

# **Transfer of Management Authority in Nepali Irrigation Systems**

**Annual Progress Report: September 1997–August 1998**

*Submitted to the Ford Foundation, October 1998*

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**\*INTERNATIONAL WATER MANAGEMENT INSTITUTE**

P O Box 2075, Colombo, Sri Lanka

tel (+94-1) 867404 • Fax (+94-1) 866854 • E-mail [iimi@cgiar.org](mailto:iimi@cgiar.org) • Website <http://www.cgiar.org/iwmi>

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*\*The International Irrigation Management Institute, one of sixteen centers supported by the Consultative Group on International Agricultural Research (CGAIR), was incorporated by an Act of Parliament in Sri Lanka. The Act is currently under amendment to read as International Water Management Institute (IWMI).*

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### **1. Introduction**

On September 1, 1996, the Ford Foundation entered into an agreement with the International Water Management Institute (IWMI) to provide support for studies on transfer of management authority in Nepali irrigation systems. This is the annual report from IWMI to the Ford Foundation outlining the accomplishments achieved, and a financial accounting.

### **2. Background**

Nepal's Irrigation Policy calls for turnover or joint management of irrigation systems presently operated and maintained by the Government of Nepal. About 25% of the nearly 1.1 million hectares of land served by irrigation infrastructure are under management of the irrigation agency, the Department of Irrigation (DOI). The DOI is now fully engaged in a process of turning over the management of these systems to water user associations (WUAs) or introducing joint DOI/farmer management of these systems to make these systems more productive and sustainable.

IWMI's proposal to the Ford Foundation offered to provide assistance to the Research and Technology Development Branch (RTDB) of the Department of Irrigation (DOI) to integrate existing monitoring activities into a system to provide clear information on how well the interventions related to management transfer are proceeding, and what the likely results will be for the project managers and policy makers. The activity would be related to IWMI's ongoing program to assess the impacts of irrigation management transfer in various countries of the world. It was envisaged that IWMI would work with RTDB to:

- Prepare policy analyses of the findings at regular intervals to point out the issues that need decisions and the implications of the findings for policy.
- Hold seminars and workshops with policy-makers and program managers on the issues arising from monitoring efforts.
- Help RTDB identify weakness in the present monitoring system and help the RTDB and DOI to improve monitoring and research on irrigation management transfer.

The activity planned to have the following outputs:

1. Eight policy analyses of the processes and impacts of the ongoing irrigation management transfer program being carried out through the irrigation management transfer program being carried out through the USAID and ADB supported Irrigation Management Transfer Project (IMTP) and perhaps other efforts.
2. Four workshops to discuss the detailed findings and their implications for policy.

3. A plan for institutionalizing with the DOI a cost-effective system for monitoring and evaluating the progress and impacts of irrigation management transfer and rehabilitation in large systems in Nepal.

Specific research outputs include:

1. Evaluation of the irrigation management transfer process in Nepal.
2. Evaluation of the participatory rehabilitation process being followed in the IMTP.
3. An improved understanding of the costs and benefits of monitoring and evaluation systems for interventions such as irrigation management transfer and rehabilitation.

### **3. Purpose of report**

The purpose of this report is to provide Ford Foundation a narrative account of what was accomplished by the expenditure of funds, including a description of progress made toward achieving the goals of the grant; and secondly, a financial accounting according to the line-item categories of the approved budget.

### **4. Previous activities and progress**

During the first year (Sept 1997 – 1998) two related initiating activities took place: First was the meeting of IWMI's Consultative Committee in Nepal, and second was Inception Report. The Nepal Consultative Committee was set up by Memorandum of Agreement between IIMI and HMG/Nepal Department of Irrigation in 1994. The group had not met in a long time due to IWMI earlier closing its Nepal office. The Inception Report was presented to the Committee who accepted it with minor changes. The Inception Report set out the research objectives and key research questions. During the three-year period of the project, 8 policy reports and 4 workshops were to be completed. The policy reports would take the form of Irrigation Management Transfer Briefs. These would be based on research reports commissioned for this activity. During the first year, one report and one brief had been completed while one workshop had been scheduled and prepared. At the end of the first year 4 activities had been initiated.

### **5. Progress during the reporting period**

After the first year of preparatory and initiating activities, the implementation of the research activities gained momentum after the assignment of a full time research coordinator and a part time office manager based in Katmandu. During the year considerable progress was made in the implementation of research activities, workshops and publication of reports and briefs. Details are given in the Tables at the end of this report.

## Highlights:

- Of the 4 research activities that were initiated in the first year, 3 were completed. Another 5 activities were initiated of which 4 were completed.
- Three workshops were held in which representatives from the Department of Irrigation, Water Users Associations, IWMI, universities, and NGOs had the opportunity to get acquainted with the results of the IWMI-RTDB research program, and discuss the results and the policy implications.
- The workshop on Irrigation Service Fee, organized by IWMI-RTDB to disseminate and discuss research results, was highly successful. High government officials involved in policy making and farmer representatives from 7 major irrigation schemes exchanged ideas and experiences on Irrigation Service Fee mechanisms. The outcomes of this workshop will be directly incorporated into future policy. The proceedings of the workshop have been drafted.
- Four policy working papers were published and widely disseminated to interested parties.
- To facilitate the easy dissemination of research results, Policy Briefs — 4 page abstracts of research reports — were printed and distributed. Two of those have been translated in Nepali and the other two are in the process of being translated.

## 6. Research activities and main findings

In this section a brief narrative description of each activity, including the major research findings, will be given. For more details please refer to the Policy Briefs and Working Papers published by IWMI-RTDB.

### 6.1 *Review of the M & E system*

To evaluate the Irrigation Management Transfer process and its impacts a good M&E system is crucial. One of the relevant question is: “Are there existing M&E Systems in Nepal that can provide relevant information on process and performance of irrigation management transfer?”. A consultancy was given to Mr. I. Neupane to find the answer to this question. He looked at the M&E systems for DOI, the National Planning Commission, Ministry of Agriculture, Agricultural Development Bank, the Bhairawa Lumbini Groundwater Project, and the Marchawar Lift Irrigation Project.

Main findings were:

- Quality and quantity of data is better on inputs than outputs.
- The best information is kept at the project level, while at a more centralized level, both quality and quantity of information is insufficient, and campaigns to collect information are sporadic rather than regular.
- At least three main gaps were identified: 1) a lack of data related to outputs, 2) poor information flow from field to higher levels, making comparative analysis for policy

decisions difficult, and 3) a severe lack of information on how the water resource is used due to a lack of information on water discharges.

- The present strengths to build on are that 1) there is much data being collected at projects sites, and through many specialized commissioned studies, 2) there is also a desire to know this information at various levels, and 3) there is a recognition of weaknesses in M&E by DOI officials.

These issues were discussed with government officials during the first workshop (5-6 October 1997). The need for improving the information flow from field to central level was generally acknowledged. A mechanism to systematically analyze information is lacking. It was felt that a major constraint is the limited budget and manpower in the DOI allocated to M&E activities.

### **6.2 Support to M & E activities**

In view of the above mentioned strengths and weaknesses in the M&E system it was decided to assist the DOI in developing a relational database to store and process data at central level. The database was developed and implemented by the M&E branch of the DOI, with support from IWMI, using the software used in the department (MS Access). The database was demonstrated at the workshop of 17–18<sup>th</sup> September 1998 and a report containing recommendations to ensure its prolonged implementation was presented. An important advantage of the database is the easy data entry and data manipulation. A variety of performance indicators covering agricultural, financial and water management aspects, can be computed using data already available at project offices. A major concern remains the quality of data especially water flow measurements. It is expected that the database can be maintained using the existing budget and manpower.

### **6.3 Rehabilitation and management transfer processes**

Turnover and Joint Management activities in Nepal typically involve varying degrees of rehabilitation or modernization. The arrangements for rehabilitation and the way in which rehabilitation is done is thought to be a major factor of the success or failure of management transfer. A comparative study was commissioned through this project to concentrate on processes of rehabilitation. Seven projects involved in management transfer<sup>1</sup> were studied to identify key factors in rehabilitation processes.

Main findings:

- Prior to management transfer most projects involved in IMT implement a rehabilitation program.
- Rehabilitation is used as incentive for beneficiaries to motivate them towards assuming greater management responsibilities, as a means to improve effectiveness

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<sup>1</sup> Irrigation Management Transfer Project, Kankai Irrigation System, Bhairawa Lumbini Ground Water Project, Marchwar Lift Irrigation Project, Sunsari Morang Irrigation Project, Handetar Irrigation Project and Irrigation Line of Credit (ILC)

and serviceability of irrigation systems and reduce the cost of operation and maintenance after transfer.

- Despite the common objectives of rehabilitation prior to transfer, a number of marked differences in approach were identified. Variables in key processes are related to the level of beneficiaries' participation, identification of rehabilitation requirements, and tendering and construction modalities. Six propositions incorporating those variables were formulated and need to be tested during subsequent studies.
- At this early stage of transfer (most schemes were transferred less than a year ago) it's premature to draw firm conclusions about which approach yields best results. In the second phase of this research during the final year studies are planned to probe those issues further.

#### **6.4 Comparative performance assessment**

IWMI's performance indicators computed with data assembled from sources available at the RTDB, project reports and project records were used to answer the following research questions related to transfer and irrigation performance:

1. What are the general trends in performance of irrigated agriculture?
2. What are the impacts of management transfer on irrigation performance?

The expected impacts of management transfer are increased agricultural production, improved use of irrigation water, a decrease in expenditures for the government with farmers bearing O&M costs. Seven sites<sup>2</sup> in the Terai were selected and a comparison between systems as well as the developments over the last 5 years were analyzed.

#### **Main findings**

- The agricultural production in all systems is rising gradually with increased irrigation intensity and improved paddy and wheat yields. This is probably due to changes in management and rehabilitation.
- Agricultural production per unit of water supplied is rising in the pump systems after management transfer. Farmers started economizing water the amount of water pumped after they had to pay part of the fuel costs, as part of the management transfer package.
- Although progress has been made over the last 3 years, the farmer contributions to O&M expenditures are still very modest and the government continues paying the major part. Most WUAs face problems to collect the assessed amount of irrigation service fees.
- O&M expenditures per unit of land fluctuate widely between the systems, but are generally low. Sustainability of the irrigation infrastructure is at stake if WUAs are not able to mobilize sufficient resources while the government is decreasing budget allocation for regular O&M.

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<sup>2</sup> West-Gandak, Khageri, Panchakanya, Kankai, Sunsari Morang, Marchwar Lift Irrigation Project and Bhairawa Lumbini Groundwater Project

### 6.5 *Institutional arrangements for supporting management transfer*

The success or failure of irrigation management transfer highly depends on adequate institutional arrangements to facilitate the process and support the WUA during the post transfer phase. A study was implemented to answer the following questions:

1. to what extent are the existing government institutions and policies attuned to meeting the current needs of farmers ?
2. Are existing institutions and legal provisions adequate for effective performance of the transferred systems ?
3. What are the gaps and weaknesses in the prevailing situation ?

Five key issues were identified, i.e., water use rights, system turnover, WUA formation, irrigation service fees, and water resource monitoring. For each issue the relevant policies and regulations were checked and analyzed on its adequacy to support management transfer processes.

#### Main findings:

- Much effort has been dedicated in attempting to create an enabling institutional environment for management transfer. The major concern is related to the post transfer phase. Three areas need to be looked at more thoroughly: water rights, government support and local water service organizations.
- Water rights: there is a lack of firm water right for newly formed WUAs, insufficient public awareness regarding water rights, and an inadequate definition of the amount of water to be received in the licensing procedure. The institution mandated to license water (District Water Resource Committee) has not got the adequate capability.
- Government support: after transfer there remain several functions that the government should provide to sustain positive impacts of management transfer. These services include water flow monitoring system, enforcement of legislation related to water rights and water quality, and technical support to WUA. At present there appeared to be a lack of commitment from high-level officials to implement policies and enforce relevant legislation.
- Local water service organizations: some weaknesses revealed by the study include 1) the committee for fixation of the irrigation service fee was not functioning or not even formed, 2) the fee collection has been far less than sufficient and 3) WUAs legal stand is not clear.

Priority areas requiring further attention have been recommended: operationalizing of existing legislation and strengthen institutions; defining and enforcing water rights; providing post-transfer support to WUAs; and obtaining legal clarity about WUA empowerment.



## 6.6 *Irrigation Service Fee*

Two main activities were centered on this most important but also controversial theme. A four-month literature and field study was implemented from April to July. At the end of July the findings were discussed in a one day workshop held in Kathmandu.

The field and literature study consisted of two parts. First, an analysis of existing experiences with fee collection in three Farmer Managed Irrigation Schemes<sup>3</sup> This analysis was contrasted to practices at three management transfer sites. In FMIS the government is not involved in the day-to-day operation and maintenance and farmers themselves bear full O&M expenditures in cash and/or labor contributions. The purpose of this part of the study is to draw lessons from FMIS, and older transferred systems, that might be useful for other transferred systems. The second part consisted of a review of past experiences in irrigation fee collection to draw lessons for the planned implementation of ISF. In the past several attempts have been undertaken to mobilize farmers' resources in agency managed systems to contribute to O&M expenses. However, those attempts were not very successful and long lasting. Less than 2% of the total O&M expenses came from farmers' contributions.

### Main findings:

- In FMIS resource mobilization is high because principles are agreed upon through a collective decision making process. Rules and regulations are flexible and can change from system to system. Labor contribution is the main resource mobilized for maintenance. Cash is mainly collected through fines if farmers fail to contribute the agreed upon amount of labor.
- In the past the water fee in agency managed systems was conceived as a tax i.e. fixed, enforced, collected and used by central level government authorities. From international evidence it became clear that the lack of a direct link between service fee collection and improved infrastructure maintenance is a strong disincentive to pay water fees. WUAs in agency managed systems should be strengthened to play a more dominant role in the water fee mobilization.
- Some farmers in agency managed systems are reluctant to pay water fees as they see it as the government's responsibility to pay for O&M. It is hard to enforce penalties on free-riders because in surface systems one cannot cut off the water in case of non-payment.

Before the workshop a meeting took place in which 20 high government officials from the DOI and National Planning Commission took part. Based on the research findings, the meeting agreed upon the suggestions listed below:

- Irrigation Fee should be treated as a service fee and not as a tax
- No government subsidies should be given in normal Operation and Maintenance expenses of agency managed irrigation systems

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<sup>3</sup> Chhattis Mauja Irrigation Scheme, Pithuwa Irrigation Scheme and Bangeri Irrigation Scheme.

- Major part of O&M expenditures should be borne out of ISF and alternative sources of income tapped by the WUA should not undermine irrigation fee payments
- ISF should be used by the WUA to pay O&M expenses. No capital costs will be recovered by the government
- The fixation of rates and collection mechanisms should be done on project level in a joint effort of farmers and agency staff.

These ideas were presented and discussed at the workshop on 30 of July, 1998. In the workshop the farmers' representatives had the opportunity to interact with the DG, DDG, and other high government officials about the recommendation made. It is highly likely that the recommendations will be incorporated in future policy plans.

### **6.7 Impact of Irrigation Management Transfer**

To capture the farmers' perspectives and perceptions regarding management transfer, surveys were held in 2 recently transferred branches of the West Gandak Irrigation Scheme and in the Bhairawa Lumbini Groundwater Project where 2 of the 4 tube wells are already transferred. In total some 365 beneficiaries were interviewed. The objectives of the survey are:

- to analyze the changes in the cost of irrigation to farmers and
- to assess farmers' perception of management transfer concerning aspects like: operation, maintenance, conflict management and functioning of the WUA.

The survey work has been completed but the processing of data is still ongoing. Some preliminary results based on surveys held in the area where two tube wells were located are presented below. In one, tube well transfer took place, while in the other transfer is about to happen.

#### **Preliminary Results:**

1. In the area with the transferred tube well, farmers are paying considerably more for their irrigation water than in the non-transferred tube-well area. This is because the government stopped paying for the pump maintenance and operator salary after transfer, so the farmers evidently see the benefit in paying for these services.
2. According to farmers' perception, agricultural production hardly increased after transfer. Since the cost for irrigation water went up, this means that their net income declined but cost to government went down. This aspect needs further analysis.
3. According to the farmers' perception, the irrigation service (adequacy, timeliness, fairness of water distribution, and difficulty of arranging water) was better in the transferred tube well.
4. The condition of the pump was considered better in the non-transferred tube well where the irrigation agency is still responsible for pump maintenance, than in the transferred tube well where the WUA maintains the pump.

## **6.8 Process documentation**

In order to gain deeper insights in the internal processes of irrigation management transfer and WUA dynamics after transfer, it was decided to conduct an in-depth case study in a recently transferred branch of the West Gandak Irrigation system, through process documentation. The RTDB signed a MoU with the IAAS / Rampur Campus for a period of 8 months. The specific tasks were:

- (a) The process how the DOI negotiated with WUA for management transfer in West Gandak;
- (b) Interactions between the DOI and WUA and within WUA structure in course of management transfer;
- (c) Issues faced by the agency people and the beneficiary farmers;
- (d) Measures adopted at various levels, both of DOI and WUA, to address these issues;
- (e) Different plans and strategies of WUA meant for undertaking the irrigation management tasks after the management transfer;
- (f) DOI's efforts for extending post transfer supports to the WUA and beneficiary farmers in general; and
- (g) experiences so far.

