

PN ABT-564

97001

HIMACHAL PRADESH

POLICY OPTIONS FOR PARTICIPATORY IRRIGATION MANAGEMENT

Farmer Organisations and
Organisational and Procedural Changes

GOHP

IRRIGATION AND PUBLIC HEALTH DEPARTMENT
AND AGRICULTURE DEPARTMENT

in collaboration with

ISPAN

IRRIGATION SUPPORT PROJECT
FOR ASIA AND THE NEAR EAST

Sponsored by the U.S. Agency for International Development

ISPAN

IRRIGATION SUPPORT PROJECT FOR ASIA AND THE NEAR EAST

ISPAN Technical Support Center
Suite 300
1611 North Kent Street
Arlington Virginia 22209-2102
U S A
Phone (703) 247-8730
Fax (703) 525-9137

INTEGRATED IRRIGATION MANAGEMENT RESOURCES

Camp Dresser & McKee International Inc. (PRIME CONTRACTOR)
CARE

Cornell University

Development Alternatives, Inc.

Harza Engineering Company

International Science and Technology Institute, Inc.

Training Resources Group

The University of Arizona

Consulting Engineering Services (India) Pvt. Ltd.

HIMACHAL PRADESH

POLICY OPTIONS FOR PARTICIPATORY IRRIGATION MANAGEMENT

**Farmer Organisations and
Organisational and Procedural Changes**

October 1994

GOHP

**IRRIGATION AND PUBLIC HEALTH DEPARTMENT
AND AGRICULTURE DEPARTMENT**

in collaboration with

ISPAN

**IRRIGATION SUPPORT PROJECT
FOR ASIA AND THE NEAR EAST**

Sponsored by the U.S. Agency for International Development

CONTENTS

EXECUTIVE SUMMARY	iii
ACRONYMS AND TERMS	ix
1. BACKGROUND	1
Introduction	1
The State	2
Development of Irrigation	3
Agencies Involved in Irrigation	3
Effort to Involve Farmers in Irrigation	5
Hill Areas Land and Water Development Project	5
Farmer Organisation Development Programme	6
Organisational and Procedural Changes Made by GOHP	8
2. EXPERIENCES	11
Type of Irrigation Schemes	11
Comparison of Tubewell Schemes and High Lift (Surface Water) Schemes	31
Role of Women	31
Organisational, Procedural and Attitudinal Changes	32
3. LESSONS LEARNED	37
4. RECOMMENDATIONS	43
5. NEXT STEPS	47

TABLES

1. HALWD Project Irrigation Schemes	12
2. Sample Irrigation Schemes	14
3. Crops and Yields in Panog	16
4. Impact of Irrigation on Cropping Pattern in Behrampur	17
5. Salient Features of Sample FIS with Long Idle Length	19
6. Crops and Yields in Dhanag	21
7. Salient Features of Sample High Lift LIS	23
8. Crops and Yields in Masal	25
9. Crops and Yields in Sainj	27

ANNEXES

A.	Map of Himachal Pradesh	51
B.	Important Features of Himachal Pradesh	53
C.	Details of HALWD Project Irrigation Schemes	55
D.	Analysis of O&M Expenses and Farm Income Data of FIS and LISs	57
E.	Memorandum of Association	59
F.	References	67

EXECUTIVE SUMMARY

This study reviews experiences with farmer organisations for irrigated agriculture which were created by the Government of Himachal Pradesh under the USAID-assisted Hill Areas Land and Water Development Project (HALWD) from 1984 to 1992. Though community-managed irrigation systems have long existed in Himachal Pradesh, some 90 percent still being farmer-managed, the state invested heavily on the construction of new irrigation projects in the post-Independence era. The responsibility fell largely on the IPH Department, the principal line agency for irrigation, which constructed and managed the state own irrigation schemes. It was soon realized that state ownership of irrigation systems without the full involvement of farmers creates many problems. One noted in Himachal Pradesh as elsewhere in India the gross underutilization of irrigation resources.

The participatory approach advocated by HALWD was implemented under the Farmer Organisation Development Program (FODP) and resulted in tangible improvements. For instance, water utilization increased from 34 percent in the government-managed irrigation systems to 67 percent in the FODP schemes. Impressed by these results, the Government of Himachal Pradesh decided to adopt the participatory approach developed under FODP.

The purpose here is to examine how KVSs functioned, the issues that influence their promotion and sustainability, and to draw lessons that may help the government formulate and implement a reasoned irrigation policy. Data are drawn from an in-depth survey of all the 24 FODP irrigation schemes against a backdrop of the 878 schemes implemented under HALWD. A few traditional and government schemes were surveyed for the purposes of comparison.

Classification of Irrigation Schemes

Irrigation schemes in Himachal Pradesh can be classified in four categories. Community schemes are the most numerous but irrigate less than one-third of the irrigated land. In recent years, the AD and RD constructed and rehabilitated them. Flow irrigation (FIS) with a long idle length constitutes one-fourth of all schemes and irrigate about one-third of the land. The high lift irrigation schemes (LIS) and tubewell schemes (TWS) taken together account for less than one-quarter of all schemes and account for less than one-third of the irrigated area. The FISs and LISs are technologically more complex. The latter are especially costly to maintain and beyond the means of small farmers. The IPH operates and maintains the FIS and the LIS schemes. Both the IPH and AD construct tubewells. They are easier for farmers to operate than the LISs but are not as simple as the community schemes.

Management Complexity

The government constructs and takes the full responsibility for the maintenance of all but the community-managed schemes. Under FODP, however, farmers were asked to look after the maintenance and water distribution of the outlet command of the government systems. This they did, but they were unwilling to take responsibility for the entire system because of the high cost of maintenance which varies, at current prices, from Rs. 550 to Rs. 5,500 per hectare. In some cases, the cost of repairs is more than the incremental income from irrigation. Added to this is the difficulty in carrying out maintenance of the FISs and LISs. FISs pass through difficult terrain which is subject to erosion and landslides. The replacement and repair of the pump, motor, and pressure pipe of the LISs require some technical expertise besides access to repair facilities. Taken as a whole, the FIS, LIS and TWS are difficult for farmers to manage entirely on their own without training and financial assistance.

Management Capability

Farmers manage irrigation systems quite well with regard to water distribution, collecting funds, mobilising maintenance, settling disputes, and obtaining know-how and farm inputs. There should not be any serious difficulty in their taking over the management of the entire irrigation system, whether flow or lift schemes. The most obvious limitation is their ability to meet the cost of repairs. However, should the government offer full or a substantial portion of the O&M funds it commits annually to the maintenance of schemes, farmers might be more willing to take over the responsibility. In the long run, the government may be able to save on maintenance expenditures and provide better service to farmers if all those schemes where farmers are willing are handed over to them. FOI did not address this issue, but the experience with farmers during the implementation of FODP supports such an inference. The nature and quantum of financial and supervisory assistance farmers need will have to be determined.

Role of the KVS

In general, the KVS served admirably the twin functions of irrigation management and agriculture development. All KVSs contributed the costs of construction in addition to the regular membership fees, carried out repairs, met frequently to sort out issues of common interest, settled conflicts and distributed water according to plans they had developed on their own. From the outset farmers demonstrated a keen interest in acquiring know-how about farm inputs once they were certain about the availability of water. They managed water because their main interest was in increasing income. There was allround success in this regard. Farm incomes increased between Rs. 800 to Rs. 1,700 per ha. The main contributor to incomes was vegetable farming which requires

high quality seeds, fertilizers and pesticides and, above all, market outlets. Without access to markets irrigated agriculture in Himachal Pradesh does not have an exciting future.

KVS operations brought out the important role of women in agriculture and irrigation and revealed an important limitation. Not having title to land, women are not admitted to the executive committee of a KVS. The KVSs have not been able to make use of their potential.

Role of the Government

The administrative apparatus created to implement HALWD and FODP worked quite well. Prior to HALWD, there had been minimal interaction between line departments and the farmers. FODP brought them together in a working relationship which helped strengthen the KVSs and, in turn, improved the performance of most irrigation schemes. However, the administrative system was disbanded as soon as FODP was terminated in 1992. Within months the KVSs began to lose their functional capability. They operated in a niche they had found between irrigation and agriculture, but they could not survive on their own.

An administrative system for follow up and assistance is an essential component of a strategy designed to create stable and self-reliant farmer organisations. Experience alone will show how long it might take, in the normal course, for KVSs in Himachal Pradesh to acquire the capacity to survive on their own. The positive role of the government and the principal line agency in this direction is indisputable.

Recommendations

The experiences with KVSs suggest what needs to be done in future to support the efforts of the government of Himachal Pradesh. Some recommendations are noted below:

- Farmer participation should form an integral part of all irrigation schemes, small and big, right from the planning stage.
- The Himachal Pradesh Irrigation Act, already under review, may be amended to provide for the possibility of the turnover of irrigation systems to farmers. As part of the act, the respective obligations of the farmers and the government need to be stated, KVSs given legal status and financial resources, and the areas of responsibility of the government and the water users as regards O&M spelled out.

- An interdepartmental administrative apparatus needs to be created at the state level to provide continued follow-up assistance to KVSs. As part of this administrative set-up, responsibility centres (administrative units) need to be identified in each sub-division so that KVSs can contact officers for assistance and guidance.
- The prevalent view of the KVS as a village-based organisation needs to be broadened to include the possibility of a two- or three-tiered organisation which covers all of the villages served by an irrigation system. Accordingly, the functions of the different tiers will need to be defined so that each level supports the other to make farmer management effective.
- All new lift schemes should be routinely operated for fixed hours every day in the entire system so that farmers gain confidence in the dependability of irrigation supplies.
- The government should try to turnover the management of the entire irrigation system from the source to the farm fields to the KVS. Since the maintenance of some schemes is far beyond the capacity of farmers to cover, the government may consider creating a special KVS O&M fund to which the government and farmers make yearly contributions. KVSs should draw from the fund to pay for annual repairs which they cannot pay for on their own and for the salaries of the service staff currently on the government payroll.
- The important role of women in irrigated agriculture as members of the executive committee of a KVS needs to be formalized. Any disabling legal provisions in this regard, such as the requirement of having title to land to be a member, should be removed.
- The state government should establish a unit to design training modules and conduct training programmes for farmers and line agency staff.

Next Steps

To accelerate the transfer process, the following steps deserve consideration on a priority basis. The GOHP should:

- amend the existing water laws of the state to provide for farmer-managed irrigation systems leading eventually to turnover

- consider creating a KVS O&M fund and reimburse the management costs wherever farmers are willing to take over the entire irrigation system on terms acceptable both to the government and the KVS
- create a permanent unit, similar to the FODP Unit of HALWD, to deal with problems faced by the KVSs and to facilitate the turnover process
- take the necessary steps to provide adequate, dedicated funding on an ongoing basis for participatory irrigation management

ACRONYMS AND TERMS

AD	Department of Agriculture
AE	Assistant Engineer
ADO	Agriculture Development Officer
ASCO	Assistant Soil Conservation Officer
CCA	Cultivable Command Area
CD	Chak Development
CGWB	Central Ground Water Board
chak	Outlet command
cusec	Cubic feet per second
DC	Deputy Commissioner
DW	Dug Well
EE	Executive Engineer
FD	Department of Forest Farming & Conservation
FIS	Flow Irrigation Scheme
FMIS	Farmer Managed Irrigation System
FO	Farmer Organization
FODP	Farmer Organization Development Programme
GOHP	Government of Himachal Pradesh
HALWD	Hill Area Land & Water Development
HD	Department of Horticulture
HH	Household
High lift	Lift more than 50 metres
HP	Horsepower
HP SEB	Himachal Pradesh State Electricity Board
Idle length	Initial stretch of main water conveyance channel where no irrigation is done
IL	Idle Length
IPH	Irrigation & Public Health
ISPAN	Irrigation Support Project for Asia and the Near East
JE	Junior Engineer
kuhl	Flow irrigation channel
KVS	Krishak Vikas Sangh
LCU	Liaison and Coordination Unit
LIS	Lift Irrigation Scheme
Long idle length	Idle length more than 1 km.
Low lift	Lift less than 50 metres
MLA	Member of Legislative Assembly
MFAL	Marginal Farmers and Landless Labourers Agency
MOA	Memorandum of Association
MOU	Memorandum of Understanding

O&M	Operation & Maintenance
PWD	Public Works Department
qtl	Quintal (100 kilograms)
RD	Rural Development
Rs	Rupees
SDM	Subdivisional Magistrate
SE	Superintending Engineer
SFDA	Small Farmers Development Agency
Short idle length	Idle length less than 1 km.
SMS	Subject Matter Specialist
SLIC	State Level Implementation Committee.
TIS	Tank Irrigation Scheme
TWS	Tubewell Scheme
USAID	United States Agency for International Development
VEO	Village Extension Officer

Chapter 1

BACKGROUND

Introduction

Himachal Pradesh can claim a rich tradition of farmer managed irrigation systems (kuhls). Though many have fallen into disuse for a variety of reasons, more than 20,000 still function, each having a variable command depending upon the abundance of the water source and the size of the irrigable land carved out of steep hills and narrow valleys. The kuhls have for centuries provided irrigation for basic food crops such as rice, maize and pulses. Accordingly, they have been at the centre of the economic and social life of the village communities.

In the post-independence era, most irrigation projects have been built and managed by the government with little involvement of farmers. Today, nearly half of the total irrigated land in Himachal Pradesh is under government schemes. This development has greatly helped in the expansion of irrigated agriculture and the cultivation of high value crops, but the schemes face several problems. The irrigation potential created is not fully utilised. Farmers do not maintain the irrigation system well which leads to wastage of water and inequity in water distribution. Government expenditures on maintenance and the construction of new schemes have increased, but the collection of water charges has remained unsatisfactory. These problems, however, are not confined to Himachal and are found elsewhere in India and in other countries of the world.

Experience in several countries shows that active farmer participation helps improve the performance of irrigation systems. It is now widely believed that without farmer participation the objectives of improved water utilisation, equitable water distribution and increased agricultural productivity cannot be achieved on a sustainable basis. Bringing users to the centre stage is becoming a strategy for improving the performance of public systems. Efforts are under way in India and elsewhere to transfer management responsibility from the government to farmer organisations.

This report reviews the experiences with farmer organisations in Himachal Pradesh and draws lessons having policy implications. In the end, some recommendations are made for the consideration of the government. These suggestions are in line with the present thinking of the government of Himachal Pradesh.

