JOINT MANAGEMENT AND TURNOVER PROGRAMS:

A CASE STUDY OF THE AGENCY MANAGED IRRIGATION SYSTEMS IN NEPAL

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Background

The agency managed irrigation systems (AMIS) in Nepal are not utilized to their full potential Available information reveal that the AMIS irrigate on average 64% of the service area in the monsoon season and only 21% in the winter Water use efficiency of surface irrigation schemes is very low, the values ranging from 20% to 47% Lack of farmer participation, low collection of irrigation fees and inadequate resource allocation for operation and maintenance (O&M), emphasis on construction rather than on management and shortage of trained and motivated Department of Irrigation (DOI) personnel to operate schemes efficiently are the prominent factors In order to improve this dismal situation, farmers'participation in all stages of irrigation development and management is considered as an absolute requirement Beginning Seventh Five Year Plan (1986 - 90) there has been growing realization of users'participation in the implementation, operation and management of irrigation programs A number of policy reforms have been made since then including Basic Needs Program (1988), Water Resoruces Act (1992) and Irrigation Policy (1992) The Irrigation Policy is instrumental in supporting users' participation in O&M of irrigation systems Two action plans steming from the policy are turnover(TO) of medium and small-scale AMIS to Water Users'Association (WUA) and joint management (JM) of large irrigation schemes by increasing farmers' participation JM is where farmers and agency make joint decisions concerning irrigation system improvement and O&M and farmers and agency agree on delineation of responsibilities in order to get increased and sustained agricultural production through the improvement of system performance

Sirsia Dudhaura (2,050 ha) and Handetar (270ha) were the first AMIS pilot sites where JM program was introduced in 1986.

Since late 1992, JMP is under implementation in five river diversion irrigation systems. Kankai (8,000 ha), Manusmara (5,200 ha), Khageri (4,000 ha), West Gandak (10,300 ha) and Banganga (6,200 ha) Preliminary works have recently been initiated in Panchakanya (600 ha), Chaurjhari (600 ha), Pathraiya (1800 ha), Kamala (25,000 ha), Mohana (3,500 ha), Hardinath (2,000 ha) and Chandra canal (8,700ha) and plans are underway to start the programs in other AMIS as well

Under the action plan attempts are made to legitimize and strengthen the WUAs and improve the physical infrastructures so that farmers can assume greater O&M responsibilities by generating and mobilizing more resources locally

During the implementation of the plan of action the system physical facilities are imporved and extensive trainings are organized for the farmers in order to enhance their capabilities The processes developed, actions taken and the status of the program implementation along with the lessons learned and the outstanding issues are highlighted in this paper The works referred hereto are carried out under the joint assistance of the AsDB and USAID

Objectives and Methodology

This case study has the following specific objectives

1 To understand the processes adopted and document the achievements of the joint management and turnover programs of irrigation systems

2 To make field investigation to document the status of the JM&TO programs

3 To derive the lessons learned from the programs, highlight possible policy implications and identify outstanding technical issues

Open ended discussions with the agency personnels and farmers, review of the pertinent reports and publications as well as the observations made during the field visit of some of the irrigation systems formed the basis of conducting this case study

Process of Joint Management

The framework for the management transfer process is shown in Figure 1 The process has three phases described below

Phase I. Initial Organization

The initial organization phase establishes an initial WUA with farmer leaders and representatives with whom the agency can communicate and pursue further activities The duration is initially expected to last from 3 to 6 months depending on the size and complexity of the irrigation system

Baseline Assessment

Initial baseline characteristics of the system are studied before turnover or joint management intervention The baseline study will point out characteristics of the farming community and the irrigation system and the status that will be important in organizing farmers and making comparisons in future.