So far 4 sub-report have been written, mainly focusing on the election process of WUA functionaries. The preliminary findings – although the fieldwork has been completed the analysis of the results is still ongoing – were presented and discussed in the last workshop. DOI officials appreciated the methodology of Process Documentation and were impressed by the outcomes. A major topic that came up during the presentation and discussion is the high degree of local party politics involved during the election process.

## **6.9 Conjunctive use of water**

The study looked at the use of two or more sources of water - canal, drainage, and ground waters - that can provide better reliability and flexibility in irrigation supplies ensuring increased crop yields and productions. It has attempted to assess, analyze and document conjunctive water use practices prevalent in three selected irrigation command areas of Kamala, Hardinath, West Gandak irrigation systems.

Key findings indicate that though Nepalese farmers have been practicing conjunctive water use practices since long and despite significant emphasis given for the use of ground water and intensification of shallow tube wells by Nepal's Agricultural Perspective Plan 1995, deliberate policies and support mechanism on promoting conjunctive water use practices are lacking. Similarly, institutional arrangements are inadequate to enhance the installation and use of tube wells in conjunction with canal water. Further, the small and marginal farmers have not been able to benefit from the use of tube wells as compared to large farmers.

Realizing the limited experience and knowledge on conjunctive water uses practices in Nepal; the study has recommended some further studies focussing on technical and economic feasibility of conjunctive water use practices considering farm size and mode of management.

## **7. Planning for next year, 1998–1999**

The planned activities for next year consist of two parts: first, the ongoing activities that need to be finalized and second, the activities that will be initiated this year. The plans were discussed and approved by the last meeting of the Consultative Committee in September, 1998.

### **A. Finalize ongoing activities:**

1. Complete phase 2 of the rehabilitation study
2. Analyze results of farmer surveys
3. Complete the process documentation study
4. Finalize the drafts of four working papers
5. Finalize four Policy briefs

### **B. New activities:**

#### *1. Key factors to success*

As described in the previous section, a broad spectrum of aspects regarding irrigation management transfer and its impacts have been studied in detail. Weaknesses and strength of sub-processes have been identified and analyzed. Next year's activities will focus on the synthesis of all these different aspects. This synthesis will lead to the answers on the main research question dealt with in this research program: which processes lead to successful IMT? Part of this important question will also be covered in the second phase of the rehabilitation study.

#### *2. Post transfer support*

During both workshops held in October 1997 and September 1998 participants from farmer groups and DOI officials stressed the need for post transfer support to newly formed WUA. The overall goal of the proposed action research activity is to achieve sustainable increases in agricultural productivity. Two specific objectives are:

- To build institutional capacity of newly formed Water Users Associations to better manage land and water resources.
- Provide policy feedback on institutional requirements to support WUA to fulfill its objectives.

Contacts have been established with various donors and research institutes. The DED (Deutsche Entwicklung Dienst) offered to provide personnel input: a German volunteer stationed in the research site to coordinate activities in the field and conduct Process

Documentation study. CIMMYT was keenly interested in working with IWMI in two recently transferred systems in a joint research on sustained agricultural production.

### *3. Water basin study*

This proposed research project will take place in the Indrawati Basin. In this area intensive development of water resources (hydropower, water supply for Kathmandu, agriculture) in the near future is targeted. If not carefully planned and executed, this might lead to severe competition between stakeholders, harming the less influential water users' groups. The overall development goal of the proposed research is to obtain more productive use of Nepal's water resources in a manner that benefits all stakeholders including poor and disadvantaged people without adverse impacts on the environment.

Contacts with relevant institutes have been established. The main collaborators will be the WECS, DOI, DWS, District Water Resource Committees, local water users groups and ICIMOD. ADB has showed interest to finance part of the study. Refer to enclosed proposal.

**Table 1. Research activities and reports**

	<b>Activity</b>	<b>Research Progress</b>	<b>Report Progress</b>	<b>Brief</b>	<b>Remark</b>
1	Review of M&E systems	Completed	Completed (working paper 1)	Published (no. 1)	
2	Rehabilitation processes	Phase 1: completed	First part completed (working paper 2)	Published (no. 2)	Phase 2 initiated
3	Comparative performance assessment	Completed	In print (working paper 4)	Published (no. 3)	
4	Institutional support systems for IMT	Completed	Completed (working paper 3)	Published (no. 4)	
5	Irrigation Service Fee	Completed	Final draft submitted	Drafted	
6	Conjunctive Water Use	Completed	Final draft submitted	In process	
7	IMT process documentation	Ongoing	Four sub-reports submitted		
8	IMT impact assessment	Surveys completed, data processing ongoing			
9	M & E support	Database established and Recommendation Report completed, continuous activity	Final draft submitted		

**Table 2. Workshops conducted**

	<b>Name</b>	<b>Date</b>	<b>Participants</b>	<b>Proceedings</b>
1	RTDB – IWMI first annual workshop	Kathmandu 5 – 6 October 1997	45 from DOI, WUA chairmen, IWMI, National Planning Commission, Winrock, Pulchowk Engg. campus, IAAS Rampur Campus, MoWR, ADB, CADI	Published
2	Irrigation Service Fee workshop	Kathmandu 30 July 1998	47 from DOI, farmers' representatives, National Planning Commission, World bank, CADI, Tribhuvan University	Draft report on Irrigation Service Fee study inclusive of Workshop's recommendations completed
3	RTDB – IWMI second annual workshop	Kathmandu 17 – 18 September 1998	41 from DOI, WUA chairmen, IWMI, National Planning Commission, Winrock, Pulchowk campus, IAAS Rampur Campus, Dept of Agriculture, MoWR, ADB, CADI	Draft in progress

**Table 3. Persons involved in the research activities**

	<b>Person's name</b>	<b>Assignment</b>	<b>Time spent</b>	<b>Activities</b>
1	Mr. Krishna C. Prasad	IWMI-Nepal	Full time	All
2	Dr. K.R. Sharma	RTDB, DOI Nepal	Part time	All
3	Dr. David Molden	IWMI – Colombo	1.5 months	All
4	Ms. Charlotte de Fraiture	IWMI – Colombo	2 months	Comparative performance assessment and project management
5	Mr. I. Neupane	Local consultant	7 months	M&E system review, Institutional arrangements for supporting IMT, and Conjunctive water use
6	Dr. Prachanda Pradhan	Consultant	1 month	Irrigation Service Fee study
7	Dr. M. Samad	IWMI - Colombo	1 month	IMT impact assessment
8	Dr. Nicola Ridell	IWMI – Colombo	1 week	Irrigation service fee study
9	Dr. Tissa Bandaragoda	IWMI – Colombo	3 days	Institutional arrangements for supporting IMT
10	Mr. A. Shukla and three research assistants	IAAS Rampur Campus	Part time	Process Documentation
11	Ms. Amita Tuladhar	Local consultant	6 months	Secondary data collection, farmer surveys
12	Mr. Bijay Adhikari	DOI-Nepal	2 months	Comparative Performance study
13	Mr. R. L. Shilpakar	Local consultant	6 months	Office management, farmer surveys
14	Mr. T.P. Sharma	DOI-Nepal	2 months	Database development
15	Mr. Suman Sijapati	DOI-Nepal	1 month	Irrigation Service Fee study Workshop organization and proceedings
16	Mr. S. K. Shrestha	DOI-Nepal	2 months	M&E support work
17	Dr. B. Neupane	APROSC	1 month	Institutional arrangements for supporting IMT
18	Mr. N. Koirala	DOI – West Gandak	Part time	Process documentation



## **Table 4. Published documents**

### **Working papers completed:**

1. Review of Irrigation Monitoring and Evaluation Systems, Nepal, RTDB-IWMI, April 1997.
2. Study on Rehabilitation and management transfer, Nepal. Phase I: Identification of current processes. RTDB-IWMI, July 1997
3. Institutional Framework Supporting Management Transfer, Nepal RTDB-IWMI, October 1997.
4. *In print*: Comparative Performance Assessment in 7 selected irrigation schemes in Nepal. RTDB-IWMI, September 1998.

### **Policy Briefs:**

1. M&E systems for evaluating management transfer, September 1997.
2. Rehabilitation and Management Transfer: Current Processes, January 1998.
3. Comparative Irrigation Performance Assessment, August 1998.
4. Institutional Arrangements for Supporting Management Transfer, August 1998.

### **Policy Briefs in Nepali:**

5. M&E systems for evaluating management transfer.
6. Rehabilitation and Management Transfer: Current Processes.

### **Workshop proceedings:**

Evaluation of Irrigation Management Transfer Process and Performance. Proceedings of a workshop held in Kathmandu 5-6 October 1997. RTDB-IWMI.

### **Process Documentation Report Series:**

1. A Process Based Diagnosis of Election of WUA Functionaries in Nepal West Gandak Irrigation Scheme. Report No. 1. April 1998.
2. A Process Based Diagnosis of Election of WUA Functionaries in Nepal West Gandak Irrigation Scheme: Election of Toli and Branch Committee Functionaries. Report No. 2. May 1998.
3. A Process Based Diagnosis of Election of WUA Functionaries in Nepal West Gandak Irrigation Scheme: Election of functionaries for the board of directors. Report No. 3. June 1998.
4. A Process Based Diagnosis of Election of WUA Functionaries in Nepal West Gandak Irrigation Scheme: Election of women representatives, functionaries of executive committee and formation of regional committees. Report No. 4. August 1998.

## **ANNEX I — Workshop Participants**

### **Participants in Workshop, October 1997**

1. Mr. A. M. Singh, Consultant, NISP, DOI, Jawalakhel
2. Mr. Amonananda Mishra, DDG, River Training Division, DOI, Jawalakhel
3. Dr. B. Neupane, Consultant, IIMI, Nepal
4. Mr. Babu Ram Adhikary, Senior Divisional Engineer, DOI, Jawalakhel
5. Mr. Bijaya Adhikari, Agri. Engineer, RTDB, DOI, Jawalakhel
6. Mr. C. M. Tater, Deputy Director General, Irrigation Management Division, DOI, Jawalakhel,
7. Ms. Charlotte de Fraiture, IIMI, Colombo, Sri Lanka
8. Mr. Chhanda Prasad Adhikary, Chairman, Panchkanya Water Users Association, Chitwan
9. Dr. D. J. Molden, IIMI, Sri Lanka
10. Mr. Durga Sankhar Sharma, Coordinator, SISP, DOI, Jawalakhel
11. Dr. Ganesh Shivakoti, Lecturer, IAAS, Rampur, Chitwan
12. Dr. Ganesh Thapa, Team Leader, Winrock International, APROSC, Kathmandu
13. Mr. Gautam Buddha Manandhar, Chief, Agri. Engineering Division, NARC, Khumaltar
14. Mr. Haidar Ali Momin, Chairman, WUA, West Gandak Irrigation Project, Nawalparasi
15. Mr. Harsha Bajracharya, Project Officer, ARD/USAID/Nepal, Rabi Bhawan, Kathmandu
16. Mr. I. Neupane, Consultant, IIMI, Nepal
17. Dr. Indra Lal Kalu, Team Leader, TA Team, CADI/IMTP, Jawalakhel
18. Mr. Jivan P. Thanju, Senior Divisional Engineer, WECS, Singha Durbar
19. Mr. K. C. Prasad, Engineer- Sociologist, System Management Branch, DOI, Jawalakhel
20. Dr. Khem R. Sharma, Chief, RTDB, DOI, Jawalakhel
21. Mr. Larik P. Yadav, Chairman, Water Users' Association, Piparpati Parsauni, Nawalparasi
22. Mr. Mahendra B. Gurung, Senior Divisional Engineer, BLGWP, Bhairahawa
23. Mr. Mahendra Nath Aryal, Director General, DOI, Jawalakhel
24. Dr. N. M. Shakya, Engineering Institute, Pulchowk
25. Mr. N. Ansari, Team Leader, SISP, Implementation Consultant, Jawalakhel
26. Mr. N. P. Bhattarai, Senior Divisional Engineer, Ministry of Water Resource, Singha Durbar
27. Mr. Narayan Bahadur Shrestha, Under Secretary, National Planning Commission, Singha Durbar
28. Mr. Niranjan Tamrakar, HRDTB, DOI, Jawalakhel
29. Mr. Nirjarananda Vaidya, Coordinator, NISP, DOI, Jawalakhel
30. Mr. Prem Bahadur Shrestha, Section Chief, Irrigation Unit, Agricultural Development Bank,
31. Mr. Puspa Raj Khanal, Chief, Narayani Lift Irrigation Office, Bharatpur, Chitwan
32. Mr. R. P. Satyal, Chief, IMTP, DOI, Jawalakhel
33. Mr. R. K. Sharma Neupane, Deputy Team Leader, TA Team, CADI/IMTP, Bharatpur, Chitwan
34. Mr. S. P. Rajbhandary, Chief, System Management Branch, Irrigation Management Division, DOI
35. Mr. Santosh K. Shrestha, Agri. Economist, IMD, DOI, Jawalakhel
36. Mr. Sharada Prasad Sharma, DDG, Planning Division, DOI, Jawalakhel
37. Mr. Suman Lal Shrestha, Engineer, RTDB, DOI, Jawalakhel
38. Mr. Surendra Shrestha, IIMI, Nepal
39. Dr. T. M. S. Pradhan, IIMI, Nepal
40. Mr. Tarka Bahadur Budhathoki, Project Chief, Marchwar Lift Irrigation Project, Bhairahawa
41. Mr. Tika Ram Dahal, Chairman, Khageri Water Users' Association, Chitwan

## Participants in ISF Workshop, July 1998

1. Mr. B. R. Regmi, Secretary, MOWR, Singh Durbar, Kathmandu
2. Mr. Y. L. Vaidya, Special Secretary, MOWR, Singh Durbar, Kathmandu
3. Mr. S. N. Poudel, Executive Secretary, WECS, Singh Durbar, Kathmandu
4. Mr. M. M. Shrestha, Joint Secretary, MOWR, Singh Durbar, Kathmandu
5. Mr. R. L. Kayastha, Joint Secretary, MOWR, Singh Durbar, Kathmandu
6. Mr. R. R. Satyal, Auditor General's Office, Babar Mahal
7. Mr. S. Shah, Representative Finance Ministry
8. Mr. M. N. Aryal, Director General, DOI, Jawalakhel, Lalitpur
9. Mr. C. M. Tater, DDG, Irrigation Management Division, DOI
10. Mr. I. B. Shrestha, DDG, Surface Irrigation Division/DOI
11. Mr. N. N. Vaidya, Coordinator, NISP, Jawalakhel, Lalitpur
12. Mr. R. P. Satyal, Coordinator, IMTP, Jawalakhel, Lalitpur
13. Mr. B. R. Adhikari, Coordinator, SISP, Jawalakhel, Lalitpur
14. Mr. J. Ghimire, Chief, Groundwater Resources Dev. Project, Babar Mahal
15. Mr. U. L. Malla, SDE, Sunsari Morang Irrigation Project
16. Mr. S. D. Manandhar, Chief, BLGWP
17. Dr. N. H. Gajurel, Planning Division, DOI
18. Mr. B. Ojha, SDE, DOI, Jawalakhel, Lalitpur
19. Mr. M. Dangol, SDE, DOI, Jawalakhel, Lalitpur
20. Mr. P. N. Singh, SDE, Planning Division, DOI
21. Mr. T. M. Gurung, SDE, DOI, Jawalakhel, Lalitpur
22. Mr. S. P. Rajbhandari, Chief, SMB/IMD/DOI
23. Mr. L. C. Pradhan, Chief, HRDTB/IMD/DOI
24. Dr. K. R. Sharma, Chief, RTDB, DOI, Jawalakhel
25. Mr. S. Sijapati, SDE, DOI
26. Mr. R. Chhetri, Ministry of Law and Justice, Babar Mahal, Kathmandu
27. Dr. P. Pradhan, IWMI Consultant
28. Mr. K. C. Prasad, IWMI, Nepal
29. Mr. R. L. Shilpakar, IWMI, Nepal
30. Ms. A. Tuladhar, IWMI, Nepal

### *Farmers' Representatives*

31. Mr. A. Ray, Chairman, West Gandak IS
32. Mr. C. P. Adhikari, Chairman, Panchkanya IS
33. Mr. H. P. Bhetwal, Chairman, Kankai IS
34. Mr. K. Neupane, Chairman, Chhattis Mauja IS
35. Mr. R. P. Sah, Chairman, Bangeri IS
36. Mr. S. Pandey, TW 13, BLGWP
37. Mr. S. Ali, West Gandak
38. Mr. K. R. Adikari, West Gandak

