory	Satisfactory	107.66
14	06/24/2004	Satisfactory	Satisfactory	119.12
15	10/07/2004	Satisfactory	Satisfactory	123.83
16	06/03/2005	Satisfactory	Satisfactory	151.50
17	08/28/2005	Satisfactory	Satisfactory	158.87
18	02/18/2006	Satisfactory	Satisfactory	180.55
19	08/26/2006	Satisfactory	Satisfactory	190.03
20	11/26/2006	Satisfactory	Satisfactory	193.48
21	05/30/2007	Satisfactory	Satisfactory	197.12
22	09/07/2007	Satisfactory	Satisfactory	197.12

H. Restructuring (if any)

Not Applicable

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

The project was designed in line with the World Bank's poverty reduction strategy for India at the time of appraisal, with priorities to work through state level interventions, focusing on institutional change and technical innovation, and aiming for sustainable natural resources management and enhancement of participation.

In Uttar Pradesh (UP) there is widespread poverty and a high dependency on agriculture for livelihoods. While the State has been relatively slow on reforms, it has made a good start in addressing its considerable land degradation problems. The project dealt with these core issues by contributing to strengthening agriculture related institutions at many levels: through participation of stakeholders, maintenance of key infrastructure, and engagement of local government and extension services. While not central to the project, it also had activities to examine and ensure project beneficiary services for marketing systems and credit, aspects of agricultural reform which were weak in the State.

1.2 Original Project Development Objectives (PDO) and Key Indicators

The PDO was sustainable reclamation of sodic lands¹ and prevention of further increases in sodicity in selected districts with the highest concentration of sodic areas in UP, which would contribute significantly to poverty alleviation in these areas.

The key performance indicators were:

- increased crop yields in reclaimed areas (paddy and wheat 3.5 and 2.7 tons (t)/ha respectively) and increased cropping intensity (up to 200%);
- four-fold increase in market value of land;
- increased household (hh) income (up to Rs. 12,000) of small and marginal farmers;
- improved drainage network in 10 districts;
- upgrading of 700 km of farm to market roads; and
- increased community participation.

The PAD logframe noted, in addition, the following indicators:

- beneficial changes in migration patterns;
- adequacy of local funding for main drain operation and maintenance channeled through Panchayats;
- execution of scheduled maintenance of main drains; and

¹ Sodic lands are characterized by accumulation of high concentrations of sodium salts (mainly sodium carbonate and bicarbonate). These lands have developed under impeded drainage and high fluctuating water table. Accumulation of sodium adversely affects soil fertility and is harmful for plant growth.

- reduction of waterlogged and sodic lands.

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

The PDO and key indicators were considered to be appropriate throughout project implementation and were not revised, aside from the targets (see section 1.7).

1.4 Main Beneficiaries

Some 375,000 farm families, 75% of whom were small and marginal farmers living below subsistence level in 10 districts of UP, were the primary beneficiaries of the project. PAD also recognized that families with land in the catchment areas of the main drainage network improved through the project would also benefit. Correcting for the average holding size, and accounting for the farmers with land in both the sodic reclaimed areas and in the surrounding main drain catchments, it was estimated that an additional 122,000 families will also benefit from the project, 77% of whom were marginal and small farmers. Secondary beneficiaries that can be identified from PAD are key local institutions: the key implementing agency Uttar Pradesh Bhumi Sudhar Nigam (UPBSN), the Remote Sensing and Application Center (RSAC) assisting identification and monitoring, the Departments of Irrigation (ID) and Public Works (PWD), local government and community based organizations.

1.5 Original Components

The project had the following seven components (based on PAD Section C, Table 1 and Annex 2) and several sub-components:

- (i) *Land Reclamation and On-farm Development:* On about 150,000 ha that would include: (a) detailed mapping of sodic lands; (b) forming water user groups (WUGs) and site implementation committees (SICs); (c) planning, design, construction and/or improving link and field drains; (d) providing shallow tubewells and pump sets to leach salts and support crop production; (e) on-farm development (OFD) through land leveling and bunding; (f) applying gypsum² /organic amendments to the soil; (g) providing crop production inputs support; and (h) developing a withdrawal strategy.
- (ii) *Main Drain Remodeling and Maintenance:* (a) Remodeling and rehabilitation 5,750 km of main drains, including pucca works; (b) technical assistance and equipment for monitoring and survey; and (c) maintenance of main drains and transferring maintenance from ID to communities through capacity building.

² Application of gypsum (calcium sulfate) supplies calcium which replaces harmful sodium from the soil. The replaced sodium is then removed from the root zone by drainage and leaching.

- (iii) *Technology Dissemination*: Establishing a demand-driven technology dissemination system for: (a) mobilizing the participation of farming communities, block level farmers advisory committees and block technology teams; with farmer self-help technology teams; (b) setting-up district implementation and technology teams; (c) establishing multi-disciplinary teams of research and extension specialists (link with component vi); (d) preparing strategic research and extension plans (SREPs); (e) strengthening communications capacity and use of mass media; (f) training of public extension workers, NGOs and farming communities; (g) disseminating information on effective land and water management practices; and (h) technical assistance for effective project implementation.
- (iv) *Upgrading Farm to Market Roads*: (a) Upgrading 700 km of roads connecting sodic villages to highways/district roads; and (b) maintenance of the upgraded roads.
- (v) *Human Resource Development and Institutional Capacity Building*: (a) Training of line department and local government bodies' staff, and capital investment to support project activities; (b) strengthening of Panchayats through training and construction of village Panchayat Bhawans (meeting halls); (c) strengthening of government agencies and NGOs at various levels; (d) pilot credit action research; and (e) marketing support through studies, upgrading of village market 'haats' (platforms), and training.
- (vi) *Adaptive Research*: Continuing and strengthening key research activities initiated under the pilot project to increase the efficiency and cost effectiveness of reclamation through: (a) adoption of competitive research system; (b) research advisory committee and linkages with national and international institutes; and (c) setting up a sub-station of the Central Soil Salinity Research Institute in UP.
- (vii) *Project Management*: (a) Strengthening of UPBSN, and implementation through district implementation units; (b) carrying out of Environmental Management Plan by monitoring of land improvement, ground water quality, biodiversity and diversification of cropping systems; and (c) overall monitoring and evaluation (M&E) of the project, with the support of independent monitoring agencies in project implementation progress, agricultural and socio-economic impact assessment, and participatory management.

1.6 Revised Components

The project components were not revised.

1.7 Other Significant Changes

The project increased its coverage from 10 to 18³ districts in May 2001. It was envisaged that works would be completed within the existing budget allocations and there was no need for any amendment to the Development Credit Agreement (DCA). Due to delays in starting the main project physical works, and lower than expected PAD unit costs, following the mid-term review (MTR) the project was extended in December 2004 by appropriate amendment to the DCA to: (i) increase the area of sodic land reclamation from 150,000 to 180,000 ha; (ii) increase the main drain remodeling and maintenance from 5,750 to 7,603 km; (iii) increase upgrading of farm to market roads from 700 to 1,330 km; and (iv) extend the project closing date by two years to September 30, 2007.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

Overall the project design was satisfactory, building on very specific needs and targeted areas, and the success of a previous pilot project (UP Sodic Lands Reclamation Project). The PDO, sustainable reclamation of sodic lands in selected districts with the highest concentration of sodic areas in UP, provided a core thrust to the project. The PDO was clear and realistic; outcome indicators were well-defined and measurable. The lessons learned from the pilot project, such as establishing logical sequence of reclamation activities, secure land titling, mobilization and involvement of communities in planning and implementation, were incorporated in the project design. Continued Bank involvement was important to take advantage of the success in implementing the pilot project to replicate and broaden the reclamation success. The Government was fully committed to the project. The project's dual objective of combining sodic land reclamation and poverty alleviation remained very focused and clear. The lessons learned in the pilot project on sodic land reclamation, the importance of M&E and the use of flexible project management and participatory approaches were strongly taken up and built upon. Main drain remodeling and maintenance rightly took a more prominent place in the project design. Also a new component, upgrading farm to market roads, was added for which UPBSN did not have any prior experience.

While innovative, the project design was complex, with too many (seven) components and implementing agencies. Furthermore, there were several coordinating/planning committees for extension and research at different levels. The horticultural sub-component could have been excluded as it was incidental to the project objectives.

2.2 Implementation

The chain of activities envisaged at appraisal for reclamation of sodic lands included: (i) identification and demarcation of sodic lands, (ii) mobilization of communities, (iii) installing shallow tube wells and pump sets, (iv) designing, constructing and

³ Two of the original project districts were bifurcated, and six districts that were previously financed by the European Union, were included.

rehabilitating the drainage network, (v) on-farm development, land leveling and bunding, (vi) applying gypsum followed by drainage of excess salts, (vii) cultivation of rice-wheat-Dhaincha in a sequence for two years, and (viii) developing an exit strategy. This sequence of activities proved very effective in the reclamation of sodic lands.

The project got off to a slow start due primarily to: (i) insufficient time allowed for the identification of sodic areas that met the project selection criteria; (ii) longer than anticipated time needed to mobilize communities for their participation in the project; and (iii) the inclusion of two new components (upgrading farm to market roads and main drain remodeling and maintenance) that were not in the pilot project and needed considerable development of implementation arrangements. This resulted in delayed disbursement in the initial years.

Project expansion to six additional districts and the two year extension of the closing date allowed savings, identified at MTR, to be used well to expand project scope and impact, and poverty alleviation outcomes. At MTR savings of approximately US\$12.4 million (m) were identified due to: (i) lower than expected unit costs, especially of gypsum; (ii) lower physical contingencies; (iii) GOUP ban on vehicle purchase; and (iv) under-utilization of training costs. Overall, the Government commitment was good and the stakeholder involvement and participatory processes were exceptional. There were no major risks to implementation.

The project design did not anticipate the extent of economic response by women self help groups (WSHGs), especially in dairy and small ruminant production. As a consequence, technical support was concentrated on crops, with relatively little attention given to animal husbandry. Opportunities for diversification after 2-3 cycles of paddy-wheat rotation, were not recognized at the outset, and the design did not emphasize green manure crops. However, the MTR proved useful in refining the project design, such as sharpening post-reclamation focus on crop diversification, curtailing the horticultural sub-component, and provided useful guidance on implementation issues. Implementation support missions (ISMs) also provided constructive guidance throughout, mostly followed by the implementing agencies. The incorporation of complimentary activities from the parallel Diversified Agriculture Support Project (DASP), such as crop diversification, popularization of organic manures, and farmer-to-farmer improved seed exchange, gave unplanned incremental benefits.

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

The M&E system of the project was well designed and was put to a very good use in implementation (see Box 1).

Box 1. High quality M&E (From Bank's Quality of Supervision Assessment in 2006) "Of particular note was the design of an M&E system that employed two independent monitoring agencies to collect baseline and implementation data. This provided a quantified record of implementation achievements, which enabled the project to demonstrate its worth to the state and national officials. The quantified

demonstration of the project impact has done much to reinforce the commitment of the Borrower and the Bank to this approach to sodic land reclamation.”

M&E Design. In addition to basic input monitoring to be supported by a Management Information System (MIS), a large portion of M&E was designed to be conducted by external independent agencies for the main field components. Special studies and evaluations were also planned for the end of project for all the main components.

M&E Implementation. Internal and external M&E was generally very well implemented. However, during the initial years one of the external agencies provided below standard reports, had substandard management, and a low presence at the field level. Supervision missions early in the project picked-up on this and it was satisfactorily addressed. Initially monitoring of environmental changes was under-resourced. This was also identified at MTR and suitable remedial actions were quickly taken.

Over 12 special studies and evaluations were undertaken, some of these reviewing the monitoring data. Nevertheless, given the complexity of the project interventions, there were some minor weaknesses in data collection. The M&E for agricultural and socio-economic impact assessment covered the pre-reclamation year and three cropping years following the reclamation. Given the poor resource base of the targeted beneficiaries, some of the reclamation impacts like crop diversification and shift to high value crops, will happen gradually beyond the first three years, which the M&E did not capture. Field observations and some rapid assessments done by UPBSN did indicate this trend. Also paddy and wheat yields, recorded initially through the M&E system, appeared to be conservative by about 10% as compared to the yields reported in special studies. ICRR mission field observations and interviews with project beneficiaries confirm this. The M&E implementation to some degree suffered from lack of a carefully planned control, which could have assisted in a more systematic comparison with non-project effects from the start of the project.

M&E Utilization. Use of the M&E information was excellent overall and implementation feedback mechanisms were responsive. For example, the two third-party M&E service providers reported directly to the managing director of UPBSN, and monitoring of physical quality of drain and road works was conveyed firmly to ID and PWD. Timely information on implementation progress of the project was reported quarterly and reports were sent to district project managers for compliance. Monitoring data formed the basis for a project MIS/Geographic Information System (GIS), proved particularly practical for tracking reclamation activities and indicators. Monitoring of community mobilization and organization processes, land reclamation and infrastructure works provided objective information on project progress, and was effectively used for making decisions to achieve project objectives. Findings of the MTR and socio-economic studies were used to improve targeting of the project towards more C class⁴ land, and

⁴ C class land: barren sodic land, soil pH > 8.5 which may go up to 11.0; B class land: single cropped sodic land with no irrigation facilities, low productivity, soil pH >8.5; B+ class land: double cropped sodic land with some irrigation facilities, productivity below normal, soil pH >8.5.

thus poorer beneficiary groups. The micro credit action research (MCAR) pilot results were used to spread micro-credit processes, particularly amongst women. Regular monitoring of the reclaimed lands and a ground-truthing exercise undertaken by RSAC, led to a revisit system for identifying the follow-up activities in each project village, which in 2005-06 directly addressed the sustainability issues.

2.4 Safeguard and Fiduciary Compliance

Environmental and Natural Habitats. The institutional responsibilities for compliance with environmental management plans were clearly defined and regularly monitored. Environmental specifications by contractors were satisfactorily implemented. The presence of Sarus cranes in project areas immediately triggered the Bank policy on natural habitats in 2001. Special studies undertaken by RSAC and the Wild Life Institute of India have shown that the project activities have not impacted on wetlands and Sarus crane populations, and any effects were caused in areas outside project control. Regular environmental monitoring has shown that land reclamation and rehabilitation of drains produced no harmful effect on quality of ground water and in the downstream areas. Reclamation improved soil quality with significant reduction in pH and electrical conductivity. Both floral and faunal diversity in sampled sodic areas increased over five-fold as a result of reclamation, as has microbial biomass. The project has promoted ecologically sustainable agriculture by popularizing the use of bio-fertilizers, green manures, compost, bio-pesticides and integrated pest management.