The State

Himachal Pradesh is essentially a mountain state comprising the transition zone from the plains to the high Himalayas. It is characterized by small and narrow valleys and steep hills. The area of the state is 55,673 sq. km. and the population about 5.11 million. The state has 12 districts with 58 towns and 19,387 villages. Almost 80 percent of the population is dependent on agriculture for its livelihood.

Snow covered peaks, tall forests, and barren hills typify the physical features of the state. A little over 10 percent of the area is cultivated; the net area sown being 0.58 million hectares. Population pressure on cultivated land is high. The average landholdings are small: 62 percent are fewer than one hectare and about 21 percent range between one to two hectares. Only 17 per cent of the holdings are more than two hectares in size. Most are owner operated. Many cultivators grow three and sometimes four crops in a year which include cereals, pulses, vegetables, and fruits. Still, growing enough to feed a family is a struggle for many. Many families have members working in cities to supplement their incomes.

Irrigation occupies a place of special importance in the life of the people in Himachal Pradesh. Wherever water is available, people work hard on land to get the most they can. The importance of irrigation for giving families self-respect cannot be overstated nor can the role of irrigated agriculture in contributing to the prosperity of the state be understated.

The ecology of Himachal Pradesh is fragile, at best. Water resources are limited, and land is overused and degraded. Water for irrigation comes from small perennial or monsoon fed streams. About 75 percent of the precipitation occurs during the monsoon from June to October. However, the rainfall is uneven and irregular.

In Himachal Pradesh, as elsewhere, irrigation and agriculture have to be seen in the larger context of land use. Deforestation, expansion of agriculture, overgrazing, and the demand for fuel wood and coal add to the degradation of land. Deprived of cover, hills become prone to rapid erosion and landslides. The soil loses the capacity to retain water. Taken as whole, these are a threat to irrigation. More than other states in India, in Himachal Pradesh ecological and social factors have long-term implications for irrigation development and economic prosperity.

A map of Himachal Pradesh is given at Annex A and a statistical brief of some important features of the state is presented in Annex B.

Development of Irrigation

Irrigation in Himachal Pradesh is quite old. Revenue records show that some flow irrigation schemes date back more than a century. These small, dispersed schemes (kuhls) were constructed and maintained by farmers without government assistance. In recent years, the government has rehabilitated some 4000 schemes and handed them back to the farmers with the understanding that they will be responsible for their upkeep. The remaining 16,000 schemes are still with farmers, but many require rehabilitation.

The government agencies started building irrigation systems from 1948 onwards. The flow systems draw surface water from perennial or seasonal streams. The lift systems use pumps to lift surface and groundwater. On an average these systems command areas fewer than 100 ha each.

The ultimate irrigation potential of the state is estimated at 3.35 lakh hectares. Of this, 1.78 lakh hectares was developed before 1993. About 50 percent of this potential has been created by the Irrigation and Public Health Department (IPH) of the state government. The remaining half consists of community managed flow systems.

Firm figures about utilization of irrigation potential are not available. According to rough estimates, utilization is much higher around 80 percent in the case of community managed schemes compared to around 60 percent under government systems. Low water utilization is attributed to a number of problems, including the maintenance of diversion works and canals, the incomplete distribution network within the outlet command, conflicts over water rights, inadequate water flows, erratic power supply to pumps, and the lack of farmer involvement.

Agencies Involved in Irrigation

Three government agencies are involved in irrigation development. The major agency is the Irrigation and Public Health Department (IPH), followed by the Agriculture Department (AD) and Rural Development Department (RD). In addition to these, the Forest Department (FD), the Revenue Department in

matters of civil administration, the agriculture university, and the forestry cum horticulture university also support the development of irrigation.

The IPH is responsible for the construction of new flow and lift irrigation systems and the operation and maintenance of these schemes up to the outlet level. Its activities also include construction of domestic water supply systems. The IPH usually undertakes the larger and technically more complex schemes requiring substantial investments on a scale farmers can not make on their own. After completion, the department assumes responsibility for operation and maintenance and charges farmers nominal water fees. The department is headed by an engineer-in-chief who is assisted by a chief engineer and a number of superintending engineers, executive engineers, assistant engineers and junior engineers for implementation at the field level.

The AD has a tradition of working with individual farmers and communities. Its irrigation activities include construction of water harvesting tanks, check dam, dug wells, and shallow tubewells. The department is headed by a director at the state level who is assisted by joint directors, deputy directors, assistant soil conservation officers, subject matter specialists, agriculture development officers and village extension officers for implementation at the field level.

The RD is engaged in the repair and construction of small community managed flow irrigation schemes. At the state level, the department is headed by a director. The AD and the RD generally construct small community managed irrigation schemes. Occasionally they rehabilitate these schemes and hand them back to farmers for maintenance and operation. The post construction management responsibilities rest with the water users. No water charges are levied for these community schemes.

The FD is primarily concerned with the management of watersheds by reforestation and engineering works. This department is headed by a principal chief conservator of forests assisted by chief conservator of forest, conservators of forest, divisional forest officers, and range officers for field level implementation.

As soon as any land comes under the command of an irrigation system it is classified as irrigated land in the revenue records of the administration. The water users are required to pay enhanced land revenue besides water charges wherever applicable.

Effort to Involve Farmers in Irrigation

In the early seventies, efforts were made to involve farmers in the management of small irrigation schemes in Mandi District under the Indo-German Agriculture Project. Farmers operated the completed lift schemes for a short period. The government took over the schemes as efforts to organise farmers were not successful.

Besides this, several piecemeal efforts were made to involve farmers in irrigation. Small Farmers Development Agency (SFDA) in Sirmour and Shimla districts and the Marginal Farmers and Landless Labourers Agency (MFAL) in Solan district provided financial and technical assistance to the farmers. Since both these centrally sponsored schemes were meant to finance small farmers, little effort was made to organize them. Self-management did not succeed.

In Solan district, irrigation committees were constituted and registered in 1970 under the Cooperative Societies Act (1968). However, farmers were not imparted any training in group formation, and there was no follow up. The irrigation cooperatives soon became defunct and, as a result, irrigation development through cooperatives did not take off.

Later, a more organized effort was made to involve farmers in irrigation management under the USAID-assisted Hill Areas Land and Water Development Project (HALWD). This project supported the Farmer Organization Development Program (FODP) which made a significant contribution toward involving farmers and developing farmer organisations in the state. The programme represents a significant achievement toward developing a viable strategy for involving farmers in the management of irrigation system in the state. The experiences and lessons drawn from the FODP are discussed in the following chapters.

Hill Areas Land and Water Development Project

The Hill Areas Land and Water Development (HALWD) Project was developed to support the design and construction of small-scale irrigation schemes emphasizing development at the chak level. It was designed to establish coordination among state agencies and to adapt technology to suit the integrated development of irrigation in the hills areas of India. Finally, the project was meant to encourage human resource and institutional development. An important component of this objective was the introduction of community based management systems to irrigation schemes. To achieve this purpose

HALWD was involved in the development of farmer organisations to manage irrigation.

HALWD was in operation between 1984 and 1992. Three departments of the government, IPH, AD, and RD, were mainly responsible for implementation. The FD played a very important role in providing protection to irrigation systems by stabilising fragile lands through afforestation and engineering works to control runoff and soil erosion. These measures formed an integrated development of irrigation systems. In all, 878 irrigation systems consisting of irrigation tanks, flow and lift irrigation schemes and tubewells were constructed or rehabilitated in 10 districts of the state.

During the first five years through 1990, the main emphasis was on construction of the physical system and related activities. Farmers remained in the background. There was little communication between them and the implementing agencies. Those who did not get water saw the project as hostile to their interests. Farmers sometimes obstructed water flows and those who were deprived had no way to get justice. When some construction or repair was needed to reach water to a field the interested farmers had to establish a personal relationship with the line agency to get the needful done. There was an undercurrent of hostility between farmers who could get things done and those who failed to have things done their way. It was obvious that preoccupation with construction had been at the cost of considerable discontent and conflict between water users. The FOD Program was designed to tackle these problems directly.

Farmer Organisation Development Program

The Farmer Organisation Development Program (FODP) was initiated in June, 1990. It was meant to improve the utilisation of water by imparting management and communication skills both to farmers and the technical staff of the government. Training and extension programmes geared specifically to irrigated agriculture and water management were developed. Further, a system to bring about joint problem-solving involving farmers and government agencies was evolved. Due to its late start FODP activities had to be carried out on irrigation schemes that had already been made operational. The GOHP created an independent administrative unit for the FODP. It consisted of three functional levels: a coordination, a supervision, and an implementation level. A coordinating officer (CO) belonging to the AD was assigned the responsibility for coordination. Along with the CO, two subject matter specialists (SMS) and six agriculture development officers (ADO) were appointed for supervising field

operations. Twenty-four village extension officers (VEO) were assigned the responsibility for implementation.

Twenty-four schemes representing different types of irrigation systems were selected as "model" schemes for the programme. VEOs were trained and posted at each scheme to work as facilitators to foster interaction between farmers and government agencies and to help farmers organise their own associations. One ADO supervised four VEOs, while a SMS supervised three ADOs and all the 12 VEOs under them. The CO, in turn, oversaw all activities in the state and was responsible for planning and coordinating all activities under the programme.

The FODP unit was disbanded by the end of June 1992 after being in operation for two years. The GOHP staff assigned to the programme returned to their pre-project jobs. The work with farmer organisations was assigned to the regular cadre of SMSs, ADOs and VEOs of the AD in their respective areas of jurisdiction.

Though FODP was implemented for only two years, it made several significant contributions, including:

- creation of a cadre of government officers and farmers trained in FOD techniques and processes
- establishment of a means for communication between the farmers (within their group) and between the farmer organizations and government which vastly improved the interaction/ communication between farmers and government agencies
- development of confidence of farmers in their own institutions
- enabling farmers to effectively participate with government in the management and co-management of small irrigation systems; encouraged farmers to actively participate in the walk throughs and identify inadequacies in the irrigation system, enter into joint agreements with government line departments and contribute to system improvement through labour, materials and cash
- help to provide a link between irrigation, agriculture and markets
- help to increase the command area of irrigation schemes

- generation of a new perspective on a team approach to farmer organization development (by encouraging engineers, agriculturists, foresters and farmers to work together for addressing farmers' problems)

At the close of HALWD in 1992 farmer organisations, or as they are locally called, krishak vikassanghs (KVS), meaning "farmer development organisation", were functioning quite well in all 24 pilot schemes. All physical works had been completed and farmers were largely satisfied with the outcomes. However, much remained to be done as regards institutionalising the entire process within the government and between the farmers and the government to make the programme sustainable.

Organisational and Procedural Changes Made by GOHP

During the course of HALWD, the GOHP realized that government control alone could not improve the performance of small irrigation systems or the prospects of irrigated agriculture. The government also realized that turning over the primary responsibility for management to farmers could be achieved only through strong farmer organisations, on the one hand, and suitable changes in the roles and service orientation of the concerned agencies of the government, on the other. GOHP made several changes in policies and procedures to enable the transfer of the responsibility for the operation and maintenance of irrigation systems to the KVSs. These are described below.

Integration of Policy with Programme Implementation

GOHP adopted a new administrative approach for working with farmers. A three-tiered committee system, consisting of a state level implementation committee (SLIC), a project level coordination committee also at the state level, and a district level monitoring committee, was introduced. This administrative apparatus supported with regular programme monitoring greatly helped integrate policy with programme implementation.

Promotion of Interdepartmental Linkages and Coordination

The administrative apparatus created for HALWD provided a structural base to promote interdepartmental coordination. It created an environment supportive of team approach. The officers of IPH, AD and FD who previously worked in isolation began working together as a team with the farmers.

The creation of the FODP unit was by itself a structural innovation. This arrangement helped link the extension apparatus of AD with IPH. This considerably improved communication between the government line agencies and the farmers. The latter could then deal with a single agency of the government at the state level.

Adoption of Streamlined Procedure for Registration of KVSs

All the KVSs formed under the project were registered under the Societies Registration Act (1860) in a short span of one and a half years. This was possible because GOHP streamlined the procedure for registering KVSs. The secretary to the IPH department gave special sanction for registration giving farmer organizations recognition as legal entities.

Setting up a Committee for Maintenance

In support of the GOHP decisions to formalize the role of farmers in system maintenance, the GOHP set up a high level committee to recommend guidelines for O&M of irrigation schemes constructed by IPH and to specify the respective obligations of the government and the KVSs. The committee recommended the following:

- Simple repairs and maintenance should be the responsibility of the farmers themselves.
- Complex repairs should be done by local craftsmen hired by a KVS and paid from its own funds.
- The more complex and expensive repairs such as intakes, pumps, motors, rising mains of lift schemes or other such repairs that may be required off and on should be undertaken by the IPH department.

These recommendations are still under consideration by the government.

Efforts to Review and Amend Water Laws

At present, irrigation systems are being planned and built under the Himachal Pradesh Minor Canal Act (1976). Under this act, the responsibility for operations and maintenance of government constructed schemes rests with the IPH department. There is no provision for farmer participation under the act. New enactment is needed to give FOs the authority to effectively participate in

the management of irrigation systems and to deal with the government and other agencies.

During the course of implementation of HALWD, the GOHP realized the importance of the role of farmer participation in improving the utilization of the created irrigation potential. A need to amend the existing legislation arose during the course of HALWD. At present, changes are under the consideration of the government. The proposed changes are likely to spell out the responsibilities of KVSs and recommend access to funds that will enable them to fulfil their O&M obligations.

Chapter 2

EXPERIENCES WITH FARMER ORGANISATIONS

The predominantly hilly state of Himachal Pradesh is gifted with thousands of natural springs and rivulets in addition to major rivers whose water has for long been harnessed for drinking purposes and for agriculture. Some 21,000 irrigation schemes are known to exist out of which about 20,000 are managed by village communities themselves. In recent years the government has rehabilitated some 4000 schemes and handed them back to farmers. The remaining 16,000 schemes are still with farmers but many require rehabilitation. The need for rehabilitation competes with the construction of new irrigation schemes for funds of the state.

Since 1948 which marks the beginning of Himachal Pradesh as a separate administrative entity, the Irrigation and Public Health Department has constructed 1250 irrigation schemes all of which are government managed. They are of two types: flow irrigation schemes with long idle length (IL), the initial stretch of the main channel without outlets, of more than one kilometre and high lift irrigation schemes that pump water to a tank (lift more than 50 meters) from which it flows down to farm fields.

In addition to these are small community managed flow schemes constructed by the Rural Development Department and the Agriculture Department, the parentage depending upon the source of funding. More recently the IPH Department and occasionally the AD have constructed tubewell schemes. Like community managed schemes, farmers take responsibility for the O&M of the irrigation system. But the IPH Department or the AD, as the case may be, operates the pump and is responsible for its maintenance.