### *Independent Thinkers*

39. Dr. R. Mishra, IIDS, Baneshwar
40. Dr. S. B. Gurung, Department of Sociology, TU
41. Mr. C. D. Bhatta, Advisor, National Planning Commission
42. Mr. M. P. Sharma, Consultant, IMTP
43. Mr. N. Ansari, SISP TA Team
44. Mr. S. S. Ranjitkar, World Bank, Yak and Yeti Complex, Kathmandu
45. Mr. R. R. S. Neupane, CADI/IMTP
46. Mr. U. R. Timilsina, DOI
47. Dr. R. Laitos, CADI/IMTP

## Participants in Workshop, September 1998

1. Dr. David Molden, Team Leader, Nepal Program, IWMI
2. Dr. I. L. Kalu, TA-IMTP
3. Dr. K. R. Sharma Chief, RTDB, IMD/DOI
4. Dr. N. M. Shakya, Institute of Engineering, Pulchowk
5. Dr. R. Pradhan, Freedeal, Anam Nagar, Kathmandu
6. Dr. Robby Laitos, Team Leader, CADI/IMTP
7. Dr. Tom Sheng, CADI
8. Mr. A. Shukla, Coordinator, IMSSG, IAAS, Rampur
9. Mr. Ajay Dixit, Water Nepal
10. Mr. A. Mishra, DDG/DOI
11. Mr. B. Devkota, IAAS, Rampur
12. Mr. B. R. Adhikari, Coordinator, SISP, Jawalakhel, Lalitpur
13. Mr. R. Adhikari, SDE, DOI
14. Mr. B. K. Adhikari, Engineer, RTDB/IMD/DOI
15. Mr. C. D. Bhatta, Advisor, NPC
16. Mr. Chhanda Prasad Adhikari, Chairman, Panchkanya WUA
17. Mr. D. R. Regmi, Joint Secretary, MOWR, Singh Durbar, Kathmandu
18. Mr. Hari Prasad Bhetwal, Chairman, Kankai WUA
19. Mr. H. R. Devkota, observer, ATZ consult
20. Mr. I. Neupane, Consultant
21. Mr. J. P. Datta, IAAS
22. Mr. J. P. Thanju, SDE, WECS, Singha Durbar, Kathmandu, Nepal
23. Mr. J. Ghimire, DDG, Groundwater Division, DOI
24. Mr. J. Kurmi, Machawar WUA
25. Mr. K. C. Prasad, Research Associate and Office in Charge, IWMI, Nepal
26. Mr. L. C. Pradhan, Chief, HRDTB/IMD/DOI
27. Mr. M. M. Shrestha, Joint Secretary, MOWR
28. Mr. M. N. Aryal, Director General, DOI, Jawalakhel, Lalitpur
29. Mr. N. Ansari, TA-SISP
30. Mr. N. Koirala, Engineer, West Gandak IS
31. Mr. N. P. Bhattarai, SDE, Ministry of Water Resources, Singh Durbar, Kathmandu, Nepal
32. Mr. P. R. Dungana, RTDB/IMD/DOI
33. Mr. R. L. Gupta, Machawar WUA
34. Mr. R. L. Shilpakar, Research Assistant and Office Manager, IWMI, Nepal
35. Mr. R. P. Satyal, DDG, Irrigation Management Division, DOI
36. Mr. R. R. S. Neupane, TA-IMTP
37. Mr. R. P. Bhandari, RTDB/IMD/DOI
38. Mr. S. K. Adhikari, Chief, Agriculture Engineering Division, NARC, Khumaltar, Lalitpur, Nepal
39. Mr. S. K. Shrestha, Economist, IMD/SMB/DOI
40. Mr. S. N. Adhikari, RTDB/IMD/DOI
41. Mr. S. P. Sharma, DDG/DOI
42. Mr. S. L. Shrestha, SDE, DOI
43. Mr. S. Sijapati, SDE, DOI
44. Mr. S. S. Ranjitkar, World Bank
45. Mr. S. S. Yadhav, West Gandak WUA
46. Mr. S. S. Yadhav, Machawar WUA
47. Mr. S. D. Mannadhar, Chief, BLGWP
48. Mr. T. P. Sharma, Chief, MISU, DOI
49. Mr. Tajmul Musalman, Marchwar WUA
50. Mr. Tika Ram Dahal, Khageri WUA
51. Ms. A. Tuladhar, Research Assistant, IWMI, Nepal
52. Ms. Charlotte de Fraiture, Research Associate, IWMI, Sri Lanka
53. Ms. S. Rimal, Research Officer, Winrock
54. Ms. S. Upadhyaya, Agriculture Economist, Ministry of Agriculture, Kathmandu, Nepal
55. Ms. van\_Etten, Jacobijn, Research Associate, IWMI, Sri Lanka

## **ANNEX II**

## M&E Systems for Evaluating Management Transfer

### Evaluating Process and Performance

Management transfer has been widely accepted as a means of improving the performance of irrigated agriculture in Nepal. The Department of Irrigation through various programs and projects is fully engaged in carrying out this policy of management transfer. It is expected that the end results will be increased agricultural productivity and a decrease in government expenditure on operation and maintenance.

At this point in time, much time and effort are needed to complete management transfer. Yet there is sufficient experience to date that can be reviewed. Two basic questions arise:

1. Is management transfer the right thing to do?
2. Are we doing management transfer right?

The first question relates to the policy of management transfer: Is the policy of transferring management really leading to desired benefits? If the expected and desired impacts are realized, then the policy direction is sound.

The second question relates to the process of management transfer. In Nepal, the management transfer process is young, and several approaches exist. Which of these leads to successful management transfer? Relating the various processes to impacts should help us to better understand which process leads to success.

How are the answers to these questions obtained? Data collection and monitoring activities do exist. Within the HMG/Nepal there are several monitoring systems. The question posed here is: *Do existing M&E systems provide information to answer the above questions?*

### Monitoring and Evaluation (M&E)

To achieve management transfer, a chain of events is visualized. Resources are provided for rehabilitation and modernization. Simultaneously, water users are organized and trained to manage irrigation. Responsive local management combined with appropriate infrastructure results in better water delivery to farmers. Improved water delivery induces more investment in other agricultural inputs leading to increased crop production, or increased value of production from higher value crops. This in

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Key Information Monitored by Different Agencies/Projects.

Indicators	NPC	MOA	DOI			ADB/N <sup>1</sup>	BLGWP	MLIP
			M&E	MIS	IMTP			
1. Climate and river discharge							✓	✓
2. O&M budget monitoring	✓		✓				✓	✓
3. Developed irrigation area	✓	✓	✓	●	✓	✓	✓	✓
4. Canal discharge monitoring			●		✓		✓	✓
5. Institutional information								
— WUA status			✓		✓		✓	✓
— WUA membership					✓		✓	✓
— Water fee collection			✓		✓		✓	✓
6. Agricultural performance								
— Cropped area and intensity			●		✓		✓	✓
— Crop yields			●		✓		✓	✓
— Crop returns (income)			●		✓		✓	✓

Notes: <sup>1</sup>ADB/N information is limited to number of systems (tubewells + surface irrigation) developed each year by district, and also includes partial information on irrigated area.

- ✓ Regularly Monitored information
- Occasionally monitored but often not available

NPC = National Planning Commission  
 MOA = Ministry of Agriculture  
 DOI = Department of Irrigation  
 M&E = Monitoring and Evaluation Unit of System Management Branch  
 MIS = Management Information System Unit

IMTP = Irrigation Management Transfer Project  
 ADB/N = Agricultural Development Bank/Nepal  
 ADB/N = Agricultural Development Bank/Nepal  
 MLIP = Marchawar Lift Irrigation Project

turn leads to increased financial benefits to farmers. Farmers invest in local management to maintain the irrigation system in order to maintain increased returns. From farmers' point of view, more net income is realized. From a national perspective, Nepal receives better returns to its land and water resources, and scarce resources can be diverted from operation and maintenance of irrigation systems to other sectors.

The inputs into the process are financial resources, rehabilitated canals, and training to water users. The expected outcomes and impacts are increased management capacity, better water delivery, better maintenance, non-deterioration of infrastructure, increased productivity and value of production, and a decrease in government expenditures on irrigation management.

At this stage in management transfer, there is considerable experimentation taking place. It is hypothesized that certain combinations of inputs, training, developing a certain type of water users association (WUA), adjusting timing of turnover, and other interventions will lead to the impacts desired. Monitoring during implementation allows for adjustments to be made. Evaluation of results allows verification of hypotheses. When it can be established that a certain combination of inputs leads to success under given conditions, better designs for management transfer can be made in other systems.

M&E systems could be present at several levels. At the irrigation-system level, details of implementation could be monitored and evaluated. At district, regional, and central levels, selected key information could be gathered and evaluated, with

less detail but on more irrigation systems at each higher level. At a central-government level such as the Planning Commission, certain key implementation variables could be monitored to allow for better decisions. A pyramid of information can be envisaged, with more details kept at the system level, and less detailed information, but information from more systems kept at higher levels.

### **Present M&E Systems**

What M&E systems now exist in Nepal that are relevant for evaluating the process and performance of management transfer? A joint RTDB/IIMI study funded by the Ford Foundation was carried out during February–April of 1996 and its results are summarized in the table.

At a glance, it can be noticed that the projects IMTP, BLGW, and MLIP collect the most comprehensive sets of information. The central level units do not regularly monitor the data. The Management Information System Unit (MISU) of DOI was designed and set up to collect and maintain all the information required for the management, including regular monitoring of system performance. Its activities are limited to keeping fragmentary records of irrigation projects, and hence it is not serving the purpose of performance monitoring. The M&E Unit of Systems Management Branch (SMB) has been preparing monitoring reports, but the data is often not received from the field.

The Second Irrigation Sector Project (SISP) virtually has no performance monitoring system at the center. More information is available at regional and district irrigation offices.

What about quality of data? In general, it is easier to measure inputs than outputs. It is easier to track investments in irrigation development than

net benefits to farmers. Quality of information follows the same trend with better quality data on irrigation investments, and decreasing quality of information on production related data.

Where is the best information? The best information is kept at the project level. In particular, projects with active donor involvement keep more complete records and have better quality data. Bhairahawa Lumbini Groundwater Project, Sunsari Morang Irrigation Project, and Marchawar Lift Irrigation Project have a wealth of information. The Irrigation Management Transfer Project now routinely monitors certain impact variables. At Kankai Irrigation System, which receives limited DOI funds, data is available, although not as complete or as well organized as at the donor funded projects. At higher levels, within Systems Management Branch (SMB) or MISU, both quality and quantity of information is insufficient, and campaigns to collect information are sporadic rather than regular.

Where are the strengths? The strength to build on is the fact that much data is being collected. These data are available at project sites, and through many specialized commissioned studies. There is also a desire to obtain this information at various levels, and a recognition of weaknesses in M&E by DOI officials.

Where are the gaps? At least three main gaps can be identified. The first is the lack of data related to outputs. The second is a poor information flow from field level to higher levels, making comparative analysis for policy decisions difficult. The third is a total lack of information on how the water resource is used due to a lack of information on water discharges.

*Output Data:* Here, let us focus on productivity, area served, cropping intensity and overall production. At the project level, time series data can readily be



obtained in only a few cases. While the M&E section of SMB has made occasional efforts, several gaps exist both in time series data and data from several irrigation systems. For the National Planning Commission, the area brought under irrigation is a key focus. But the actual area irrigated season by season, or agricultural production does not form a main part of their monitoring system. Given this status, it is difficult to determine if management transfer is helping agricultural production.

*Information Flow:* For MISU and the M&E Unit of SMB to receive information, they have to actively pursue the information, rather than rely on a regular flow of information from the field. This makes it extremely difficult to maintain a time series of information. Evidently, there is neither great motivation to supply the data, nor can serious actions be taken if the data is not provided.

*Water Flow Information:* Where water is plentiful, information on water flows may not be critical. But, especially during the dry season, in many locations water is insufficient to meet demands. Without water discharge information, effectiveness of water distribution cannot be determined, a water balance cannot be generated to know how water resources are being used, and finally, the productivity of water cannot be determined.

Can existing M&E systems be used to evaluate the process and impacts? The answer is at present clearly no. Adequate information provided by M&E systems is not readily available. Certainly, M&E systems could be upgraded to help provide the answers.

### **How to Proceed**

*A demand for output and impact information needs to come from key decision makers.* When there is little demand for this type of information, there is little motivation to maintain an M&E system. Presently, key decision makers focus on provision of

inputs and budget expenditures. More focus is required on the returns from these inputs.

*Encourage information flows from field level to central level, and feedback from central level to field level.* Collection and reporting of information, as well as development and dissemination of reports from the center, can become part of the regular program of the concerned units to ensure it gets done. Likewise, results obtained from M&E should be made readily available to field offices.

*Assist local management organizations to develop their own M&E systems.* In transferred systems, build capacity for M&E through record keeping. As part of the transfer program, require Water Users Associations to track key variables through their record keeping and submit reports. This will build their capacity to monitor the performance of their system, and could become a part of DOI's monitoring efforts.

*Streamline reporting requirements.* The art of M&E is identifying the minimum required information. The usual practice is to ask for too much information, creating an unnecessary burden on all involved. The approach suggested here is to start with the minimum necessary information, then add more information when it becomes evident that it is required. For outputs, it is recommended that MISU and M&E Unit of SMB focus on O&M budget expenditures by government and farmers, fee collection, area irrigated, cropping patterns, yields and prices of major crops, and inflow into the irrigated area.

*Supplement monitoring information with special research studies.* To identify a successful management transfer process, it will be necessary to develop special studies to determine the links between the process and impacts. Monitoring information should provide clues, then a research hypotheses should be developed and field studies carried out to find answers.

## Rehabilitation and Management Transfer: Current Processes

### Background

Directed by its irrigation policy, the Government of Nepal has initiated several management transfer programs in different state-run public irrigation schemes. Such programs aim at transferring irrigation management responsibilities over to organized farmers, partially or fully.

Invariably, all such programs incorporate a component of rehabilitation. The process through which rehabilitation is done is considered to have a substantial bearing on the implementation of the entire management transfer program and the impacts thereof. There is no standard process for scheme rehabilitation. Also, evidence to suggest an appropriate process for scheme rehabilitation, leading to successful management transfer, is lacking.

### Study Series

To obtain a better understanding of the rehabilitation process in relation to management transfer, a study series has been conceived, focusing on management transfer processes and performance. The main objective of this study series is to identify rehabilitation and modernization processes that lead to successful management transfer. An initial study (RTDB and IIMI 1997) on identification of current rehabilitation processes reviewed the stated processes of irrigation system rehabilitation that are in place in Nepal under management transfer. Further studies would look into the actual implementation process of such programs and the results thereof.

This initial study mainly looked into two aspects of rehabilitation: basis of project/program formulation and the adopted approach. The cases studied, which included both groundwater and surface schemes, are:

- Irrigation Management Transfer Project (IMTP)
- Kankai Irrigation System (KIS)
- Bhairahwa Lumbini Ground Water Project (BLGWP)
- Marchwar Lift Irrigation Project (MLIP)
- Sunsari Morang Irrigation Project (SMIP)
- Handetar Irrigation System (HIS)
- Irrigation Line of Credit (ILC)

### Findings

#### Basis of Project/Program Formulation

The major findings related to the basis of project/program formulation are:

1. All of the management programs are guided by the irrigation policy.

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2. In the majority of cases, scheme rehabilitation works are supported by some external donors.
3. Rehabilitation covers a wide range of work, from repair of headwork and flood damages to development of water courses, and from construction of new water controlling and regulating structures to construction of roads to transport produce from farm to market and to service canals.
4. Rehabilitation activities have the following main purposes:
  - An incentive for beneficiaries to motivate them toward assuming greater management responsibilities
  - Improving effectiveness and serviceability of irrigation and drainage schemes
  - A means of farmer participation
  - A measure for reducing the costs of operation and maintenance activities
5. Rehabilitation works are generally driven by farmers' demands and, in some cases, by the agency's own assessment.
6. All the cases meet the criteria of "minimum" cost sharing as stipulated in the irrigation policy but, there are variations in the upper limits.

### Adopted Approaches

All the cases studied have rehabilitation components and in all of them rehabilitation is done before management transfer. Similarly, formation of local farmers' organizations and their involvement in rehabilitation works are common in all cases. Also, all of them have some form of cost sharing arrangement. However, there are significant differences in the approach to rehabilitation. The key differences in the adopted approaches of the different cases are summarized in the table below.

In all the cases, the management is not transferred immediately after the commissioning of rehabilitation works. There are differences of up to 3 years in the period for management transfer to take place upon completion of rehabilitation works.