Social. Compliance with social safeguards has been satisfactory, ensuring that no roads and drains were considered for upgrading unless lands were voluntarily donated by the beneficiaries. Sample surveys and field visits were undertaken to directly consult with the affected populations. Objective, transparent and verifiable criteria were employed, including remote sensing data, to identify the sodic lands to be taken up for reclamation. Independent surveys and stakeholder consultations (including farmers and NGOs) assessed poverty and gender outcomes.

Procurement. Overall procurement performance has been satisfactory. The major items procured were gypsum, drainage civil works, rural roads, as well as inputs such as poly vinyl chloride pipes, seeds, fertilizer, etc. All items procured exceeded PAD targets, although early on there were some delays in procurement for the construction of rural roads and drains. Issues arose with regard to the procurement of gypsum. About 1.8 million t of gypsum was procured through international competitive bidding but no foreign suppliers participated in the bids. After trying different approaches to procure gypsum, bulk purchases were made from three Rajasthan suppliers transporting by rail. The landed cost of gypsum was about US\$ 45 million. However, there was limited competition from the three public corporation suppliers.

Financial Management. Overall financial management has been satisfactory. In view of large spread of the project, three specific legal covenants were included to ensure effective implementation of basic accounting, reporting and internal control systems. These covenants were regularly complied with. In earlier years, there were some delays

in submitting quarterly audits and compliance with audit observations. Consequently the financial management was rated as unsatisfactory in 2005. As a result of a special drive by the project, all the pending observations were resolved in FY 2005-06. Total audit disallowances were Rs. 2.8 million, constituting only 0.02% of total expenditures. The Annual Audit Report was always submitted on time. Flow of funds from GOUP to UPBSN, and then from UPBSN to the implementing units was remarkably smooth.

2.5 Post-completion Operation/Next Phase

The project put considerable emphasis, both in design and implementation, on the sustainability of reclamation and on-farm development activities. For three key areas of post-operation – maintenance of roads, link and main drains, and local institutional capacity, systems have been established and resources allocated (discussed in Section 4 Assessment of risk...), such as maintenance schedules and budgets. However, there is no system for continuing external monitoring that was being done during the project.

The Bank has received a request for a follow-on project to continue support to the reclaimed lands and the institutions set up under the project, and to expand to other similar areas in UP. In the meanwhile, under the Kisan Samridhi/Hitt Yojna of the GOUP, Rs. 340.3 million have been provided to UPBSN for reclamation of sodic, barren and ravine lands in the 18 project districts in FY 2007-08. Also under the Horticulture Mission funded by Government of India (GOI), Rs. 26.5 million has been provided to promote horticulture on the reclaimed lands in FY 2007-08. The competitive agricultural research funding approach has been expanded with the UP Council for Agricultural Research adopting the approach across its programs and the setting up of a Corpus Fund, now financing 9 new projects. Key activities initiated or consolidated through the project will be continued by GOUP for ensuring continued technical support to farmers through the Mitra Kisans (MKs)/Mahila Mitra Kisans (MMKs) and the farmer field schools (FFSs) and strengthening their linkages to State Agricultural Universities (SAUs), line departments, private sector and other relevant organizations. The Department of Agriculture (DOA) is also committed to continue to provide technical services to farmers through trainings, demonstrations, field days and farmer fairs.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

Relevance of objectives. The objectives were highly relevant at the start of the project and remain so at the time of ICRR: in terms of the Country Assistance Strategy (CAS) priorities of poverty alleviation, rural livelihoods development and agricultural growth focus; and building up of participatory agricultural support institutions and community driven approaches. The project also remains relevant to the focus on geographical areas of the poor and engaging the private sector. In addition, the project squarely addresses the rehabilitation of the environment. These are also high priority areas in the government strategy.

Relevance of design. The project design was underpinned by a coherent strategy for sodic land reclamation developed and owned by GOUP, and tested under the pilot project. The project incorporated design features which remain highly relevant to the present Bank strategies and project objectives: for precise targeting of critical geographical areas, targeting and working with the poor, widely using participatory processes, private sector development, provision of critical infrastructure and agricultural support services. The use of a relatively autonomous UPBSN, as the main implementing agency, was important for flexibility to address changing needs and to maintain poverty alleviation focus.

Relevance of implementation. In general, the implementation remained responsive to the project objectives and principles (see Sections 2.2 Implementation, and 2.3 M&E). The broader project management and the Borrower relationship with the Bank was highly responsive to the changing needs and issues arising, as reflected in the prominence given to the project in the State Portfolio Performance Reviews.

3.2 Achievement of Project Development Objectives

For its development objectives, the project has achieved and exceeded the main original targets, and also achieved or surpassed most of the revised targets. Baseline values, original and revised targets and actual values at completion of the project outcome indicators are shown in Data Sheet Section F(a) PDO Indicators. The project has substantially reduced sodicity and contributed significantly to poverty alleviation. This has been done by effectively completing all the main core activities, as well as through the additional benefits accruing from the project (see Annex 2 Outputs by component).

Reclamation of sodic lands. 189,715 ha of formerly sodic lands have been reclaimed and are being utilized, out of which around 126,990 ha were the most severely affected class C lands which were lying barren with no production - 54% more than targeted. The local farmer groups have successfully adopted the sodic land reclamation technology and the improved crop husbandry, soil fertility and water management practices. Durability studies using satellite imagery show that 93% of the reclaimed lands are under double cropping 3-5 years after reclamation. As a result of large scale adoption of the new practices by the farmers, the cropping intensity has increased from a baseline of 63% to 198%, on an average, across all classes of reclaimed lands, above the 190% originally targeted. The crop yields have increased across all classes of reclaimed sodic lands from a weighted average of 0.9 to 3.5 t/ha for paddy and 0.4 to 3.0 t/ha for wheat. For paddy this yield is the same, and for wheat this is 11% higher than the original target. As a result of improved cropping intensity and crop yields, the annual incremental production is 531,000 t for paddy (353,700 t original target) and 428,000 t for wheat (310,500 t target) giving a very large 44% overall higher production than expected. The market value of land has increased 3.9 folds for C class land and 2.1 folds for B and B+ class land. At the same time, the environmental impacts of reclamation have been positive for soil quality and biodiversity (see Section 2.4), and neutral for water quality and natural habitats.

Maintenance of main drains. Through improved main drains it is estimated that the extent of waterlogged areas has been reduced by 57% -- based on comparison of 1998

and 2007 satellite imageries -- though rainfall was relatively lower in 2006 which would affect the data. Impact assessment showed decreased number of days of water logging, though this happened in control areas too. Paddy and wheat yields have increased by 18% and 15%, respectively, in villages benefiting from project reclamation, 12% and 18% in neighboring villages benefiting from drainage only, but 6% and 11% in control villages.

Sustaining reclamation benefits through continued maintenance of drains is essential, as was shown in the pilot project. Project activities for drain maintenance were delayed by two years, but once implemented the maintenance activities covered 132% of the expected maintenance of pilot project drains, and 106% of the expected maintenance of the project drains. The sustainability aspects of drain maintenance were incorporated into project objectives (see Section 4 Assessment of risk...). They have been satisfactorily, but not fully, accomplished.

Improved access from farm to market roads. 1,112 km of rural roads have been upgraded against the PAD target of 700 km. Impact assessment has shown that they have significantly improved farm household income. Farmers report getting better prices for their produce (averaging 5%) and have incentives to produce more. The project has also significantly improved capacity of the PWD in planning, design, quality assurance, procurement, contract management, dispute resolution and maintenance of roads.

Poverty alleviation. The project has had a major impact on reducing poverty. The primary benefit of reclamation has been the increase in annual farm income by Rs. 5,947, 21% more than the PAD estimated increase in farm income for an average holding of 0.4 ha in 1998 real prices. Most important has been the number of expected direct beneficiary households. The project reached out to 367,621 households, though this is slightly lower than the revised target of 375,000. However, while the PAD estimated that 75% of these beneficiaries would be small or marginal farmers, the actual proportion of small and marginal farmers covered by the project is 93%. This was because the project not only achieved its expected poverty targeting, but considerably expanded on it with a greater emphasis after the MTR on sodic class C lands – generally with smaller pieces of land belonging to poorer households.

Distribution of benefits and quality of life improvements. The PAD logframe indicators at the CAS impact level specify expected changes in incomes and welfare/quality of life improvements, including their distribution in relation to poverty alleviation. No targets were set apart from increased income (see above). Nevertheless there has been important positive distributional effect by the project. With increased farm work on reclaimed lands, the project has contributed to the reduced annual out-migration for labor (typical of poor households) from 98 to 45 person days for men and from 38 to 5 for women, while staying more or less constant in the control villages. The project also assisted 126,542 villagers to be allotted and/or provided firm possession of 58,660 ha land. This provided much greater security of tenure to a large number of poor, scheduled and backward classes or landless. The share of aggregate income of the three poorest deciles has increased from 6% to 14%.

Community participation outcomes. There were key community groupings that were expected to be established and play a key role in implementation and sustainability. A total of 3,591 SICs were established, covering all reclamation villages with members from farmers and self-help groups (SHGs), and fully involved in implementation at the village level throughout the project cycle - from site planning, delivery of inputs to implementation review. SIC members themselves selected male and female progressive farmers to act as change agents. Together with the WUG leaders, they formed the SIC core team. 2,471 SICs are now formalized under the Gram Panchayat (GP) Water Management Committee (WMC). 48,167 WUGs covering nearly all beneficiary farm households are continuing to share water after project activities have been completed in their area.

The development of women's SHGs has gone beyond original expectations. A total of 7,193 groups (3,500 originally planned) have been set up covering 84,526 members, most of whom are from small or marginal farmer households. Many of the WSHGs have scaled up their economic activities and diversified into social programs demanded by their members such as population management, health care and education for girls. They have saved Rs. 85.77 million, and recycled this over 3 times. About 94% of the groups have linked with banks and accessed Rs. 177 million in bank loans. While many women bought cattle using credit, 6,675 were also linked to 125 commercial milk routes. A total of 1,716 WSHGs have joined into 165 cluster groups, some with informal contract linkages to traders. Some of the WSHG clusters have federated and become self-supporting (see Box 2). WSHGs have acted as focal points for implementing a 'convergence' of other government activities. While over 3,200 men's SHGs were also set up, these were not as active since they have alternative channels to access credit.

Box 2. Five "people managed federations" in Hathras district are paying the service charges to 7 NGO staff since August 2005, for the services provided by them after the withdrawal of project support.

Farmer field schools (FFSs), incorporating elements of originally envisaged block level farmer committees and technology teams, have been a major achievement. A total of 238 FFSs were formed covering 2,823 villages with 18,225 members. While coverage of project villages is 79%, all project blocks have an FFS, and 159 are registered societies. The FFSs have facilitated Kisan credit cards for accessing agricultural inputs for 13,686 mainly male farmers, and other services to members, and in many cases, master trainers have initiated some income generating activity for FFS members. In response to supervision mission concerns, steps have been taken to enhance inclusivity of women and poorer farmers in the FFS. While their links to government have been fairly weak, many (60%) but not all members felt that the FFS has a fair chance of sustaining after the project closure.

3.3 Efficiency

The PAD estimated economic rate of return (ERR) was 14.8% for the entire project. For individual activities the ICRR estimated rates of return are as follows: sodic land

reclamation and on-farm development by land class C: 21.6%, B: 14.3% and B+: 34%, horticulture: 14.6%, main drains: 14.3%, and rural roads: 14.1%. The ICRR estimated ERR for the project is 19.3%. The ERR is higher than the PAD estimate mainly due to the following reasons:

- achievements at the end of project implementation exceeded the PAD targets as follows: total reclaimed land area by 26%; reclaimed C class land area by 54%; rehabilitated main drains by 32%; farm to market link roads by 59%; and wheat productivity on reclaimed lands by 11%;
- crop diversification on 20% of the reclaimed areas against nil in the PAD;
- about 22% of the main drain catchment area with critical shallow water problems benefited from rehabilitation of main drains against the assumption of 15% in the PAD; and
- only the area under fruit crops is lower by 73%, as compared to the PAD estimate.

3.4 Justification of Overall Outcome Rating

Overall Rating: *Satisfactory*

The project was and remains highly relevant. Outcomes were achieved and exceeded on many important fronts and efficiency was greater than foreseen. There were minor shortcomings in some component outcomes, but overall the two main objectives were achieved.

3.5 Overarching Themes, Other Outcomes and Impacts

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

The project has had considerable poverty alleviation impacts. Several of the poverty impacts, gender and quality of life have been noted in the section on assessment of outcomes above (see Box 3). The project has had a considerable emphasis on gender issues: WSHGs have provided significant economic benefits; 6,731 ha were allotted in both spouses' names of 16,926 families; and there has been empowerment in terms of self confidence, greater prominence in the community with women farmer change agents and numerous non-economic activities. Interviews indicated that increased incomes have led to reduced female drudgery, improved housing, clothing and health, and improvement in education, especially of girls. However, while women spend considerable time working in the fields, often more than men, they are represented in relatively low numbers in FFSs and SICs. The possibility of elite capture was minimized, both for on-farm activities as well as other support, by the very rigorous use of selection criteria. This has resulted in high proportions of project resources going to support the poor. Beneficiaries from FFS activities have been largely (80%) marginal and small farmers, and scheduled and backward castes. However, some attention will need to be given for ensuring continued inclusivity of the poorer farmers and women for services from FFSs. FFS leadership has a greater proportion of larger farmers (28%), as compared to the beneficiary group as a whole.

Box.3. Poverty reduction rate doubled in the sodic land households

By end-project, the income distribution has become more equitable in the sodic beneficiary households. The share of poor households (bottom three income deciles) in the project area accounted for 6% of the aggregate income, which has more than doubled during the project period to reach 14% by project-end. The project has made significant impact on reducing poverty in the beneficiary households. In the project area, the poverty level has come down from 72% to 48%. After adjusting for the poverty reduction in the control villages (from 72% to 65%), net poverty reducing effect of the project is 17% during the project period, averaging about 2.1% per annum in the project benefited families. For the UP state as a whole, the annual decline in rural poverty is about 1.2% (1991-2005). Additional rural jobs for 86,710 persons per year are generated from the cultivated area expansion and intensification in the reclaimed sodic lands, which will increase the income of landless labor households accounting for 10% of the rural households in the project area.