Types of Irrigation Schemes

Broadly speaking the various irrigation schemes in Himachal Pradesh involve flow or both lift and flow. The traditional systems are all small flow schemes and are among the simplest to manage. The new flow irrigation schemes constructed by IPH are more difficult to manage. They tap water from a perennial source and carry it through a long stretch of inhospitable territory to human settlements. The long idle length requires vigilant supervision and costly repairs when it is dislodged due to rains or landslides. The size of the command which often includes several villages makes the management complex. The LISs combine elements of lift and flow schemes and therefore demand still greater organisational effort for a command of comparable size. The TWSs are lift schemes but are comparatively easier to service as they are often located in the

middle of the irrigation command. The hydraulic and technological complexities of an irrigation scheme play an important role in the success with which farmers can manage an irrigation system.

The FODP schemes on which this study is based have been classified in four broad categories with these factors in mind to understand what demands they make on the management capability of farmers and the implications for the sustainability of FOs. The categories include:

- **Community Schemes.** These are community managed with short idle length of less than one kilometre. Some are of recent origin constructed usually by the AD and sometimes by the RD. One dug well has been included in this category.
- **Flow Irrigation Schemes (FIS Long IL).** All these are flow irrigation schemes with long idle length built and owned by the IPH Department. The idle length could be 1-5 kilometres, sometimes longer.
- **Lift Irrigation Schemes (LIS high lift).** The lift is more than 50 meters. These are built and owned by IPH.
- **Tubewell Schemes (TWS).** These schemes which lift groundwater. Most tubewells were built and are owned by IPH. AD too has constructed some tubewells.

The breakup of the schemes by categories under HALWD are presented in Table 1. The FODP schemes were selected from them.

Table 1
HALWD Project Irrigation Schemes

Sr. No.	Description	Number of Schemes & CCA			
		Schemes	%	CCA	%
1. Community Schemes					
a)	FIS (short IL)	393	45.0	9,579	27.9
b)	LIS (low lift)	23	2.5	227	0.7
	Sub-total	416	47.5	9,806	28.6
2. IPH Schemes					
(a)	FIS (long IL)	219	25.0	11,696	34.0
(b)	LIS (high lift)	138	16.0	9,613	28.0
(c)	TWS	105	11.5	3,241	9.4
	Sub-total	462	52.5	24,550	71.4
	Grand Total:	878	100.0	34,356	100.0

Detailed information by departments is given in Annex C. Table 1 shows that nearly half of HALWD schemes are community managed but being small they account for about 30 percent of the total irrigated area. IPH-managed FISs with long IL constitute one-fourth of all schemes but account for one-third of the irrigated area. They are the single largest contributor to the state's irrigation potential.

Common Elements in the FODP Schemes

Before discussing experiences with KVSs by type of scheme, it is appropriate to comment on the procedure used to identify schemes and to involve farmers in participatory management.

Farmers took the first step in identifying a scheme. Typically, they requested the locally elected political leader (MLA) to get a scheme sanctioned. On the MLA's recommendation the scheme was included in the annual budget of the state. Subsequently, IPH investigated it for feasibility and the AD surveyed the area for a suitable cropping pattern.

The concerned line agency then asked the farmers for an undertaking to the effect that they would take responsibility for the operation and maintenance of the system after it was completed. Estimates and designs conforming to the criteria prescribed for USAID schemes were prepared after the undertaking was received. If the scheme was within the prescribed norms, approval for its execution was obtained from the state level implementation committee (SLIC). Normally, this process took about one year. The construction of a project took anywhere from three to four years.

Prior to the initiation of the farmer organisation development programme (FODP), farmers had been consulted as a routine without explaining the details of the works to be carried out, or asking for suggestions or even explaining what all was expected as regards operations and maintenance. What the undertaking meant in reality was never taken seriously. Accordingly, farmers did not take much interest in helping the line agency.

Since the intent of the FODP was to involve farmers in both the development and management of the irrigation system and to have them make a token contribution towards the cost of investment for upgrading the system, they were encouraged to actively participate in the walkthroughs and to offer suggestions as regards what they wanted. In many villages farmers initially declined to join walkthroughs or to make a contribution on the ground that they had not been consulted in the earlier phases. Only after the need for their involvement was stressed through continued follow-up did the farmers constitute the KVS, appoint office bearers and decide to make voluntary contributions (Annex D).

KVSs were formed for all irrigation schemes and registered under the Societies Registration Act (1960). On the average, it took up to six months to establish a farmer organisation or KVS, advise farmers about their functions and to train them. The KVSs in Himachal Pradesh were from the beginning conceived as being responsible both for irrigation (which principally meant O&M and equitable water distribution) and for agriculture development. The links with agriculture technology and markets were given as much importance as upkeep of the irrigation system.

As stated earlier, a special administrative apparatus was created to train and support the officials of the IPH and AD. This was a three-tiered committee system consisting of a state level implementing committee, a project level coordination committee also at the state level, and a circle level monitoring committee. This system greatly helped integrate policy formulation with programme implementation.

• Community Schemes

Traditional community schemes are operated and maintained by the water users. Table 2 gives some details about projects included under this category. Four are operated from tanks while four are fed by perennial streams with short idle length channels. One scheme is a dugwell (DW) with a lift of 22 meters. Seven of the nine were traditional community schemes. Since the channels were unlined they had deteriorated in the course of time, thus placing the system in a state of virtual disuse. Rehabilitation enlarged the size of the command. Two schemes were new, a dugwell and a tank irrigation scheme.

Table 2
Sample Irrigation Schemes

Sr. No.	Name	Type of Scheme	CCA (ha)	Farmer's Contribution (Rs./%)	No. of HH	Meetings held 1991-92	Year KVS formed
1.	Panog	TIS	10	NIL	11	23	1988
2.	Matholi	TIS	10	102/5	17	14	1991
3.	Moolbery	TIS	8	1100/4	11	17	1991
4.	Shakrori	FIS	20	7000/4	80	17	1991
5.	Ghariana	FIS	14	4000/4	66	22	1991
6.	Mahakal	FIS	6	1100/4	27	14	1991
7.	Darang	TIS	4	800/12	11	12	1991
8.	Lanj	FIS	8	500/1	61	14	1992
9.	Behrampur	DW	11.4	NIL	7	-	1992

Note: Farmers' contribution is shown as a percentage of the total investment on the scheme. No improvement had to be carried out in Panog and Behrampur.

FIS Shokrori. FIS Shokrori is discussed here in some depth as an example of a community managed scheme. The main rehabilitation works undertaken were lining the channels and construction of drop structures at turnouts. A VEO was posted in the scheme in 1991 as a facilitator after initial training in FODP. The KVS was organised and registered in the same year. After carrying out a joint walkthrough with representatives of KVS the problems of providing drop structure at turnout points and regulatory arrangements were highlighted. The design and estimates for repairs were first prepared by the AD staff and later shown to the KVS for approval. Farmers contributed Rs. 7,000 or four percent of the total expenditure although they had earlier agreed to pay only half that amount.

KVS executive committee met regularly. Some seventeen meetings were held by June 1992. Matters regarding distribution of water, mobilisation of resources, and adoption of irrigated agriculture technology were discussed in the meetings. The office bearers took interest in the work and the farmers appreciated their effort.

The Shokrori scheme is functioning very well. The leadership has drawn strength from the traditional arrangement. Once when the diversion structure developed leakage, the KVS members worked together to plug it and restored normal supply. As a routine, the KVS carries out repairs of the channel and removes silt and weeds. The KVS protects the section of lined field channels which is in danger of being damaged due to seasonal ploughings close to the base.

When the KVS was formed the area under irrigation was 15 ha against a potential of 20 ha. Due to the improved water supply it increased to 17.5 ha (1992) and 18 ha (1993). There is a shift in favour of vegetables and other high value crops. Substantial increase in paddy and wheat yields has been observed over these two years. The gross income has also increased on the average by Rs. 1500 per ha.

The KVS has successfully settled six disputes relating to obstructions created in the passage of water, taking water out of turn and taking water for a longer period than permitted under the warabandi system.

Other Schemes. The experiences at Ghariana, Mahakal and Lanjschemes were more or less similar. Ghariana has a CCA of 14 ha, but only 11 ha was under irrigation prior to the formation of the KVS. Water is drawn from a perennial spring, stored in a tank and released to the command. The KVS was organised and registered in 1991. Post-construction improvements included the construction of an additional water tank and a pacca channel 250 meters long. These were carried out in consultation with the KVS which contributed Rs. 4,000 (4%) for these works. The irrigated area has expanded to 12.5 ha from

11 ha. Vegetable farming has received a boost. Farmers grow two to three crops in a year.

Irrigation schemes at Panog, Matholi, Moolberri and Darang that command small areas ranging from 4 ha to 10 ha are among the most successful. For example, at Matholi the KVS was organised in 1991. Following a walkthrough of the system the need for two improvements were identified: a cut-off wall at the head weir to divert water to the tank and extension of the existing HDPE pipeline by five hundred meters to increase the area under irrigation. The KVS raised Rs. 102 or five percent of the total cost of repairs as its share. As a result, the irrigated area which was six ha in Rabi has expanded to 9.5 ha after the completion of works. As in other villages, high value vegetable farming has become popular. The KVS meets quarterly and a monthly contribution of Rs.5 per member is collected. The cash balance with the KVS was Rs. 3,136.35 in March 1994. Repairs and maintenance are promptly attended to. Water is allocated on the basis of one tank full per member regardless of the size of the land owned.

Additional income from off-season vegetables alone is as high as Rs. 3,600 to Rs. 10,000 per hectare in case of Panog, Moolberri, Matholi and Darang. The income is likely to go up with the introduction of floriculture which has already begun at Darang. The change in cropping pattern in Panog is mostly attributable to improved irrigation and the creation of a KVS. This is illustrated in Table 3.

Table 3
Crops and Yields in Panog

Season	Crop	1986-87		1992-93		Additional Income (Rs./ha)
		Area (ha)	Yield (qtl/ha)	Area (ha)	Yield (qtl/ha)	
Kharif	Maize	4.00	18	3.0	30	1,200
	Vegetables	1.8	30	3.5	60	1,800
	Mash	0.2	8	0.2	8*	
	Fallow	4.0	-	3.3	-	-
Rabi	Wheat	3.5	10	2.6	20	1,000
	Vegetable	0.9	30	2.0	60	1,800
	Mustard	0.2	3	0.1	3*	
	Barley	1.0	12.5	0.2	13	
	Fallow	4.4	-	5.1	-	-
Zaid	Peas	-	-	3.6	60	3,600

Note: *Rainfed

Dugwell Behrampur. The dugwell at Behrampur is a lift irrigation scheme. The lift involved is 22 meters and the CCA is 11.4 ha. The scheme was completed in 1990 and handed over to the farmers for operation and maintenance. The KVS was formed in 1992.

The KVS has operated and maintained the system well. One office bearer of the KVS who was well acquainted with the operation of the pump and motor trained some farmers in the operation of the pump. The pump is operated for 18-20 hours/day. The record of energy consumption is kept in a log-book against the name of the water user. Users pay energy charges. Water is shared in rotation.

After a period of low activity at the end of the USAID project, the KVS became active once more when the village was revisited in the course of ISPAN. The KVS began to hold regular meetings due to continued follow up by the ADO/ASCO Nalagarh. A sum of Rs. 3,200 was collected as subscription fee from members.

Prior to the dugwell, the main kharif crops were maize and mash. Rabi crops were wheat and gram. With irrigation, the area under maize has gone down and paddy and vegetables have replaced it. The trend is toward growing vegetables. Of late, sugarcane has been introduced. The impact of irrigation on the choice of crops is shown in Table 4.

Table 4
Impact of Irrigation on Cropping Pattern in Behrampur

Sr. No.	Season	Crop	Area in ha.	
			Pre-Project	Post- Project
1.	Kharif	Maize	8.0	6.0
		Mash	3.4	0.4
		Paddy	-	3.0
		Vegetables	-	1.5
		Sugarcane	-	0.5
2.	Rabi	Wheat	7.0	7.5
		Gram	4.4	2.0
		Vegetable	-	1.5
		Sugarcane	-	0.4

Other Community Managed Schemes. To understand how the KVSs in community managed schemes performed in comparison with traditional schemes not included in HALWD, FISS in villages Basa Waziran-Jachh in Kangra district was investigated. The two villages have a combined command of 140 ha owned by 120 farm families. The panchayats of the two villages are involved in water management. Their respective water rights are recorded in official documents.

A three kilometre kuhl, mostly unlined, supplies water by common agreement for four days to one village and for three days to the other. Operation and maintenance of the system is jointly controlled by the panchayats. Cleaning and repairs are done jointly four times in a year; twice during winter and once before and once after the rainy season. Twenty persons are engaged. Every farmer contributes to these operations either in cash or with labour. Two kohlis (water distributors) are employed, one for each village and are paid in kind according to traditional practice.

Farmers share water according to a rotational plan endorsed by the panchayats. There are hardly any conflicts. Should any conflict arise the panchayats may intervene to settle them. The farmers desired assistance from government for lining both the main and the field channels. But they do not want to surrender the ownership of the system after rehabilitation. Lining is considered essential for preserving the existing command and possibly increasing it with improved availability of water. Farmers have already shifted in favour of high value horticulture crops. Some 12 ha are already under orchards with a variety of fruits such as mangoes, kinnow, oranges, pear and litchi. These yield better incomes at around Rs. 10,000 per hectare in a year. The motivation to enlarge the irrigation command is understandable.

Community Management: An Assessment. Farmers in Himachal Pradesh manage their indigenous irrigation systems with competence. But as elsewhere these systems gradually deteriorate and a time comes when the investment required for restoring them is beyond the capacity of the water users. Farmers then look for assistance as do those in Basa Waziran-Jachh. However, they do not want to pay for such assistance by surrendering the right to manage the system. They want government assistance but not government control.

There seems to be nothing objectionable in the farmers' viewpoint. In Himachal Pradesh this could be an asset for the state. Projects like HALWD have rehabilitated old community schemes of which there are thousands in the state and build new ones that have been handed over to communities without making them a burden on the state with recurring cost of maintenance or commitment to an elaborate administrative structure for monitoring performance. Community schemes show that the interests of the farmers and

the government are preserved equally when farmers are given the responsibility for irrigation management.

- **Flow Irrigation Schemes with Long Idle Length**

Nine irrigation schemes taken up under FODP were visited. These are relatively large schemes with an average CCA of 430 ha in the range of 10 ha. to 1493 hectares. Salient features of the schemes are given in Table 5.