The table indicates some procedural variations in the adopted approaches under different projects/programs. SMIP is radically different from the other cases. A major reason for this is that SMIP is a mega project compared to the other projects in the country. The policy also provides for only joint management in such projects in contrast to a complete management transfer. There is no concept of involving the beneficiary farmers in management of the system above the tertiary level. Even below the tertiary level, the program focuses on intensive command area development activities seeking beneficiaries' feedback and cooperation during program implementation. Thus, SMIP is more

### Key Differences in Rehabilitation Approaches

Activity	IMTP	KIS	BLGWP	MLIP	SMIP	HIS	ILC
Need identification by joint walk-through	Yes	Yes	Yes	Yes	No	Yes	Yes
Joint prioritization of identified works	Yes	Yes	No	No	No	Yes	No
Measures for controlling ambitious demands	Yes	Yes	Yes	No	No	No	Yes
Design works in consultation with WUA	No	No	No	No	No	No	No
Construction scheduling in consultation with WUA	Yes	Yes	Yes	Yes	No	Yes	Yes
Contracting to WUA	Yes	Yes	No	Yes	No	Yes	Yes
Loans or mobilization advances to WUA	No	No	No	Yes	No	Yes	Yes
Joint construction supervision	Yes	Yes	Yes	No	No	Yes	Yes
Joint quality control	Yes	No	Yes	No	No	Yes	Yes
Joint commissioning	Yes	Yes	Yes	Yes	No	No	Yes

Note: WUA = Water Users' Association.

inclined toward a *consolidation program* of the irrigation scheme with farmer participation compared to a management transfer program.

The ILC extended its rehabilitation support package to different farmer-managed or agency-managed irrigation schemes. The endeavors of extending support to organized beneficiary farmers in such schemes are driven from the demonstrated successes of the farmer-managed irrigation schemes in Nepal. Further, it had the dual purpose of reducing the burden of operation and maintenance expenses in the completed irrigation schemes and increasing the performance of such schemes through promoting irrigation management activities by the concerned beneficiaries themselves. Accordingly, the program concentrated mostly on small irrigation schemes (that are relatively easier for the farmers to manage) and joint efforts were made at almost each step of program implementation. It was launched as a *package program* and hence there was no process for fixing priority to individual rehabilitation works. Similarly, not much farmer participation was sought in design works. However, before finalizing work, for example, finalizing canal alignment, the respective District Irrigation Offices consult the concerned farmers and discuss the matter in detail.

Activities of MLIP have been modified at different stages of the project's progress and, finally, it has come to a stage where different works related to scheme consolidations are under way and the objective of management transfer is clear. With the same goal, arrangements are being devised by which the water users' group could gain the confidence to take over the management of the irrigation scheme. Most of the activities in this irrigation scheme were implemented through hired national and international consultants and many of the project activities were driven by the consultants and, at many crucial stages, the beneficiaries were not involved to the extent they have been involved in some other projects. It also reflects a case of an *experimental approach* in a project that acquires water through a pump house equipped with technically sophisticated accessories.

The BLGWP has put clear emphasis on management transfer as directed by the irrigation policy. It also has a form of a *package program*, involving no activity like prioritization of identified works related to scheme rehabilitation leading to management transfer. The project has kept itself away from matters such as contracting the construction works to water users' groups. Further, the design works are entirely undertaken by the hired project consultants. In the course of its three stages, the BLGWP has gained enough experience to standardize the design criteria that have proved successful in the project area. Consequently, it was not very interested in seeking farmers' input in design considerations at each step.

The HIS was a laboratory site to *experiment* and thus refine the process of joint management and transfer under the Irrigation Management Project. Accordingly, many of its activities were undertaken on a trial basis. As there was not much experience related to participatory irrigation development in Nepal before the Irrigation Management Project and as the policy emphasizing participatory approach for irrigation development and management first came in 1988, i.e., after almost 2 years of experience with the Irrigation Management Project, the program was mainly based on "learning-by-doing" technique. Contracting work to the water users' association was also done in a very crude manner because, during the time of its implementation, no legitimate process for doing so existed. A formal commissioning of completed works never happened in HIS, and farmers kept on asking for more and more system improvement work even after the completion of all the agreed upon rehabilitation works. As a result, management of HIS was not actually transferred to the water users' association, though it was declared to be so by the agency.

The IMTP, comparatively, is the most recent project and has been able to benefit from the various lessons and experiences gained during similar programs. The project activities are very well articulated and roles and responsibilities of each

party are well stipulated. In addition, IMTP has adopted a *bench-marked* implementation plan that involves some string conditions at different stages of project implementation. In other words, pre-determined achievements must be accomplished, specially on the beneficiaries' part, before further support could be extended to its sub-projects. Thus, the extent of rehabilitation works are linked to some institutional development milestones. IMTP has sought farmers' involvement at each stage of project implementation and has much stronger legal and institutional support that was lacking in other projects/programs. Further, it included the 2 types of a management transfer program, i.e., full turnover and partial turnover through joint management.

The Kankai Irrigation System (KIS) was the first to take the initiative on management transfer with its limited budget provided through the Department of Irrigation. Though the allocated budget is generally meant for undertaking regular operation and maintenance of the irrigation scheme, KIS has made use of the available funds to get some management transfer objectives fulfilled. The approach adopted in KIS is very comparable to that of IMTP. Many of its provisions are based on the IMTP approach. However, KIS does not have the same level of institutional support that IMTP has. The adopted approach is very similar to a *package program*.

Basically, 3 approaches are identified in relation to rehabilitation works associated with management transfer in Nepal. The cases of BLGWP, ILC, SMIP, and KIS have the approach of a *package program*, which is based on a mutual agreement that requires the beneficiaries and the agency to share the work to be done. After completion of the agreed upon works, the management responsibilities are transferred to the respective beneficiaries.

In contrast, the cases of MLIP and HIS have a form of *experimental* approach in which some adjustments and modifications have been made in the course of sub-project implementation.

The IMTP has adopted a *phased and conditional* approach in which different categories of support extended to its sub-projects are linked to some

conditions and milestones of institutional development activities.

### Next Steps

Besides these variations in the envisaged approaches of rehabilitation, one could expect further deviations in the courses of their implementation in the field. So, in order to understand the process of irrigation rehabilitation in relation to management transfer in a better way, the following propositions are suggested. They should be tested during subsequent studies focusing on actual implementation of rehabilitation in the field and on impacts of management transfer.

**Proposition I.**—The method of phasing and conditioning rehabilitation support on some development milestones of local irrigation organizations facilitates the building up of the management capability of the organization.

**Proposition II.**—Contracting construction works to local organizations makes them more effective provided there are sufficient control mechanisms in place.

**Proposition III.**—An effective local irrigation organization aids the process of management transfer.

**Proposition IV.**—Participation of the local organizations in design considerations leads to successful management transfer.

**Proposition V.**—Quality of construction work that satisfies farmers leads to successful management transfer.

**Proposition VI.**—Transfer of management to an effective local organization results in sustainable performance includes of the partially or fully turned over irrigation scheme.

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## Comparative Irrigation Performance Assessment

### BACKGROUND

Over the last few decades, His Majesty's Government of Nepal (HMG), supported by foreign donors, invested substantially not only in the expansion of area under irrigation but also in modernization of existing irrigation infrastructure and management. For example, the Irrigation Management Transfer Project is designed to rehabilitate irrigation systems and turn over the management to the users' groups. Other projects like Marchwar Lift, Bhairawa Lumbini, Sunsari Morang and, Kankai have similar objectives. It is expected that this will lead to higher agricultural production and lower expenses for the government. A proper performance assessment is an essential part of such efforts in order to evaluate achievements and recommend refinements in future programs. In Nepal, this important task is the responsibility of the Research and Technology Development Branch (RTDB) under the Department of Irrigation. The International Water Management Institute (IWMI) is providing support in improving the Monitoring and Evaluation (M&E) data collection and analyzing the collected data. This brief deals with some of the results of a performance study conducted by IWMI in collaboration with RTDB from January to April 1998.

### Performance assessment

In Nepal, performance assessment is often done on a single project basis. Often, the consultant involved in the execution of the project reports on the achievements and benefits of the program. Every program has its own objectives and uses its own measures to evaluate the degree to which the objectives were met. For this reason, a comparison

between systems to obtain an overview of general trends in irrigation performance is difficult. In this study the same indicators were applied to seven schemes in the Terai over a time span of 5 years. A comparison between systems (spatial) and the development of performance over time (temporal) was accomplished.

The main questions to be answered by this comparative performance assessment study are:

- What are the general trends in performance of irrigated agriculture ?
- What are the impacts of management transfer on irrigation performance ?

### METHODOLOGY

#### IWMI's set of standard performance indicators

To answer these questions the choice of appropriate indicators to measure this performance is essential. IWMI identified a set of standard performance indicators, which were tested in several countries (Molden et al. 1998).<sup>1</sup> The main indicators measure the major outputs (agricultural production) against the major inputs of land and water. Additional indicators reflect key features of water control and financial management. The set proved a valuable tool for comparative irrigation performance evaluation and intervention impact assessment. A great advantage of the set is the limited data requirements. The indicators can be computed with basic data on agricultural production, water use, and financial management. These data are generally available from secondary sources.

<sup>1</sup>Molden et al. 1998. Indicators for comparing performance of irrigated agricultural systems. IWMI Research Report 20.

## Indicators used in the study

### Basic Indicators

1. Gross Value of Production per hectare of the command area
2. Gross value of Production per hectare of the irrigated area
3. Gross Value of Production per unit of irrigation supplied
4. Gross Value of Production per unit of water consumed by  $ET_{crop}$

### Additional Measures

1. Relative Water Supply
2. Relative Irrigation Supply

### Financial management

1. Fee collection efficiency
2. Financial self-sufficiency
3. O&M expenditures per unit of land and water

## Description of indicators

For this study, the main performance indicators reflecting land and water productivity were taken from IWMI's set. The additional indicators deviate slightly from the IWMI set to suit the objectives of this study,

taking into account the local circumstances. The indicators used in this study are listed in the box.

## The selected schemes

The indicators were applied to 7 schemes located in the Terai of Nepal. The main monthly temperature varies from 6 to 37 °C. The rainfall averages from 1,300 to 1,900 mm annually of which 80 to 90 percent falls in the monsoon from June to September. In all schemes, efforts to transfer management, fully or partly, to Water Users' Associations (WUAs) are being undertaken or recently completed. Details are provided in table 1.

## RESULTS<sup>2</sup>

### Gross Value of Production per hectare of the command area

The Gross Value of Production (GVP) per unit of command area reflects the land productivity taking into account the whole scheme. Its values depend on crop choice, yields and prices, and also on the cropping intensity.

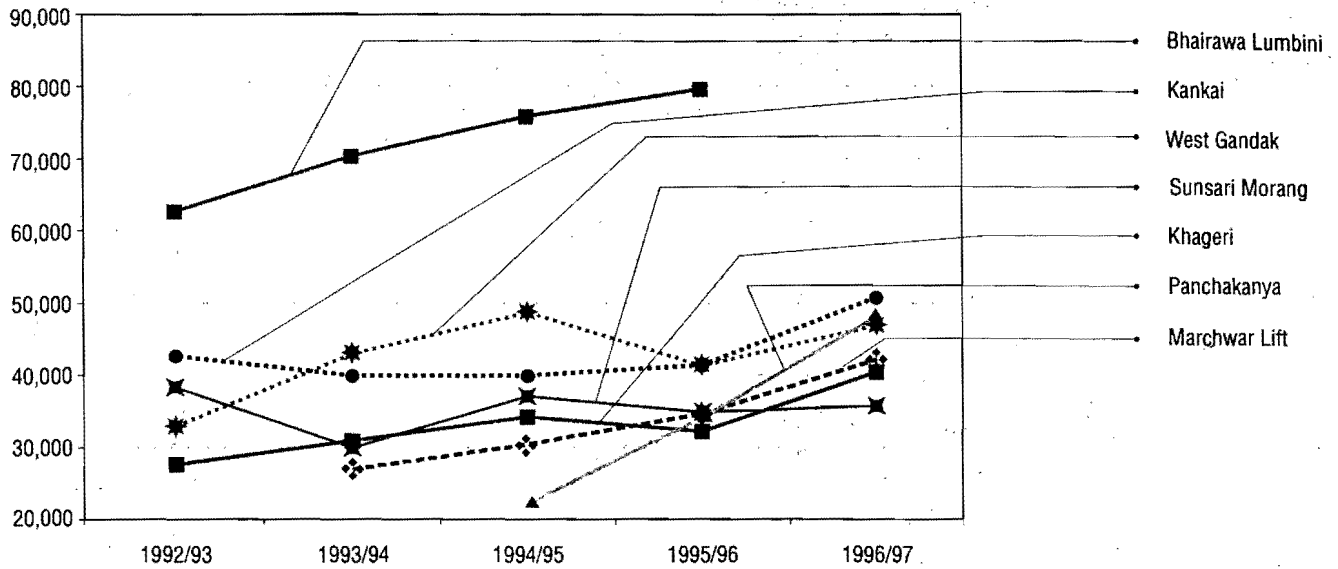
Graph 1 shows that in most schemes the GVP shows a rising trend due to recent efforts of rehabilitation, which in most schemes are still ongoing. In the past years, values fluctuated between Nepal rupees (NRs.) 35,000 and 50,000 per hectare of the command area. In West Gandak, the rising trend

Table 1. Salient features of studied schemes.

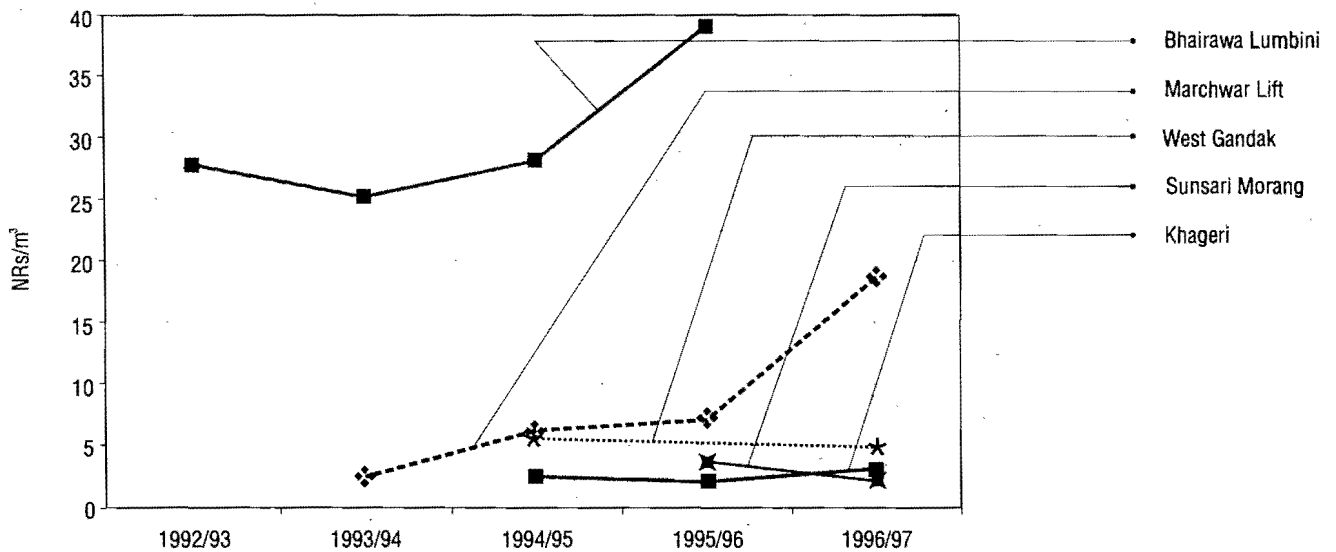
Name	Size (ha)	Type of scheme	Management transfer
West Gandak	10,300	Run of the River	Jointly managed since 1992, fully transferred in September 1997 under IMTP
Panchakanya	600	Run of the River	Fully transferred in November 1997 under the IMTP
Khageri	3,900	Run of the River	Jointly managed since 1992
Kankai	7,000	Run of the River	Jointly managed since 1993
Sunsari Morang II	16,550	Run of the River	Jointly managed since 1994
Marchwar Lift	2,815	Pump from River	Fully transferred in February 1998
Bhairawa Lumbini Groundwater	7,200 (Stage I tube wells)	Groundwater, deep tube wells	Stage I consist of 65 tube wells. Some have been fully transferred, others still are in turnover process.

<sup>2</sup>In this brief, only a selection of indicators is discussed. For a complete description refer to the research paper, "Comparative Performance Assessment in 7 Selected Systems in Nepal" by RTDB & IWMI (Forthcoming).

Graph 1. Gross Value of Production per unit command area.



Graph 2. Gross Value of Production per unit of irrigation supplied.



stabilized (and even dropped because the cropping intensity went down) after 1994/95 when the rehabilitation works completed. It would be interesting to monitor whether the increased level of output in the other schemes can be sustained after the rehabilitation program finishes. The values for Bhairawa Lumbini Groundwater Project (BLGWP) are high due to well-developed crop diversification. The flexible water delivery of individual wells facilitates this diversification.