Formation of Water Users Association

Water users are organized into multi-level organizations following democratic norms, bylaws are drafted, elections are held, and the assoication is registered This phase is started with an introductory workshop where discussions are held with farmers to explain the joint management

and turnover concept Sociologists or other professional organizers work side-by-side with system management engineering staff during this process Professional from the agency train local farmers to become farmer organizers (FOs) Farmer organizers communicate with farmers and acquire relevant data and information

Phase II. Joint Agreement

Development of a Plan of Action

During this phase agreements btween the WUA and the agency are formulated stating roles and responsibilities of each party The inventory included in the baseline survey form the basis for a joint inventory study in which WUA and DOI walk through the system They prepare and prioritize list of improvement needs which are used in the preparation of the Plan of Action The plan describes trainings to be provided to WUA members, improvement works to be undertaken including indicative cost estimates, responsibilities of both DOI and WUA with cost sharing arrangement, and WUA plan for raising its cost share from members All of these items are discussed in a meeting of the WUA general assembly The POA is also used by DOI in preparing detailed designs, cost estimates and work programs for approval at the central level

Action trainings on maintenance, operation, and share system take place at the irrigation system with participants drawn from farmer leaders and agency staff Maintenance and operation options are identified, and the costs of system improvement and operation and maintenance estimated Operation plans are developed taking into consideration the share system, water supply, and water control structures The share system establishes a basis for water allocation and resource mobilization to cover costs of operation and maintenance

Memorandum of Agreement

The POA forms the basis for signing the MOA between DOI and WUA It includes among other details the benchmark indicators that must be satisfied before rehabilitation and improvement works can be undertaken, procurement, disbursement and quality control procedures report keeping and resource mobilization responsibilities of the DOI and WUA and the conditions for O&M transfer