Table 5
Salient Features of Sample FIS with Long Idle Length

Sr. No.	Name	CCA (ha)	Farmers' contribution (Rs./ %age)	No. of HH	Meetings held 1991-92	Year KVS formed	Length of Idle Channel Kms
1.	Kuthar Kalawan	15	3160/3	29	14	1991	1.5
2.	Katyana Balghar	43	-	50	21	1991	3
3.	a) Chamiana	15	-	35	22	1989	1
	b) Surala	13	5000/8	38	19	1991	1
4.	Dhanag	81	4000/6	153	18	1991	4
5.	Charnamati	69	500/1	149	26	1991	2
6.	Baijnath	84	-	119	14	1991	4
7.	Khanyara	257	-	860	13	1991	2
8.	Kirpal Chand (Phase-2)	106	2200/1	650	14	1991	5
9.	Bin Bintu	10	6645/1	23	27	1991	1.5

The KVS in Kuthar Kalawan, Surala, and Bin Bintu were quite active while those in Baijnath, Khaniara and Katyana Balghar, Chamiana and Kirpal Chand were facing difficulties. Dhanag and Chirnamati KVSs were able to work reasonably well. An analysis of the reasons for success in performance seems to suggest that the idle length of the main channel has an important though not exclusive bearing on the effort required for management. Relatively compact commands, fewer farm families and shorter idle length of the main channel make it easier for KVSs to become strong and viable.

KVS Dhanag. The functioning of the KVS in Dhanag was studied in detail to gain insight into the performance of flow irrigation schemes. However, significant learnings from the other schemes are also brought out. The FIS has a 4 km long main channel. The length of the distribution system is 8 kms and the CCA is 81 ha. Problems faced by the farmers were identified through individual contact and group meetings and placed before the farmers or the government staff for solution. The IPH Department prepared the restoration plan and showed it to the farmers for approval before implementation. The KVS contributed Rs. 4000 (6%) toward the estimated cost of repairs.

Necessary improvements were then carried out. According to the undertaking obtained prior to sanctioning the scheme, farmers took over the responsibility for maintenance and water distribution.

The KVS was formed in 1991 and registered thereafter as done with all KVSs. An executive committee consisting of seven members was formed and to this seven more members were added to represent as many chaks (outlet commands) that formed the scheme.

Functions. Principally, the KVS performs three important functions with regard to irrigation, namely, water distribution, maintenance of field channels and settlement of disputes. A warabandi schedule prepared by the IPH Department was accepted with some modification. Farmers took part in desilting field channels, removing weeds and clearing blockages in channels. The KVS leadership intervened to redress the grievances of the tail end farmers who were being denied access to water because farmers through whose land the unlined field channels had passed had eroded them. In some cases the channels were reconstructed and the water supply was restored. However, in others the involved farmers did not agree. KVS members expressed helplessness in obtaining compliance in the absence of legal authority for resolving such issues. Several KVSs referred to the need for legal powers.

The KVS was taking interest in obtaining farm inputs such as seeds and fertilizers at reasonable rates. The AD was actively assisting the farmers.

Resource Mobilisation. Members pay an annual membership fee of Rs. 5. They mobilize labour for the maintenance of the eight km long field channels within the outlet command which earlier was the responsibility of the IPH Department according to the practice existing in Himachal Pradesh. Farmers were also willing to look after the main channel but its length and the expense involved in its maintenance were significant deterrents.

Evidence of Success and Failure. Regular meetings were held throughout the duration of HALWD. Later the level of activity declined as officers moved out. Only symbolic follow up from the state was provided. However, the activity increased during ISPAN's efforts when senior officers belonging to IPH Department and AD revisited Dhanag. The area under irrigation increased significantly in Kharif from about 50 ha to 72 ha.

The slowing down in the level of activity and its subsequent revival was noticed in most villages where the KVSs had been formed. The exception were Baijnath, Kripal Chand, Khaniara, and Chamiana where KVSs had difficulty gaining strength.

Paddy and wheat are the main crops in Dhanag. Paddy yields increased from 12 qtl. per ha to 25 qtl. per ha and of wheat from 15 qtl. per ha to 20 qtl. per ha. In addition, vegetables were being grown. About 2 ha was under peas, potato, garlic, onion and ginger. Much of the produce is sold in the local market. Some data on changes in cropping pattern, crop yields and additional income per hectare are presented in Table 6.

High value vegetable crops are grown in Kuthar Kalawan, Bin Bintu and Surala. Surala has emerged as the main supplier of vegetables to Shimla.

Maintenance of the Idle Length. The main channel in Dhanag passes through a highly unstable hilly strata over retaining walls at various places. This is both difficult and costly to maintain. In a normal year the IPH Department spends about Rs. 35,000 to maintain channels in this vulnerable portion alone. But whenever rains are heavy, extensive slippages take place. Sometime back IPH department reportedly spent Rs. 2,00,000 on restoring this portion of the channel. In future, however, such sums may prove too little for the purpose. Even this amount is huge for farmers to bear on their own. Spreadover 153 households the per household contribution comes to about Rs.1,300 which is clearly a large sum for a family owning 0.5 ha of land. Long idle length schemes by their very nature discourage farmers from volunteering to take over the responsibility for maintenance of the entire system. They consider it more appropriate to manage the portion closest to them.

Table 6
Crops and Yields in Dhanag

Sr. No.	Season	Crop	1985		1992-1993		Yield (qtl/ha) with Irrigation	Additional Income (Rs/ha)	
			Area (ha)	Yield qtl/ha	Area (ha)				
					Rain fed	Irrigated			
1.	Kharif	Maize	10	15	7	3	20	500	
		Paddy	54	12	28	38	25	1300	
			12	15	-	-	-	-	-
		Tea	4	12	4	-	-	-	-
		Vegetables	-	-	-	1	60	3600	
		Fallow	1	-	-	-	-	-	-
		Total		81		39	42		
2.	Rabi	Wheat	7	15	1	69	20	500	
		Tea	4	12	4	-	-	-	
		Fodder			-	1	250	Domestic use	
		Vegetables				2	60	3600	
		Fallow	4	-	4	-	-	-	
		Total		81		9	72		

An Assessment of KVSs on Other Flow Schemes. In Baijnath, improvement in the irrigation system was carried out in four phases covering an area of 468.94 ha. spread over 13 villages during the course of seven years. The villages included for development in each phase were not contiguous. Though four KVSs had been formed, one in each phase for a group of villages, neither the villages nor the KVSs were interconnected. The hydraulic continuity of the irrigation system was not reflected in the KVSs. A common point of view could not emerge across all the KVSs. Further, representatives from different villages failed to attend meetings because of the distance involved. Farmers in Baijnath were not pleased with their set up.

FIS Kirpal Chand faced an entirely different problem. The president and member said that they were not in a position to take up operation and maintenance of any portion of the system as slabs of the cement concrete lining had broken at almost all the places and needed to be redone. Under the circumstances it is not possible for the FOs to manage the system either from the source (which will be quite costly) or closer to their fields. In addition, the availability of water in required quantities with predictable frequency was a source of uncertainty in planning for high value agriculture.

KVS Chamiana is not functioning well as the quantity of water at the source has decreased and due to non-cooperation between its members. Men folk of this village work in Shimla in large numbers. In neighbouring Surala there is greater dependence on agriculture for a livelihood. Farmers responded eagerly to the idea of a KVS.

KVS Khaniara is not very active. Villagers in large numbers are employed in the near by slate mines. To them agriculture is of secondary importance.

Settlement of Disputes. With the formation and emergence of strong KVSs, disputes between farmers are settled amicably. They do not have to spend on travel to the office of a Magistrate/Judge, obtaining copies of documents, meeting court expenses and paying the fees of an advocate. A number of cases of disputes regarding water is pending in various courts of the state.

Need to Involve Farmers at the Planning Stage. KVS members in Chirnamati informed that their irrigation channel acts as a catchwater drain during the rainy season and that the cross section of the channel does not have the capacity to carry rain water from the catchment. Rainwater overflows the banks of the channel and causes heavy damage to the fields and structures nearby. Farmers say if they had been involved in the initial stages of planning their experience with local conditions could have been put to use in designing the system.

Taken as whole, farmer organisations on flow scheme are functioning well. The main difficulty lies in taking responsibility for the idle length which is both costly and difficult to maintain. There is increase in area under irrigation, apparent shift in the cropping pattern and increase in production.

- **Lift Irrigation Schemes (LIS) with High Lift**

These were built by IPH department. Perennial streams are diverted through an intake channel to a sump well from where water is pumped through the rising main to a delivery tank. The lift generally varies from 50 meters to over 200 meters. Water from the delivery tank is distributed to farmers' fields through piped conduits or open field channels.

Seven pilot schemes were studied. The CCA ranges between 32 ha to 180 ha with an average of 75 hectares. The salient features of the schemes surveyed are given in Table 7, below:

Table 7
Salient Features of Sample High Lift LIS

Sr. Name No.	CCA (ha)	Farmers' contribution (Rs.)/%age	No. of HH	Meetings held 1991-92	Year KVS formed	Head (meters)
1. Sainj	32	12,165/8	48	24	1991	81
2. Panesh Kanda	32	12,165/8	85	18	1991	285
3. Dargi	45	None/8	61	20	1991	142
4. Bhadwar	180	45,000/8	145	14	1991	110
5. Balol	101	2,560/8	151	14	1991	108
6. Masal	32	6,800/9	84	29	1991	53
7. Bhaura	100	1,500/2	292	16	1992	138

KVS Masal. The KVS in Masal has been investigated in depth. Learnings from the other schemes have also been highlighted. LIS Masal uses a 50 HP pump and a 1410 meter long rising main to a height of 53 meters which empties in a delivery tank. The pumped water is carried through a 1050 meter long RCC closed conduit and 1960 meter lined and 2100 meter unlined field channels for distribution in farmers' fields. The scheme was completed in 1989, but the KVS was reluctant to take the responsibility for the operation and maintenance of the system. Following the FODP implementation pattern, the KVS was formed and registered in 1991. Farmers contributed Rs. 6,800 (9%) against

the total cost of repairs estimated at Rs. 74,550. Five members were elected to the executive committee. Since there are 8 chaks (outlet commands), eight additional members were included in the executive committee to represent all chaks.

The KVS was quite active but as with other schemes the level of interest declined after the conclusion of HALWD. However, no major difficulties were faced. With the revival of interest in the village as part of the ISPAN project, supported by frequent visit of government officials, the KVS became active once again. Ali farmers became members and paid the annual fee. Fresh elections to the executive committee were held. Two women members were inducted as members of the executive committee.

Functions Performed. The KVS now manages the farm water distribution system and looks after routine maintenance as well. Water is supplied to farmers on a rotational (Warabandi) schedule prepared by the executive committee in consultation with the IPH department. The system is shut down for one day in the week for repairs. The KVS maintains the distribution system rather well. During one visit it was found that repairs to some damaged field channels were in progress. Stones had been collected and broken. When disputes arose the KVS leadership intervened to bring about a settlement. A few that arose were related to turns and excess time taken for irrigation.

Resource Mobilisation. An annual membership fee of Rs. 5 is collected. Members contribute voluntary labour for collective repairs. Each farmer or small group is expected to keep in good shape part of the system that serves them. The KVS provided free labour valued at Rs. 1000 to the IPH for repairing damaged conduits. During Kharif 1994 the KVS collected Rs. 500 per hectare at harvest time from farmers who had grown potatoes. Contribution on the same pattern is proposed for other crops. The KVS seems quite keen on building a fund for its current and future needs.

Evidence of Success and Failure. Meetings were well attended and regularly held. The concerned ADO and JE who are officers of the AD and IPH Departments respectively were often in attendance. Currently about 20 ha out of the 32 ha command is under irrigation. In Kharif 1994 another hectare was added. The area under irrigation is increasing. The yield of paddy has gone up from 15 qtl. to 25 qtl. per ha. Similarly, the yield of wheat has increased from 13 qtl. to 20 qtl. per ha. It is reported that during Kharif 1993 farmers earned Rs. 15,000 from the sale of potatoes. The village is getting linked with

external marketing channels. Details about changes in cropping pattern, crop yields and additional income per hectare are given in Table 8.

Table 8
Crops and Yields in Masal

Sr. No.	Season	Crop	Rainfed 1985-86		1992-1993		Additional Income (Rs/ha)	
			Area (ha)	Yield (qtl/ha)	Area (ha)	Yield (qtl/ha)		
1.	Kharif	Paddy	12	15	12	25	1000	
		Vegetable	-	-	3	60	3600	
		Maize	16	13	5	18	500	
						8*		-
		Oilseeds	2	5	2*		-	
		Pulses	2	8	2*		-	
2.	Rabi	Vegetables	-	-	3	60	3600	
		Wheat	26	13	17	20	700	
						6*		-
		Mustard	2	5	2*		-	
		Pulses	2	5	2*		-	

Note: *Rainfed

Prohibitive Cost of Operation and Maintenance. The farmers in Masal as in most irrigation schemes under FODP have taken full responsibility for managing the system below the delivery tank. But they are reluctant to take over the entire scheme, from the source to the last field. The reasons given are lack of technical know how, high cost of repairs, the wage bill of the staff, and location of repair shops at far away places not within the reach of farmers. Poor quality repairs result in frequent breakdowns and long gaps in the working of the irrigation system. This means that repairs have to be done in places quite far from the village. The yearly wage bill of the staff comprising a pump operator, a watchman, a helper and two beldars comes to Rs. 50,000. The annual charges for electricity come to another Rs 65,000. Though the IPH Department pays for both and the government levies modest irrigation charges, the farmers will not be able to pay the electricity and wage bill from their own resources. At the most they might be able to bear the other expenses connected with the upkeep of the system from the intake point to the distribution tank.

At least in the foreseeable future, taking the most optimistic view of farm incomes, it seems unrealistic to expect 84 farm households owning less than one

acre each to pay around Rs. 1,400 annually per household towards repairs. Farmers are not willing to undertake responsibility for the entire system, from the source to the last field.

Appointment of a Water Distributor. The KVS has appointed a water distributor. This enables each farmer to have a fair share of water. Payment of wages is made in kind at harvest according to traditional practice.

Active Leadership. After a recent visit to Gujarat to see farmer managed irrigation systems, the KVS leadership is considering takeover of the entire system including the pumps provided the government gives them a grant to cover energy charges and the wages of the operators. The subject was proposed to be discussed in a meeting of the general body of the KVS. The government of Himachal Pradesh should have no difficulty to such an arrangement since IPH already pays the bill. Should the farmers agree, this would most likely benefit both the state and the KVS. To illustrate, the KVS will run the pumps only when water is required and will economise in the use of electricity. Repair of pumps will be economical, of good quality and done quickly.