(b) Institutional Change/Strengthening

Agricultural extension system. As discussed in Section 4.2, a major change has taken place at the village level, with the development of 238 FFSs covering 2,823 villages and servicing a farmer owned and managed village extension system through volunteer farmers linked to village level WUGs and SICs. The concept has successfully spread with a broader technical coverage and into economic activities. At very little cost to government, a significant institutional change is occurring in the adoption of the FFS approach at the state level, as a result of the project experience. At district level, the principles of Agricultural Technology Management Agency (ATMA) have been internalized and steps to introduce prioritized and fully integrated district planning are underway. However, it still has a long way to go to be fully accepted by the concerned line departments and become fully sustainable.

Engagement of Gram Panchayat and other administrative level agencies. Project coordination/planning committees were established at Nayyay Panchayat, block and district levels. These have played a key role in implementation. The project originally set out to strengthen the Panchayat Secretariat and District Panchayats to provide administrative support and greater financial responsibility over project activities, through trainings and exposure visits. Community meeting halls (Panchayat Bawans) were constructed to provide venues for training, meetings and other community activities. These facilities have been important, as they have often been the first neutral and sheltered spaces available in the community for such activities. Convergence plan 'matrices' were developed at various levels which often provided the Gram Panchayat opportunities to mobilize a wide range of government programs to project beneficiaries. It is less clear to what extent Panchayats have been systematically strengthened to sustain project activities and monitoring.

UPBSN and other implementing agencies. The project supported an extensive training program for UPBSN, NGOs, DOA, PWD, ID and other staff to ensure participatory implementation of the project activities with active involvement of all stakeholders. The key features of the participatory management are summarized in Box 4. The trainings on the whole seem to have been relevant and effective, with generally good levels of community satisfaction in the trainings. Trainings on participation and technical subjects directly contributed to the project outcomes. The NGO performance assessment system provided rigorous and objective mechanisms to ensure improvements in implementation of community development activities. On an individual level, the capacity built will remain in the region for future programs. The RSAC has strengthened its environmental monitoring capacity and services, which it is now providing state-wide, including the Bank funded UP Water Sector Restructuring Project. The PWD has developed special methodology for constructing roads in sodic areas which has led to significant cost savings for maintenance.

Box 4. Important features of the project participatory support included rigorous contracting and monitoring of NGO engagement in all key village level activities; community based technology dissemination at the village level; PRA based planning; women's participation through self-help groups; transparent delivery of inputs to farmers; cost sharing by farmers through labor; and working with various stakeholders at all levels to develop convergence and sustainability strategies.

The project experiences have defined a set of approaches and procedures for implementing land improvement and poverty alleviation programs for the poor, which have been recognized by GOUP as a model for application within its own programs. However, one of the results expected from project was the establishment of UPBSN as a 'center of excellence' with a solid base for sustaining and expanding the project efforts. This achievement has been limited. There was over 100 staff on deputation and as consultants, who have left on project closure, leaving 21 permanent technical staff with little capacity for sustaining the monitoring system and follow-up mechanisms. An Exit Policy was prepared for UPBSN, but the necessary resources to implement this are not fully in place. Short-term assured funding to sustain the model on large scale by UPBSN and partners, is only partial with the GOUP funding Kisan Samridhi for land reclamation costs in new areas only. A 'Corpus Fund' was envisaged in the PAD to make UPBSN more independent of the GOUP funds. However, this has not been done, except for establishing a corpus fund of Rs. 125.98 million (Anurakshan Nidhi) to meet 10% farmer contribution for the maintenance of drains.

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

As noted above, the project benefited more poor rural families than was anticipated at appraisal, both from on-farm reclamation and drain improvements. The families with land in the catchments of the main drains improved through the project increased from about 122,000 to 174,015 - where 77% are marginal and small farmers. The positive outcomes and impacts, not foreseen in the design, include: (i) a substantial number of WSHGs successfully generating additional income; (ii) considerable diversification from

paddy and wheat after initial sodic land treatment covering 20% of the reclaimed area; (iii) paddy and wheat seed exchange among farmers from the seed supplied for demonstration purposes; (iv) green manure crops covering about 30% of the reclaimed area during the zaid (summer) season; and (v) the technology for reducing the maintenance costs and extending the life of roads constructed in sodic lands. Potential negative effects, such as loss of grazing lands and increased fertilizer use, appear not to have been significant.

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

Not applicable.

4. Assessment of Risk to Development Outcome

Rating: *Moderate*

Outcome sustainability will depend upon avoiding reversion of the reclaimed lands to sodicity by continuing dynamic technological support and backstopping to the community based extension services and FFFs, and maintenance of the improved drainage system. As such the probability of reversion to sodicity has been minimized because the project did not undertake reclamation of sodic lands having water table within two meter of ground surface.

Sustainability of land reclamation and on-farm developments. As noted above, most farmers are sustaining rice-wheat cropping, and nearly all WUGs are actively sharing water after project withdrawal, assisted by the exit plans developed. In addition, there are positive environmental benefits which GOUP are well aware of and wish to maintain. Since DOA has adopted the FFS approach with village based MKs and MMKs state-wide, a major change has happened in the approach and ethos from the earlier top-down approach, facilitated by the rotation of project staff back to senior positions in DOA. Greater continuity is possible with secured adequate budgetary provisions for FFS and farmer extension development⁵. However, there is a risk that the DOA will offer the farmer extension workers a payment for services whereupon the concept would be compromised.

Sustainability of drain maintenance. Main drain maintenance is probably the main sustainability issue for the reclaimed lands. While M&E studies indicated some issues in field and link drain maintenance, these were relatively minor. SICs have been merged with Water Management Committees of the Gram Panchayat, whose responsibility covers maintenance of tubewells and link drains. Farmers are likely to maintain field and link drains as they can see benefits and have contributed to a maintenance fund, as seen also in the earlier reclaimed areas. In addition, National Rural Employment Guarantee

⁵ The DOA has provided funds for FFS development and support, Rs. 10 million in 2007 and Rs.700 million under the 11th Five Year Plan.

Scheme funds are being used in some villages for maintenance of these drains. A satisfactory funding mechanism has been operationalized for main drain maintenance, and adequate budgetary provisions made, albeit after considerable delays. This includes 90% budgetary contribution by GOUP and 10% by the farmers. The GOUP has been providing funds since 2005 as a separate line item in ID budget specifically for the maintenance of pilot project drains, raised to Rs. 48.3 million from FY 2007-08 to cover the drains rehabilitated under the project. A corpus fund (Anurakshan Nidhi) of Rs. 125.98 million (invested @ 10.5% annual interest) has been established from the small levies collected from the farmers on inputs provided by the project to meet the 10% farmer contribution. However, the timing of fund release and past performance give some causes for concern. Regular monitoring and corrective actions are required to ensure that farmers do not lose incentives to maintain the link and field drains.

Maintenance of rural roads and community meeting halls. The PWD has taken the responsibility of maintaining the roads upgraded under the project in the post-project period, using their regular budget as per government norms. This is backed up by a maintenance plan for these roads over the next seven years. GOUP has established a road fund for the maintenance of the entire road network in the state, including the roads upgraded under the project. The 1,271 Panchayat Bhawans, constructed under the project, have been transferred to the Gram Panchayats which have sufficient funds for their operation and maintenance.

Follow-up support to project areas. While UPBSN, NGOs, DOA, district and other agencies have been strengthened, in the short-term there are limited resources to provide continuing support to community institutions should they need follow-up assistance [Section 3.5 (b)].

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: *Satisfactory*

The Bank performance was satisfactory. The pilot project provided good data based on sodic lands reclamation experience and a tested working institutional framework. Consequently the project was overall well designed. However, the project was too complex with seven components and several implementing agencies which slowed implementation during the first three years and missed some opportunities to improve the level and sustainability of farmers' incomes.

(b) Quality of Supervision

Rating: *Highly satisfactory*

Overall supervision has been constructive and supportive throughout and this contributed significantly to the successful implementation of the project. Much of the success of supervision derives from the experience, expertise and local knowledge of the task team that has been continuously involved with the project. Some key risks were foreseen but when others arose, they were dealt with effectively. The team used Bank management judiciously to head off potentially serious problems. When it was necessary, supervision was bold enough to give unsatisfactory ratings with respect to progress of the main drains, farm to market roads and land reclamation components as well as procurement and financial management, to spur problem-solving by the implementing agencies and/or the Borrower. Supervision and the MTR missions were pro-active in incorporating useful lessons of other projects, particularly DASP, on strengthening farmer extension services and introducing crop diversification. Supervision acted swiftly on the lessons drawn from the Bank Project Performance Assessment Report of the pilot project, done in 2004, which noted that insufficient attention had been paid to green manuring and linking the village level SICs and WUGs to the Gram Panchayat. The Bank Quality of Supervision Assessment completed in September 2006 rated supervision for the period 2004-05 and 2005-06 as highly satisfactory overall and for focus on development effectiveness and adequacy of supervision inputs and processes. Supervision of fiduciary/safeguard aspects and candor of quality of Implementation Status Reports were rated satisfactory.

(c) Justification of Rating for Overall Bank Performance

Rating: *Satisfactory*

Taking into consideration performance during both project design and implementation, the overall Bank performance is rated satisfactory.

5.2 Borrower Performance

(a) Government Performance

Rating: *Satisfactory*

The Government was committed to the project throughout preparation and implementation. The release of counterpart funds was timely and overall support satisfactory. However, GOUP could not provide continuity of UPBSN managing directors, with a total of 11 incumbents over the project period. Also, there was inordinate delay in operationalizing the maintenance policy for the main drains. Continuity of technical staff in the implementing agencies considerably facilitated project implementation.

(b) Implementing Agency or Agencies Performance

Rating: *Satisfactory*

Despite frequent changes of managing director and early implementation delays, the

UPBSN and most of its staff did a very good job and delivered the project, especially considering the scale of implementation and coordination compared to the pilot project. The information and recommendations provided by the third party M&E service providers were followed up in a timely manner and immediate steps were taken to address the identified weaknesses. The NGOs responsible for group formation and beneficiary motivation performed satisfactorily, as did the ID and PWD in the implementation, respectively, of the main drains and farm to market roads components after a slow start. The RSAC provided a high quality objective service in site identification, village-level and environmental monitoring.

(c) Justification of Rating for Overall Borrower Performance

Rating: *Satisfactory*

6. Lessons Learned

Piloting can produce a pro-poor and sophisticated land development system. Building on a pilot project, which in itself was a lesson in scaling-up, has produced a set of robust and highly efficient systems for intervention suited to the particular needs of sodic land reclamation - while at the same time targeting the needs of the poor. These systems can provide for technically sound and transparent criteria for area and beneficiary selection, which target the poor, without excluding benefits to the wider community.

Scaling-up must take into account new conditions. While the project systems developed for area and beneficiary selection have worked extremely well, they may have done so partly because of the relative homogeneity of the targeted lands and groups, and the quick visible returns to sodic land reclamation. This bodes well for scaling-up on further larger areas of sodic lands, but considerable effort and resources may be needed to extend these approaches to more complex environments (such as ravine areas in the region).

Third-party independent and timely M&E improves implementation. Independent monitoring of implementation and using a variety of evaluations of outcome progress have been invaluable to quickly address issues arising, as well as identify and make adjustments to further expand the project impacts.

Communities must be supported by demand driven-services. With significant and rapid asset build-up through reclamation and production benefits, considerable household resources are released to further enhance livelihoods. To tap those resources communities must be supported by services which are household-focused, needs-based, responsive to markets, flexible and multi-sectoral.

Participatory processes and inclusive community institutions that are efficient and effective remain cornerstones for success. They are essential for site selection, planning of activities, implementation and sustaining benefits. The building of lasting social capital needs sustained support, which should start well before physical interventions with awareness raising and empowerment. For community institutions to grow, their

linkages with line departments, credit, marketing and other agribusiness services, need to be continually strengthened. Key to this is the government facilitation (but not control) and the help of NGOs to federate them into larger more vibrant and independent organizations.

Community mobilization and preparatory activities are essential for successful sodic land reclamation. These result in delayed disbursement in the initial years, followed by accelerated disbursement in the later years.

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

(a) Borrower/implementing agencies

No issues were raised by the Borrower/implementing agencies.

(b) Cofinanciers

Not applicable.

(c) Other partners and stakeholders

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

No issues were raised by other partners and stakeholders.

Annex 1. Project Costs and Financing

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

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
On-farm development and land reclamation	138.3	181.9	131.5
Rehabilitation and maintenance of main drains	32.7	40.3	123.2
Technology dissemination	7.7	3.5	45.0
Upgrading farm to market roads	33.0	37.8	114.6
HRD & institutional capacity building of support services	12.3	11.0	89.0
Adaptive research	1.4	0.6	46.2
Project management	28.4	36.5	128.7
Total Baseline Cost	253.8	311.6	122.8
Physical Contingencies	25.7		
Price Contingencies	7.1		
Total Project Costs	286.6	311.6	108.7
Project Preparation Facility (PPF)			
Front-end fee (IBRD only)			
Total Financing Required	286.6	311.6	108.7

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
GOUP		44.8	41.9	93.5
IDA		194.1	197.8	101.9
Beneficiaries		47.7	71.9	150.7
Total		286.6	311.6	108.7

Annex 2. Outputs by Component

Component 1: On-Farm Development and Land Reclamation

Performance of this component is *highly satisfactory*.

Detailed mapping of sodic lands: RSAC involvement in area identification, selection and mapping was very professional with a total 338,428 ha of potential areas mapped. Through annual mapping by RSAC and joint ground-truthing with UPBSN, annual reclamation area targets were set. Due to cost savings, a significant increase in actually reclaimed area could be achieved, 189,715 ha over PAD target of 150,000 ha. The mapping assisted in detailed identification and monitoring of specific classes of farm plots. Identifying and demarcating land ownership, allotting new community lands and providing secure title deeds is a very creditable performance. A total of 16,926 families have been allotted 6,731 ha GP land; and another 109,616 families have been given possession of 51,929 ha land, some of which was allotted in 1970s. These are all 'C' category lands and constitute 31% of the total lands reclaimed under the project. Coordination with the District Magistrates and Revenue Departments through the District Implementation and Coordination Committees (DICC)s to achieve this difficult task is notable.