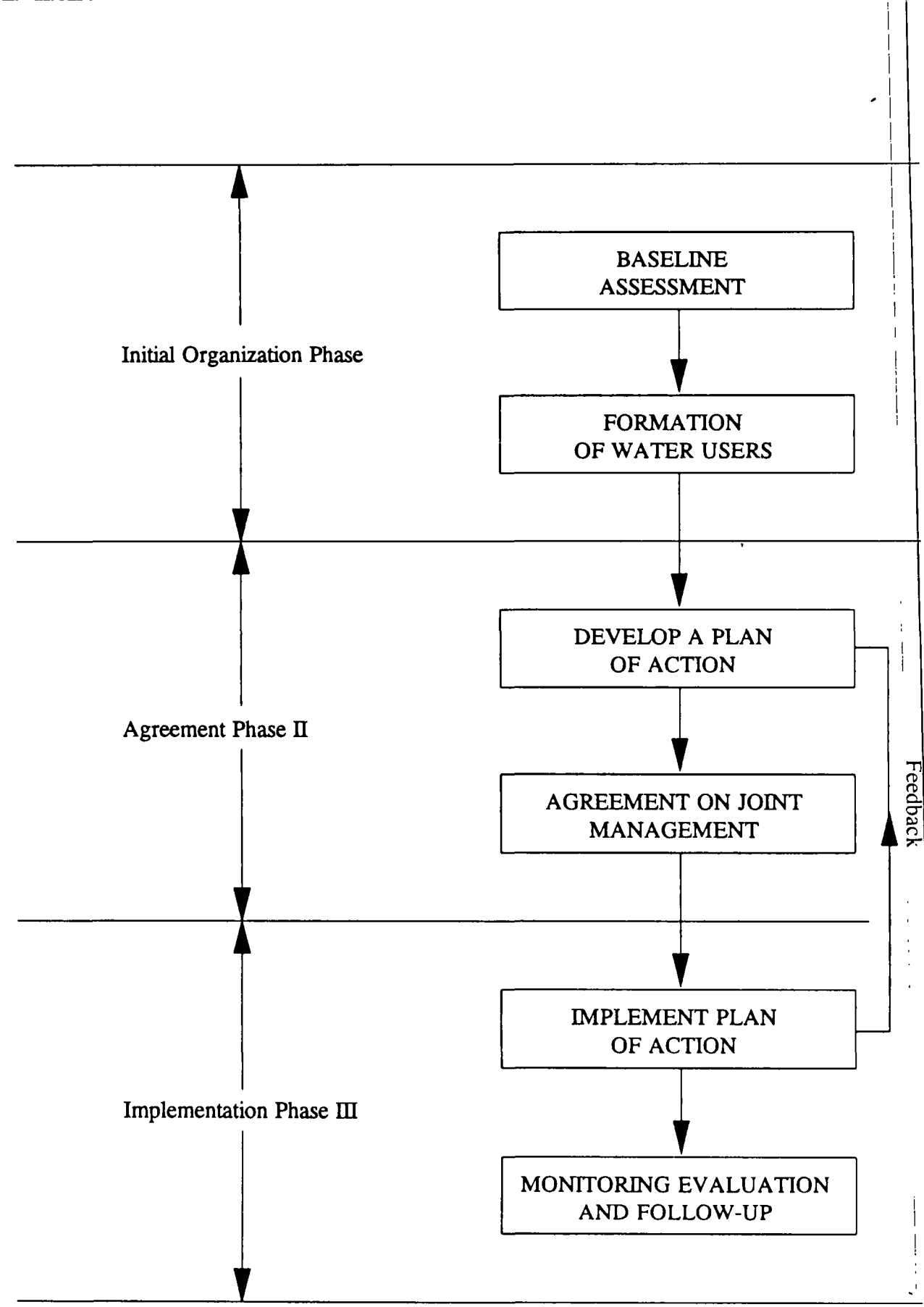

Figure 1: Framework for Joint Management and Turnover

Phase III. Implementation of Program

During phase III, the agreed upon programs are implemented Full implementation will take its own course for the expected end results as a sustaining, productive irrigation system managed by local users, requiring minimum amounts of outside support for management

Implement Plan of Action

The plan of action developed during the agreement in phase II, consisting of programs for system improvement, operations, deferred and regular maintenance, and other activities are implemented During phase III, extensive training for water users take place to strengthen their capabilities in areas such as share system, communications, leadership, account and record keeping, agricultural production, improved on-farm practices, procedures for operation and maintenance, and management transfer

Monitoring, Evaluation, and Feedback

The DOI system office and the WUA are to develop and implement procedures for monitoring and evaluating the management transfer programs Feedback from the evaluation procedure are to be reviewed by the WUA and the agency system manager Based on the findings of ME&F, agreements and programs can be updated and improved

Status of Joint Management Systems

Khageri

The Khageri irrigation system in Chitwan has received the most institutional development inputs of any of the joint management sites The two tier WUA is developing into a strong organization They have hired an office administration staff for the main WUA office to assist with record keeping. The WUA is quite active in controlling the limited supply of water from the river source and yields were reported to have improved Water is now reaching the tail end of the system during monsoon season While the WUA has not been able to mobilize resources for deferred maintenance, they are collecting a great deal of membership fees and water cess

The WUA has been receiving contracts from DOI system office to perform maintenance work in main and branch canals. There was significant work done for the amount of money and the quality of work was very good The desilting and cross-section improvement did lead to better water delivery performance The WUA is also acting as a cooperative and has got a dealership from Agriculture Input Corporation (AIC) to distribute agricultural inputs This helps generate income and facilitates the farmers to have direct access to production inputs

The WUA upon completion of its tenure for 2 years was elected again They have prepared the Action Plan and Memorandum of Agreement for the Irrigation Management Transfer Project (IMTP) which is to further expand and support the DOI's management transfer program The WUA is quite capable and active, and with some skillful technical work and negotiation, the system can be turned over to farmers, and the system can be more productive

Water shares have been defined on the basis of land area (one share/bigha) Flow calibration is performed and water control has improved Rotational water delivery is followed The WUA may retain upto 50% of the collected amount and use the funds for system O&M After the turnover the DOI shall not collect the irrigation fees and the WUA can decide the rates to cover the O&M costs They need not to pay back any amount to the government The 1994 and 1995 monsoon seasons were quite good for Khageri farmers They benefitted from additional water from the repaired Narayani Lift Irrigation System and were able to serve the entire area The yield of monsoon paddy increased from the baseline value of 2 5 tons per hectare in 1992 to an average value of 3 1 tons per hectare Similarly wheat has gone up to 2 0 t/ha from 1 05 t/ha and maize is reported to be 1 5 t/ha whose baseline value was only 0 79 t/ha Collection of irrigation service fee (ISF) in Khageri has increased by 50% in the last three years Recently the government has made the decision to settle 1600 families from Padampur to Sagun tole which is located in the Khageri river catchment This step has created confusion among the farmers as it may have adverse effects on the environment, water supply and water quality

West Gandak

At West Gandak, the stragety so far has been for the agency to operate the main canal in a better way and negotiate turnover agreements with the farmers from branches and lower order canals For turnover, partial funds for maintenance are provided by DOI on the condition that the branch committees take over future O&M responsibility of the system So far, 6,400 ha out of 10,300 ha served by branch and lower order canals have been turned over to users It is targeted to turn over the remaining area to branch committees, tolis, and upa-tolis (Sub branch and tertiary organizations) After this, the main canal will be turned over to the WUA However, the whole 1600 ha of Piparpate Parsauni has been turned over to the WUA