The KVS was also considering acquisition of a depot for the ready supply of agriculture inputs. Farmers have to make many 'runs' to the town every year and not always with success. They saw the ease in local access as an asset and seemed willing to work for it. Similarly, they were keen to have officers of the line agencies inform them about the latest developments in technology so that they could get the most out of irrigated agriculture.

The KVS had requested government officers to provide crated spurs and afforestation near the pump house and the intake channel. This was done by the forest department under HALWD. It helped prevent damage to the intake channel and to the pump house. Siltation and clogging of the intake channel have also been reduced. The plantations are now being maintained by the farmer organisations.

Other Lift Irrigation Schemes. The KVSs in Sainj, Bhaura, and Panesh Kanda performed well. But those in Bhadwar, Dargi, and Balol faced many difficulties. A review of these experiences follows:

- **Impact on Cropping Pattern**

The KVS in Sainj scheme was formed in 1991. After the initial difficulty in getting used to irrigated agriculture was over farmers began to change the cropping pattern in favour of vegetables that helped them improve farm incomes. The shift in cropping pattern is given in Table 9.

Table 9
Crops and Yields in Sainj

Sr. No.	Season	Crop	Rainfed 1985		1992-1993		Additional Income at current prices (Rs./ha)
			Area (ha)	Yield (qtl/ha)	Area (ha)	Yield (qtl/ha)	
1.	Kharif	Maize	14	15	14*		
		Mash	6	6	6*		
		Vegetable	-	-	8	60	3600
		Fallow	12	-	4	-	-
2.	Rabi	Wheat	17	12	17	16	400
		Barley	3	13	3*		
		Vegetable	-	-	4	60	3600
		Fallow	12	-	8	-	

Note: *Rainfed

The increase in yield per hectare can be credited both to the efficient working of the KVS and the availability of water for irrigation. By conducting regular meetings and meeting officers of the AD, the farmers could obtain vegetable nurseries and other farm inputs. There was an increase in agriculture income. It was observed that living standards of the farmers have begun to improve. A similar trend was noticed in other villages where the KVSs were active.

- **Active Leadership**

A similar trend has been observed in Panesh Kanda and some other schemes. The chairman of the KVS succeeded in putting pressure on the HPSEB to supply electricity at proper voltage. But for this, the scheme could not have been properly operated. Acting as individuals farmers most likely would not have succeeded in getting HP SEB to rectify faults.

- **Restricting Pump Use**

Bhadwar Dargi and to a degree Balol faced some difficulties. The president and members of the Bhadwar KVS stated that they were not getting adequate quantity of water. While the line agency personnel informed that due to lack of demand for irrigation water they are not in a position to operate pumps even up to the minimum demand charges of electricity being paid to HP SEB. In

order to resolve this dilemma, the line agency staff agreed to operate pumps during fixed hours every day at least for two seasons equal the minimum charges paid for electricity to build confidence in the farmer about assured availability of irrigation water.

In case of Dargi only 15 percent of the CCA was being irrigated. The scheme was not operated most of the time as the electricity voltage was low. The members of KVS informed that requests made to the line agencies had not brought positive results.

- **Using Irrigation Water for Drinking**

The Balol scheme was initially designed to irrigate 100 hectares. However, nearly half the water was being used for drinking purposes in eight villages as the original source had dried up. Agriculture is a supplementary source of income for most families as the large majority of males are in service professions. As such, shortage of water for agriculture was not articulated as a need based issue. The KVS is not active because of the diversion of water.

Except Bhadwar and some other schemes, HALWD schemes have resulted in better utilisation of the irrigation potential due to a coordinated interdepartmental approach of the government, new design procedures and an innovative approach to the involvement of farmers in O&M. There has been an overall increase in agriculture production and farm incomes. This trend is true for other FODP schemes as well.

Government Managed LIS Schemes: An Assessment. In order to assess how LISs under the FOD programme compared with those administered by the government, LIS Jawali constructed in 1975 was studied. Three 180 HP pumps lift 10.5 cusecs to a head of 50 metres. The command area of 471 ha serves about 350 farm families. In addition to the seven outlets provided under the scheme, some farmers had fixed additional outlets to suit particular individuals without thinking about others. The maintenance of the main channel is the responsibility of the IPH. Field channels which farmers were expected to repair require improvement. Farmers acted as individuals to promote their own interests as there was no forum for articulating collective interests. Extensive seepage and silt deposit at several places reduced the availability of water. Water did not travel beyond the first 40 metres in the field channels. As a result only 26 percent of the total command was being served with irrigation.

Water utilization was not so low in any of the FODP projects, whether lift or flow. In most villages, the KVSs were active, farmers discussed problems, contributed labour and money, dealt with conflicts and adopted new agriculture

practices to increase farm incomes. Jawali is fairly representative of irrigation schemes managed by the government. In them local, leadership rarely developed, maintenance was frequently neglected, voluntary contribution was scarce, and conflicts over water often divided people. It is reasonable to conclude that FODP made a decisive contribution to better water management and to increased farm incomes.

Data for 1992 show that water utilization for HALWDs was better at 67 percent compared to 34 percent for the government managed irrigation schemes. This is mainly due to better design procedures, consultation with farmers in programme implementation and encouraging farmers to assume responsibility for the management of the irrigation system after its completion.

Generally, many difficulties were faced in forming KVS in LISs. The complex nature of the schemes, lack of reliability due to technical problems, location in difficult terrain which makes accessibility poor, and inexperience in maintenance were the major hurdles in convincing farmers that a group approach through FOs should prove beneficial. Frequent visits by the staff of the line agencies and consultants helped in giving farmers the confidence that KVSs will really help. In flow schemes, the creation of KVSs was relatively simpler.

- **Tubewell Schemes**

The Central Ground Water Board estimates that 2074 deep tubewells are feasible in Himachal Pradesh. So far 350 tubewells have been drilled. Of these, 105 tubewells were constructed under HALWD. The total CCA of these tubewells is 3241 ha. Each tubewell, on the average, commands 31 ha. The AD & IPH departments have constructed 19 and 86 tubewells respectively. Ground water is pumped through the rising main to a delivery tank. Water from the delivery tank is distributed to farmers' field through piped conduits or open field channels.

TWS Panjasra. TWS Panjasra was taken up for detailed investigation. It has a CCA of 25 ha and 25 farm families. Water is lifted by a 25 HP pump. The rising main is a 445 metres long AC pressure pipe and the total length of the underground and surface channel is about three kilometres. After the scheme was completed in 1990, farmers were asked to give an undertaking that they will take the responsibility for its operation and maintenance. But they were reluctant due to the high cost of operation and maintenance of a tubewell scheme.

The superintendent driller of AD in charge of the scheme, who was impressed by the success of the KVSs in other schemes, took the initiative to encourage farmers to form a KVS. When farmers seemed interested, meetings were called

to discuss the issue in detail. A KVS was formed and registered in 1991. It agreed to take over the operation and maintenance of the system from the delivery tank to the farm fields.

The KVS executive committee has seven members, all of whom were trained under the project. Regular monthly meetings were held until the close of HALWD. Later the KVS met less frequently but remained active. Attendance was always good because all 25 families took part in every meeting.

Functions Performed. KVS is responsible for water distribution. The warabandi schedule prepared by the line department was rejected in favour of a fixed schedule. All farmers were given water for four hours irrespective of the size of the landholding or crops sown. Field channels were regularly maintained. Desilting, removal of weeds, and repairs were carried out as a routine. One additional outlet requested by the KVS in a meeting was provided by the department. The KVS contributed unskilled labour for the construction work. Disputes about exceeding one's time or not doing one's fair share of work did arise, but these were settled amicably.

Resource Mobilisation. The farmers pay an annual membership fee of Rs. 5. No other contributions are required except labour for maintenance. However, major resource commitment will be required for repairing or replacing machinery. Farmers have so far not considered the idea of taking over the management of the entire system.

Evidence of Success and Failure. Irrigated agriculture was new to farmers. But once they had access to the tubewell, keen efforts have been made to increase production. There has been an increase in the yield of paddy from 15 to 30 quintal per ha within a period of three years. Though the area under wheat has come down from 22 ha to 18 ha, the yield has increased from 12 to 20 quintal per hectare. Vegetables are grown in about 1 ha. Some are sold in the local market. Farm incomes are said to have increased by about Rs. 1500 per hectare.

Alfa-valves provided at outlets to regulate water were frequently stolen. The KVS decided that replacement of such valves was the sole responsibility of farmers served by an outlet. All the stolen alfa-valves have now been replaced and are closely guarded. Not a single valve has been lost since the KVS made the decision to make farmers accountable for replacement.

Prohibitive Cost of Operation. As in case of high lift schemes, the KVS is reluctant to take responsibility for the entire irrigation system. Farmers believe that the cost of energy charges, repair of machinery and wages of the operating staff will be well beyond their capacity to pay.

At present Rs. 80,000 is spent on operating the system. This includes wages of operators and the charges for electricity. This works out to Rs. 3,200 per household. The average family owning one ha land will find it beyond its capacity to pay such a large sum.

Comparison of Tubewell Schemes and High Lift (Surface Water) Schemes

The KVSs that manage tubewells perform better than those established for other LISs. Water utilization is superior. In rabi 1992, utilisation was close to 58 percent for TWSs compared to 46 percent for LISs.

TWSs are less prone to fluctuation in voltage and damage due to floods. Repairs are easier to make as they are often in the middle of human settlements. The command area is smaller and clearly bounded. The number of farmers served is not so large as to make the management group socially diffuse.

KVSs in TWS are functioning better throughout Himachal Pradesh. There is an increase in production and marked diversification of crops. Vegetable cultivation has been taken up in most schemes.

Role of Women

Women are actively involved in farming operations in Himachal Pradesh. They sow, weed, and harvest crops. They apply agricultural inputs and water to crops. In areas where men are employed outside the village or the state in large numbers, women assume full responsibility for developing agriculture and irrigation. They repair and desilt irrigation channels, guard water at night, and take turns drawing water in an orderly manner.

In most KVSs, however, women's formal role in irrigation remains unrecognized. Induction in KVSs would strengthen the management of irrigation. The main hurdle is that women rarely have title to land. Land ownership is often a condition for becoming an officebearer of a KVS.

In some FODP villages such as Sainj, Masal, and Dhanag women actively took part in discussions and meetings. The executive committee had one woman member in Sainj and two in Masal. The lady from Sainj had visited Gujarat under an ISPAN arranged visit to farmer operated irrigation projects. She now maintains accounts of the KVS after receiving training in the state. In such cases, women are either landowners or are inducted at the initiative of an enthusiastic extension worker.

Although in traditionally managed irrigation systems males dominate decision-making roles, one cannot miss the presence of women doing their bit for keeping the irrigation system serviceable. In all parts of the state, women are seen rebuilding temporary diversion works damaged during rains, desilting channels and removing obstructions. In Himachal Pradesh, the question is not how to get women to contribute to better irrigation management, but how to legitimize this role as part of the formal system.

Organisational, Procedural, and Attitudinal Changes

Several significant changes were made in Himachal Pradesh to implement the HALWD and FOD efforts. These are presented below:

Interdepartmental Linkages

From the outset, the government developed a coordinated approach to draw farmers into the management of schemes under HALWD. An implementation committee at the state level, a project cell to coordinate various line departments at the state level, a circle level committee with officers of concerned line departments, and district/sub-divisional level committees headed by DCs and SDMs were formed for overseeing field level officer efforts.

The administrative apparatus developed for HALWD encouraged interdepartmental cooperation. It brought IPH into a close working relationship with AD, and other departments such as Forest, Horticulture, and Revenue.

In addition, under the FODP, a special coordinating officer was appointed at the state level, assisted by the concerned SMS, ADOs and VEOs, who reported directly to the secretary IPH department. This arrangement meant specially for the KVS component of the programme recognised the importance of linking the extension apparatus of AD with IPH, which has the technical expertise and resources to build irrigation systems.

Both administrative innovations brought the line agencies into a problem-solving work relationship and improved communication between the government and the farmers. It also clarified the farmers' access to government since they had to deal with only one agency.

At the conclusion of the project, however, the administrative apparatus was disbanded. It had brought about positive attitudinal changes in the government officers at all levels, and its dissolution created a void as far as the KVSs were concerned. No mechanism for follow-up was provided. Even in the short time gap between the conclusion of FODP and the beginning of ISPAN, most KVSs declined in activity. Meetings became infrequent, water distribution and maintenance began to suffer, conflicts increased, and a sense of apathy crept in the thinking of the KVS leadership.

Impact on the Government and the Line Agency

The government, at the highest level, is favourably inclined to the idea of transferring the responsibility for system operations and maintenance to the KVSs. The decision to register KVSs under the Societies Registration Act (1860) and related government directives marks a definite departure from the past.

The approach to forming KVSs and giving them some control irrigation and agriculture has helped line department officers to understand the farmers' perspective. Many now realize that participative management assures dependable access to water to a larger number of farmers and gives them the confidence to invest on high value crops. Farmers take responsibility for O&M because they are interested in agriculture.

Farmers are now being asked by government to raise resources to meet a part of the cost of rehabilitation and to cover a substantial portion of the recurring costs of maintenance. They have generally complied and, in some cases, done more than asked. The result is a reduction in the financial burden of the government. The IPH Department, for example, spent over 100 million rupees on repair and maintenance of all irrigation systems in 1992-93. Against this, the assessed water charge was 0.8 million rupees (less than 1%), but only 0.26 million rupees were recovered.

If all KVSs take up routine maintenance of field channels and part of the main channel close to them, as done by farmers in the traditional community schemes, they would have contributed 15 million rupees for 1992-93. This could be taken as payment for irrigation in kind as against cash. Change of a fundamental kind in administrative approach is in the making in Himachal Pradesh. Considered against the background of the National Water Policy (1987), the stage is set for the government to formulate a water policy for the state.

Legal Changes

The proposed revised draft irrigation law has taken participatory management into consideration. The changes envisaged in the act spell out the responsibilities of KVSs and recommend access to funds that will enable them to discharge their obligations.

Memorandum of Association and Memorandum of Understanding

An MOA indicating the rights and obligations of KVS has been prepared and approved by the government. This document has been signed by all the KVSs under HALWD (Annex E).

A draft MOU between the KVSs and the GOHP has been drafted and is being processed by the GOHP.

Committee for Maintenance

A high level committee was constituted in 1992 to study and recommend guidelines for the operation and maintenance of irrigation schemes specifying the respective obligations of the government and the KVSs. The report is under the consideration of the GOHP.