Formation of water user groups and site implementation committees and planning: As the most basic community implementation groups, a total of 48,167 WUGs, based on tubewell command areas, have been formed with 97% of the WUGs continuing to share irrigation water. 3,591 SICs were established to manage the reclamation process, one for each project village, formed by a male and female representative from each beneficiary household, male and female Mitra Kisans as trainers, and village animators. The latter together with WUG leaders formed the 'core team' coordinating village activities, and ensuring inclusive planning and implementation. All villages, through an NGO/UPBSN facilitated PRA process developed site implementation plans, which defined the phasing of land development in the village, sequencing of activities, inputs supply and technical support.

Shallow tubewells and pump sets for leaching and crop production: Of these WUGs, 31,766 acquired new borings and pump sets while the remaining 16,401 had existing borings and pump sets. The project has created an additional assured irrigation potential of 127,064 ha at the command of the farmers which is playing a key role in the adoption of improved technology and crop cultivation practices.

Improvement of field and link drains, land leveling and bunding: Field and link drain development⁶ is a vital on-farm development activity with individual farmers and/or water user groups/management committees responsible for their maintenance. Drains seen by the ICRR mission were mostly in good shape but more thorough M&E surveys

⁶ About 5,860 km link drains have been constructed.

indicated some delays or shortcomings in maintenance (see Section 4 Assessment of risk...). As part of the reclamation activities, the planning, training and mobilization raised awareness and labor contribution by farmers, leading to successful reclamation and water control. This included land leveling and bunding. Only a few early project plots had weak crop patches, arising from poor leveling.

Applying chemical and organic amendments to soil: Bulk procurement of 1.8 m t gypsum was done from 3 state level public mining corporations in Rajasthan. Considering the logistical complexity, the gypsum was delivered from mines by rails to farms efficiently, effectively and transparently. To reduce the cost of reclamation, the project has successfully used pressmud (more below), organic wastes and scraping of surface salts, resulting in reclamation of 26% additional sodic lands as compared with the PAD target of 150,000 ha. The main alternative to gypsum, was use of “pressmud”, a sugar mill by-product, in reclamation of 8,640 ha. It is only economical within 10 km of a sugar mill where it has proved a good alternative to gypsum, provided the price is competitive. It has the additional benefit of adding organic matter to the soil.

The green manure program using Dhaincha during the first two years, as part of the reclamation process, has been very successful and covered 184,000 ha. Parallel extension of other organic manures, including ploughed in cereal straw stubbles, farm yard manure and compost are also encouraging. Given the past resistance to the adoption of green manuring in the state, its incorporation into regular farming systems under the project is an important additional benefit.

Crop production: With technical guidance from NGOs, UPBSN and DOA field staff, farmers have intensified their cropping patterns to assist the reclamation process, sustain it, and expand the benefits from it. In most cases, the paddy/wheat rotation is retained for the first three crop years, with some diversification thereafter. With promotion of green manuring, there was a consequent decrease in chemical fertilizer use due to green manure nutrient contributions.

Horticultural production: The project had an inter-cropped horticultural sub-component covering 8,000 ha, comprising of guava, *ber* or *aonla* intercropped with crops such as mustard and green gram in the first five years. Performance of this small sub-component was unsatisfactory as the tree survival rate was less than 50%.

Diversification: An unexpected positive result of the project, as a result of adoption of lessons from a parallel DASP, was the successful promotion of diversification. After 2-3 years of rice-wheat cycle, about 20% farmers have diversified to cultivation of sugarcane, maize, oilseeds, pulses and high value vegetable, spice and medicinal crops. Diversification was given greater emphasis after the MTR when the focus of demonstration programs was switched from paddy and wheat to diversification opportunities. Unfortunately, incremental production information on these crops was not captured in M&E surveys. A number of farmers did not diversify on their reclaimed land but did do so on the other land they had.

Withdrawal/exit strategy: As a part of the withdrawal strategy, UPBSN undertook a revisit and exit policy exercise in 2005-06. The sustainability index prepared from this revealed that out of a total of 3,263 villages, 2,601, 594 and 68 villages were under good, medium and poor sustainability categories, respectively. Surveys indicated that only about 2-3% of the reclaimed land is not being cropped in any one year, mainly for reasons of farmer absenteeism.

The post reclamation re-visit survey proved very useful in identifying problems to enable corrective follow up measures. These included sodic patches requiring additional treatment, maintenance of field drains, some boring failures, lack of pump sets, and inactivity of some Mitra Kisans and Mahila Mitra Kisans. A follow up program was initiated and the identified deficiencies were largely corrected. A training program to develop village based pump mechanics will also contribute to sustaining the irrigation assets.

The project has implemented a withdrawal strategy focusing on the sustainability of assets and institutions created under the project. Most of the SICs have been amalgamated into the WMCs of the GPs. This amalgamation required transfer of community assets and SIC funds to GPs and recognition of the Mitra Kisan and Mahila Mitra Kisan as co-opted members of the GP. The SICs have collected farmer contribution of Rs. 6.97 million, of which Rs. 4.79 million has been utilized for the maintenance of link drains.

Component 2: Rehabilitation and Maintenance of Main Drains

The performance of this component is *satisfactory*.

Rehabilitation and modeling of main drains: Under the project, rehabilitation and remodeling of 7,620 km of main drains and construction of 3,058 pucca structures have been completed. All project completion reports have been approved. The project has thus exceeded the PAD target of 5,750 km and MTR target of 7,000 km main drain rehabilitation at a cost of about Rs. 1,898.8 million as compared with PAD target of Rs. 1,970.9 million. In all, 10,608 km of main drains have been rehabilitated under the two projects, constituting about 50% of the drains in the project area, and 26% of the total drains in UP.

Technical assistance and equipment for monitoring and survey: Trainings/technical assistance was provided on planning, design, quality assurance and contract management for drainage civil works in 2002-03. The quality of works was assessed independently by Consulting Engineering Services. The entire drainage networks in the state was mapped on GIS and is now being used by many agencies.

Maintenance of drains and transfer to communities: Maintenance of 6,522 km of pilot project and 7,565 km of present project drains has been completed. After some delay, the drain maintenance policy has been developed and implemented since FY 2004-05 and adequate funds provided by GOUP and the communities (see Section 4). The timing of maintenance does remain a critical issue based on past ID performance. Major transfer of

responsibility (apart from the 10% contribution) to community, in terms of a more direct role in implementation, has not occurred.

Component 3: Technology Dissemination

The performance of this component is *satisfactory*.

District and block implementation and technology teams: An Inter-Departmental Working Group constituted under the Chairmanship of Agriculture Production Commissioner has been promoting inter-departmental coordination and policy harmonization at the state level in addition to reviewing implementation progress of technology dissemination programs. The group has met 7 times and been instrumental in dovetailing project and departmental activities. Broad-based DICC under the chairmanship of District Magistrate has provided good oversight in the implementation of land demarcation, allotment and land titling program; land reclamation and technology dissemination activities. The PAD also made provision to test the privatization of extension services through NGOs. This was attempted in Fatehpur, Hardoi and Pratapgarh districts; but was not sustainable after the withdrawal of project support. In the end, a similar system of farmer field schools was developed covering all the project blocks. As the overall component objective is to develop a de facto privatized farmer-owned service at the village level, this activity appears redundant (the same was the case for a similar activity under DASP).

Multi-disciplinary research and extension teams and strategic research and extension plans (SREPs): To promote decentralized, farmer-focused technology dissemination system, and strengthen research-extension linkages, Agricultural Technology Management Agencies (ATMAs) were set up in 8 project districts. In addition, 32 ATMAs were set up under DASP. ICRR mission interviews in Etawah district also indicated that principles envisaged for the ATMA have been internalized: SREPs are prepared and implemented with farmer, researcher, extensionist and other stakeholder participation. However, plan coverage is not necessarily complete, for example the district plan for Etawah did not have a specific program for the reclaimed sodic lands.

Strengthening communications capacity: The project identified communications to be a possible impediment to technology dissemination due to the geographic dispersion of the project and the weak communication system throughout the project area. A multi-faceted approach was used to reach out to project areas utilizing facilities that were available. It employed new technologies and revived a number of traditional technologies with great success. For example, 847 bi-weekly radio and 265 project specific TV broadcasts were transmitted; 805 libraries were established in Panchayat Bhawans; 115 hoardings were put up; pamphlets, posters, and traditional media, such as songs and puppet shows, were extensively used.

Early in the project the lack of rapid communication technology was overcome by systematic planning based on the experiences of the pilot project. Any gaps were filled as the project progressed by the expansion of the GSM telephone networks into the project areas. The project also tried two new systems: video conferencing and the creation of e-

chaupals (electronic community centers) but these did not become widely used and their potential was underutilized.

Dissemination of information on effective land and water management practices: The Indigenous Technical Knowledge (ITK) research verification sub-component was perhaps somewhat misplaced in the technology dissemination component rather than in the adaptive research component. However, from 60 ITKs recommended, 11 ITKs were selected for trial at DOA research stations. Five were validated and deemed suitable for dissemination through DOA extension. The main technology dissemination program was through a large demonstration program comprising a total 16,442 agricultural and 452 horticultural demonstrations (usually 0.4 ha). Some of these demonstrations were also used as seed exchange sites whereby the owner of the demonstration plot was contracted to pass on 50% of the harvest to other farmers on an exchange basis. This useful add-on activity resulted in 46 tons of improved crop seed exchange.

Human resource development and technical assistance for project implementation: A comprehensive training and exposure visit program was delivered in cascade form: district level training institutions/UPBSN/NGO staff training MKs, MMKs, group leaders and animators, who in turn disseminated the information to the village beneficiaries, mainly through SIC meetings. UPBSN has organized various types of training and field days: technical, business oriented and leadership development. Trainings of a technical nature, were both for the reclamation process and for food production, integrated pest and nutrient management, diversification and other cropping issues.

Mobilizing the participation of farmers in advisory committees and technology teams: The development of a community based extension system has evolved from the experiences of the pilot project and DASP. It is based on locally selected village volunteer extension agents Mitra Kisans (male) and Mahila Mitra Kisans (female). Groupings of about 10 villages form a farmer field school (FFS), essentially a farmer association which selected subject matter master trainers from amongst their members and who were especially trained to serve as resource persons to the Mitra Kisans, Mahila Mitra Kisans and the community at large. Links are established between FFS and external agencies for services such as banks, input supply agents and research scientists.

Some 238 FFS have been developed serving all project villages. 15 FFSs have been upgraded to e-choupals with computer facilities and improved information sourcing capacities. 2,429 master trainers have been identified and trained in a wide range of subjects appropriate to their locality⁷. 81% of members belong to the small and marginal farmer category. 99% of beneficiaries knew of FFS existence and 73% were aware of the trainings offered.

⁷ Agriculture, horticulture, animal husbandry, fisheries, credit, bee keeping, marketing, etc.

Component 4: Upgrading Farm-to-Market Roads

The performance of this component is *satisfactory*.

Upgrading of roads: Initially, this component included upgrading of 700 km of rural roads involving an expenditure of Rs. 1,880 million. 1,112 km of rural roads have been upgraded involving an expenditure of Rs. 1,715 million. This includes a maintenance pilot for 187 km roads. The roads were selected from a core network linking each village in the project area to nearby markets. The effective identification of roads and quality control has been the focus of attention under the project.

Maintenance of upgraded roads: The 187 km roads, taken up under the maintenance pilot, have the provision of 3 years subsequent maintenance after completion of the defect liability period. Except a few remaining roads which are still under the defect liability period, all roads have been transferred to the regular divisions of PWD for maintenance. The maintenance expenditure of these roads is to be borne by PWD and the contracts are to be supervised by the regular PWD divisions. The PWD has agreed to provide the necessary funds for maintenance of these roads for the next three years from the regular maintenance grants. A road fund has been established by introducing a levy on the sale of petrol and diesel to mobilize additional funds for maintenance of roads – significantly improving the maintenance of roads in the state, though these are not specifically targeted to the project improved roads.

Component 5: HRD and Institutional Capacity Building of Support Services

The performance of this component is *satisfactory*.

Strengthening of Government agencies and NGOs: A comprehensive training program, covering all the implementing stakeholders, was implemented by over 40 local, national and international agencies. The project faced considerable challenges in implementing such a large training program - participatory methodologies were new for many agencies, and UPBSN had to mobilize and tap many local agencies to assist in training. To ensure adequate support on capacity building training and communication, organizers had to be identified and recruited for each district. They were especially important for undertaking more detailed training needs assessments and adapting training program. The human resource development and institutional capacity building of support services covered village and district Panchayats, NGOs and other line agencies, as well as the key support agencies involved in project implementation. Large numbers of trainings were provided to UPBSN and implementing and support agencies (see Annex 7 Borrower's ICR). Although concerns were raised by supervision mission on the quality of the assessment of trainings, the report did indicate mostly satisfied responses from communities of the trainings they had received.

Training to communities: In addition to the training of farmers, WUGs and FFS master trainers, core team members and MKs/MMKs were trained to serve as extension agents (discussed in component 3). Furthermore, local level extensionists of the DOA were

trained for providing extension support and technical back-up to farmers. SHGs were also strengthened through various training programs, workshops and exposure visits, and members were provided specific enterprise trainings, though only to a small proportion of women. Through encouragement of convergence further training from a range of government and private agencies has also been provided.

Pilot Micro Credit Action Research (MCAR): For addressing concerns of sustainability of emerging microcredit activities under the pilot project, the MCAR was successfully implemented from 1999 to 2005 in Hathras and Raebareli districts with NGOs and local Banks. SHG numbers and membership have expanded, savings and loans have increased. The learning and success from the MCAR pilot was extended to the project through identification and revival of weak SHGs, and training of SHG leaders in group management. The project has supported the creation of 10,400 self-help groups to whom Rs. 255 m has been disbursed. Kisan credit cards have been accessed by 366,091 beneficiaries who have received loans of Rs. 1,505 m.

Strengthening of Panchayats: Of the 1,272 Panchayat Bhawans planned, 1,271 have been completed. Construction of one Bhawan had to be abandoned due to site dispute. All 810 additional modules have been constructed. These buildings are being used as Panchayat office; meeting place by GPs, SICs, FFSs and SHGs; information resource centers; and venues for social gatherings. 1,342 libraries have also been established. Government Orders have been issued for the proper use and maintenance of Panchayat Bhawans. A large number of GP officers were trained and attended study tours to strengthen their role and serve project communities. A study of the Panchayat planning and its outreach was conducted. As a result, village officials have been actively involved in project activities and identifying opportunities for non-project related government programs.