#### Gross Value of Production per unit of irrigation supplied

This indicator reflects the productivity of one unit of water supplied to the system. Unfortunately in many schemes, especially the run-of-the-river systems, flow records are not always reliable and often fragmented and far from complete. Generally, water flows in the river are highly variable and canal discharges fluctuate accordingly, requiring frequent measurements. Despite



these limitations the general picture as shown in graph 2 is clear. In the run-of-the-river systems, the output is low compared to the groundwater and lift systems. Every additional unit of water supplied involves additional expenditures (mainly energy costs). Hence, there is a direct incentive to reduce the amount of water supplied to a minimum. In run-of-the-river systems, the costs per additional unit of water supplied is close to zero and incentives for individual schemes to divert less water are low. Remarkable is the sharp rise in GVP per unit supplied in the Marchwar Lift Irrigation Project after 1995/96. From then onwards farmers started to contribute to energy expenses to run the pumps. For the WUA this was a strong stimulus to reduce the amount of water pumped. The same happened in Bhairawa Lumbini after 1993 when the project started to turn over part of the tube wells.

### Financial Self-Sufficiency and Fee Collection Rate

All studied schemes are in the process of irrigation management transfer, or are recently been turned over to the users, fully or partially. One of the elements in the management transfer is that users will pay all operation and maintenance expenditures. This is a process of a number of years in which the irrigation service fee will be increased gradually to meet real expenses. The Financial Self-Sufficiency (FSS) reflects the degree to which farmers are bearing O&M expenses.<sup>3</sup> For example, if the FSS is 10 percent, farmers pay 10

percent of all O&M expenses and the government 90 percent.<sup>4</sup> The fee collection rate indicates the percentage of the targeted amount of water fees, actually collected. If all beneficiaries are paying the full amount of their water fees, this value will be 100 percent. Before management transfer, in most schemes farmers were not paying for their water.

Looking at the numbers for the studied schemes presented in tables 2 and 3, one can see that although progress has been made, still a lot has to be done in this area. In the BLGWP, the Irrigation Service Fee (ISF) policy seems most strict: the WUAs of the recently turned over schemes bear the full amount of O&M implying a FSS of 100 percent.<sup>5</sup> Fee collection rates are also high because in groundwater systems it is relatively easy to exclude non-paying beneficiaries from irrigation water supply. The IMTP paid a lot of attention to fee collection and training the WUAs for financial record keeping. These efforts are reflected in rising fee collection rates and rising values of FSS in the IMTP sites (West Gandak, Khageri, and Panchakanya). The lowest values of FSS and fee collection rates are found in Kankai, Marchwar, and Sunsari Morang. Until now, most efforts in the irrigation management transfer process in those schemes focused on rehabilitation works rather than on financial management by the WUAs.

All studied systems are facing problems to raise water fees according to the assessed amount. In most schemes less than half of the fees due was collected.

Table 2. Financial Self-Sufficiency (%).\*

Year	West Gandak	Khageri	Pancha-kanya	Sunsari Morang	Kankai	Marchwar Lift	Bhairawa Lumbini
1996 / 97	—	—	48	4	3	3	—
1995 / 96	10	24	23	2	4	2	—
1994 / 95	4	28	0	0	2	2	—
1993 / 94	2	22	0	0	1	0	—
1992 / 93	0	0	0	0	4	0	49
1991 / 92	0	0	0	0	0	0	44

\*Due to lack of reliable data, labor contributions are not included.

<sup>3</sup>Expenses and contributions can be in cash as well as in labor.

<sup>4</sup>Note that the FSS takes into consideration the actual expenses, which does not necessarily reflects O&M requirements.

<sup>5</sup>Not mentioned in table 2 because some tube wells have been turned over and others not yet. So, it is hard to give a generalization for the whole scheme.

(corrected by inflation) by the government are going down. The contributions of WUAs still are very modest in comparison with overall expenditures and do not fill the gap of declining HMG expenses.

The O&M expenses per unit of land are low in comparison with the Gross Value of Production. In the run-of-the-river systems, the O&M expenses consist of less than 1 percent of the production. Only in Kankai this amounts to 2 percent. Even in both pump systems with high running costs this percentage does not exceed 5 percent. This indicates that the cost of water is small and that high costs should not be a constraint in water fee collection.

## CONCLUSIONS

### Trends in performance

- Agricultural production per unit of land is rising with increased irrigation intensity and improved paddy and wheat yields, likely due to changes in management and rehabilitation.
- Agricultural production per unit of water supplied is rising in both pump schemes because agricultural production is increasing while water supply is getting less. Farmers started economizing water supply after they had to pay part of the energy expenses.
- The Financial Self-Sufficiency reflecting the degree to which WUA are contributing to O&M

expenses is rising over the last few years, but still are far from the targeted 100 percent value.

- The fee collection rates fluctuate considerably per scheme and over the years. Generally, they are low, indicating problems in collecting water fees.
- O&M expenditures per unit of land are declining because the government is allocating less budget and WUA contributions still are modest. Budget allocations per unit land fluctuate considerably from scheme to scheme and the guideline used by the government to determine allocations is not always clear. In general, O&M expenses are low and constitute less than 1 percent of the Gross Value of Production.

### Impacts of irrigation management transfer

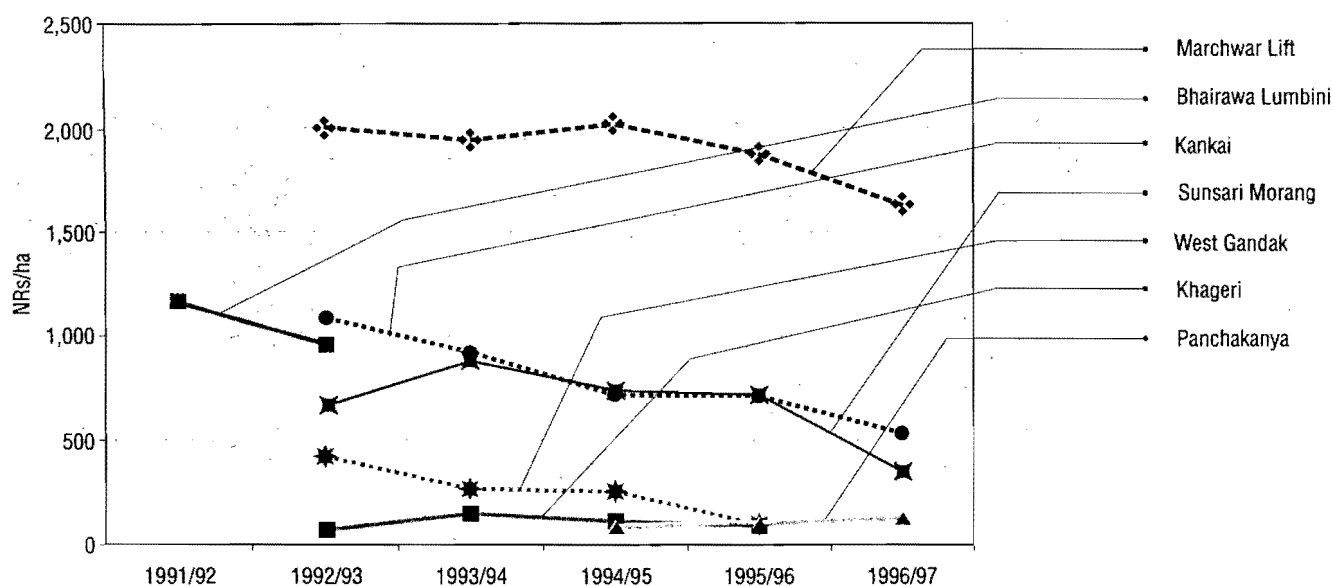
Agricultural production went up, probably largely due to the rehabilitation works carried out as a part of the transfer process. The test of success will be whether the WUAs can sustain and improve performance gains.

Sustainability will largely be a function of the WUAs' ability to fund O&M. Farmers started contributing to the O&M expenditures. However, by far, the major part of the expenses is still being paid by the government. Still, a lot of progress has to be made before farmers will be able to bear the costs to run the system.

Table 3. Fee collection rate (%).

Year	West Gandak	Khageri	Pancha-kanya	Sunsari Morang	Kankai	Marchwar Lift	Bhairawa Lumbini
1996 / 97	48	-	65	24	51	24	-
1995 / 96	37	58	91	27	63	43	-
1994 / 95	-	67	-	2	41	-	-
1993 / 94	-	56	-	-	6	-	-
1992 / 93	-	56	-	-	70	-	91
1991 / 92	-	-	-	-	40	-	89

Graph 3. O&M expenditures per unit command area.



### O&M expenditures per unit of land

Besides evaluating the Financial Self-Sufficiency it is essential to monitor O&M expenditures per unit of land to check whether sufficient resources are being allocated to maintain the system properly. Ideally, one would like to compare O&M requirements with the actual O&M expenses. Unfortunately, realistic assessments of O&M requirements based on maintenance surveys are seldom found. The requirements will differ from scheme to scheme, depending on type and location. In this study actual O&M expenditures per unit of land are monitored.

Graph 3 shows the total O&M expenditures (including WUA contributions) per unit of the command area over the last 5 years. It raises a few concerns. The first is the enormous variation in budget allocation without a clear explanation. The expenses vary roughly from NRs 100 to 2,000 per hectare (all in constant 1995 rupees). Obviously, a river pump system such as Marchwar Lift has higher operational costs due to high energy costs inherent in pump systems. Reasons for the other variations are harder to find. Secondly, there is a clear descending trend in expenditures expressed in constant 1995 rupees. The O&M allocations

## Institutional Arrangement for Supporting Management Transfer

### BACKGROUND

Presently, His Majesty's Government of Nepal, through its Department of Irrigation (DOI), is actively engaged in management transfer programs starting with the Irrigation Management Project in 1986. The Irrigation Management Transfer Project, commenced in 1995, has specifically focused on transferring operation and maintenance responsibilities or ownership of public irrigation systems to farmers in 11 public irrigation schemes. It has already transferred the management of two irrigation systems to the water users' associations (WUAs). Similarly, many of DOI projects or programs such as Irrigation Line of Credit, Irrigation Sector Project, Marchwar Lift Irrigation Project, Bhairahwa Lumbini Ground Water Project, Sunsari Morang Irrigation Project, and Mahakali Irrigation Project have incorporated the theme of management transfer in one way or the other. In addition, some pipeline projects such as Second Irrigation Sector Project and the Nepal Irrigation Sector Project emphasize irrigation system management by local organizations.

The management transfer policy has two main objectives. The first is to reduce the regular government expenditure in operation and maintenance (O&M) in the government-managed irrigation systems, and the second is to attain sustained management and prolonged serviceability of the irrigation systems.

Two major issues appear prominently in recent initiatives made on irrigation management transfer. The first is related to the need for successful implementation of the policy. The second, even more pertinent, is to achieve sustained management of the transferred systems yielding the desired results.

Appropriate institutional and legal frameworks are essential to create a favorable environment for effective performance of transferred irrigation systems and to provide them with a sustainable life. Well-orchestrated government service institutions, legislatures, and policies can safeguard the interest of farmers by regulating legal norms and policies while providing the needed supports. Pertinent questions regarding management transfer in Nepal are:

1. To what extent are the existing government institutions and policies attuned to meeting the current needs of farmers?
2. Are existing institutions and legal provisions adequate for effective performance of the transferred systems?
3. What are the gaps and weaknesses in the prevailing situation?

A recent study by RTDB and IWMI (RTDB and IIMI 1997) on institutional arrangements for supporting management transfer forms a base to explore the related legal and institutional supports.

### IWMI STUDY ON ESSENTIAL TASKS

A recent IWMI study (Vissia and Frederiksen 1997) of management transfer in Sri Lanka, Indonesia, Turkey, Mexico, United States, and Nepal identified essential tasks and support services for management transfer. The study recommends that for successful management transfer, attention should be given to: 1) clearly defined objectives of transfer and assigned responsibilities for both the government and the local irrigation organizations, 2) an appropriate institutional and legal framework with defined land and water rights, 3) functioning irrigation facilities, 4) a water service entity with appropriate authority to perform O&M functions and related services, and collect fees to cover O&M expenses. The study identified the main features of Nepal's water resources development and management systems, before making some recommendations. As identified, the main features are given below.

### POLICIES AND REGULATION

The National Code of Conduct (1963) (Muluki Ain) is essentially the basic code for exercising the right of the public on issues related to water use. The Water Resources Act (1992) provides a basis for utilizing and allocating water based on national preferences and priorities. The Water Resources Regulation (1993) is a legal elucidation of the

Water Resources Act. It facilitates effective implementation of the Act. Similarly, the Irrigation Policy (1997) has been enacted to facilitate development of feasible irrigation schemes with active participation of beneficiary farmers. The policy has also recognized the prime role of the farmers to increase managerial and operational efficiency of the irrigation systems. Most policies and legislatures in water resources sector are new. The detailed implementation procedure of the Irrigation Policy is currently being drafted. There are some other legislatures, acts, and policies that are directly related to water resources development and management and are indirectly related to irrigation development. These legal arrangements address the following aspects related to water use and its management:

**Water Use Right:** The Water Resources Act states that the ownership of water, surface, underground or in whatsoever form available within the country, lies with the government. The right to use water can be obtained from the government by acquiring a license. No person is entitled to use water without obtaining a license from the government, and the licensee is liable to pay a charge or annual fee for utilizing water. The annual fee must be paid to the government. The rates would be fixed by a three-member Service Charge Fixation Committee consisting of a chairperson, a consumer representative and one more member, all nominated by the government. The Committee would fix the rates based on the rate of depreciation, reasonable benefit, way of managing the system, changes in the consumer price index, etc.

The license is both salable and transferable, but the licensee must submit an application to the District Water Resource Committee and obtain permission to do so.

**System Turnover:** The Irrigation Policy has made some definite and clear legislation concerning turnover of irrigation schemes. The major governing factors for implementing turnover policy are based on the size of the systems, consent of WUAs, and the ability of the users to take the O&M responsibilities. Before irrigation schemes/projects are turned over, the government would enter into an agreement with the WUA on scheme rehabilitation or improvement works.

**WUA Formation:** The Water Resources Act avails opportunities to anyone aspiring to use water resources on an institutional basis through a beneficiaries' association, which can be formed and registered locally with the District Water Resource Committee (DWRC). Such arrangements provide a legal basis for the establishment of WUAs. The binding document and regulation for individual WUA activities would depend on the organization itself. The WUA would prepare a constitution amenable to the prevailing legislation.

**Irrigation Service Fees (ISF):** There are sound policies and legal provisions that have laid specific guidelines regarding irrigation service fees both in agency- or farmer-managed irrigation systems. In particular, WUAs in farmer-managed irrigation systems are fully authorized to fix irrigation service fee rates, and collect and utilize the sum. However, in agency-managed irrigation systems, it must be jointly fixed by the project and beneficiaries based on the land type, mode of irrigation system management, its operation and maintenance, and cropping intensity. The rates may vary from one project to the other.

**Water Resource Monitoring:** The DWRC is responsible for monitoring of water resources in each district and for administering the water use license. According to the policy, the government would establish detailed geographic and management information systems, which would be institutionalized and updated over time. It is also expected to guide implementation of related programs in the future.

## GOVERNMENT INSTITUTIONS

The National Planning Commission is the leading agency responsible for the formulation of national level policies and maintaining central level coordination between various programs implemented in the country. It formulates the overall plan for water resources development including irrigation and undertakes related monitoring and evaluation activities.

The Water and Energy Commission Secretariat is also a national level organization responsible for overseeing, studying, researching, and making policies for the development of water resource and energy sectors and their management. It operates as the policymaking and applied research wing under the Ministry of Water Resources.

The Ministry of Agriculture and the Department of Agriculture have the responsibility to provide technical and training support to the farmers to help them realize the ultimate goals of irrigation development in the country. While the ministry is more of a policy making body, the department is more involved in implementation. The agriculture department collaborates with Nepal Agriculture Research Center to develop and test agricultural innovations in different parts of the country.

The National Agriculture Coordination Committee is coordinating arrangement concerning planning, implementation, and monitoring and evaluation of agricultural development activities in the country. The committee is represented by the institutional heads/representatives from the Ministry of Agriculture, Ministry of Water Resources, Department of Agriculture, Department of Irrigation, Department of Livestock Services, Agriculture Development Bank, Agriculture Inputs Corporation, and Department of Cooperative Development and National

Cooperative Society. The Agricultural Development Bank is also intensively involved in extending credits for the development of farmer-managed irrigation systems and tube well programs. There is also a provision for the District Agricultural Coordination Committee to function at the district level.

The DOI, under Ministry of Water Resources, is the main government agency involved in irrigation development of the country. The DOI, with a central office in the Kathmandu valley, has 5 regional directorates, 75 District Irrigation Offices and about two dozens of other project offices. The District Irrigation Offices are the key agencies to undertake irrigation development activities at the district level. They are also responsible for regular O&M of the irrigation systems in the respective districts. In many cases, District Irrigation Office personnel work in association with beneficiaries' organizations for O&M activities. These offices play a vital role in the implementation of joint management or system turnover policies. They also have the responsibility of building up the capability of local WUAs to get them involved in the joint management activities.