Human Resources Development

Training programmes for officers of the line agencies and for the field staff of AD were organised. The officers were told about the FODP, what it meant, why it was needed, and the new elements of programme planning and monitoring necessary for administering the programme. The field staff were given job-oriented training about how to contact and work with farmers, the right time to convene meetings, and what to expect from discussions about irrigation problems. They were also advised on how to organise farmers, form a KVS and deal with functions.

The officebearers and members of the KVS, once it was formed, were also trained. The training covered matters relating to the operation of the irrigation system, performing various functions, mobilizing resources and keeping records. Significance of the bye-laws of the KVS, conducting meetings, and communicating with the government were also discussed.

Farmers found the training valuable and developed a positive outlook toward FODP. In this context, cooperation with government, the significance of joint walkthrough to diagnose defects, and the possibilities of making modifications to suit farm requirements were stressed. In all, about 80,000 farmers and the office bearers of 336 KVS were trained. Among officers 1788 received training.

Farmers and members of the executive committee of the KVSs visited some of the more successful schemes such as Masal and Sainj. This provided an opportunity for farmer to farmer interaction and helped in building confidence. Such visits proved immensely useful in bring about a change. They appeared more persuasive than training camps and talks.

System Turnover

Though the Himachal Pradesh irrigation act does not provide for farmer managed irrigation systems, the state has many community managed systems that have existed for centuries. Schedule II of the irrigation act recognizes community managed schemes that have a CCA of 8 ha. or more but do not belong to an individual.

The question of turnover does not arise for such schemes because they belong to communities. The fact that the source of water or part of the main channel is on government land does change the fact of communal ownership. Handing back to the owners what belongs to them does not constitute irrigation management transfer or turnover. Formation of the KVSs and their registration can be deemed as giving formal recognition to community managed system. Even the newly constructed small community schemes cannot be considered turned over as they never belonged to the government in the first place.

The possibility of turnover arises only in the case of irrigation systems owned by the government. The government has the full responsibility for the repairs of these systems. Farmers pay some charges for irrigation. None of the government managed schemes have been turned over to farmers in Himachal Pradesh, nor is this proposed in the near future. Any discussion of the issue at this stage is premature.

Wherever farmers have been asked to take over the responsibility for the entire system of government owned schemes, they have expressed their inability, as discussed in this report, on the grounds that they could not pay for the entire expenses. They were often willing to take over the responsibility for the outlet command. In some instances, as in Masal, farmers seemed willing to consider taking over the entire system provided the IPH Department paid the electricity bill and wages of the government staff, which it does as a matter of state policy. One significant change could be payment of a fixed amount to the KVS as middlemen rather than the actual charges with respect to electricity and wages.

The long IL flow schemes and high lift schemes pose comparable problems as regards the farmers ability to pay for the maintenance of the entire system. Given the present level of farm incomes and the small size of landholdings, farmers cannot on their own generate the needed resources. However, they can pay more than what they do at present. The additional charge on the farmers must be offset by commensurate gains from the ownership of the entire system.

The basic question remains whether the GOHP is willing to turnover irrigation systems to farmers and, if so, what level of funds it can commit for this purpose. How much farmers require and how far the state can go in assisting them are important questions which has to be answered by examining facts as regards farm incomes and the cost of maintenance provided by the government. Annex D provides some data on the O&M expenses and farm incomes for three schemes. They suggest that it is easier for farmers to manage flow schemes than lift schemes. Flow schemes may be turned over, but since lift schemes require more financial support than farmers can provide, it is unlikely that they can be turned over in the near future.

Chapter 3

LESSONS LEARNED

The Hill Areas Land and Water Development Project had a significant impact on the development of irrigated agriculture in Himachal Pradesh. The construction and rehabilitation of 878 small irrigation schemes was an enormous administrative challenge in terms of technical requirements, project planning, and design, and programme implementation. Extensive training of government officers established a nucleus for participative management in each FODP village and the transfer of the latest agriculture technology to farmers. It was an essential part of an implementation strategy aimed at achieving time-bound results. The GOHP welcomed financial assistance for irrigation development, but it demanded a strategy suited to its traditions. Farmers became key players in transforming subsistence farming into high income agriculture.

Many lessons were learned from HALWD. Some of the most important lessons have policy implications for the expansion of farmer-managed irrigation systems in the state. They are identified and explained below.

KVSs are replicable social institutions.

The success of the approach adopted for the creation of KVSs in different irrigation schemes confirms that farmers want to operate and maintain irrigation systems through local institutions. Though participatory irrigation management was not new to many farmers in Himachal Pradesh the linkage of irrigation with agriculture was an innovation, and they took to it immediately because it promised higher incomes from irrigated agriculture.

Despite the difficulties faced, the KVS approach has proven to be viable and replicable. It has worked particularly well where farmers were in a position to manage the entire irrigation system. The community managed systems which include tubewells are likely to remain functional. However, the government-owned and operated long IL FISs and the LISs might not be sustainable. In these schemes, while the farmers manage the outlet command, the vital lifeline is still maintained and operated by the government. Farmers remain dependent on the agency. It is in this context that the question of the desirability of KVSs owning the entire system arises.

The coordinated administrative system developed by the GOHP for implementing participatory irrigation management proved to be a powerful tool for promoting and sustaining KVSs.

One of the more significant achievements of HALWD was the creation of an enabling administrative apparatus to plan, design and execute irrigation schemes with a focus on farmer participation. But for this apparatus, programme implementation would have been slower and perhaps less successful in supporting KVS formation and operation.

The coordinated approach HALWD adopted served its purpose well. However, the apparatus fell apart after the conclusion of the project, not because the approach was contrived, but because from the very beginning it was seen as having a project life span. If the apparatus had been retained, even in a modified form, after the conclusion of the project, its positive impact on the KVSs could have continued, and the decline observed in many KVSs might not have set in. The need for administrative support exists even after donor assistance to a project concludes.

In Himachal Pradesh, the principal line agencies involved in irrigation and agriculture, IPH and the AD, are capable of having a productive working relationship for creating and supporting KVSs. There is no need to recruit outside personnel as catalysts.

The FODP experience shows that properly trained and supervised field level officers of IPH and AD were quite successful in working with communities. They did an excellent job of training the KVS office bearers and helping them conduct business. The departments worked in collaboration, each doing its part in the different schemes.

There were difficulties in working with KVS in some schemes. Sometimes the village leadership was too divided to work as a group. In others, the irrigation system created problems which the KVSs could not tackle. Such instances, however, are not a reflection on the appropriateness of the department staff work as catalysts or the ability of the two departments to work together in a supportive and cooperative manner.

It is necessary for the government to provide support to the KVSs over a number of years after they are formed and registered to keep them alive and functioning.

A great deal of effort went into educating farmers about the advantages of taking the responsibility for their irrigation system. Even greater effort was made to form KVSs, specify their functions, train office bearers, mobilize the community, encourage donations, keep accounts, and finally, register them. Most KVSs became quite active. The office bearers began to take considerable interest, convened meetings, and arranged for farm inputs.

No sooner had the FODP programme concluded, than the government apparatus created to support the KVSs was withdrawn. The KVSs began to lose their capacity to function. There was a decline in the level of activity and in group cohesiveness. Organising and sustaining KVSs are two interconnected but different functions. KVSs in Himachal Pradesh required a much longer period of follow-up than was provided under FODP.

Single-tiered KVSs constrain information sharing and collective decisionmaking in schemes that serve several villages in an extended area.

KVSs are village-based organisations. Their jurisdiction lies over a village from which the membership is drawn. Once a KVS is formed, members meet and discuss problems. Conflicts of interest are usually not serious, which helps the executive committee of the KVS to function unitedly. However, flow and lift schemes that serve farmers in several villages find it difficult to meet as a group. For effective management a representative body for the irrigation system as a whole is required. This, the second tier, can address important O&M issues relevant to all its constituents and take binding decisions with the force of consensus.

Farmers want to be certain that their irrigation scheme is capable of supplying water before they invest in farm inputs.

In several villages, such as Sainj and Bhadwar, water was pumped for much less time than the minimal power charges payable to the Himachal Pradesh State Electricity Board (HPSEB). According to the IPH Department, this was because there was not a sufficient demand for water, but farmers complained about not getting water. In the absence of demand, the pump was operated for brief periods, and many farmers did not see water running in field channels.

Accordingly, they were not sure whether they could take a chance on investing in irrigated crops.

Both parties, the IPH Department staff and the farmers were right, despite their different perspectives. In Sainj, the problem was resolved by running the pump for fixed hours every day within the minimum charges payable so that farmers could see water flowing in field channels. After a while they became confident, and demand for water increased as did the area under irrigation. The apparent, initial waste of water will be balanced by eventual use of the system.

A KVS managing long IL flow schemes or high lift schemes, which are by their nature expensive to maintain, can be persuaded to take responsibility for the entire scheme with financial assistance from government.

Farmers in KVSs on government-managed flow and lift schemes said that it was beyond their means to take over the entire system. Depending on the scheme, an annual investment of up to 0.30 million rupees a year was required for the maintenance of the system from the source to the distribution tank. Farmers cannot be expected to contribute more than 10-20 percent of this amount. In fact, under FODP they took over the maintenance of the outlet command which up to that time had been the responsibility of the government.

If farmers' responsibility could be enlarged to cover the entire scheme, it might improve irrigation utilization and also allow farmers greater flexibility in operations. It should also help the state government as the IPH has not been able to keep the government owned systems in good condition due to financial and other constraints. The case is clearly in favour of giving farmers the responsibility for the entire irrigation system. However, they will need financial and technical assistance. The amount and pattern of financial assistance to KVSs need to be considered and may require further study.

The formal recognition of the significant, and in some situations decisive, role of women in system operation and maintenance can greatly strengthen the management of irrigation schemes.

The presence of women in various farm operations was widely observed. They carry a fair burden of the work in agriculture and irrigation. Women repair temporary diversion works, maintain channels, guard and distribute water, and often substitute for males who follow service professions in cities. Women in large number attend KVS meetings.

However, their representation in the executive committees of a KVS is almost negligible. Two reasons are possible: rural women tend to defer to males and they are usually not landowners. If their representation can be increased, women are likely to become active decisionmakers. This will greatly enhance the capacity of a KVS to manage irrigation and promote irrigated agriculture.

Line departments of the state government, even with the best intentions, tend to adopt a patronizing target-oriented approach to participatory irrigation management which is at variance with the goal of creating strong farmer organisations.

HALWD was conceived as a project for the construction and rehabilitation of irrigation schemes with farmer participation. However, a review of the project in 1989 showed that the participatory aspects had been neglected. Procedures had been followed without fulfilling their intent. For example, farmers were asked to give an undertaking regarding maintenance of the irrigation system after construction was completed, but they were never told what it really meant.

The line agencies got all the necessary documentation completed so that rehabilitation could be carried out. Having done the paper work they thought they had done all that was needed. They were not tuned to the participatory aspects and neglected them. It took some four years for them to realize that an important component of the programme had been neglected. FODP tried and succeeded in making the correction. The fact that FODP was able to activate KVSs shows that the government and the line agencies are capable of building participatory management, but setting goals according to the number of KVSs forms ran counter to the program's interests.

Comprehensive training programmes at regular intervals for line agency officers, field staff, and farmers are an essential part of promoting and sustaining KVSs.

HALWD trained a large number of staff/officers of the line agency and farmers/office bearers of the KVS. Both were given comprehensive needs-based training. Government officers were trained in farmers' needs and perceptions, the organisational aspects of group formation, and their own role in sustaining participatory management. Farmers were trained in the functions of the KVS and the responsibilities of the office bearers. A nucleus for participatory management was established in each FODP village. As a result, there was overall improvement in the pace of implementation of FODP.

Chapter 4

RECOMMENDATIONS

The following recommendations are based on the review of state experiences with farmer organisations and line agencies in the context of participatory irrigation management. They seek to improve the promotion and sustainability of FOs and supporting government efforts in Himachal Pradesh.

Farmer participation should be an integral part of all irrigation schemes, big and small, and their involvement should be ensured from the planning stage.

Irrigation schemes built or rehabilitated without involving farmers during the design and implementation phases are found deficient from the farmers' viewpoint. Should farmers be asked to take over O&M, they usually are not interested and often make their participation contingent on some essential improvements being made in the irrigation system. The performance of an irrigation scheme improves considerably when local knowledge is used to shape its construction or rehabilitation.

The Himachal Pradesh Irrigation Act, now under review, should be amended to provide for the turnover of irrigation systems to farmers. As part of the act and rules, the rights and responsibilities of the farmers and the government need to be clarified. KVSs should be given legal status and financial resources.

The present irrigation act does not provide for farmer managed irrigation systems. In the interest of better use of state's water resources for agriculture, KVSs need formal and legal recognition with powers to deal with farmers and agencies. Provision for system turnover and the demarcation of the functions and responsibilities of the KVS and government should help KVSs to become important vehicles of the transformation of irrigated agriculture.

The state government should establish an administrative unit or agency to design training modules and conduct training programmes for farmers and the line agency staff.

For implementing participatory management the roles, responsibilities and obligations with regard to control, regulation and distribution of water of the line agency officers as well as the farmers will need to be redefined and clearly established. The existing functions and obligations will doubtless undergo

significant changes. These will require supportive attitudinal changes and commitment to participatory management, especially on the part of the officers of the government. The process could be facilitated by a comprehensive training programme aimed at human resource development. The state government should consider creating a suitable agency for the purpose.

All new lift schemes should be routinely operated for fixed number of hours every day and water run through the entire system so that farmers can gain confidence in the dependability of the water supply.

In several new lift schemes, farmers are not demanding water and the IPH is not operating the system at capacity, even though it must pay a minimum electricity charge. The IPH should consider operating LISs regularly during fixed hours for a few irrigation seasons so that farmers feel they can get irrigation water. This will help create demand and encourage farmers to invest on irrigated crops that are risky but more profitable.

The existing concept of the KVS as a village-based organisation needs to be broadened to the possibility of two- or three-tiered organisation which would represent all the villages served by an irrigation system. The functions of the different tiers will need to be defined so that each level supports the other to make farmer management effective.

Participatory management is particularly difficult in irrigation schemes that serve a dispersed command with several villages. A two-tiered organisation, one based in a village and the other for the command, is extremely desirable. In the larger irrigation schemes the possibility of a multi-tiered KVS is necessary, and its different tiers, their powers and resources, will need to be spelled out.