Marketing support: Steps taken for strengthening marketing of the increased agricultural production include setting up of 360 sodic haats and 23 covered shed haats, linking of 206 sodic villages with Mandi Samitis, allotment of 114 shops in the Mandis to project beneficiaries, buy-back arrangements with procurement agencies and contract farming. One progressive farmer in each FFS was trained as a marketing animator.

To cater to the needs of milk producers, the project has facilitated linking of 338 villages with 125 milk routes and tie-ups with the dairies. A total of 19 Primary Horticultural Cooperative Societies have been set up and several WSHGs have been supported in setting up agro-processing income generating activities. 63 income generation activities clusters have been promoted with assured backward and forward linkages.

Participatory management: Participatory management cut across several components of the project particularly, on-farm development, technology dissemination, institutional development and project management. It was coordinated, supported and monitored exceptionally well by the UPBSN participatory management cell, contributing considerably to project success.

Component 6: Adaptive Research

The performance of this component is *satisfactory*.

Adoption of competitive research system: To bring pluralism in the research system and support short term, problem solving research, the project has helped in developing and operationalizing a Competitive Agriculture Research Program (CARP). In all 335 proposals were received in response to advertisements for inviting research projects on the identified themes. NGOs participated but no interest was evoked from the private agri-business sector. All the 30 research projects undertaken by the SAUs, central institutes, general universities and NGOs have been successfully completed before project closure. Because the PAD gave sound thematic guidance on research priorities, the promising technologies identified through this research have been taken up for further testing and/or mainstreamed through the extension system of the State. Though not all the research projects were designed to develop specific technologies, 14 projects have produced recommendations considered fit for extension such as sodic tolerant crop genotypes, guidance on minimizing gypsum dressing and nutrient management, and standardization of specifications for pressmud. A corpus of Rs. 80 million has been created for the sustainability of CARP program after project closure.

Advisory committee and linkages with national and international institutes: The Research Advisory Committee has provided effective oversight to the research program under the project. However, not much progress has been made in developing international linkages.

Central Soil Salinity Research Institute, Karnal has established a sub-station at Shivri Farm for carrying out location-specific land reclamation research in UP, implemented relevant training programs and completed 9 of the 30 CARP projects.

Component 7: Project Management

The performance of this component is *satisfactory*.

Strengthening UPBSN and project implementation structure: The overall implementation of the project has been managed through an expanded UPBSN as planned, operating in all project districts. The state and district level project units managed all aspects of planning, coordination and implementation. Good technical and administrative staffing and capacity building of UPBSN for implementation of the project was set up, with generally good continuity of the core staff. High turn over of senior and middle management as well as some technical staff positions has been a major issue for the project.

Environmental Management: Overall, the project has been carrying out the environmental monitoring and management activities satisfactorily. Comprehensive environmental monitoring for surface and groundwater and soil quality was cost-effectively performed by RSAC, providing timely and useful information on project progress at farm level, and data for activity adjustments. RSAC established longer-term groundwater monitoring stations. The project has thus been able to ensure satisfactory environmental management and minimization of risk from the project. Special studies

were conducted to monitor changes in fauna and flora and address specific issues, such as perceived risks to Sarus crane population.

Monitoring and evaluation: Based on workshops, annual district planning meetings and feedback from monitoring reports, the project has been implemented through well crafted activity schedules. Annual action plans were prepared using a computerized project management system which defined each project activity and disseminated to all implementing staff in the field. A computerised network for sharing monitoring data was set up and linked to the UPBSN MIS and GIS mapping system, some of which was web accessible, and was regularly updated. Close monitoring of reclamation needs and activity schedules ensured timely supply of inputs at the project sites.

For assessing socio-economic and environmental impacts, and monitoring the implementation progress, third party independent external M&E agencies were hired. WAPCOS-TAHAL and Agricultural Finance Corporation conducted concurrent monitoring, and also assessed the project impacts. These independent progress monitoring activities and how they were used were critical for project success (see Section 2.3). Quality of road and drainage works was monitored by Consulting Engineering Services. Revisit was carried out in 2005-06 for the first six cohorts. Findings of M&E agencies were regularly discussed in monthly project management meetings and compliance with all issues ensured. The project has produced quality progress, completion, and synthesis reports, special studies and impact assessments. A list of key studies and reports is given in Annex 9.

Summary table of key outputs:

	<i>Baseline Value</i>	<i>Original Target Values (from approval documents)</i>	<i>Formally Revised Target Values</i>	<i>Actual Values Achieved at Completion or Target Years</i>
1	Sodic land area treated			
Total sodic land area treated		150,000	180,000	189,715
Class C land		82,500		126,990
Class B land		40,500		23,344
Class B+ land		27,000		39,381
Date achieved		2005	2007	2007
Comments (incl. % achievement)	Actual achievement is 26% higher than the original PAD target and 5.4 % more than the revised target values. More importantly, the reclaimed lands exceeded the target by 54% for class C lands, which are pro-poor since 50% of the land area with the marginal farmers is affected by sodicity.			
2	Farmer beneficiaries under sodic land reclamation and OFD improvement			
Total number of beneficiary farmers		375,000	No revision	367,621
Number of marginal and small farmers		281,250	No revision	341,888

	<i>Baseline Value</i>	<i>Original Target Values</i>	<i>Formally Revised Target Values</i>	<i>Actual Values Achieved</i>
		<i>(from approval documents)</i>		<i>at Completion or Target Years</i>
Proportion of marginal and small farms (%)		75%	No revision	93%
Date achieved		2005	2007	2007
Comments (incl. % achievement)	Marginal and small farm beneficiary farmers at project-end are 22% more than the PAD target; which is pro-poor since 73% of the marginal and small farmers live below the poverty line.			
3	Improved water managements practices implemented			
Additional irrigation potential area created (ha)		135,000	No revision	127,064
Area of improved irrigation and drainage network		150,000	180,000	171,700
Percent of rice and wheat area irrigated at critical stage	26%	Not given	No revision	71%
Date achieved	1999	2005	2007	2007
Comments (incl. % achievement)	Additional irrigation potential created is lower than the target because the existing boring was found to be 46% more than the PAD estimated value; hence, the number of new borings has come down.			
4	Number of SICs/WUGs/FFSs/WSHG formed			
Site Implementation Committees		3,500	No revision	3,591
Water User Groups		37,500	No revision	48,167
Farmer Field Schools		Not given	No revision	238
Men Self Help Groups		3,500	No revision	3,213
Women Self Help Groups		3,500	No revision	7,193
Date achieved		2005	2007	2007
Comments (incl. % achievement)	While slightly fewer than expected men's SHGs were formed, more than twice as many women's groups were formed. With more area reclaimed more WUGs were formed than originally planned.			
5	Remodeled/Rehabilitated main drains			
Length of main drain (km)		5,750	7,603	7,620
Date achieved		2005	2007	2007
Comments (incl. % achievement)	Improved drain length is 32% more than the PAD target and marginally higher than the revised target.			
6	Farm to market roads upgraded			
Road length (km)		700	1,330	1,112
Date achieved		2005	2007	2007
Comments (incl. % achievement)	Actual achievement is 59% more than the PAD target value, which includes the 187 km of roads from the maintenance pilot.			

Annex 3. Economic and Financial Analysis

(including assumptions in the analysis)

A. Project Benefits and Expected Returns in PAD

Project economic analysis in PAD focused on quantifying the incremental benefits from sodic land reclamation and on-farm development (OFD) related investments, following standard methodology. Three major sources of benefits namely, land reclamation (including OFD) benefits, main drain benefits and rural roads benefits are identified. *Land reclamation benefits* are derived from incremental crop production arising from crop area expansion, increased cropping intensity, enhanced crop productivity and crop diversification following improved agriculture management in the reclaimed class C, class B and class B+ sodic lands. *Main drain benefits* are estimated from incremental crop production due to reduced water logging and annual flooding duration in the catchment areas of the improved main drains falling outside the reclaimed sodic lands. Main drain benefits are estimated from wheat crop area expansion in the reduced water logged areas and enhanced wheat productivity due to early planting in the areas with reduced flooding duration. *Rural roads benefits* are assessed based on the savings in transport cost for agriculture commodities and increased economic development impacts due to rural roads investments.

The major gains in agriculture, driven by improvements in cropped area, crop productivity, cropping intensity and crop diversification, were captured by representative crop budgets for paddy, wheat and dhaincha (green manure crop) in class C, class B and class B+ sodic lands. Based on the observed choices made by farmers, *aonla* and *ber*, with mustard and aromatic plants as inter-crops, were considered as representative alternative crops in case of horticulture. The economic analysis was carried out separately for: (i) class C, class B and class B+ sodic reclaimed lands; (ii) horticulture; (iii) main drains rehabilitation; (iv) rural roads; and (v) overall project. Import/export parity prices are estimated for the internationally traded farm commodities and inputs. The project analysis was done for 25 year period at 1998 prices using a standard conversion factor (SCF) of 0.9 for farm inputs and commodities that are not traded internationally and 12% opportunity cost of capital.

In PAD, economic analysis of sodic lands reclamation and OFD related investments rested on following assumptions: 55% increase in net cropped area, 201% increase in weighted cropping intensity, 298% increase in weighted paddy yield, 575% increase in weighted wheat yield, 15% area (coming under class C lands) to go under horticulture with intercropping, 100% area under paddy to be preceded with a crop of dhaincha for green manuring, and continuous cropping with improved production technology in the reclaimed sodic lands, including the application of zinc sulphate as demonstrated during the project implementation. For the economic analysis of main drain investments, the assumptions were: 15% of the catchment area of the improved main drains would benefit by reduction in water logged areas and duration of annual flooding, 90% of such benefited area to come under early planting of wheat with 5% increase in wheat yield. The remaining 10% of the benefited area would be planted with wheat as a new crop in rabi which was not previously feasible due to prolonged water logging. The economic analysis of rural road investments was based on the following assumptions: average

savings in transport cost @ Rs. 16/t/km (1998 prices), average annual transport of 9.6 t of agriculture commodities per household, average annual household income of Rs 40,000 (1998 prices), and increase in average household income by 0.5% every year due to improved development activities following the rural road investments.

The Economic Rate of Return (ERR) for overall project was estimated at 14.8%. The project wide analysis considered 99% of the project costs, with the exclusion of adaptive research component only. Illustrative ERRs for selected project activities were as follows: (i) land reclamation: class C land 12.3%, class B land 19.6%, class B+ land 8.1%, horticulture 14.2%; (ii) main drain rehabilitation 29.1%; and (iii) rural roads 12%. As per PAD, implementation of sodic land reclamation project was expected to additionally produce 416,076 t of paddy, 389,148 t of wheat and 175,500 t of fruits per annum after full development, directly and indirectly benefiting 917,200 farm families, from the project area as a whole. At full development, the project was expected to create 79,350 additional jobs (300 working days per job) for the farm labor per annum.

B. ICRR Estimation Methodology

PAD methodology was applied to the extent feasible in order to update estimated project returns. The analysis was done at 2007 prices. A majority of the data used for ICRR estimation has been collected from M&E and impact assessment studies undertaken by the external independent agencies. There were some variations in the design and quality of implementation of these studies, including the use of “control villages” and “non-project villages” (non-project villages are also benefited by improved main drains and rural link roads). For instance, the M&E for agricultural and socio-economic impact assessment study has covered the pre-reclamation year and post-reclamation coverage was limited to only three cropping years following the reclamation. In re-estimating returns for the ICRR, attempts were made to overcome some of the limitations of M&E through use of information derived from other sources such as published statistics and triangulation from discussions and field visits during the ICRR mission. Parity prices for relevant tradable goods have been estimated using World Bank Commodity Price Projections. Financial prices of non-traded goods and services have been adjusted using SCF of 0.9. For comparability, cost and benefit flows have been calculated with 12% opportunity cost of capital over a period of 25 years in line with the PAD analysis.

Sodic Land Reclamation and OFD Benefits

The project targeted to reclaim 150,000 ha of sodic lands with OFD and irrigation development interventions, which consisted of class C lands (82,500 ha), class B lands (40,500 ha), and class B+ lands (27,000 ha). Incremental benefits arise from increase in crop area, cropping intensity, crop productivity and crop diversification. Table 1 summarizes ICRR estimations by the project-end. Increases in crop area and cropping intensity are high, since class C sodic lands, accounting for 55% of the without project (WOP) area, are not cultivated in the kharif and rabi seasons while class B sodic lands accounting for 27% of the WOP area are not cultivated in rabi season.

Returns to land reclamation and OFD investments were estimated using representative farm models for marginal (0.63 ha), small (1.42 ha) and large farms (3.51 ha) and aggregated for the reclaimed sodic land area as a whole using farm size distribution as weights. Overall, average farm holding size is about 1.1 ha, out of which 50% comes under sodic lands and the rest under normal land area. No impact on normal land area is assumed, which gets canceled out while estimating the incremental benefits due to the project. The proportion of sodic lands is highest in marginal farms (59%), followed by small farms (49%) and large farms (35%).

Table 1. Project impacts on crop area expansion, intensification and diversification

Sodic land/Crops	Crop area (ha)	
	WOP	WP
Crop		
Paddy, C class land		126990
Wheat, C class land		101046
Paddy, B class land	40500	19350
Wheat, B class land		15396
Fruits, B+ class land		3994
Paddy, B+ class land	27000	39381
Wheat, B+ class land	27000	31335
Diversification		
Mustard		15177
Pulses		15177
Potato		7589
Sodic land area	150000	189715
Gross cropped area	94500	375436
Cropping intensity	63%	198%

The ICRR analysis has been conducted with respect to major crops namely: paddy, wheat, mustard, pulses and potato - which together dominated the gross cropped area on the representative farms. Major crops like paddy and wheat, cultivated in the reclaimed sodic lands are differentiated by land class types, with appropriate crop budgets to represent different land classes. Major expansion in kharif and rabi cropped area has occurred in the reclaimed class C lands. Reclaimed class B lands are additionally cropped in rabi season. Crop diversification is limited to 20% of the crop area in rabi as per the impact assessment studies, and mustard, pulses and potato are the major diversified crops. For these crops, differences in yield, cropping intensity, crop mix and input costs (Tables 1 and 2) between with project (WP) and without project (WOP) situations were used to estimate the incremental benefit from the project. For horticulture, production models for guava and *aonla*, intercropped with mustard and pulses, have been used for assessing the benefits from horticulture development.