The Water Resources Act has made provision for forming a DWRC in each district. It would deal with licensing to individuals or groups aspiring to use water resources. It is to work as a coordinating agency for transferred irrigation systems in terms of providing the required institutional and legal supports.

Besides various district line agencies, the district administration and local development offices are additional local agencies that are supposed to provide necessary support in local development endeavors. The Village Development Committees are the lowest level political bodies responsible for village level development and their roles in local development initiatives are vital.

## ISSUES

Through the above discussion on policies, regulations, and institutions it can be seen that there has been much effort in attempting to create an enabling institutional environment for irrigation, and this effort should be appreciated. Major questions at this point are the degree to which these are implemented, and the effectiveness of implementation.

The focus of this discussion is on the institutional arrangements that will allow local organizations, including management transfer systems and farmer managed irrigation systems, to function. It addresses the question: After transfer what do we do? As identified in the global IWMI study, three important areas are identified: water rights, government support institutions, and local water service organizations.

**Water Rights:** Firm water rights provide a more predictable environment for the WUAs and farmers to

function. It is difficult enough to plan given the uncertainties of climate, but it is more difficult when water use rights are not secured.

Defined and secured water rights are critical at two levels: within an irrigation system, and between other irrigation systems and other users. Within an irrigation system, individuals may have rights either registered with a government, or decided by the organization managing the system. At another level, rights could be defined along a river, where different parties—organization of irrigation water users, industry, municipal, and others—have a right to use water. Generally, within the management transfer sites, rights are embedded in the water allocation procedure. Some transfer sites use a share system giving a right to use water, and an obligation to pay. Nepal does have a tradition of using local means as well as courts to define and defend rights (IWMI 1997).

The IWMI/RTDB study for Nepal identified the following weaknesses:

- Lack of a firm water right for newly formed WUAs.
- Insufficient public awareness regarding water rights.
- Inadequate definition of the amount of water to be received in the licensing procedure.
- Inadequate functional capability of the DWRC.

The DWRC is mandated to license water to transferred systems as well as to other users of water. With increasing demands and competition for water, this is a critical role. At present, there are practical problems of stating how much water the different users are to receive, how to monitor the entitlements, and how to enforce the rights in case there are violators.

**Government Support:** After transfer, there remain several functions related to water management that the government could provide. The most difficult of these are the regulatory framework and broad oversight required to managing the nation's water resources. This involves a water monitoring system, a water rights system with effective enforcement of these rights, and monitoring and enforcing compliance with water quality standards. The main goals of transferring management are to improve productivity of irrigation and to reduce government O&M expenditures. If the government totally drops support for newly formed WUAs, it is unlikely that productivity increases can be sustained. A shift of government services in irrigation from day-to-day operations to roles of policy formulation, regulation, oversight, and provision of other support to WUAs is required. This has been partially carried out in Nepal, but there remains a clear need for more attention to implementation of existing laws, acts

and regulations, including monitoring and enforcement. The IWMI/RTDB study identified weaknesses in:

- Implementation of existing laws, including monitoring and enforcement of these laws.
- Lack of commitment from high-level politicians and senior administrators to policies and programs.

Managing a complex irrigation system is not something that a local organization can do overnight. There is considerable trial and error, and learning involved. Facilitation and training of newly formed WUAs after transfer can speed up this process. And, in some cases, it could make the difference between success and failure. Typically, transferred systems have a different infrastructure than traditional farmer-managed irrigation systems. Support to WUAs in the form of advice and training will become increasingly important. At the same time, learning through research is required to understand where needs are, and how to solve real problems.

**Local Water Service Organizations:** There remain policy and regulation issues that need to be resolved to assist local water service organizations. The research pointed out that:

- The ISF fixation committee was not functioning as conceived and not even formed in many cases.
- ISF collection by WUAs has been far less than sufficient.
- The WUA's legal stand is not clear, thus the degree to which they can take actions is not clear.

It is expected that the WUA must, on its own accord, carry out functions of water distribution, and setting and collecting fees. Of crucial importance is the need to be able to levy penalties or place other sanctions when rules related to these activities are not followed. In order to do these, the WUA requires legal empowerment. More clarity is required on what the WUAs may and may not do.

### **SUGGESTED PRIORITY AREAS**

There has been much progress in the area of developing irrigated areas and improving their management. With increasing competition for water, the need for more production and profitability, and the need for social equity and justice, more consideration should be given to appropriate government functions. There has been progress in defining regulations and policies, but less progress in their implementation. Four priority areas are suggested:

**Operationalize existing legislation and strengthen existing institutions:** Presently, there are many good

policies and regulations, and well-conceived institutions. Effort should be placed on enforcing existing regulations, and strengthening existing institutions. Based on this experience of action, revisions can be made. Refining policies and regulations will require close monitoring and research in these areas, and an ability to adapt.

**Defining and enforcing water rights:** A stable right for newly formed organizations is of utmost importance. This task is far from trivial, as a practical means of monitoring and enforcing rights needs to be developed. An important consideration will be the recognition of existing users, and the recognition of local means of dealing with water rights.

Water Rights are vital for sound water resources management to keep water supplies from being over appropriated, and to eliminate the vulnerability of users from increased demands from more powerful users. Effective water rights programs reduce the opportunity for political pressures to override bureaucracies, and for bureaucracies to override the productive and equitable behavior of the water users. The report recommends that water rights should be clearly spelled out for the transfer to succeed, and that water rights programs should be administered by an agency separate from water resources development agencies.

**Providing post-transfer support to WUAs:** It is likely that it will take time after transfer for the WUAs to be fully functional. Technical advice and facilitation will help the process. Consideration should be given to a mixture of government agencies, NGOs, and the private sector to fulfill this function. For this support, focus should be placed on improving the service provided, obtaining support from outside agencies, and improving management capabilities.

**Obtaining legal clarity on issues about WUA empowerment:** Clear legal guidelines are required to set the bounds for WUA actions.

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## सिंचाई व्यवस्थापन हस्तान्तरणको मूल्याङ्कनको लागि अनुगमन तथा मूल्याङ्कन पद्धति

### प्रक्रिया र प्रतिफल मूल्याङ्कन

नेपालमा सिंचाई व्यवस्थापन हस्तान्तरण प्रक्रियालाई सिंचित कृषिबाट प्राप्त हुने प्रतिफलमा उल्लेख्य सुधार गर्ने माध्यमको रूपमा स्वीकार गरिएको छ । श्री ५ को सरकार, सिंचाई विभागले विभिन्न कार्यक्रम र आयोजनाको माध्यमबाट व्यवस्थापन हस्तान्तरणलाई सशक्त रूपमा कार्यान्वयन गर्दै आएको छ । यसबाट कृषि उत्पादकत्वमा वृद्धि हुनुको साथै सिंचाई प्रणालीको मर्मत सभार र संचालनको लागि लाग्ने सरकारी खर्चमा पनि कटौती हुने अपेक्षा गरिएको छ ।

अहिलेको परिस्थितिमा व्यवस्थापन हस्तान्तरण कार्यक्रमलाई सफल तुल्याउन प्रशस्त समय र प्रयत्नको आवश्यकता छ। तथापि हालसम्मको अनुभवको आधारमा यसबाट प्रशस्त जानकारी हासिल गर्न सकिन्छ । यस्मा दुईवटा आधारभूत प्रश्नहरू उठाउन सकिन्छ :

१. के सिंचाई व्यवस्थापन हस्तान्तरण गर्नु उपयुक्त कदम हो?
२. के सिंचाई व्यवस्थापन हस्तान्तरण सही तरिकाले गरिएको छ?

पहिलो प्रश्न सिंचाई व्यवस्थापन हस्तान्तरण गर्ने नीति सित सम्बन्धित छ : के हस्तान्तरण गर्ने नीति अवलम्बन गरेबाट अपेक्षित फाइदाहरू प्राप्त गर्ने दिशा तर्फ हामी उन्मुख भएका छौं त ? यदि अपेक्षित उपलब्धिहरू हासिल भएका छन् भने मात्र नीतिको सार्थकता रहन्छ ।

दोश्रो प्रश्न व्यवस्थापन हस्तान्तरण प्रक्रिया सित सम्बन्धित छ : हाल नेपालमा सिंचाई व्यवस्थापन हस्तान्तरण प्रक्रिया शैशव अवस्थामा छ र यसको कार्यान्वयनमा भिन्न भिन्न तरिकाहरू अपनाइदै आएका छन् । यस्ता विभिन्न प्रक्रियाबाट परेको प्रभाव मूल्याङ्कन - अध्ययन बाट सफलता प्राप्तिको लागि उत्कृष्ट प्रक्रियाको पहिचान गर्न सघाउ पुग्दछ ।

यी प्रश्नहरूको उचित उत्तर कसरी प्राप्त गर्ने त? श्री ५ को सरकारका विभिन्न निकायमा अनुगमन प्रणालीको सूत्रपात गरिएको र यसबाट तथ्याङ्क संकलन गर्ने परिपाटी

पनि अपनाइदै आएको छ । यस प्रसङ्गमा पुनः अर्को प्रश्न खडा हुन्छ: के विद्यमान अनुगमन तथा मूल्याङ्कन प्रणालीबाट माथि उठाइएका प्रश्नहरूको उत्तर मिल्न सक्छ?

### अनुगमन तथा मूल्याङ्कन (अ.मू.)

सिंचाई व्यवस्थापन हस्तान्तरणलाई सार्थक पार्न पंक्तिवद्ध रूपमा विभिन्न कार्यहरू कार्यान्वयनको लागि पहिचान गरिएका छन् । सिंचाई प्रणालीको भौतिक संरचना सुदृढीकरण र आधुनिकीकरणको लागि आवश्यक स्रोतको व्यवस्था गरिन्छ । साथै जल उपभोक्ताहरूलाई संगठित गर्ने र प्रणाली व्यवस्थापन कार्य क्षमता अभिवृद्धि गर्न उनीहरूलाई तालिमको व्यवस्था पनि गरिन्छ । उत्तरदायी स्थानीय व्यवस्थापन र सुधारिएको भौतिक संरचनाबाट सुचारु रूपमा किसानको खेतमा पानी पुर्‍याउन सजिलो पर्ने हुन्छ । पानी वितरणमा अपेक्षित सुधारबाट किसानलाई अन्य उत्पादन सामग्रीमा बढी लगानी गर्न अभिप्रेरित गर्छ जसबाट कृषि उत्पादनमा वृद्धिका साथै फाइदाजनक बालीहरू लगाउन समेत सघाउ पुग्दछ । अन्ततः यसबाट किसानको आय आर्जनमा वृद्धि हुन्छ । बढ्दो आमदानीबाट किसानले प्रणाली व्यवस्थापन र मर्मत सुधारमा बढी लगानी गर्न सक्छ र यसबाट बढ्दो कृषिजन्य आयश्रोतको व्यवस्थालाई निरन्तरता दिन सकिन्छ । तसर्थ हस्तान्तरण कार्यक्रमबाट स्थानीय स्तरमा सिंचाईको मर्मत संचालन भई किसानको आमदानी बढ्ने, राष्ट्रिय स्तरमा देशको कृषियोग्य जमिन र पानीको श्रोतको अधिकतम सदुपयोग हुनुको साथै सरकारको सीमित साधन र श्रोतलाई सिंचाई प्रणालीको मर्मत सुधारको सट्टा अन्य विकास निर्माणका काममा लगाउन सकिने हुन्छ।

**अनुसन्धानको माध्यमबाट नेपालको सिंचाई व्यवस्थापन हस्तान्तरण कार्यक्रमको प्रविधिक प्रक्रिया सम्बन्धमा विकसित गन्तव्य नीतिगत पहलहरू चारे संक्षिप्त जानकारी दिने उद्देश्यले शुरू गरिएको अनुसन्धान कार्यक्रमको यो पहिलो अंक हो । यो अनुसन्धान कार्यको फाइदा रानको आर्थिक अनुदानमा सिंचाई विभागाको अनुसन्धान तथा प्रविधि विकास शाखा र अन्तर्राष्ट्रिय सिंचाई व्यवस्थापन संस्थाको सहायता पुरा सवाट गरिएको छ ।**



विभिन्न निकाय/आयोजना द्वारा अनुगमन गरिदै आएका मूलभूत सूचकाङ्कहरू

सूचकाङ्क	रा.यो.आ.	कृ.म.	सि.वि.			*कृ.वि.बैंक	भे.सु.भू.ज.प.	म.सि.सि.प्र.
			अ.भू.	व्य.सू.प्र.	सि.व्य.ह.आ.			
१. हावापानी र नदीमा पागिको बहाव							✓	✓
२. मर्मत तथा संचालन खर्च	✓		✓				✓	✓
३. सिंचित क्षेत्रफल	✓	✓	✓	•	✓	✓	✓	✓
४. नहरमा पानी मापन			•		✓		✓	✓
५. संस्थागत जानकारी								
- ज.उ.स.को अद्यावधिक स्थिति			✓		✓		✓	✓
- ज.उ.स.मा सदस्यता					✓		✓	✓
- सिंचाई सेवा शुल्क संकलन			✓		✓		✓	✓
६. कृषिबाट उपलब्धि								
बाली लगाइएको क्षेत्रफल र बाली सघनता			•		✓		✓	✓
- बाली उत्पादन			•		✓		✓	✓
- बालीबाट आयदानी			•		✓		✓	✓

दृष्टव्यः\* कृषि विकास बैंकबाट प्रत्येक वर्ष विभिन्न जिल्लामा विकास गरिएको (टयुबवेल + सतह सिंचाई) प्रणाली मध्येबाट आंशिक सिंचित क्षेत्रफल सहित सीमित सूचकाङ्कको मात्र अनुगमन गरिन्छ ।

• नियमित रूपमा अनुगमन गरिएको

• यदाकदा अनुगमन गरिएको तर धेरै जसो जानकारी उपलब्ध नहुने

रा.यो.आ. : राष्ट्रिय योजना आयोग

कृ.म. : कृषि मन्त्रालय

सि.वि. : सिंचाई विभाग

अ.भू. : प्रणाली व्यवस्थापन शाखा अन्तर्गतको अनुगमन तथा मूल्याङ्कन ईकाई

व्य.सू.प्र. : व्यवस्थापन सूचना प्रणाली ईकाई, सिंचाई विभाग

सि.व्य.ह.आ. : सिंचाई व्यवस्थापन हस्तान्तरण आयोजना

कृ.वि.बैंक : कृषि विकास बैंक, नेपाल

भे.सु.भू.ज.प. : भैरहवा लुम्बिनी भूमिगत जल परियोजना

म.सि.सि.प्र. : मर्चवार लिफ्ट सिंचाई प्रणाली

व्यवस्थापन हस्तान्तरण प्रक्रिया अन्तर्गत पर्ने मुख्य लगानीमा वित्तीय श्रोतको व्यवस्था, सुदृढीकरण गरिएका नहर प्रणाली र जल उपभोक्ताहरूलाई तालिमको व्यवस्था पर्दछन् । अपेक्षित उपलब्धि र प्रभावमा ज.उ.स.को कार्य क्षमता वृद्धि, पानीको उचित वितरण प्रणाली, मर्मत सभारमा सुधार, भौतिक संरचना भत्कने विग्रने प्रक्रियामा कमी, बढी कृषि उत्पादकत्व र उत्पादन एवं मर्मत सभार र संचालनमा विभिन्न थरिका लगानीको समिश्रण, तालिम कार्यक्रम, निश्चित तौर तरिकाबाट जल उपभोक्ता संस्थाको गठन, हस्तान्तरण गर्ने समय निर्धारणमा लचकता र सम्बन्धित अन्य लगानीबाट समेत अपेक्षित फाइदा लिन सकिन्छ भन्ने मान्यता रहेको पाइन्छ । तसर्थ कार्यक्रमको मूल्याङ्कनबाट उल्लेखित मान्यताको औचित्यबारे निष्कर्षमा पुग्न मद्दत मिल्न जान्छ। जब खास खास लगानीको समिश्रणबाट विद्यमान परिस्थितिमा सफलता पाउन सकिन्छ भन्ने जानकारी प्राप्त हुन्छ, त्यसपछि अन्य सिंचाई हस्तान्तरण कार्यक्रम सञ्चालन गर्ने दिशामा प्रक्रियागत सुधार गर्न सकिन्छ ।

अनुगमन तथा मूल्याङ्कन विभिन्न तहमा गर्न सकिन्छ । सिंचाई प्रणालीको हकमा कार्यक्रम कार्यान्वयनको विस्तृत अनुगमन र मूल्याङ्कन गर्न सकिन्छ । जिल्ला क्षेत्र र केन्द्रीय स्तरमा पहिचान गरिएका केही मुख्य मुख्य जानकारी