The important role of women in irrigated agriculture as members of KVSs needs to be formally recognized. Any disabling legal provisions, such as the requirement of having title to land that may prevent women from becoming office bearers, should be removed. Women participation will greatly strengthen KVSs with regard to resource mobilisation, operation and maintenance, and the adoption of innovations in agriculture.

Generally, women are actively involved in farming operation in the state since many seek employment outside the village, but few have title to land. As such, they cannot become members of a KVS. It is important to have women as members of the executive committee of the KVS. The existing MOA should be amended to allow women members of the family to become office bearers of KVS, even if the title to land is in the name of the male members of the family.

The government should try to turn over to KVS the management of the entire irrigation system from the source to the farm fields. Since maintenance of some schemes is beyond the capacity of farmers, the government should consider creating a special KVS O&M fund. The government and the farmers should both make a yearly contribution to this fund. KVSs should be able to draw from the fund to pay for annual repairs which they cannot pay for on their own and to cover the salaries of the service staff currently on the government payroll.

The government should also consider helping KVSs undertake emergency repairs, such as mechanical failures in LISs or landslides and floods that are known to inflict FISs with long idle length. This will give the KVSs the confidence to take over the management of the entire irrigation system. The government should provide technical guidance and follow-up assistance.

Farmers management has many benefits, such as more economic and better use of resources, greater flexibility in operations, and perhaps better quality repairs and maintenance. When management responsibilities for different parts of the system are divided between a government agency and the farmers, both sides need to be committed for good management. Experiences show that when farmers manage the entire irrigation system, they take personal interest in keeping it in good working condition. In addition, good quality work is done at reasonable cost. If farmers manage the long IL flow schemes and the high lift schemes on their own, the government too will gain. In the long run, it will be cheaper, administratively and financially, to encourage farmers to take over the management of all irrigation schemes.

An inter-departmental administrative apparatus needs to be created at the state level to provide continued follow up assistance to KVSs. As part of this administrative set up, responsibility centres (officers) need to be identified in each sub-division so that KVSs can contact them for assistance and guidance.

KVSs became less active when FODP ended. ISPAN, which came 18 months later and activated many KVSs. During the several visits of state officials to the villages, the problems farmers faced emerged for discussion. The KVS leadership was encouraged to tackle them, particularly those of resource mobilization, maintenance and water distribution. KVSs may in all likelihood begin to cool off again. A system of follow-up and assistance is necessary to keep them active. The financial burden on the government on this account is likely to be minimal compared to the benefits to the farmers and the state.

Chapter 5

NEXT STEPS

Gross underutilisation of irrigation resources, inadequate recovery of costs, and difficulties in managing irrigation systems have prompted several countries to look for better ways of managing irrigation. Countries like the Philippines, Indonesia, Sri Lanka and Thailand have tried with some success to transfer management responsibility from government agencies to farmer organisations. In India, Gujarat, Maharashtra, Bihar, Tamil Nadu and West Bengal have experimented with the turnover of irrigation systems to farmers on a limited scale.

In Himachal Pradesh, HALWD was implemented to introduce the community approach into irrigation system management. The experiences gained have been rich, and some important lessons have been learned. Farmers in a number of schemes accepted responsibility for maintaining the outlet commands in schemes that had previously been managed by the government. To accelerate the transfer process, the following steps deserve consideration on a priority basis:

1. Amend the existing water laws of the state.

The GOHP is now considering amending the existing state water laws to provide for farmer-managed irrigation systems leading eventually to turnover. The rules to be framed under the law must specify the structure and functions of farmer organisations, the roles and responsibilities of the farmers and the government, and the authority of each to carry out their functions.

2. Create a government fund for meeting O&M and management costs.

KVSs are not in a position to cover the heavy expenditures required to repair and maintain the entire irrigation system themselves. Nor can they alone pay the salaries of service staff. They need financial help from the government. A dependable and adequate source of funds for meeting the maintenance and management costs would encourage the KVSs to make their own contribution to supplement funds allocated by the government. GOHP should consider creating a KVS O&M fund for this purpose and reimbursing management costs wherever farmers are willing to take over the entire irrigation system according to terms acceptable both to the government and the KVS.

3. Establish a permanent administrative infrastructure and make budget provisions for supporting and sustaining FOs.

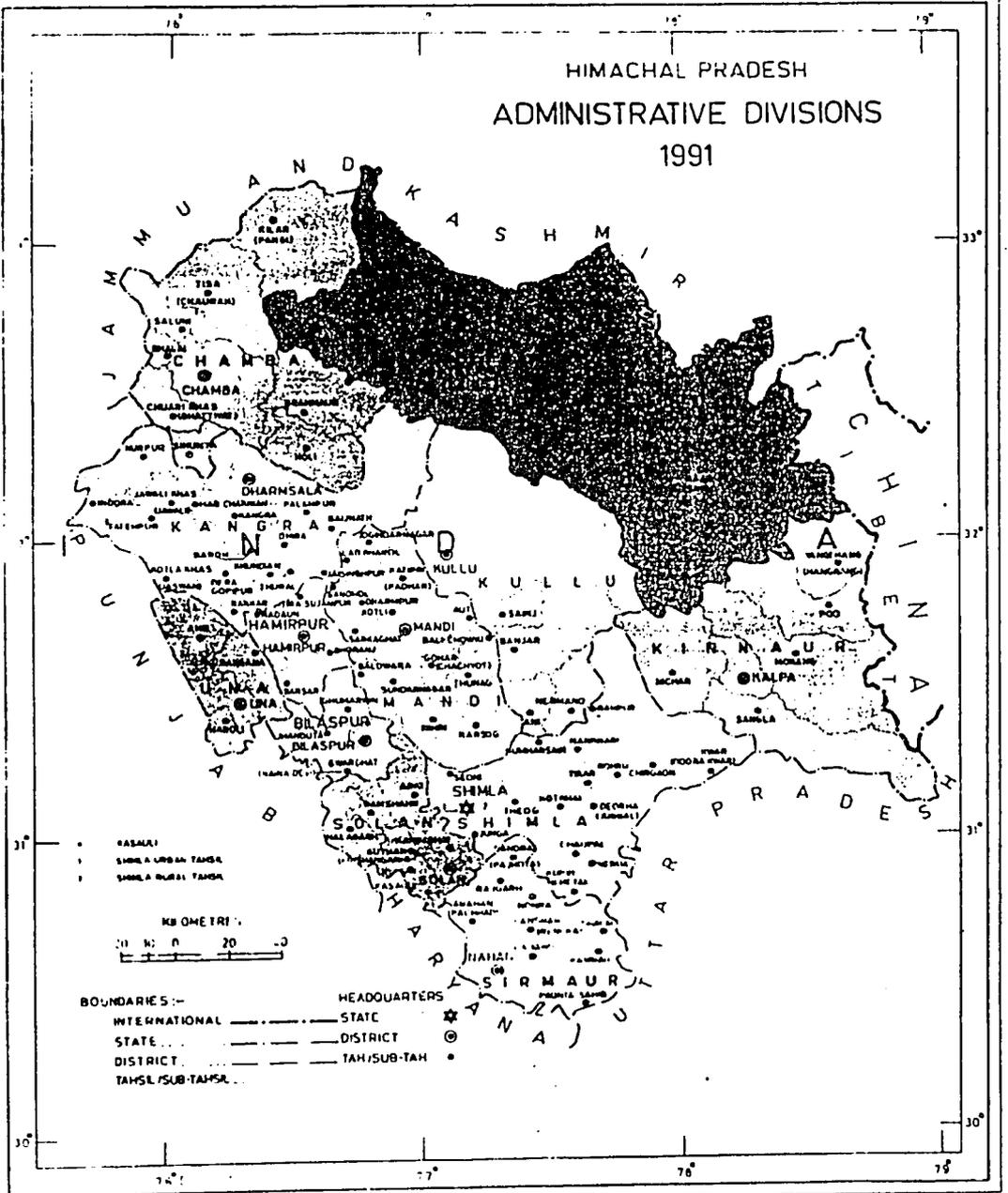
The FODP Unit created under HALWD was largely instrumental for the development of farmer organisations. The assistance provided to them by this unit on a continuing basis kept the KVSs alive and active. When the support was withdrawn, the FOs became less active. The GOHP should consider creating a unit (similar to the FODP Unit of HALWD) in the state on a long-term basis to deal with problems faced by the KVSs and to facilitate the turnover process.

As yet, there is no separate budget provision for financial support for participatory irrigation management in the state budget. The government should take the necessary steps to provide adequate, dedicated funding on an ongoing basis for this purpose.

ANNEXES

Annex A

MAP OF HIMACHAL PRADESH



Annex B

IMPORTANT FEATURES OF HIMACHIAL PRADESH

S.No.	Item	Unit	Particulars	
			1981	1991
A.	<u>General</u>			
1.	Geographical Area	Sq.kms.	55673	55673
2.	Districts	Nos.	12	12
3.	Villages	Nos.	16807	19387
4.	Towns	Nos.	47	58
5.	Population	Nos.	4,280,818	5,111,079
	a. Rural	Nos.	3,954,847	4,666,255
	b. Urban	Nos.	325,971	444,824
	c. Percentage of rural population to total population	%	92.39	91.3
	d. Percentage of urban population to total population	%	7.61	8.7
	e. Density	per sq.km.	77	92
	f. Males	Nos.	2,169,931	2,560,894
	g. Females	Nos.	2,110,887	2,550,185
	h. Sex ratio (females per thousand males)	Nos.	973	996
6.	Literacy			
	a. Total	%	42.48	63.74
	b. Male	%	53.19	74.57
	c. Female	%	31.46	52.46

B. Cropped Area/Irrigated Area Details (1988-89)

S.No.	Item	Unit	Particulars
8.	Total Cropped area	000 ha	928.0
	a. Net sown area	"	583.6
	b. Area sown more than once	"	398.4
9.	Irrigated area		
	a. Net	"	99.5
	b. Gross	"	171.2
	a. <u>Food Grains</u>		
	i) Cereals		
	Rice	"	49.3
	Maize	"	24.7
	Wheat	"	63.8
	Barley	"	4.3
	Ragi	"	0.2
	Millets	"	2.1
	ii) Pulses	"	1.9
	Total	"	146.3
	b. <u>Non food grains</u>		
	Potato	"	3.3
	Rape and mustard	"	0.5
	Linseed	"	3.9
	Others	"	17.2
	Total :	"	24.9

C. Details of Operational Holdings (1985-86)

Size (ha.)	Holding Nos./%age	Area (ha) %age	Average size holding (ha)
Upto 0.5	296,231 (39.4)	79,413 (8.1)	0.27
0.5-1	167,172 (22.2)	121,171 (12.4)	0.72
1-2	155,311 (20.6)	222,589 (22.7)	1.43
2-10	128,525 (17.1)	462,217 (47.1)	3.59
10-50	5,643 (0.7)	94,850 (9.7)	16.80
Total:	752,882 (100)	980,240 (100)	1.30

Annex C
Details of HALWD Project Irrigation Schemes

Sr. Category	IPH Dept.Schemes		AD Schemes		RD Schemes		TOTAL	
	CCA ha/%	No/%	CCA ha/%	No/%	CCA ha/%	No/%	CCA ha/%	No/%
1. Community Schemes								
a) FIS With short IL	-	-	2042 (5.9)	240 (27)	7537 (22)	153 (18)	9579 (27.9)	393 (45)
b) LIS head low head	-	-	227 (0.7)	23 (2.5)	-	-	227 (0.7)	23 (2.5)
Sub-total	-	-	2269 (6.6)	263 (29.5)	7537 (22)	153 (18)	9806 (28.6)	416 (47.5)
2. IPH Schemes								
a. FIS with (long IL)	11696 (34)	219 (25)	-	-	-	-	11696 (34)	219 (25)
b. LIS (high lift)	9613 (28)	138 (16)	-	-	-	-	9613 (28)	138 (16)
c. TWS	2501 (7.3)	81 (9)	740 (2.1)	24 (2.5)	-	-	3241 (9.4)	105 (11.5)
Sub-total	23810 (69.3)	438 (50)	740 (2.1)	24 2.5	-	-	23550 71.4	462 (52.5)
TOTAL:	23910 (69.3)	438 (50)	3009 (8.7)	287 (32)	7537 (22)	153 (18)	34356 (100)	878 (100)

Annex D

ANALYSIS OF O&M EXPENSES AND FARM INCOME DATA OF FIS AND LIS

The National Water Policy, formulated in 1987, emphasized that (a) water rates should be so fixed as to convey the scarcity value of water to the farmers and to induce economy in water use, and that (b) the rates should be adequate to recover the annual operation and maintenance costs (O&M Costs) of the irrigation systems. These are unexceptionable objectives. However, there are difficulties in the way of raising water rates at one stroke to the level where they might cover costs. These difficulties relate mainly to magnitude of the O&M expenditure and the net additional income generated by irrigation.

First, the O&M costs vary widely between systems. Flow irrigation schemes (FIS) have low O&M costs per hectare irrigated. Lift schemes (LIS) have relatively very high O&M cost per hectare irrigated. This is because a major component of the O&M cost of the latter is energy which constitutes 20 to 60 percent of the capital cost. Currently, the energy cost is highly subsidized. It is likely that the subsidy element will be gradually reduced and correspondingly the O&M costs go up.

Data from FIS Dhanag and LIS Sainj and Masal illustrate the difference in the O&M cost of the two types of schemes. The O&M cost per irrigated hectare in FIS Dhanag is Rs. 526 whereas it is Rs. 5517 for LIS Sainj and Rs. 3200 for LIS Masal. The O&M costs include those incurred by the IPH and by farmers for the maintenance of field channels/water courses*. Given this large requirement it is clear that recovery of full cost of O&M for lift schemes will place a formidable burden on farmers.

Second, an assumption implicit in the National Water Policy is that irrigation substantially raises farm income so that the recovery of O&M cost from farmers will not be a problem. Evidence however is otherwise. Irrigated crop yields vary widely from region to region. Net addition to income is quite sensitive to commodity prices and market outlets.

In Himachal, the yields of irrigated crops are not high. Crop cutting sample surveys show that yields are barely 15 to 30 percent higher than under rainfed conditions. The net additional income due to irrigation is not high. This is supported by data from the three schemes mentioned earlier. The net additional income generated per hectare was Rs. 826, Rs. 1724 and Rs. 1200 in Dhanag, Sainj and Masal, respectively. The additional income exceeds the annual O&M costs only for Dhanag by about Rs. 300. It is less than the

requirements for the other two cases. The question of recovery of O&M cost is hardly relevant in the two cases. Even for Dhanag, recovery of the full cost of O&M might discourage farmers from using water.