While horticulture crops were planted in 7,989 ha, only 50% survival, mostly occurring in class B lands is reported. Overall weighted cropping intensity has gone up to 198% in the reclaimed lands.

Enhanced crop productivity in wheat has ensured increase in returns for the project beneficiary farms (Table 2). All diversified crops gave higher

Table 2. Project impacts on crop productivity and returns

Sodic land/Crops	Yield (t/ha)		Returns (Rs./ha)	
	WOP	WP	WOP	WP
Cereals				
Paddy, C class land		3.50		9435
Wheat, C class land		3.00		14630
Paddy, B class land	1.4	3.50	1230	9435
Wheat, B class land		3.00		14630
Fruits, B class land				93779
Paddy, B+ class land	2.3	3.50	3690	9435
Wheat, B+ class land	2.0	3.00	8020	14630
Diversification				
Mustard		1.04		12742
Pulses		0.98		15823
Potato		25.0		22505

returns compared to the cereals. At full development, agriculture activities in reclaimed and OFD benefited project area would generate incremental economic benefits of Rs. 4,139 million every year.

Main Drain Benefits

The project targeted to improve 5,750 km of main drains. By the project end, 7,620 km main drains were remodeled/rehabilitated. Average catchment area is 230 ha/km of the main drain. Remote sensing studies estimated that 22% of the catchment area has benefited by reduction in water logged areas. Early planting of wheat is made possible in 385,600 ha of land area benefited by reduced water logging due to the improved main drains. By design, the sodic land area selected for reclamation treatment excluded the areas susceptible to water logging. Hence enhanced wheat productivity by 5% over the existing B class land wheat yield of 2 t/ha over area benefited by rehabilitated main drains is quantified and included as a project benefit. At full development, improved drains would generate annually, Rs. 325 million worth of economic benefits at 2007 prices.

Rural Link Road Benefits

The project upgraded 1,112 km of rural link roads in the sodic villages, which includes the maintenance pilot for 187 km as against the PAD target of 700 km. With regard to rural infrastructure, the benefit from upgrading rural link roads has been captured in the form of savings on vehicle operating costs (VOC), savings in time and increased price realization for the marketed agricultural commodities. Incremental benefits due to rural roads are quantified using the concept of consumer surplus. One of the quantifiable benefits following rural roads development is savings in vehicle operating costs, implying a downward shift in the cost curve and the resulting movement along the demand curve. This brings in VOC benefits from two sources, namely, incremental traffic volume and non-incremental traffic volume, which is estimated by assuming a linear demand segment. VOC savings are estimated for seven types of vehicles based on the roads impact assessment study and other standard procedures suggested in the Indian Roads Congress Manual (Table 3). Traffic volume is expected to increase during the 25 year period @ 5%/annum for the developed rural roads while it would increase @ 2%/annum without the project. The estimated economic benefits from VOC savings is Rs. 0.07 million/year/km for the developed roads at 2007 prices.

Another quantifiable benefit from improved road connectivity is value of time saved (VOT). Following similar procedure adopted for VOC, the consumer surplus arising from incremental traffic volume and non-incremental traffic volume are quantified and added to estimate the VOT with the project. The value of time is @

Table 3. VOC and passenger density

Vehicle type	Vehicle operating costs (Rs./km)			Passengers/vehicle	
	WOP	WP	VOC savings	WOP	WP
Carts	5.2	6.7	1.5	3	3
Cycle/Rickshaw	0.3	0.5	0.2	1.5	1.5
Bus	11.3	14.3	3.0	40	40
Truck	11.2	14.3	3.1	3	3
Agriculture- Tractor/Trailer	11.4	13.9	2.5	5	5
Car/Jeep	4.6	8.0	3.4	4	5
Two wheeler	1.4	2.6	1.2	2	2

Rs. 6.60/hour. VOT savings are estimated for seven types of vehicles using the data on traffic volume and travel time available for before and after project situation (Table 4). The estimated economic benefits from VOT savings is Rs. 0.05 million/year/km for improved roads at 2007 prices.

Table 4. Traffic density and travel time

Vehicle type	Traffic volume (vehicles/day)		Travel time (hour/10 km)	
	WOP	WP	WOP	WP
Carts	2.8	7.1	1.9	1.15
Cycle/Rickshaw	86.7	140.3	2.4	1.85
Bus	0.0	0.4	0.75	0.5
Truck	0.2	1.0	2.5	1.5
Agriculture- Tractor/Trailer	3.7	8.9	3.3	1.65
Car/Jeep	0.9	5.4	0.3	0.25
Two wheeler	5.4	48.3	0.8	0.6

Another quantifiable benefit from roads upgradation is the increased price realized for the agricultural commodities produced by the project participants. Major agricultural commodities to fetch higher prices include rice, wheat, mustard, oilseeds, fruits and vegetables. The marketed surplus, as estimated in the impact studies, varied from 40% for cereals to 85% for pulses and oilseeds and 100% for fruits and vegetables. Based on the roads impact assessment, a price increase of 3.7% for the marketed commodities is considered for economic analysis of roads investment. The estimated economic benefits from better producer price realization is Rs. 0.165 million/year/km for the sodic villages benefited by the improved roads connectivity.

C. Economic Rate of Return

The comparative picture of project benefits, costs and returns estimated for individual activities is given in Table 5. The ICRR estimated ERR⁸ for the overall project is 19.3%, as against 14.8% projected at the time of appraisal. In calculating the project ERR, all project costs were included, and set against the incremental benefits arising from reclaimed sodic lands, improved main drain catchments, and upgraded rural link roads. While the present value (PV) of actual project costs is marginally more than the PV of PAD estimated costs at constant 2007 prices, the PV of realized benefits is more by 90% as compared to the PV of PAD projected benefits. This is mainly driven by land reclamation and OFD benefits coming from the reclaimed sodic class C and class B+ lands.

Table 5. PAD and ICRR estimated returns at 2007 prices

	Unit	ERR	
		PAD	ICRR
Land Reclamation & OFD			
Class C Land	%	12.3	21.6
Class B Land	%	19.6	14.3
Class B+ Land	%	8.1	34.0
Horticulture	%	14.2	14.6
Main Drain Rehabilitation	%	29.1	14.3
Rural Roads	%	12.0	14.1
Overall Project	%	14.8	19.3
Present value of costs	Rs. m	10221	11085
Present value of benefits	Rs. m	8555	16222
NPV for the Project	Rs. m	1665	5137

⁸ The ICRR estimates did not consider some of the benefits like expanding crop productivity, diversification, income generating activities or impact of 46 tons of improved crop seeds exchanged.

Horticulture and rural roads recorded marginally higher rate of return, while class B lands registered lower rate of return as compared to the PAD projected ERR.

Reasons for divergence in ERR

As compared to the PAD estimate, the end-project achievements exceeded the physical targets in most of the performance indicators as follows: total reclaimed sodic land area by 26%; reclaimed C class sodic land area by 54%; rehabilitated main drain length by 32%; farm to market link roads by 59%; wheat crop yield in sodic reclaimed areas by 11%; weighted cropping intensity by 3.2%; and reduction in shallow water table affected lands by 92%. Also, crop diversification has taken place in 20% of the sodic reclaimed areas against nil in PAD. Under the improved drains, 22% of the main drain catchment area with critical shallow water problem benefited as against the assumption of 15% in PAD. Only the area under fruits by end-project is lower by 73% as compared to the PAD estimate.

Sustainability

Efficiency in the utilization of sodic lands is ensured through a sequence of farmer-led land reclamation processes to restore the productivity and additional assured ground water irrigation of the reclaimed lands, continuous cropping in both kharif and rabi seasons and about 30% of the reclaimed lands coming under green manure based farming. Rehabilitation of main drains helped to improve the area with critical shallow water problems, where wheat sowing in rabi could be advanced by a week to gain 5% increase in yield. Roads have improved market access by reducing the transportation cost and higher realization of farm commodity prices by about 3.7% for cereals, pulses and oilseeds.

Sustainability of the project benefits is considered likely through community level participatory institutions that maintain and use the project created rural infrastructure. However, the implementation monitoring and M&E study on post-project sustainability revealed some weaknesses: (i) continuous double cropping in about 93% of the reclaimed sodic lands, (ii) some of the main and link drains not maintained adequately, (iii) marginal deterioration in the maintenance of bunds and irrigation channels, (iv) failure of bore wells assessed at 1.1%, and (v) about 30% paddy area preceded by a green manure crop. While corrective actions were taken on most of these issues, in order to capture the impact of such sustainability issues on the project benefits, the incremental benefits are discounted by 20% while carrying out the overall project economic analysis.

Project Impacts

The incremental financial farm benefits due to the project are estimated at Rs. 20,755/ha/annum. Annual per hectare financial farm income for different sodic land class types are: class C land Rs. 23,220, class B land Rs. 19,710 and class B+ land Rs. 13,145. For the project beneficiary with an average holding size of 0.55 ha sodic lands, farm financial income would increase by Rs. 11,415/annum. For rural UP, poverty line income level is Rs. 4,800/annum. For average farm holdings, exclusively depending

on own farm income, the incremental farm income of Rs. 11,415 generated by the project would be sufficient to lift at least two members of the family above the poverty line.

The project has contributed strongly to local production of food crops. Incremental production due to project is: paddy 531,000 t, wheat 428,000 t, oilseeds 20,000 t, pulses 15,000 t and potato 190,000 t per annum. As compared to the PAD estimates, incremental production is higher in paddy and wheat by 28% and 10% respectively. However, production of fruits in the project area is only 27% of the projection due to limited expansion in the area under horticulture crops.

The PAD projected 375,000 farm families to be directly benefited by reclamation and OFD works, and another 542,200 families outside the project area to be benefited by reduction in the extent and intensity of annual flooding during the crop seasons due to improved main drains⁹. The reclamation and OFD interventions directly benefited 367,620 farm families, 23% more than the corrected PAD estimate. Improved main drains indirectly benefited 174,015 farm families, 44% more than the corrected PAD estimate. Overall, the total number of project beneficiaries by project end, exceeded the PAD target by 29% due to increased coverage under reclamation and main drain improvements. The baseline study estimated that 72% of the population is below poverty line, one-third belonging to scheduled caste; top 10% of the households sharing 43% of the aggregate income with the bottom 10% accounting for a meager 0.5%; about 50% of the average farm land comprise sodic soils and the proportion being the highest among the marginal farm holders. Improved farm income for the reclaimed lands had positive impact on reducing poverty in the resource poor sodic farm households. The project has generated 26 million man days of additional employment opportunities due to crop area expansion, intensification and diversification in the reclaimed sodic lands. At 300 days per year, this is equivalent to 86,710 additional jobs in the project area (see Section 3.2 Assessment of outcomes).

⁹ The PAD projected 375,000 farm families to be directly benefited by reclamation and OFD works based on the average farm holding size (FHS) of 0.4 ha sodic lands in the project area. But the actual FHS is about 0.5 ha of sodic lands and as per the social assessment survey, equal area for the farm lies outside the sodic patches. For the main drain beneficiaries, the PAD assumed an average FHS of 0.5 ha, benefiting 542,200 farm families. After netting out the 150,000 ha of normal lands lying outside the sodic patches for the direct beneficiaries and using the average FHS of 1 ha for normal farms, actual number of beneficiaries due to main drains improvement will come down to 121,200 farm families. Thus, the total number of farm families to be benefited, as per the PAD target, should be corrected to 300,000 for direct beneficiaries and 121,200 for indirect beneficiaries.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Jeeva A. Perumalpillai-Essex	Senior Economist	SASRD	Task Team Leader
Ashok K. Seth	Lead Agriculturist	SASRD	Research, Technology Dissemination
M. Balasubramanian	Senior Agriculturist	SASRD	Land Reclamation
T.K. Balakrishnan	Financial Analyst	SASRD	Financial Management
S. Satish	Social Development Officer	SASSD	Social Development
C.S. Nawathe	Senior Road Specialist	SASRD	Roads
S. Rajagopal	Senior Water Resources Engineer	SASRD	Drains
E.V. Jagannathan	Senior Water Resources Engineer	SASRD	Drains
S. Krishnan	Senior Procurement Engineer	SARPS	Procurement
H. Imamura	Lawyer	LEGSA	Legal
S. Salman	Lawyer	LEGSA	Legal
W. Marke	Disbursement Officer	SARFM	Disbursement
S. Vani	Disbursement Officer	SARFM	Disbursement
P. Jipp	Forester	SASRD	Natural Resource Management
R. Crooks	Environmental Specialist	SASEN	Environment
B. Scott	Team Assistant	SASRD	Administrative
T. Karmiris	Team Assistant	SASRD	Administrative
V. Peters	Team Assistant	SASRD	Administrative
Supervision/ICR			
Paul Singh Sidhu	Senior Agricultural Specialist	SASDA	Task Team Leader
Sakwa Bunyasi	Lead Operations Officer	SASRD	Task Team Leader (2003-05)
Jeeva A. Perumalpillai-Essex	Lead Operations Officer	SASAR	Task Team Leader (2000-03)
M. Balasubramanian	Senior Agriculturist	SASRD	Task Team Leader (1999-2000)
Ashok K. Seth	Lead Agriculturist	SASRD	Research, Extension
Deepak Ahluwalia	Senior Economist	SASDA	M&E

Names	Title	Unit	Responsibility/ Specialty
C. Bravi	Economist	FAOCP	Economic Analysis, M&E
Dhimant Jayendraray Baxi	Senior Procurement Specialist	SARPS	Procurement
Madhavan Balachandran	Financial Management Specialist	SARFM	Financial Management
Asha Bhagat	Consultant	SARFM	Financial Management
Papia Bhattacharya	Senior Financial Management Specialist	SARFM	Financial Management
Manvinder Mamak	Senior Financial Management Specialist	SARFM	Financial Management
S. Rastogi	Consultant	SARFM	Financial Management
Ashok Kumar	Senior Highway Engineer	SASDA	Roads
Shyam Sundar Ranjitkar	Senior Irrigation Engineer	SASDA	Drains
A. Azad	Drainage Engineer	FAOCP	Drains
C. Davey	Consultant	FAOCP	Drains
Ranjan Samantaray	E T Consultant	SASDN	Environment
N. Harshadeep	Environmental Specialist	SASEN	Environment
R. Kanwar	Consultant	FAOCP	Environment
Varalakshmi Vemuru	Senior Social Development Specialist	SASDS	Social Development
S. Satish	Senior Social Development Specialist	SASSD	Social Development
William Sorrenson	Chief Asia Pacific Service	FAOCP	ICRR
Jim Hancock	Livelihoods Specialist	FAOCP	ICRR
Michael Macklin	Agriculture Specialist, Consultant	FAOCP	ICRR
S. Selvarajan	Economist, Consultant	FAOCP	ICRR
Ben O' Brien	Agriculturist, Consultant	FAOCP	ICRR

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending¹⁰		
FY98		243.71
FY99		83.49
FY00		26.23
	Total:	353.43
Supervision¹¹/ICR		
FY98		0.32
FY99		51.39
FY00		62.76
FY01	26	54.82
FY02	30	162.50
FY03	26	87.92
FY04	29	115.59
FY05	31	91.29
FY06	28	76.40
FY07	24	55.12
FY08	12	33.64
	Total:	791.75

¹⁰ Staff Weeks are not available for FY 1998-00

¹¹ Staff Weeks are not available for FY 1998-00

Annex 5. Beneficiary Survey Results
(if any)

Not Applicable

Annex 6. Stakeholder Workshop Report and Results
(if any)

Not Applicable

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

Borrower's ICR

Introduction

At the time of nearing completion of the World Bank funded UP Sodic Lands Reclamation I Project and the European Commission (EC) aided Alkali Land Reclamation Project, UPBSN had reclaimed about 0.1 million (m) ha sodic lands. Based on the success of these projects, the UP Sodic Lands Reclamation II Project (UPSLRIIP) was launched in 1999 to reverse the process of sodification through sustainable reclamation of sodic lands and prevention of further increase in sodicity in the selected districts of the State. This project has contributed significantly to poverty alleviation in these areas. The project was initiated in 10 districts (now 12 due to bifurcation of two districts), and in 2001 six districts of EC aided project were also included. The districts covered are Aligarh, Hathras, Azamgarh, Allahabad, Bulandshahar, Etah, Etawah, Auraiya, Fatehpur, Hardoi, Jaunpur, Kanpur Nagar, Kanpur Dehat, Mainpuri, Pratapgarh, Raebareli, Sultanpur and Unnao.