One of the striking differences between Khageri and West Gandak is the activity of the Main Committee and General Assembly at both places At Khageri, the Main Committee and General Assembly are strong, with branch committees subordinating to them At West Gandak, certain branch committees are exhibiting positive institutional development with good record keeping and resource mobilization But the main committee is not as strong as the Khageri main committee. In 1992, at the start of JMP, about 4000 ha was irrigated The discharge at the main canal was only 2 2 cumec (design discharge 8 5 cumec)

Due to massive desilting work, water supply situation has improved considerably Water shares are fixed and farmers are to pay for their shares The tendency therefore is to use the limited shares and pay less The water savings derived are used for irrigating more area The increase in irrigated area was 41% in summer and 17% in winter During monsoon season the entire service area is irrigated Agricultural performance of West Gandak for the 1993/94 and 1994/95 seasons have shown a remarkable improvement over the baseline situation of 1992/93 Average yields of rice increased form 2 2 to 4 tons per hectare, while average yields for wheat increased from 1 65 to 3 4 tons per hectare After subtracting production costs, the increment in net benefit to farmers at West Gandak was estimated at 66 million rupees for one year for the two crops The incremental net benefit from sugar cane was found to be about Rs 18,000 per hectare On a per hectare basis, the net benefit from rice and wheat was Rs 6,600 more in 1993/94 and 1994/1995 than in 1992/93 The change has been due to improved management of the system, and the involvement of the farmers through the joint management program An applied study on constraints analysis is being conducted

Two WUAs have been formed for the areas taking water from the Nepal Gandak Western Canal and the Indian Western Main Canal, represented by the Nepal Gandak Western WUA and the Piparpati Parsauni Main Management Committee This was done as the two systems are hydrologically independent of one another The WUA has launched a program to plant trees along canals as a measure of soil conservation and income The WUA is also seeking, a license from AIC to deal with the agricultural inputs like improved seeds and chemical fertilizers The WUAs are willing to diversify their activities in order to generate more local resources for the system O&M Seventy seven percent of the farmers have paid the ISF

In this irrigation system, the water level at the head regulator to the canal must be about 111m for the main canal to receive water as per its capacity But the barrage, for fear of floods, is maintained at lower water level at the head regulator It is therefore, difficult to operate the main canal at its capacity and when water is flowing at less capacity sediment deposition in the main canal increases

Poor drainage and the subsequent submergence of a portion of the command area is another problem The drainage system is planned to be improved under the management transfer program Elections for the WUA were held after a tenure of 2 years In order to participate in the elections farmers had to obtain their share system certificate and pay the watercess

Banganga

The Banganga case has been more difficult than Khageri and West Gandak The scope for improvement is similar to West Gandak and greater than Khageri, but this has yet to be achieved The start of the joint management program at Banganga was marred by difficulties The organizational design and formation process did not yield leaders who were representative of farmers' wishes and could inspire the confidence of farmers Fortunately, enough checks and balances were built into the organizational design so that appropriate changes could be made In 1994, new chairholders were elected and the modifications made to the organization structure Additionally, the DOI System Management was more receptive to the farmers With these changes, the program gained some momentum in a positive direction

Two indicators of positive progress are the area turned over to farmers and the amount of resource mobilization from the farmers themselves Up to present, 1096 ha have been turned over to farmers It has been observed that farmers are becoming more active in the cleanup of the canals, and the amount of labor mobilized as part of the cost share program was significant This is in comparison to almost zero in the first two years

Two issues need to be addressed to get the program moving at a greater pace The first is to improve the operation of the main system At both Khageri and West Gandak it has been demonstrated that improved main system operation allowing a more adequate and reliable supply of water leads to increase in area irrigated and higher crop yield With these improvements farmers get more interested in the program At Banganga, the System Management has got to find a way to get more water in the main canal and to better operate the reservoir The maximum observed discharge at Banganga at the reservoir outlet was 3 26 cumecs compared to a design capacity of 5.66 cumecs at that point

The second issue is regarding institutional development While turnover has taken place the branch organizations running the turnover areas do not represent the strength of the West Gandak organizations nor the Khageri main committee The Main Committee is definitely improving, but there remains a lack of vision and a lack of understanding their role Training activities are highly recommended to improve the situation In addition, funds for O&M need to be effectively used to leverage improved WUA activities including membership, record keeping, resource mobilization, and water cess collection