संकलन र मूल्याङ्कन गर्न सकिन्छ, जस्मा सिंचाई प्रणालीको विस्तृत विवरणको सट्टा सीमित विवरण लिने तर धेरै प्रणालीलाई समावेश गर्ने परिपाटी अपनाउन सकिन्छ । राष्ट्रिय योजना आयोग जस्तो केन्द्रीय स्तरको निकायको हकमा केही महत्वपूर्ण र कार्यान्वयन पक्ष सित सम्बन्धित कुराहरू मात्र अनुगमन गरेर पनि उचित निर्णय प्रक्रियामा पुग्न सकिन्छ । यसर्थ समुच्चमा हेर्दा अनुगमनबाट प्राप्त जानकारीले एउटा पिरामिडको स्वरूप लिन सक्छ जस्मा विस्तृत विवरण तल्लो तह अर्थात् सिंचाई प्रणालीमा राखिन्छ भने माथिल्लो तह अर्थात् केन्द्रमा सीमित विवरण राख्ने तर धेरै प्रणालीहरू समावेश गर्ने परिपाटी अपनाउन सकिन्छ।

विद्यमान अनुगमन तथा मूल्याङ्कन प्रणालीहरू

सिंचाई व्यवस्थापन हस्तान्तरण प्रक्रिया र प्रतिफल मूल्याङ्कनको लागि हाल नेपालमा विद्यमान अनुगमन र मूल्याङ्कनको व्यवस्था के कस्तो छ त भन्ने जानकारी लिन फोर्ड फाउण्डेशनको आर्थिक अनुदानमा सिंचाई विभागको अनुसन्धान तथा प्रविधि विकास शाखा र अन्तर्राष्ट्रिय सिंचाई व्यवस्थापन संस्थाको संयुक्त तत्वावधानमा २०५३ साल माघ (सन १९९६ को फरवरी) देखि वैशाख (अप्रिल) सम्म एक अध्ययन कार्य गरिएको थियो र सो बाट प्राप्त संक्षिप्त विवरण माथिको तालिकामा दिइएको छ ।

भट्ट हेर्दा उक्त तालिकाबाट के छर्लङ्ग हुन्छ भने सिंचाई व्यवस्थापन हस्तान्तरण बारे भैरहवा लुम्बिनी भूमिगत जल र मर्चवार लिफ्ट आयोजनाहरूले धेरै जसो विवरणहरू नियमित रूपमा संकलन गरेका छन् । केन्द्रीय स्तरका ईकाईहरूले आवश्यक तथ्याङ्कहरू नियमित रूपमा संकलन गरेको पाइँदैन । सिंचाई विभागको व्यवस्थापन सूचना प्रणाली ईकाई व्यवस्थापन सम्बन्धी सूचना संकलन र संरक्षण गर्नुकासाथै सिंचाई प्रणालीहरूको प्रभावकारिता अनुगमन गर्ने उद्देश्यले स्थापना भएको देखिन्छ, तापनि यस्तो हाल सम्म यदाकदा प्राप्त हुने जानकारी मात्र संकलन गर्ने र प्रणालीको प्रभावकारिता मूल्याङ्कन गर्ने दिशामा खासै सेवा पुर्‍याउन सकेको छैन । यस्तै प्रणाली व्यवस्थापन शाखा अन्तर्गतको अनुगमन तथा मूल्याङ्कन ईकाईले पनि अनुगमन सम्बन्धी प्रतिवेदनहरू तयार गर्दै आएका पनि आवश्यक अद्यावधिक तथ्याङ्कहरू फिल्ड अथवा प्रणालीहरूबाटै नियमित रूपमा प्राप्त गर्न सकेको छैन ।

दोश्रो सिंचाई सेक्टर आयोजना अन्तर्गत केन्द्रीय स्तरमा प्रभावकारिता मूल्याङ्कन गर्ने व्यवस्था नै छैन । क्षेत्रीय र जिल्ला स्तरबाट विविध जानकारी लिन भने सकिन्छ।

प्राप्त तथ्याङ्कको गुणस्तर कस्तो छ त ? प्रणालीमा भएको लगानी नाप्न जति सजिलो छ त्यसबाट प्राप्त प्रतिफल बारे भन्न त्यतिकै असजिलो पर्छ । सिंचाई विकासमा विभिन्न चरणमा भएका खर्चको फाटवारी दिन सजिलो हुन्छ तर सो लगानीबाट किसानले कति फाइदा पायो त भन्न त्यति सहज हुँदैन । यसै अनुरूप प्रणालीको विकासमा लागेको लागतको तथ्याङ्क जति गुणस्तर युक्त छ उत्पादन क्षेत्रमा भएका उपलब्धि बारे प्राप्त जानकारीको गुणस्तर त्यतिकै कमजोर र त्रुटिपूर्ण छ ।

सबभन्दा बढी भरपर्दो जानकारी कहाँ पाइँन्छ त ? सबभन्दा बढी भरपर्दो जानकारी प्रणाली तहमा नै प्राप्त हुन्छ । खास गरेर ती सिंचाई आयोजनाहरू जुन कुनै दातृ संस्थाको सहयोगमा कार्यान्वित भएतापनि तिनबाट बढी गुणस्तर युक्त र यथेष्ट जानकारी दिने तथ्याङ्क पाउन सकिन्छ। भैरहवा लुम्बिनी, सुनसरी मोरङ्ग र मर्चवार लिफ्ट सिंचाई आयोजना (जुन दातृ संस्थाको सहयोगमा संचालित छन्) मा प्रशस्त तथ्याङ्कहरू संकलन गर्ने गरेको पाइँन्छ । सिंचाई विभागको आफ्नै सीमित श्रोतबाट संचालित कन्काई सिंचाई प्रणालीले पनि प्रशस्त तथ्याङ्कहरू राख्ने गरेको पाइँन्छ तापनि कुनै दातृ संस्थाले सहयोग गरेको आयोजनाको तुलनामा ती जानकारीहरू आफैमा पूरा र व्यवस्थित छैनन्। त्यस्तै प्रणाली व्यवस्थापन शाखा र सूचना प्रणाली ईकाईमा

संकलित तथ्याङ्कहरू अपर्याप्त र पूर्ण गुणस्तरयुक्त छैनन्, साथै तथ्याङ्क संकलन अभियान नियमित नभई यदाकदा मात्र गर्ने गरेको पाइँन्छ ।

बलिया पक्ष केही छन् कि ? थप विकासको लागि बलियो पक्ष के छन् भने धेरै तथ्याङ्कहरू संकलन गर्ने परिपाटी छ। यस्ता तथ्याङ्कहरू आयोजना स्थलमा र विभिन्न अध्ययन प्रतिवेदनहरूमा उपलब्ध छन् । विभिन्न तहमा तथ्याङ्क बारे जिज्ञासा रहेको छ र अनुगमन तथा मूल्याङ्कन प्रणालीमा कमी कमजोरी छन् भन्ने कुरालाई सिंचाई विभागको नेतृत्व पत्तिले महशुस पनि गरेको छ ।

समस्या कहाँ छन् त ? यस्तो लागि कम्तिमा ३ मुख्य क्षेत्र पहिचान गर्न सकिन्छ : १) लगानीको तुलनामा प्राप्त उपलब्धि बारे कम जानकारी हुनु २) आयोजना स्थलबाट माथिल्लो तह सम्म तथ्याङ्कहरू उपलब्ध गराउने परिपाटी नियमित नहुनु (यसबाट नीतिगत निर्णय गर्नमा बाधा पुगेको छ) र ३) उपलब्ध पानीको मात्रा सम्बन्धी तथ्याङ्कको अभावमा जलश्रोतको उपयोगिता बारे जानकारीको कमी ।

उपलब्धि सम्बन्धी तथ्याङ्कहरू: अहिलेलाई उत्पादकत्व, सिंचाई सेवा पुगेको क्षेत्रफल, बाली सघनता र कूल उत्पादनमा ध्यान केन्द्रित गरौं । केही सीमित आयोजना स्थलमा यी तथ्याङ्कहरू खास समयको लागि उपलब्ध छन् । यद्यपि प्रणाली व्यवस्थापन शाखाबाट तथ्याङ्क प्राप्तिका लागि विभिन्न समयमा प्रयासहरू भएका छन् तथापि समयावधिक तथ्याङ्कका साथै कतिपय सिंचाई प्रणालीबाट त साधारण तथ्याङ्क प्राप्त गर्न पनि कठिनाई भएको पाइँन्छ । राष्ट्रिय योजना आयोगको मुख्य अभिलेखि सिंचित क्षेत्रफलमा रहेको पाइँन्छ। तथापि वर्ष भरिका विभिन्न मौसमी खेती र सो अनुसारको बाली प्रणालीमा हुने गरेको सिंचित क्षेत्रफल र कृषि उत्पादन बारे अनुगमन गर्न खास जोड दिइएको देखिँदैन। यस्तो परिस्थितिमा व्यवस्थापन हस्तान्तरणबाट कृषि उत्पादनमा सघाउ पुगे/नपुगेको किटेर भन्न कठिन छ ।

सूचना प्रवाह: प्रणाली व्यवस्थापन शाखाको अनुगमन तथा मूल्याङ्कन ईकाई र व्यवस्थापन सूचना प्रणाली ईकाईले तथ्याङ्क प्राप्त गर्ने फिल्डबाट नियमित रूपमा उपलब्धि हुन्छ भनी अपेक्षा राख्नु भन्दा आफ्नै अग्रसरतामा सूचना भित्र्याउने तर्फ सक्रियता साथ लाग्नु पर्छ । अन्यथा नियमित रूपमा तथ्याङ्क संकलन र संचय गर्ने आधार अत्यन्त क्षीण देखिन्छ । स्पष्टतः फिल्ड तहमा तथ्याङ्कहरू उपलब्ध गराउने बारे प्रेरणामा कमी छ र यसरी सूचना नदिएमा पनि खासै कारवाही गर्न सकिने पनि देखिँदैन ।

पानीको बहावमात्रा सम्बन्धी जानकारी : प्रशस्त पानी उपलब्ध भएको अवस्थामा पानी सम्बन्धी तथ्याङ्कको खासै महत्त्व नहुन पनि सक्छ । तर गर्मी याममा धेरै जसो ठाउँमा पानीको माग अनुसारको आपूर्ति हुँदैन । उपलब्ध पानीको मात्रा थाहा नपाइकन, पानी वितरण प्रणालीलाई प्रभावकारी बनाउन सकिँदैन । पानीको श्रोत कसरी प्रयोग भई राखेको छ र प्रयोग भएको र उपलब्ध पानीको हिसाब मिलाउन धारै स्पष्ट जानकारी नहुने हुँदा जलश्रोतको उत्पादकत्व बारे पनि यसै भन्न सकिने अवस्था रहँदैन ।

के विद्यमान अनुगमन तथा मूल्याङ्कन प्रणालीबाट हस्तान्तरण कार्यक्रमको प्रक्रिया र प्रभाव बारे मूल्याङ्कन गर्न सकिन्छ? अहिलेलाई यसको जवाफ नकारात्मक बाहेक अर्को हुँदैन । अनुगमन तथा मूल्याङ्कन प्रणालीबाट प्राप्त सम्पूर्ण जानकारी सजिलोसित प्राप्त गर्न सकिँदैन । यसर्थ अनुगमन तथा मूल्याङ्कन प्रणालीलाई व्यवस्थित गरी सम्बन्धित ईकाईहरूलाई बढी सक्षम बनाउनु नै यस्ता समस्याको समाधान गर्ने उपाय हुनेछ ।

अब अघि कसरी बढ्ने त ?

लगानीबाट प्राप्त उपलब्धि र प्रभावकारिता बारे जानकारीको माग योजनाविद् र निर्णयकर्ताहरूबाट आउनु पर्छ । जब यस किसिमको जानकारीको माग न्यूनरूपमा हुन्छ, अनुगमन तथा मूल्याङ्कन प्रणालीलाई सुदृढ बनाउने प्रेरक तत्व पनि कमजोर पर्छ । अहिलेको स्थितिमा निर्णयकर्ताहरूको जोड लगानी र बजेट खर्चमा नै सीमित रहेको पाईन्छ । लगानीको अनुपातमा हुने उपलब्धिमा जोड दिनु नितान्त आवश्यक हुन्छ ।

फिल्ड तहबाट केन्द्रमा सूचना प्रवाह गर्ने र सो को मूल्याङ्कनको आधारमा केन्द्रबाट फिल्डमा आवश्यक सुझाव सल्लाह दिने परिपाटी अपनाउनु पर्छ ।

फिल्ड तहबाट तथ्याङ्क संकलन गरी केन्द्रमा पठाउने र केन्द्रले प्रतिवेदन तयार गरी सो को जानकारी र सुझाव फिल्डमा पठाउने परिपाटी नियमित कार्यक्रम अन्तर्गत समावेश गर्न सकिन्छ । त्यसरी अनुगमन तथा मूल्याङ्कनबाट प्राप्त नतिजाहरू पनि फिल्ड अथवा तत्त्वो तहका कार्यालयहरूलाई उपलब्ध गराउनु पर्छ ।

स्थानीय तहका संघ संस्थाहरूलाई आफ्नै अनुगमन तथा मूल्याङ्कनको व्यवस्था गर्न सहयोग दिने - हस्तान्तरित सिंचाई प्रणालीमा अभिलेख राख्ने कार्य दक्षतामा अभिवृद्धि गरी अनुगमन तथा मूल्याङ्कन प्रणालीमा स्थानीय तहमै सुधार ल्याउन सकिन्छ । हस्तान्तरण कार्यक्रमको परिधि भित्र ज.उ.स.ले मुख्य मुख्य बुँदाहरूको रेकर्ड राख्ने र प्रतिवेदन तयार गर्ने कुरालाई समावेश गर्न सकिन्छ । यसबाट ज.उ.स. को आफ्नो प्रणालीको प्रभावकारिता अनुगमन गर्ने कार्य क्षमतामा वृद्धि हुने र सिंचाई विभागको अनुगमन तथा मूल्याङ्कन कार्यलाई टेवा दिन पनि सकिन्छ ।

प्रतिवेदन दिनु पर्ने बाध्यतालाई मूल प्रवाहमा समाहित गर्ने - अनुगमन तथा मूल्याङ्कन यस्तो कला हो जसबाट आधारभूत न्यूनतम आवश्यक जानकारी बारे पहिचान गरिन्छ। साधारणतया यस प्रक्रिया अन्तर्गत थुप्रै जानकारी बटुल्ने गरिन्छ जसबाट काम गर्ने व्यक्तिलाई अनावश्यक बोझ भएको महशुस हुन्छ । तर यहाँ सुझाइएको उपाय त्यसबाट पृथक छ । त्यो हो शुरुमा आवश्यक न्यूनतम जानकारी मात्र लिने र क्रमशः आवश्यकतानुसार थप जानकारी लिने परिपाटी विस्तार गर्ने । प्राप्त उपलब्धिको हकमा व्यवस्थापन सूचना प्रणाली ईकाई र प्रणाली व्यवस्थापन शाखाको अनुगमन तथा मूल्याङ्कन ईकाईले हाललाई मर्मत संभारको बजेट र त्यसमा श्री ५ को सरकार र किसानहरूले व्यहोरेको अंश, सिंचाई सेवा शुल्क संकलन, सिंचित क्षेत्रफल, बाली प्रणाली, उत्पादन र मुख्य मुख्य बालीको बजार मूल्य र प्रणालीमा उपलब्ध पानीको मात्रा बारे तथ्याङ्क संकलन गर्नु उचित हुनेछ ।

विशेष अध्ययनको आधारमा अनुगमनको लागि थप व्यवस्था-सिंचाई व्यवस्थापन हस्तान्तरणको सफल प्रक्रियागत पहिचानको लागि आवद्ध प्रक्रिया र त्यसबाट परेको प्रभावको अन्तर सम्बन्ध बारे बुझ्न विशेष खालको अध्ययनको आवश्यकता हुन सक्छ । अनुगमनबाट प्राप्त जानकारीको आधारमा अध्ययनको मार्ग प्रशस्त हुने र सो अनुसार मान्यता स्थापित (Hypothesis) गरी अधि बद्धा अनुत्तरित प्रश्नहरूको जवाफका साथै प्रक्रियागत कुराहरूको अन्तर सम्बन्ध बारे बुझ्न पनि सघाउ पुग्नेछ ।

## सुदृढीकरण र व्यवस्थापन हस्तान्तरण: वर्तमान प्रक्रियाहरू

### भूमिका

श्री ५ को सरकारको सिंचाई नीतिले निर्देशन गरे अनुसार सरकारद्वारा संचालित कतिपय सिंचाई प्रणालीहरूमा व्यवस्थापन हस्तान्तरण कार्यक्रमहरू प्रारम्भ गरिएका छन् । सिंचाई व्यवस्थापन सम्बन्धी पूरा वा आंशिक दायित्व किसानहरूको संगठित संस्थालाई सुम्पिनु नै यी कार्यक्रमहरूको मुख्य लक्ष हो ।