Component-wise Achievements

1. On-farm development and land reclamation

On farm development work (land levelling, installing tube wells, developing irrigation and drainage network, etc.) was an essential prerequisite for sustainable reclamation of sodic lands. The

project facilitated the new allotment and possession of 6,731 ha of Gram Panchayat sodic lands to 16,926 landless, small and marginal farmers. It also demarcated and ensured possession of earlier allotted (some dating back to 1970s) 51,929 ha sodic lands to 109,616 farmers with the support of District Implementation

Achievements and impacts

- 3,38,428 ha mapped for selection of sodic lands
- 189,715 ha reclaimed in 3,591 villages against the PAD target of 1,50,000 ha
- 67% (PAD target 55%) of reclaimed land was C class which has been brought under cultivation for the first time
- 77% of about 0.367 million (m) beneficiaries belong to SC/ST and Backward Classes
- 93% beneficiaries are marginal and small farmers
- Focussed emphasis on small plots, levelling, scrapping and double flushing before leaching improved efficiency of reclamation
- 31,766 shallow tube wells developed creating an additional assured irrigation potential of 127,064 ha
- Cropping intensity increased from 63 to 198%
- Paddy productivity increased from 0.9 to 3.5 tons (t)/ha and wheat productivity from 0.4 to 3.0 t/ha
- Annual house hold (HH) income increased from Rs. 21,600 to Rs. 32,176
- Annual out migration decreased by 53 and 33 days for men women respectively
- Annual incremental foodgrain production on reclaimed lands is 1.06 mt
- 24% beneficiaries brought above the poverty line (at 1999-2000 constant prices)

Coordination Committee (DICC) and active participation of Site Implementation Committee (SIC) and Revenue Department.

The project was built on the experience of the pilot project. A water user group (WUG) was formed in about 4 ha contiguous area as basic reclamation unit. The project selected C and B class land and B+ category land was included only if it formed a part of the contiguous area.

The project was implemented in areas where ground water quality was good. Quantity of gypsum was determined separately for each field. Using this system, the project has been able to reclaim additional 40,000 ha of sodic lands against the PAD target of 150,000 ha. After 2 years of paddy and wheat, diversification was promoted as a result of which crops like pulses, oilseeds, spices, sugarcane, vegetables, etc. are being grown on 20% of the reclaimed area.

Participatory management: The project's success in effecting participation was based on five fundamental principles: transparency, equity, accountability, decentralized decision making, and human and institutional capacity building. Extensive efforts were made with the help of partner NGOs to create management structure among farmers, establish functional linkages, and promote participatory processes to ensure farmer participation. It enabled the project to share the implementation responsibilities with farmers and made them accountable for project performance. WUGs, SICs, women self help groups (WSHGs), Core Team, Farmer Field Schools (FFSs), Mitra Kisan (MKs) and Mahila Mitra Kisan (MMKs), with well-defined roles and responsibilities, and cross linkages, ensured participatory planning and management of the project activities at the village level. 48,167 WUGs were formed, with 97% of the WUGs continuing to share tube well irrigation water. The key contributing factors include water selling being an income source for the pumpset owners, group pressure for ensuring equity in water distribution and dependence of pumpset viability on larger command area.

For facilitating community led micro-planning, technology dissemination, monitoring and maintenance of community assets, 3,591 SICs were formed. The site implementation plan (SIP) prepared at SIC level reflected ground realities and farmer priorities, and also made them accountable for timely execution of the planned activities. The SICs collected farmers' contribution of Rs. 6.97 m out of which Rs. 4.79 m were utilized for maintenance of link drains. The SICs have been amalgamated with Water Management Committee (WMC) of Gram Panchayat (GP) for post project maintenance of community assets. In the process of amalgamation, SIC funds and community assets (link drains and tube well borings) have been handed over to WMC, and MK and MMK have been nominated as co-opted members in WMC for sensitizing GP for post project maintenance of link drains and borings.

Gender mainstreaming: For addressing women's needs and empowerment, the project ensured women as co-title holders of all the newly allotted lands and established inclusive institutions (SIC and WSHGs) to make explicit the role of women in reclamation activities. Mobilization of 7,193 WSHGs not only supported 84,526 farm

households with supplementary savings of Rs. 85.77 m but also empowered women by enhancing their role in decision making and provided them opportunities for income generation. 6,743 WSHGs were linked with banks for cash credit limit and loans of Rs. 17.7 m were disbursed. In addition, these groups inter-loaned Rs 263.7 m from their savings, 68% of which was used for financing agriculture and other economic activities. Promotion of MMKs facilitated technology interface between project and women farmers and enabled gender sensitive environment in the project villages.

2. Rehabilitation and maintenance of main drains

Proper drainage is essential for the sustainability of land reclamation. The rehabilitation and maintenance of drains was undertaken by UP Irrigation Department (UPID) using appropriate design parameters. 7,620 km main drains were rehabilitated, which constitute about 36.4% of the drain network in the project districts. 3,070 cross drainage pucca structures were also constructed on these drains as per site requirements. In addition, 6,522 km of UPSLRIP and 7,565 km of UPSLRIP drains have been maintained. These main drains were connected with the link and field drains to ensure smooth flow of drainage waters. This resulted in efficient removal saline effluents from the reclaimed areas and also drained excess rain water from the other cultivated areas in these districts. The quality of drainage works was independently monitored by Consulting Engineering Services.

For the maintenance of main drains a funding mechanism has been developed and operationalized which includes 90% budgetary support by GOUP through UPID, and 10% contribution by the farmers. For meeting the 90% budgetary support, a separate line item in UPID has been created since FY 2005-06 and an amount of Rs. 17.9 m per year has been provided specifically for the maintenance of sodic drains. This arrangement would continue in the post project period. For meeting the 10% farmers' contribution, UPBSN has established a corpus fund "UP Bhumi Sudhar Anurakshan Nidhi Niyamawali 2006" out of the small levies collected from farmers on inputs provided to them under the project. An amount of Rs. 125.98 m was deposited in this corpus @ 8.35% interest/annum (now raised to 10.5% per annum). UPID has prepared the maintenance plan for the UPSLRI and IIP drains for the next five years. With this provision, both the UPSLRI and IIP drains will be maintained.

3. Technology dissemination

State, district, block and village level institutions have been developed which promoted effective inter-departmental coordination for implementation and monitoring of the project activities and dissemination of appropriate technologies. An Inter-Departmental Working Group under the Chairmanship of Agriculture Production Commissioner has been promoting inter-departmental coordination and policy harmonization at the state level in addition to reviewing implementation progress of technology dissemination programs. Broad-based DICCC has been overseeing the implementation of land reclamation and technology dissemination activities in the project districts. To promote decentralized, farmer-focused technology dissemination system, Agricultural Technology

Management Agencies (ATMAs) were setup in 8 project districts. In addition, 32 ATMAs were set up under the Diversified Agriculture Support Project.

Farmer field schools: 238 Farmer Field Schools (FFSs) covering all the project blocks and 2823 villages were established as community-based, demand-driven institutes for promoting farmer-to-farmer technology dissemination. The FFSs comprised of progressive farmers of 8-10 sodic villages located in a radius of 5 km. A total of 2,533 master trainers on different subjects (agriculture, horticulture, animal husbandry, credit, organic farming, soil testing, boring and pumpset maintenance, marketing, health, etc) were developed to provide training/support to the member farmers. These FFSs were linked with different public and private institutions like State Agricultural Universities (SAUs), Krishi Vigyan Kendras, Departments of Agriculture and Animal Husbandry for technical backstopping. Some members of FFSs were nominated in block level Farmer Advisory Committees of ATMAs for raising farmer's voices in the district agriculture plans. Libraries were established in all FFSs and computers were provided to establish e-chaupals in 15 FFSs. The FFSs also helped in addressing issues critical to project sustainability like timely availability of agricultural inputs, credit, technical know-how and community awareness on drainage maintenance. 205 agriculture service centres managed by FFSs, facilitated timely availability of quality agriculture inputs. To sustain these FFS, business plans were prepared and implemented to ensure regular source of income. The FFSs enhanced the participation of farming communities in agriculture development, appropriate land use and knowledge exchange. 159 FFSs were registered as societies to implement rural development programs.

Farmer training programs, crop demonstrations, adaptive trials, wall writings, print and electronic media were successfully used for dissemination of appropriate technologies to the farmers. This helped in promoting use of certified seed, timely planting of crops, integrated pest management, balanced fertilizer use and irrigation of crops at critical stages. The recommendations emanating from the adaptive research component on various topics like suitable medicinal crops, spice crops, sesbania and use of pressmud were disseminated to the farmers through the extension units like ATMAs/DICCs/FFSs and the state extension system. The extension efforts promoted crop diversification after 2-3 cycles of rice-wheat rotation following land reclamation.

Use of bio-fertilizers

- Green manure and farm yard manure on 48,915 and 41,048 ha respectively
- NADEP compost on 1,350 ha by 1900 farmers
- Vermicompost on 950 ha by 2,225 farmers
- Azotobactor on 2,136 ha by 6186 farmers
- Rhizobium on 1,670 ha by 3394 farmers
- Phosphatica on 2,264 ha by 4086 farmers

4. Upgrading farm to market roads

Upgrading of farm-to-market roads was included in the project to connect the isolated sodic villages with the main road network to enable the farmers to take their agricultural produce to the nearby markets. Selection of these roads was done as per the ranking formula agreed with the World Bank. U.P. Public Works Department (PWD) and U.P.

Rajkiya Nirman Nigam were the implementing agencies. The roads were constructed as per GOI Ministry of Surface Transport specifications. The quality of road works was independently monitored by Consulting Engineering Services. A total of 1,112 km roads, including 187 km under maintenance pilot project, were upgraded against the PAD target of 700 km. The PWD has taken the responsibility of maintaining these roads in post project period from their regular budget as per state government norms. The PWD has prepared a maintenance plan for these roads for the next seven years.

5. Human resource development and institutional capacity building of support services

Training programs: The human resource development and institutional capacity building of support services emphasised on staff training and institutional strengthening of panchayats, NGOs and other line agencies, viz. Departments of Agriculture (DOA), Public Works, Irrigation, Panchayati Raj, Remote Sensing Application Center (RSAC) and UP Council of Agricultural Research involved in project implementation. A total of 690 trainings for 11,630 UPBSN staff, 1,066 trainings for 13,220 line department staff and 447 trainings for 6,461 NGO workers were organized. Additionally 12,647 multi-purpose workers of the GP and 104 Kisan Sahayaks of DOA were trained for providing extension support and technical back-up to farming community and FFS. A total of 106,345 core team members and MKs/MMKs were trained to serve as extension agents. Self help groups (SHGs) promoted in the project were also strengthened through various training programs, workshops and exposure visits. Need based Micro Enterprise Development (MED) trainings were provided to 1,675 members of the SHGs. These capacity building initiatives resulted in initiation of micro enterprises and other economic activities.

Strengthening of Panchayats: 1,271 Panchayat Bhawans (PBs) were constructed to provide village communities, farmer groups, SICs and FFSs a platform for organizing trainings, setting up libraries, IT kiosks, holding meetings, and for other social activities. 1,342 libraries were established and 810 additional modules were constructed in the already existing PBs. These PBs are serving as a secretariat for village level local institutions and have also become a platform/hub for carrying out various developmental activities in the villages by the community-based organizations. The Government of UP has issued guidelines for strengthening and maintenance of PBs and library-cum-information centers.

Marketing: Initiatives for strengthening marketing of agricultural produce include setting up of 360 Sodic Haats (rural market hubs), out of which 46 were equipped with infrastructural facilities. 206 project villages were linked with Mandi Samitis. Construction of 1,197 zero energy cool chambers enhanced shelf life of perishable produce. Opportunities for marketing of horticultural produces were tapped through development of 19 Primary Horticultural Cooperative Societies. 338 project villages were linked with 125 milk routes with daily turnover of 31,754 litres. One progressive farmer in each FFS was trained as Marketing Animator to promote backward and forward market linkages. WSHGs were trained in various income-generating activities, resulting in setting up of 51,572 micro enterprises. 262 SHG members were promoted as Shakti

Dealers under Hindustan Lever Ltd. rural development initiatives. Under contract farming, Chikori was produced on 135 ha through Nutricia; Cargill purchased 342 t wheat; and 5,892 farmers produced spinach seed on 819 ha land and gained better returns. Some FFSs played a key role in collective bargaining on behalf of farmers.