Panchakanya

Panchkanya has the advantages of being a smaller system and even though this is an AMIS and receives maintenance assistance from the DOI, a significant amount of O&M activities are done

by farmers Previously, there was an informal WUA In the first half of 1994, the WUA was made formal with bylaws and by registration

In the beginning there was a lack of overall vision, and a lack of procedures for the operation, maintenance, and resource generation But this is changing and the WUA is in the process of gaining confidence An important issue that must be dealt with is the distinct head-tail end problem that could be divisive Since the management transfer program has just started, no major impacts have been observed The baseline survey is nearing completion Diagnostic studies have been completed and the plan of action is finalized The MOA has been signed and the system improvement work is going well Upon completion of the improvement works the system will be fully turned over to the WUA

Manusmara

Manusmara organizational efforts led to two WUAs representing two separate command areas within the system The area was severely affected by flood during the 1993 monsoons Institutional development of the WUA is very slow, mostly due to recovery from the flood, but also in part due to the lack of follow up efforts with the WUA The WUA still exists but is not very active Irrigation management and institutional development programs were very few in the last two years The DOI and farmers have been working very hard to repair the flood damaged system Unfortunately, they did not use this flood repair opportunity to build up the strength of the WUAs Before it is too late, some further efforts need to be done with institutional development The crop cut samples of last two years give encouraging results

Kankai

Major joint management inputs into the Kankai irrigation system have been WUA formation and share system training Kankai received little budget for O&M, and most is used for repair of damaged culverts and emergency maintenance

In spite of the limited budget, the system has shown remarkable signs of improvements through excellent initiatives of the WUA and DOI Farmers through their organizations are mobilizing their own resources to clean and repair canals In one branch, S14, the branch committee had mobilized Rs 150,000 to clean the canal and repair the embankment This branch received water for early paddy for the first time ever The Main Committee of the WUA is quite active and is involved in water distribution, and system maintenance New office bearers of WUA have been elected after the former committee served its tenure of 2 years

The DOI is now involved in the turnover of 3 branch canals, and it has been stated that the demand for turnover of branches has been high Institutional issues that must be carefully watched are i) the branches should not feel separate form the system-wide WUA even though they are turned over, and ii) the WUA has to begin efforts to install the share system Last year government sanctioned Rs 4 4 million to construct the extension canal to irrigate an additional 1000 ha of land

Kamala

The Kamala Irrigation System is one of the biggest run-of-the river surface type irrigation systems in Nepal. It diverts water from the Kamala River to irrigate 25,000 hectares of land in two districts, namely, Siraha and Dhanusha There is a separate main canal for each district The irrigation system has been taken under the Irrigation management Transfer Project It is the largest of the joint management programs included under IMTP

Under the IMTP, efforts for organizing beneficiary farmers have been initiated with the creation of an organizational deisgn The design has envisaged two WUAs, one corresponding to each of the main canals going to Siraha and Dhanusha districts The organizing job, and other works will require a massive effort

So far, jobs of collecting detailed household data - number of households, individual's irrigable and irrigated land in different hydrological boundaries of the command area, major crops grown, etc have been collected, in close participation of the user farmers of Dhanusha district Similarly, farmers were assisted in identifying their representatives for drafting the constitution of the foreseen WUA's structure and its roles, responsibilities and the authorities The draft of the WUA's constitution is ready to be presented and ratified in the general assembly In parallel, as envisaged in the organizational design of the WUA, farmers of different hydrological sectors are selecting/electing their representatives Farmers representatives for the WUA have already been identified in Raghunathpur and Parbaha branch canals The same works are underway in the Siraha district

Just recently, an orientation program on institutional development was organized for the farmer representatives Thirty-four farmers from Raghunathpur and Parbaha branch canals participated in it

Besides the organizational development effort, some emergency maintenance works are going on For a comprehensive planning, inventory of all the structures and structural improvement works is being prepared for the canal system in Dhanusha Base line information of the Kamala Irrigation System has already been collected Diagnostic analyses of the tertiary system in both districts are being conducted

Yet, it is felt that over the long run, there are vast improvements that could be done here One must be careful not to make a false start by getting activities going, then dropping them later