सम्बन्धित सबै प्रणालीहरूमा यस्ता कार्यक्रमहरू मध्ये सिंचाईका भौतिक संरचनाहरूको सुदृढीकरण गर्नु एक प्रमुख अङ्गको रूपमा रहेको पाइन्छ । सुदृढीकरणको लागि सबैलाई मान्य हुने कुनै निर्दिष्ट प्रक्रिया छैन तथापि सम्पूर्ण व्यवस्थापन हस्तान्तरण कार्यक्रमको कार्यान्वयन र त्यसको प्रभावकारितामा सुदृढीकरण प्रक्रियाको अहम् भूमिका रहने गर्दछ । हाल सम्म सफल हस्तान्तरणको लागि सिंचाई प्रणालीको सुदृढीकरणको प्रक्रियाको कुनै उदाहरणीय नमूना पनि विद्यमान छैन ।

### अध्ययन श्रृङ्खला

व्यवस्थापन हस्तान्तरण कार्यान्वयनको क्रममा सुदृढीकरण प्रक्रिया बारे गहन जानकारी हासिल गर्न श्रृङ्खलाबद्ध रूपमा अध्ययन गर्ने अवधारणा लिइएको र यस क्रममा विशेष जोड व्यवस्थापन हस्तान्तरणको तरिका र प्रतिफलमा दिइएको छ । अध्ययनको मुख्य उद्देश्य प्रणाली सुदृढीकरण र आधुनिकीकरण सम्बन्धी प्रक्रियाहरूको पहिचान गर्नु रहेको छ जसबाट व्यवस्थापन हस्तान्तरण कार्यक्रमलाई सफल बनाउन सकियोस् । अनुसन्धान तथा प्रविधि विकास शाखा र अन्तर्राष्ट्रिय सिंचाई व्यवस्थापन संस्थाले हाल हस्तान्तरण कार्यक्रम कार्यान्वयन भएका प्रणालीहरूमा २०५४ माघ तिर (सन १९९७ को शुरुमा) प्रकाशित गरेको प्रारम्भिक चरणको अध्ययन प्रतिवेदन अनुसार सुदृढीकरणको लागि वर्तमानमा अपनाइएका प्रक्रियाहरू लाई पहिचान गरिएकोछा अध्ययन गरी यस पछिको अध्ययनमा वास्तविक कार्यान्वयन प्रक्रिया र त्यसबाट प्राप्त नतिजा बारे ध्यान दिइनेछ ।

यो प्रारम्भिक अध्ययन खास गरी सुदृढीकरण सम्बन्धी दुई विशेष पक्षमा केन्द्रित गरिएको छ: १) कार्यक्रम तर्जुमा गर्दा अपनाइएका आधार र २) अङ्किकार गरिएको तौर तरिका । यो सतह सिंचाई र भूमिगत सिंचाई दुवै संलग्न हुने गरी निम्न प्रणालीहरूमा अध्ययन गरिएको थियो ।

- सिंचाई व्यवस्थापन हस्तान्तरण आयोजना (सि.व्य.ह.आ.)
- कन्काई सिंचाई प्रणाली (क.सि.प्र.)
- भैरहवा लुम्बिनी भूमिगत जल परियोजना (भै.लू.भू.ज.प.)
- सुनसरी मोरङ सिंचाई योजना (सु.मो.यो.)
- हाडेटार सिंचाई प्रणाली (हा.सि.प्र.)
- इरिगेशन लाइन अफ क्रेडिट (आई.एल.सी.)

### प्राप्त नतिजाहरू

आयोजना/कार्यक्रम निर्माणका आधार

आयोजना/कार्यक्रम निर्माण सित आवद्ध मुख्य नतिजाहरू निम्न छन् :

१. सबै हस्तान्तरण कार्यक्रमहरू सिंचाई नीतिबाट निर्देशित छन् ।
२. अधिकतर प्रणालीहरूमा सुदृढीकरण कार्यहरू बाहिरी दातृ संस्थाहरूको सहयोगमा संचालित छन् ।
३. सुदृढीकरण अन्तर्गत व्यापक निर्माण सुधार कार्यहरू समावेश हुन्छन् जस्तै बाँध मर्मत र बाढीबाट पुगेको क्षतिमा सुधार, नहर/नहरीको विकास, पानी नियन्त्रण तथा बहाव नियमित गर्ने संरचनाहरूको निर्माण, नहर

अनुसन्धानको माध्यमबाट नेपालको सिंचाई व्यवस्थापन हस्तान्तरण कार्यक्रमको प्रतिफल प्रक्रिया सम्बन्धमा विदेशीमा गुतागुता नीतिगत पक्षहरू बारे संक्षिप्त जानकारी दिने उद्देश्यले शुरू गरिएको श्रृङ्खलाबद्ध कार्यक्रमको यो दोस्रो अंक हो । यो अनुसन्धान कार्य 'फोर्ड' फाउन्डेसनको आर्थिक अनुदानमा सिंचाई विभागको अनुसन्धान तथा प्रविधि विकास प्रास्ता र अन्तर्राष्ट्रिय सिंचाई व्यवस्थापन संस्थाको संयुक्त प्रयासबाट गरिएको छ ।

संचालन र सर सामान साथै खाद्यान्न ओसार पसारको लागि ग्रामीण सडक ।

४. सुदृढीकरण सम्बन्धी कामका निम्न उद्देश्यहरू हुन्छन् :
  - उपभोक्ताहरूलाई सिंचाई प्रणाली व्यवस्थापनको दायित्व वहन गर्न अभिप्रेरित गर्ने उद्देश्यले सुविधा दिनु
  - सिंचाई र निकास सम्बन्धी प्रणालीका संरचनाहरूको असर र सेवा स्तरमा सुधार गर्नु ।
  - उपभोक्ता सहभागिताको माध्यम
  - मर्मत संभार र संचालन खर्चमा कटौती गर्ने माध्यम
५. सामान्य सुदृढीकरण सम्बन्धी कामहरू किसानहरूको मागको आधारमा गरिन्छन्, केही खास अवस्थामा मात्र प्राविधिकको निर्णयलाई अवलम्बन गरिन्छ ।
६. सिंचाई नीतिमा प्रावधान भए अनुसार उपभोक्ताहरूबाट सवै प्रणालीमा न्यूनतम प्रतिशत खर्च व्यहोरिन्छ, भने बढीमा कुनै सीमा तोकिदैन ।

### पटलनमा ल्याइएका तौर तरिकाहरू

अध्ययन अन्तर्गतका सवै सिंचाई प्रणालीमा सुदृढीकरण कार्यक्रम समावेश गरिएकोछ र यो कार्य व्यवस्थापन हस्तान्तरण हुनु भन्दा अगाडि गरिन्छ । त्यसरी नै जल उपभोक्ता संस्थाको गठन र सुदृढीकरण कार्यमा उक्त संस्थाको संलग्नता पनि सवै प्रणालीमा अनिवार्य गरिएको छ । यस्तै

सुदृढीकरणको लागि लाग्ने कुल लागत खर्च ज.उ.स. र श्री ५ को सरकारले आपसी सम्झौता द्वारा व्यवस्था गरी आ - आफ्नो भागमा परेको अंश व्यहोर्ने प्रावधान पनि सवै प्रणालीमा रहेको पाइन्छ । यसरी केही साभ्ना पक्ष भए पनि कतिपय भिन्नता पनि यी प्रणालीहरूको हस्तान्तरण प्रक्रियामा विद्यमान छन् । तल संलग्न तालिकामा केही यस्ता पक्षहरू प्रस्तुत गरिएकाछन् ।

कुनै पनि प्रणालीमा सुदृढीकरण कार्य पछि आवश्यक छिटफुट सुधार गरिन्छ । व्यवस्थापन हस्तान्तरण तुरुन्तै गरिदैन र सुदृढीकरणको ३ वर्ष पछि सम्म पनि हस्तान्तरण प्रक्रिया चालू रहेका उदाहरणहरू छन् ।

संलग्न तालिकाबाट के पनि स्पष्ट हुन्छ भने व्यवस्थापन हस्तान्तरणको लागि अपनाइएको तौर तरिकामा केही प्रक्रियागत भिन्नता पाइन्छ । यस अर्थमा सुनसरी मोरङ सिंचाई योजना विशेषतः भिन्नै प्रकारको देखिन्छ । यसको मुख्य कारणमा यो योजना देशको अन्य सिंचाई प्रणालीहरूको तुलनामा निकै ठूलो आकारको भएर पनि हुन सक्छ ।

सिंचाई नीति अनुसार पनि यस्ता ठूला योजनाहरूको सम्पूर्ण व्यवस्थापन ज.उ.स.लाई हस्तान्तरण गर्नुको सट्टा श्री ५ को सरकार र ज.उ.स.ले संयुक्त रूपमा गर्ने प्रावधान रहेको छ। यो योजनामा उपभोक्ताहरूलाई प्रशाखा भन्दा माथि (शाखा, मूलनहर, बाँध) को व्यवस्थापनमा सहभागी गराउने अवधारणा हाल सम्म राखेको पाइदैन । प्रशाखा तह भन्दा तल पनि हस्तान्तरण कार्यक्रमले सघन सिंचित क्षेत्रफल विकासमा मात्र उपभोक्ताको सहयोग र सुभावको अपेक्षा राखेको छ । यसर्थ सुनसरी मोरङ सिंचाई योजनामा उपभोक्ताहरूको मुख्य भूमिका योजना अन्तर्गत सिंचित क्षेत्रफलको एकिकृत

### सुदृढीकरण सम्बन्धी तौर तरिकामा महत्वपूर्ण भिन्नताहरू

कार्यक्रम	सि.व्य.ह.आ.	क.सि.प्र.	भे.लु.ज.प	म.सि.सि.प्र.	सु.मो.सि.यो.	हडिटेर सि.यो.	आई.एस.सी.
संयुक्त भ्रमणद्वारा आवश्यकता पहिचान	छ	छ	छ	छ	छैन	छ	छ
संयुक्त रूपमा प्राथमिकता निर्धारण	छ	छ	छैन	छैन	छैन	छ	छैन
सुधारको लागि बढी माग नियन्त्रण प्रक्रिया	छ	छ	छ	छैन	छैन	छैन	छ
ज.उ.स. को सल्लाह अनुसार डिजाइन	छैन	छैन	छैन	छैन	छैन	छैन	छैन
ज.उ.स. को सल्लाह अनुसार निर्माण तालिका	छ	छ	छ	छ	छैन	छ	छ
ज.उ.स.लाई ठेक्का दिने प्रावधान	छ	छ	छैन	छ	छैन	छ	छ
ज.उ.स.लाई श्रम अथवा पेशकी	छैन	छैन	छैन	छ	छैन	छ	छ
संयुक्त रूपमा निर्माण रेखबेख	छ	छ	छ	छैन	छैन	छ	छ
संयुक्त रूपमा गुणस्तर नियन्त्रण	छ	छैन	छ	छैन	छैन	छ	छ
संयुक्त रूपमा निर्माण सुधार	छ	छ	छ	छ	छैन	छैन	छ

गरिएका छन् र संलग्न पक्षहरूको भूमिका र दायित्व स्पष्टसंग किटान गर्ने जमर्को गरिएको छ । साथै आयोजनाले यस सम्बन्धमा कार्यान्वयनका विभिन्न चरणमा केही आधारभूत शर्तहरू निर्धारण गरेको छ जसबाट अगाडिको काम शुरु गर्न उपभोक्ताको तर्फबाट उक्त शर्त अनुसारको दायित्व पूरा परिसक्नु पर्ने हुन्छ । भौतिक सुदृढीकरण सम्बन्धी कामलाई संस्थागत विकास संग आवद्ध गरिएको छ । पहिलेका व्यवस्थापन हस्तान्तरण कार्यक्रमहरूको तुलनामा सि.व्य.ह.आ. को कार्यान्वयन प्रचलित कानूनी र संस्थागत मान्यताको आधारमा भएकाछन् र आयोजनाको हरेक चरणमा उपभोक्ताको सहभागिताको अपेक्षा गरिएको छ । साथै आयोजनाले संयुक्त व्यवस्थापन र सम्पूर्ण व्यवस्थापन हस्तान्तरण गरी २ प्रकारका कार्यक्रम एक साथ संचालन गरेको छ ।

कन्काई एक मात्र त्यस्तो सिंचाई प्रणाली हो जस्मा सिंचाई विभागले आफ्नो श्रोतबाट उपलब्ध गराएको सीमित बजेटबाट व्यवस्थापन हस्तान्तरण कार्यक्रम संचालन गरिएको छ । यद्यपि यसरी विनियोजित बजेट प्रणालीको मर्मत संभार र संचालन लागि मात्र दिइएको हो तथापि प्रणालीले यस बजेटको रकम व्यवस्थापन हस्तान्तरणको उद्देश्य प्राप्तिका लागि योग्यमा ल्याएको छ । कन्काईमा अपनाइएको कार्यान्वयन विधि सि.व्य.ह.आ. सित मिल्दा जुल्दो छ । सि.व्य.ह.आ.मा जस्तो प्रचुर मात्रामा संस्थागत सहयोगितालाई मा उपलब्ध छैन । अवलम्बन गरेको कार्यान्वयन प्रक्रिया एकमुष्ट (Package Program) को रूपमा रहेको देखिन्छ ।

सिंचाई व्यवस्थापन हस्तान्तरण गर्ने क्रममा प्रणालीको सुदृढीकरणको लागि नेपालमा मूलतः ३ प्रकारका तरिका अपनाइएको देखिन्छ । भैरहवा लुम्बिनी, आई.एल.सी., सुनसरी मोरङ्ग र कन्काई सिंचाई प्रणालीहरूमा एकमुष्ट कार्यक्रम विधि अवलम्बन गरिएको छ जस अन्तर्गत उपभोक्ता र श्री ५ को सरकारले आपसी समझदारीमा गर्नु पर्ने कामको बाडफाड गर्दछन् । यसरी पहिचान गरिएका काम पूरा भएपछि प्रणालीको व्यवस्थापन सम्बन्धी दायित्व सम्बन्धित ज.उ.स.लाई हस्तान्तरण गरिन्छ ।

यसको विपरित मर्चवार र हाडेटार सिंचाई प्रणालीहरूमा प्रयोगात्मक तरिका अपनाइएको छ, जस्मा कार्यक्रम कार्यान्वयनको क्रममा निर्दिष्ट विधिमा केही संशोधन/परिमार्जन गरिएको पाइन्छ ।

सि.व्य.ह.आ.ले चरणबद्ध रूपमा सशर्त कार्यान्वयन विधि अपनाएको छ जस अनुसार आयोजना लागू भएका सिंचाई प्रणालीहरूमा प्रदान गरिने सुदृढीकरण सित सम्बद्ध सहयोगको स्वरूप संस्थागत विकासको कार्यक्रमसित आवद्ध गरिएको हुन्छ ।

### अनूसन्धानको अर्को चरण

प्रणाली सुदृढीकरणको लागि माथि उल्लेखित कार्यशैली बाहेक फिल्डमा कार्यान्वयनको क्रममा निर्दिष्ट मार्गबाट अर्भै वायादाया लाग्न सक्ने परिस्थितिको सिर्जना हुन सक्छ। तसर्थ व्यवस्थापन हस्तान्तरणको लागि प्रणाली सुदृढीकरण प्रक्रियालाई अर्भै गहिरिएर बुझ्न तल केही प्रस्तावनाहरू प्रस्तुत गरिएको छ । यस पछि गरिने अध्ययनमा व्यवस्थापन हस्तान्तरणको कार्यान्वयन पक्षमा विशेष जोड दिई यी प्रस्तावनाहरूको औचित्यको परीक्षण गर्नु पर्दछ ।

प्रस्तावना १: सुदृढीकरण प्रक्रियालाई श्रृङ्खलाबद्ध रूपमा विभाजन गरी संस्थागत विकासको क्रमसित आवद्ध गर्ने शर्त राख्दा ज.उ.स.को प्रणाली व्यवस्थापन गर्ने कार्य क्षमता बृद्धि गर्न सघाउ पुचाउछ ।

प्रस्तावना २: आवश्यक नियन्त्रणको व्यवस्था द्वारा प्रणाली सुदृढीकरणको लागि ठेक्का पट्टा सम्बन्धित ज.उ.स.लाई दिदा ज.उ.स. बढी प्रभावकारी सिद्ध हुन्छ ।

प्रस्तावना ३: प्रभावकारी ज.उ.स. व्यवस्थापन हस्तान्तरण प्रक्रियाको सफल कार्यान्वयनमा सहायक सिद्ध हुन्छ ।

प्रस्तावना ४: सुदृढीकरणको लागि डिजाइन गर्दा ज.उ.स. को सहभागिता सफल व्यवस्थापन हस्तान्तरणको लागि कारक तत्व हुन्छ ।

प्रस्तावना ५ : उपभोक्तालाई सन्तुष्टि दिने खालको गुणस्तर युक्त कार्यबाट व्यवस्थापन हस्तान्तरणमा सघाउ पुग्छ ।

प्रस्तावना ६: सशक्त ज.उ.स. को संलग्नता भएको संयुक्त व्यवस्थापन वा व्यवस्थापन हस्तान्तरण कार्यक्रम द्वारा सिंचाई प्रणालीबाट प्राप्त हुने प्रतिफलमा बृद्धि गर्न र उक्त बृद्धिलाई निरन्तरता प्रदान गर्न सकिन्छ ।