Micro-Credit Action Research (MCAR): MCAR was launched as a pilot in two districts, and the NGO and the bank worked together for promotion and strengthening of SHGs, aiming people's empowerment and rural livelihood generation, sustainable outreach and access to micro credit for consumption, production and investment purposes. The credit coverage reached 91% and sustainable linkages of SHGs with banks helped rural poor in accessing institutional credit. Application of learnings of MCAR helped in strengthening of SHGs and promotion of clusters. A total of 165 clusters, networking 1,716 SHGs were developed to support groups in auditing, record-keeping, conflict resolution and initiation of marketable MEDs. To sustain the SHGs, endeavours were made to link them with various mainstream central and state sponsored programs related to literacy, health care, sanitation, etc. As such, 162 WSHGs started implementing mid-day meal scheme of Government of India. Other key achievements include the initiative taken up by 5 "people managed federations" in Hathras to pay the service charges to 7 NGO staff since August 2005 for the services provided by them after the withdrawal of project support.

6. Adaptive Research

The project helped in developing and operationlizing a competitive agricultural research program (CARP) to bring in pluralism in the research system. 30 CARP projects were successfully completed by SAUs (10), Indian Council of Agriculture Research (13), NGOs (2), RSAC (1) and general universities (4). To sustain the CARP model, a corpus of Rs. 80 m has been created by UPCAR as Shodh Nidhi (Research Fund). The promising technologies identified through 30 research projects have been taken up for further testing and/or mainstreamed through the extension system of the state. Standardization of specifications for pressmud played a key role in promoting the use of this cheap by-product of sugar mills in the reclamation of 8,619 ha sodic lands against the target of 2,500 ha. The research advisory committee provided effective oversight to the CARP. For carrying out location-specific land reclamation research in UP, Central Soil Salinity Research Institute Shivri was established and implemented relevant training programmes. An international conference on "Sustainable Management of Sodic Lands" was organized in 2005 which provided an opportunity to develop international linkages and showcase the project accomplishments.

7. Project management

The project has been implemented through a well crafted Activity Schedules on the basis of which Annual Action Plans were prepared using a Computerized Project Management system which defined each project activity, the required critical path for completion, and displayed the proposed physical and expenditure targets. All the 23 Project Management Units were linked to the UPBSN headquarters (HQ). All the units at HQ were connected through LAN. This ensured a smooth flow of information and helped in effective internal

monitoring. The website www.upbsn.org with MIS and GIS mapping was developed and regularly updated.

Procurement schedules for inputs were strictly adhered, and in the later years rake-wise, village-wise schedules for gypsum were developed resulting in significant savings, and ensuring timely supply of inputs at the project sites.

For assessing socio-economic and environmental impacts, and monitoring the project progress, third party independent external M&E agencies were hired.

Monitoring and evaluation

- WAPCOS-TAHL and Agricultural Finance Corporation conducted concurrent monitoring, and also assessed the project impacts
- Every project village was monitored at least once
- Revisit was carried out in the 6th year for the first six cohorts
- Development indicators and physical performance indicators were developed and regularly monitored
- Impact assessment was carried out after every crop season
- Findings of M&E consultants were regularly discussed in monthly project management meetings and compliance with all issues ensured
- Environmental monitoring was done by Remote Sensing Application Centre
- Impact of reclamation on bio-diversity was assessed by National Botanical Research Institute
- Quality of road and drainage works was monitored by Consulting Engineering Services

Environmental management: The quality of ground water in the reclaimed areas was similar to the unreclaimed areas indicating that the leaching of salts has not produced any adverse effect on the quality of ground water. Similarly the quality of surface waters in the link drains, and at the outfall points where these drains join the main drains was within the permissible limits for irrigation quality standards. Reclamation improved soil quality in the surface (0-15 cm) soils with significant reduction in pH and electrical conductivity. The floral diversity increased from 12 to 81 species, and the faunal diversity from 52 to 250 species as a result of reclamation. Microbial biomass increased from 52 to 418 milligram/gram soil after 10 years of reclamation.

Arrangements for Future Operation of the Project

Sustainability strategy: A well crafted sustainability strategy was adopted. In the four years process of reclamation, exit policy exercises were conducted by the farmers themselves with the help of PRA techniques and developing issues matrix and sustainability index for each village. The critical issues identified during exit policy exercises were addressed through follow-up exercises. A “Convergence Matrix” was developed to sustain project impacts and maintain continuity of activities through convergence with various line departments and private sector. This matrix helped in identifying the weak areas and fostering linkages with public and private sector agencies. The critical risks identified in the PAD like “timely rehabilitation of main drains, maintenance of drains and roads” and other issues identified during exit policy exercises have been addressed and all efforts have been made to ensure the continuity of activities

during the post project period and for sustaining the project impacts. GOUP has prepared a proposal for the follow on project which is being processed by GOI.

Borrower's Performance

UPBSN's performance is rated as Highly Satisfactory, although frequent change of project management was an issue. The

<i>Steps for sustainability</i>
<ul style="list-style-type: none"> • Only those sodic lands were selected for reclamation where ground water was 2 meter below ground surface to avoid reversion of sodicity • DOA has taken over the responsibility of ensuring continuous cropping and conducting crop demonstrations for dissemination of latest practices and technologies on the reclaimed areas. • Budgetary provision made for maintenance of sodic drains and a corpus fund "Anurakshan Nidhi" established for meeting 10% farmer contribution • FFS set up at the block level to ensure institutional arrangements for farmer-to-farmer technology dissemination • SIC merged into Water Management Committee of Gram Panchayat providing it a constitutional status and ensuring link drain maintenance • PWD will maintain the upgraded roads from their regular maintenance budget and maintenance plan is in place • Panchayat Bhawans and Sodic Haats will be maintained by Panchayati Raj Department • SHGs linked with banks for institutional credit

Government of UP (GOUP) allowed UPBSN substantial flexibility and authority for implementing project activities. It took steps to adapt the project design to emerging challenges. For example, when the original funding mechanism for main drain maintenance did not work well and the issue of sustainability of institutions set up under the project came up in the OED review of the pilot project, UPBSN and GOUP were quick to develop and operationalize sustainable institutional arrangements for addressing these weaknesses. The implementing agencies also showed enormous commitment in achieving project outputs and goals. UPBSN staff played a critical role in the reclamation of sodic lands belonging to thousands of poor farmers by working with them and successfully negotiating the complex process of ensuring clear land titles. NGOs were effectively used to motivate beneficiaries to participate in the design, implementation and monitoring of the program. UPBSN designed innovative tools like "Convergence Matrix", "Exit policy" and "FFS Calendar" which proved beneficial in achieving the larger objective of sustainability. With the effective management and judicious uses of inputs, UPBSN was able to reclaim additional about 40,000 ha sodic lands.

Bank's Performance

The Bank performance is rated as Highly Satisfactory. There was continuity of the Task Team, although the Task Leadership changed three times. Issues critical for improving implementation, technology transfer and sustainability were regularly raised; and workable solutions were provided to address the identified weaknesses. Despite the technical nature of the project, social, participatory, environmental and poverty issues were emphasised by the Bank team. Mission field visits and Aide Memoires greatly helped in providing guidance and directions to the implementing agencies for achieving project objectives and outputs. The Bank also highlighted the critical issues in meetings with the Chief Secretary, Agriculture Production Commissioner and Principal Secretary Agriculture, GOUP; as well as in the Annual Portfolio Reviews with Department of Economic Affairs, GOI, and GOUP.

Project Constraints and Areas of Concern

Although the project achieved or exceeded the original targets, there were a few constraints. The major area of concern for the Bank missions was the frequent change of Project Manager. Another constraint was lack of continuity of middle level and technical staff during the later years of the project since as per GOUP rules staff from the line departments had to be repatriated back after completing five year deputation term. There was no concrete plan to address the gaps identified during the Exit Policy exercises in the project design, although during the later stages these were addressed, and convergence strategy was formulated to hand over the ongoing activities to the relevant departments. Although formation of ATMAs was planned for technology dissemination, these could not take off during the earlier years and became functional in the later years. The extension system at Block level was strengthened through Farmer Field Schools. Another concern since the beginning of the project was the main drain maintenance after the project closure since effective drainage system is very critical for sustainable reclamation. Till 5th year of the project there were constraints in operationalizing the budgetary mechanism as proposed in the PAD, whereby Irrigation Department was to provide 25%, Rural Development Department 65% and 10% was the beneficiary share. Persistent efforts by the Bank and rigorous follow-up by the UPBSN resulted in insitutionalizing an alternative arrangement described under the Drains Component.

Lessons Learnt

- Sodic areas with ground water within 2 meter from the surface or within 500 meter on the sides of canals should not be taken up for reclamation as the chances of reversion of sodicity are high.
- Selection of area should be done jointly by the technical staff and farmer teams. Ground truthing by involving farmers facilitates right selection of sodic lands.
- Awareness creation and social capital building are essential pre-requisites for effective land reclamation.
- “Convergence Action Plan Matrix” should be made an integral part of training modules from the beginning of the reclamation process.
- Horticulture should be promoted only in B+ category land and that, too, on the fields of “Willing farmer” only.
- Focussed attention should be given to marketing of agricultural produce.

Borrower’s Comments on Draft ICRR

We have gone through the entire report and found that it has captured all the aspects of the project in a very precise manner and the report makes mention of the contents, implementation and outcomes very concisely and yet thoroughly.

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

NGO Comments on Draft ICRR

1. Sarvodaya Ashram, Hardoi

Our association with the Uttar Pradesh Sodic Lands Reclamation II Project is more than a decade old and we worked in nine districts. The project was highly successful and helped in providing livelihood and food security to the poor communities. The infrastructure built under the project will continue to be used by the communities in future. The project was also a good model of government and NGO partnership. The project design provided ample scope for innovation and learning by doing. The key success of the project was its emphasis on participatory approaches. During the project period various types of human resources like Mitra Kisan, Mahila Mitra Kisan, self help group leaders, pump-set and boring mechanics, and farmer leaders were developed which will remain as an asset to the sodic villages. The women self help groups were not only linked with alternative sources of credit but also played an important role in the reclamation process. Through the project a cadre of qualified and skilled staff was developed, and gained valuable implementation experience in building social capital and technical aspects which will be very useful to our organization in future projects. The lessons learnt from the project are:

- Attention should be given to the marketing activities from the beginning of the project
- Selection of the reclamation area should be done in consultation with the community
- Convergence with different organizations should be promoted
- Successful MCAR model should be replicated in other districts

2. Krishi Evam Shaikshik Prabandha Santhan, Partapgarh

We thoroughly studied the above report and found it excellent.

Annex 9. List of Supporting Documents

1. Implementation Completion and Results Report and Final Implementation Support Mission Aide Memoire, November 13, 2007
2. Project Appraisal Document, India: Uttar Pradesh Sodic Lands Reclamation II Project, World Bank Report No. 18506-IN, November 3, 1998
3. Development Credit Agreement, Project Agreement and Loan Agreement, World Bank
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6. Mid-Term Review Report (2002)
7. Project Completion Reports Volume I – XI covering overview, seven project components, participatory management and compliances with agreed actions and covenants. UPBSN, Lucknow, September 2007
8. Project Completion Presentations Volume I – X covering overview, components I to VI, environmental monitoring, biodiversity, participatory management, M&E and impact assessment. UPBSN, Lucknow, September 2007
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12. Study on Assessment of Social and Economic Impact of Farm-to-Market-Roads under UPSLRP-II, Final Report, Indian Institute of Management, Lucknow, October 2007
13. Impact and Effectiveness of Training and Capacity Building Undertaken Under the Project, Giri Institute of Development Studies, July 2007
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15. Micro Credit Action Research Project – Final Report. Bankers Institute of Rural Development (BIRD), Lucknow, August 2005
16. Assessment of Output, Outcome and Economic Impact of Marketing Support Provided Under the Project. UP Industrial Consultants Ltd. Kanpur, September 2007
17. Market Study on Aonla, WIZMIN Consultants, Kanpur, March, 2001
18. Evaluation of Participatory Management Processes. STEM (Centre for Symbiosis of Technology, Environment and Management), Bangalore, 2001
19. Assessing the Impact of the Sodic Lands Reclamation Project over the Years through Sustainability-Index in Villages under Sodic -I & Ist year of Sodic-II. WIZMIN Management Consultants, Kanpur
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22. Monitoring & Evaluation Project End Report, WAPCOS Limited, India in Association with TAHAL Consulting Engineers, Israel, June 2007
23. Monitoring and Evaluation of World Bank Funded U.P. Sodic Land Reclamation-II Project in Extended Districts of Uttar Pradesh, Agriculture & Socio-Economic Impact Assessment, Agricultural Finance Corporation Ltd., Lucknow, 2007
24. Economic and Financial Analysis Note on Farm Income Analysis.
25. UP Sodic Lands Reclamation Project II ICR Mapping and Environmental Monitoring Component, RSAC, Lucknow
26. A Cumulative Report on Project Durability Study – Monitoring of Sodic Land Reclamation at Plot Level in Selected Villages in Project Areas Using Satellite Data, RSAC, Lucknow, 2007
27. Evaluation of Floral and Faunal Diversity and Soil Microbial Biomass in Reclaimed Sodic Land After 10 Years of Reclamation, National Botanical Research Institute, Lucknow, 2007
28. Report on Selected Wetlands in Etawah and Mainpuri Districts of Uttar Pradesh, RSAC, Lucknow
29. Evaluation of Biodiversity in Mainpuri and Etawah Wetlands of UP, National Botanical Research Institute, Lucknow, 2003
30. Corporate Plan for Uttar Pradesh Bhumi Sudha Nigam (UPBSN, Lucknow. Indian Institute of Management. Revised final report
31. Uttar Pradesh Land Reclamation Project [III] – Concept Paper. UPBSN, November 2006
32. Economic Survey of India, Government of India, 1998-99
33. Economic Survey of India, Government of India, 2006-07
34. Uttar Pradesh: Annual Production 1999/00 to 2004/05 for Kharif and Rabi. Agricultural Statistics Division, GOUP, September 2006

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UTTAR PRADESH SODIC LANDS RECLAMATION II PROJECT

- PROJECT DISTRICTS
- EXECUTING AGENCY HEADQUARTERS
- SODIC LANDS
- STATE CAPITAL
- DISTRICT BOUNDARIES
- STATE BOUNDARIES
- INTERNATIONAL BOUNDARIES