Training

The trainings focus on organizational concepts, developing bylaws for WUA, O&M, record keeping, resource generation and mobilization, defining shares and the decision-making process Farmers from farmer-managed irrigation systems (FMIS) are also invited as resource persons to deal with site-specific issues in the training Farmers from AMIS are taken around the successful FMIS for demonstration

Performance Monitoring

Realizing the past pitfalls of non-involvement of users in the process of irrigation project development and management, the joint management and turnover programs have focused on institutional issues through its organization and training activities Performance monitoring in terms of system O&M, agricultural production and inputs and WUA capability to mobilize cash, labor and kind resources, to manage conflicts, keep records to monitor and improve irrigation activities, negotiate with DOI are the key ingredients of the program During the formation and implementation of O&M plans, regular coordination meetings to discuss the programs are held between the WUA and DOI field personnel Monitoring the variables like water flows at certain fixed points and its distribution as well as the farming activities and the utilization of government funds are planned Essential physical improvements are identified following a participatory approach and the quality of work is maintained through joint supervision A System Management Committee (SMC) is set up for this special task

The regular DOI- WUA meetings also evaluate the strategies adopted and make necessary revisions in the schedule for a reliable and equitable water distribution The time series monitoring can later be used to measure the performance of the system compared with previous year's data

Lessons Learned and Policy Implications

- A key ingredient for the successful and sustainable joint management program is to involve the District Irrigation Office in either planning or execution of the program introduced by DOI The role of the system manager and his staff is crucial Strengthening the WUA along with the DOI should form the basis for launching the program

- Fielding of farmer organizers (FOs) in the formation of WUA is found effective The FOs with necessary trainings help establish good communication between users and the agency

personnel The existing informal farmer associations should not be completely overlooked while forming a WUA

- Formation of multi-faceted WUA for the entire area based on hydrologic boundary of the irrigation system should be a basis for institutional development where participatory management is to be introduced This facilitates the farmers participation in the management of the entire irrigation system

- The role of WUA President and other office bearers is very important. Selection of the President and his colleagues, therefore should be one the ground of their standing with regard to farming activities Political interventions are found to have adverse effects on the program

- Delineation of roles and responsibilities of the agency and the WUA Main Committee, Branch, Tertiary and lower units should be clearly spelled out after a thorough discussion Likewise, a good communication system should be maintained

- DOI in particular should make commitments that can be fulfilled With regard to irrigation management both the agency and farmers should share common objectives and priorities

- Transparency with regard to availability and mobilization of funds and the process of decision making must be maintained

- The reliability of water supply at source has great impact on the willingness of the farmers to get involved in the joint management program They should know how much water is available and they should have their say as to when to operate and maintain the system

- The extent of physical infrastructure development along with their appropriateness of design and layout is instrumental in bringing favorable institutional atmosphere as they help in proper water allocation and distribution However, construction should not take precedence over institutional development The organization process should not be target driven

- Diagnostic study of the irrigation system before initiating the participatory management helps to undertake the program in a systematic way Likewise, trainings on the basis of prior needs assessment should be organized for both the farmers and the agency personnel

- Monitoring the irrigated area, share systems developed, where water allocation is roughly proportional to resources generated and mobilized helps to sustain the program in an efficient manner.

- Affordable degree of flexibility in the rules and regulations, especially in local resource generation and mobilization by the farmers should be maintained The supporting strategies of the government should be revised and refined on the basis of the field experiences and lessons learned

- The DOI can successfully facilitate farmers institutional development, improve system operations, perform deferred maintenance jointly with the farmers, gradually allow the WUA to take over system management and provide guidance and training to the farmers' associations

Technical Issues

- When initiating participatory management, irrigation systems have a backlog of costly deferred maintenance The deteriorating physical infrastructure and the essential structural improvement requirements of canal systems do not allow for equitable and productive irrigation water delivery On the other hand this provides an opportunity for WUA to learn how to work together with the DOI and how to make optimum use of government and local resources

- Monitoring water flows and hydraulic operation on the basis of structural calibration are not done on a regular basis.

- Silt accumulation in the system and its effect on the soil fertility needs in-depth study Action research on water control technology irrigated agriculture extension and the irrigation management transfer process and performance monitoring should be pursued

- The DOI field personnel's evaluation should be based on the irrigation system performance

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