What proportion of additional income can be set aside for O&M without becoming a disincentive to farming is a matter of speculation. Supposing that one-third of the net additional income per hectare is taken toward meeting O&M costs, the amount to be set aside will be Rs. 275 per hectare in Dhanag, Rs. 575 in Sainj and Rs. 400 in Masal. These are not large amounts to pay provided farmers can increase income levels with the adoption of high value agriculture. Some background data and details of estimates are presented below:

O&M Expenditures and Income

S.No.	Description	FIS Dhanag (Rs./ha)	LIS Sainj (Rs./ha)	LIS Masal (Rs./ha)
1.	Annual O&M expenditure			
a)	by IPH Deptt.	307	5034	2875
b)	by farmers (for maintenance of Field channel/Distributary system)	219	483	325
c)	Total	526	5517	3200
2.	Annual additional income			
a)	Total	826	1724	1200
b)	Percentage of total O&M expenditure	157%	33%	38%
3.	Contribution by farmers in O&M (say 1/3rd of annual additional income)	275	575	400
4.	Sharing of O&M cost (based on 3 above)			
a)	IPH dept.	32	4459	2475
		6%	81%	62%
b)	Farmers	494	1058	725
		94%	19%	18%
c)	Total	526	5517	4000

Annex E

MEMORANDUM OF ASSOCIATION

1. Name of the Association
2. Complete address of the Association
3. Aims and Objects of the Association:
 - a) To enter into an agreement with GOHP (ID/AD) for securing irrigation water, taking over physical infrastructure and operation and maintenance of irrigation systems.
 - b) To encourage, popularise and promote maximum use of water for increasing agriculture production.
 - c) To manage and ensure equity and distribution of water and maximum participation of the beneficiaries for repair and maintenance of the irrigation schemes handed over by the government.
 - d) To coordinate the activities of various beneficiaries of the scheme, resolve complaints, if any regarding internal distribution of water and to impose penalties to unauthorised users of water etc.
 - e) To coordinate with the concerned officers/officials of the government deputed for the area for timely intimation of problem and their advice and cooperation regarding management of irrigation water and maintenance of the scheme.
 - f) To raise the financial resources for the organisation for the benefit of members.
 - g) To purchase or hire on rent machinery and other arrangements.
 - h) To encourage self help cooperation for operating, maintaining irrigation system, ensure adequate, timely supply of water and its equity and improve agricultural production.
 - i) To take up any other matter which will help/achieve /support the above mentioned activities.

4. Names and other particulars of Managing Committee members and office bearers to whom under Rules and Regulation the management of its affairs is entrusted.

Sr. No.	Name	Designation	Occupation	Address
1.		President		
2.		Vice President		
3.		General Secretary		
4.		Joint Secretary		
5.		Treasurer		
6.		Member		
7.		Member		
8.		Ex. officio member.	J E/A.D.O.	
		President	General Secretary	

We the several persons whose names and other particulars is hereunder are desirous to get the association registered in accordance of attached Memorandum of Association under the Societies Registration Act, 1860 and are applicants for its registration.

Sr.No.	Name	Father/ Husbands Name	Age	Occupation	Address	Signature
--------	------	-----------------------------	-----	------------	---------	-----------

Signatures of above named all the persons are attested.

MLA/M.I.C. with seal.

CONSTITUTION OF KRISHAK VIKAS SANGH (KVS)

For the FIS/LIS/TIS DUGWELL/TUBEWELL
Tehsil _____ District _____
(Himachal Pradesh).

1. NOMENCLATURE :

The name of the Association shall be Krishak Vikas Sangh (KVS) for
FIS/LIS/TIS/DUGWELL/TUBEWELL
Tehsil _____ District _____ H.P.

2. HEADQUARTER :

The headquarter of the Sangh (Association) will be at Village _____ Tehsil
_____ District _____ (H.P)

3. BUSINESS YEAR AND JURISDICTION :

The business year of the K.V.S. will be from June 1 to May 31, of each year. The elections for the vacant posts of members of Management Committee shall be held before May 15 each year.

The jurisdiction of the K.V.S. will extend over the entire command area served by the Minor Canal.

4. MEMBERSHIP:

The membership shall be open to all the land owners having land under the command of the schemes and are of sound mind not bankrupt, and not below the age of 18 years.

5. SUBSCRIPTION :

Each member shall subscribe Rs. 5/- annually to the Association which is not refundable.

6. GENERAL HOUSE :

General House of the Association shall consist of all irrigator member in accordance of Rule 4 above.

7. MEETING OF GENERAL HOUSE:

The General House shall invariably meet once in a year and on the requisition signed by atleast one tenth members of the total members with a notice of ten days.

8. QUORUM OF GENERAL HOUSE :

The quorum for the General House meeting shall consist of two third of it's members. No quorum is necessary for adjourned meeting.

9. FUNCTIONS AND DUTIES OF GENERAL HOUSE :

- a) The General House shall elect the members of Management Committee for the vacant posts.
- b) It shall pass the Annual Report of the General Secretary.
- c) It shall have powers to amend the Constitution by passing with a simple majority of the total members present.
- d) It shall pass the Annual Audit, Accounts Statement.
- e) It shall have powers to rectify the decisions taken by the Management Committee.

10. MANAGEMENT COMMITTEE

The Management Committee of the Association (KVS) shall consist of the following :

- a) President
- b) Vice President
- c) Honorary General Secretary
- d) Honorary Joint Secretary
- e) Treasurer
- f) Two other members elected by the General House.
- g) ADO/JE as ex officio members.

The Chairman of the Nikas Dwar Samiti shall not be eligible to contest/become the member of the Management Committee. A member will cease to be a member of Management Committee after two years or if he loses his status as bonafide irrigator. About half of the members shall retire in rotation each year. Election will be held each year to fill in such vacancies. In the first year of formation of this KVS about half the number of members in the order of percentage of votes secured (votes secured /total number of votes polled) will be appointed for two years and the rest for one year. One representative of the Government i.e. JE (ID)/ADO(AD) concerned will be in the

Management Committee as an Ex-Officio Honorary member with no voting right in the affairs of the KVS.

11. MEETINGS OF MANAGEMENT COMMITTEE :

The Management Committee shall meet invariably once in a month and even earlier if so desired by the President or the Honorary General Secretary.

12. QUORUM FOR MANAGEMENT COMMITTEE MEETINGS :

The quorum for the Management Committee meeting shall consist of two third of the members. No quorum is required for adjourned meeting.

13. MANAGEMENT COMMITTEE DECISIONS :

The Management Committee decision shall be taken by a majority of the Management Committee members present in the management.

14. FUNCTIONS OF THE MANAGEMENT COMMITTEE (MC)

- a) To decide all the policy matters of the KVS from time to time and to frame rules to perform all functions of the Management Committee subject to the approval of General House.
- b) To enter into an agreement with GOHP (Irrigation Department/AD) for securing irrigation water, operation and maintenance of the irrigation systems.
- c) To decide the crop pattern for each season for command of the schemes and their respective areas taking into consideration the likely availability of water, crop water requirement of different crops dates of planting and harvesting etc.
- d) To decide the period of irrigation to be allotted to each outlet, the rotation period and the discharge to be let in the distribution system.
- e) To allocate water outlet wise in every season and check to ensure no unauthorised use of water and to prevent the wastage of water.
- f) To maintain the physical infrastructure and the entire distribution system in good working condition.
- g) To keep liaison with the Nikas Dwar Samiti and with any other Committees/Groups/Individuals for meeting the objectives.
- h) To decide the service charges/water rates to be charged from members/non members of the Society.

- i) To frame rules of business for the Nikas Dwar Samiti and KVS employees carrying out all the executive functions as and when required.
- j) To perform any or all functions in furtherance to the objective of the KVS.
- k) To do maintenance and special repairs of the distribution system and execute such work.
- l) To assist I.D. in holding panchayats etc. in accordance with the rules against those who commit such offences as unauthorised use of water.
- m) To settle mutually the complaints if any regarding internal distribution of water and to impose penalties for unauthorised use of water.
- n) To solve the problem arising between Nikas Dwar Samitees.
- o) To satisfy the GOHP (ID) particularly in Lift Irrigation Schemes that water made available by the GOHP is not being wasted or misused and all necessary steps to keep water losses to bear minimum.
- p) To satisfy the GOHP that all necessary steps will be taken to check soil erosion due to canal water.

15. TERMS OF MANAGEMENT COMMITTEE MEMBERS:

The terms of the Management Committee members shall be of two years.

16. FUNCTIONS OF OFFICE BEARERS:

a) President

The President shall preside over the meeting of the General House and the Management Committee and have full control over the working of the KVS. He shall have the right of casting vote in the meeting of General House and the Management Committee in the event of dead-lock.

b) Vice President:

He will discharge the functions of the President in his absence. He shall also operate upon the accounts alongwith the Treasurer jointly.

c) Honorary General Secretary:

- i) He shall call and conduct the meetings of the General House and the Management Committee.

ii) He shall get the decisions of the General House and the Management Committee implemented.

iii) He shall keep with him an amount of Rs. _____ as an imprest money and will have the power to incur an expenditure upto the tune of Rs. _____ at a time.

iv) He shall keep and maintain all the correspondence of KVS.

d) Honorary Joint Secretary:

He shall assist Honorary General Secretary in his work and shall act as Honorary General Secretary in his absence.

e) Treasurer:

i) He shall maintain the accounts of the KVS and maintain the cash book of the day-to-day expenses.

ii) He shall collect the membership fee, from the beneficiary member of the KVS and voluntary donation alongwith the Vice President.

iii) He shall operate upon the accounts alongwith the Vice President.

iv) He will be responsible to get the accounts of the KVS audited by the auditor appointed by the General House.

v) He shall be responsible to deposit the collected amount in bank approved by the Management Committee.

f) Other members of Management Committee:

They shall attend the meetings of the Management Committee and shall give their opinion by casting their votes on the above issues put on in the Management Committee meeting.

17. FINANCES OF THE KVS:

a) The finances of the KVS shall be raised through the following sources:

i) Membership fees of Rs. 5/- per annum.

ii) Grant-in-Aid from Government or any other source.

iii) Water charges/service charges fixed by the Management Committee from time to time.

iv) Voluntary donations: The KVS open it's account with the _____ bank _____.

b) Consequences of Non payment of Annual subscription

The member who becomes defaulter for non payment of subscription for more than 3 months is automatically presumed to be terminated. However the Managing Committee is empowered to restore his / her membership if the defaulter member clear the arrear within one month a/w penalty of Rs. 1/-.

c) The membership of any member of the Association will be terminated by the Managing Committee in the following circumstances:

- i) Become unsound mind.
- ii) Fails to pay subscription.
- iii) Acts contrary to the aims and object of the Association.
- iv) Absents himself/herself from three consecutive meetings of the Association.

18. UTILIZATION OF FINANCES:

The finances will be utilized to achieve the aims and objectives of KVS as decided by the Management Committee from time to time. The Managing Committee may fix a limit upto which the Hony. General Secretary may incur expenditure in cases of emergency like breach in the canal etc. but ex-post-facto sanction will be required to be taken from the Management Committee in all such cases.

19. VACANT VACANCIES IN THE MANAGEMENT COMMITTEE :

The President of the Association shall have power to fill up vacancies in the Managing Committee by nomination out of the members of the Association for a period not exceeding three months.

20. DISSOLUTION :

In case the Association is not functioning properly or failed it will be dissolved by 3/5th majority of the total membership and the procedure laid down in section 13 and 14 of the Societies Registration Act, 1860 will be followed.

Annex F

REFERENCES

1. Anna University, Madras- Alternative approaches to tank Rehabilitation and Management. Centre for Water Resources- Annual Report 1988-89, 1989-90 and 1990-91.
2. Banerjee N.R. and Manzardo A.E. (November 1993): Organising water users: An overview of efforts in India; ISPAN Report No. 58.
3. Central Water Commission - 1992. An Approach to Organizational and Procedural Changes in Irrigation Sector. New Delhi.
4. Directorate of Land records Himachal Pradesh, Agricultural Statistics (1985-86): Report on Agriculture census, Himachal Pradesh.
5. Government of India, Ministry of Water Resources, Command Area Development Division -1991. Farmers' Participation in Irrigation Water Management. R.S.Pathak, New Delhi.
6. Government of India, Ministry of Water Resources, New Delhi (September 1987): National Water Policy.
7. IPH Deptt. Himachal Pradesh (March 1993): A detailed report on Hill areas and land and water Development Project (July 1984 to September 1992).
8. IPH Deptt. Himachal Pradesh (September 1993): Irrigation and allied activities of Irrigation and Public Health Deptt. in Himachal Pradesh.
9. Korten Franci's F., Robert Y.Siy Jr. (1988): Transforming a Bureaucracy.
10. LCU-CES,(1992): Manual on Minor irrigation schemes in Himachal Pradesh.
11. LCU-CES, (January 1992): Farmers organisation and their participation in sustainable irrigation management - Training material.
12. LCU-CES, (April 1992): Workshop on Farmers organisation development programm and implementation of irrigated agriculture extension and Water management Plan Workshop paper, Palampur, April 1992.

13. LCU-CES(1992): Draft Guidelines for O&M of minor irrigation schemes in Himachal Pradesh by farmers organisation.
14. Ministry of Water Resources GOI, October 1993: Proceedings National Workshop on farmers participation in management of irrigation system Roorkee (October 12-14, 1993).
15. Manzardo A.E. (1992): Small-Scale Irrigation in Himachal Pradesh: Implementation of the Hill Areas Land and Water Development Project in the final Period, May 25-June 27, 1992. USAID Contract No. 386-489-C-00-1048. Sheladia Associates Inc., Rockville, MD.
16. Manzardo A.E. (1992): The Farmers' Organization Development Program of the USAID-Sponsored Hill Areas Land and Water Development Project: A Pilot Program in Farmer Managed Irrigation, March 1991-June 1992. Hill Areas Land and Water Development Project. R.S.Ratan, Shimla, India: Manzardo A.E. (1992).
17. Manzardo A.E. (1992): Small-Scale Irrigation in Himachal Pradesh: Institutional Development, Training Planning and Project Certification January 18-February 20, 1992. USAID Contract No. 386-0489-C-00-1048. Sheladia Associates Inc., Rockville, MD.
18. Manzardo A.E. (1991): Small-Scale Irrigation in Himachal Pradesh: Farmer Organization Development and Project Certification October 20- November 21, 1991. USAID Contract No. 386-0489-C-00-1048. Sheladia Associates Inc., Rockville, MD.
19. Manzardo A.E. (1991): Farmer Organization Development in Himachal Pradesh: Project Certification, Closing Activities and the Widening of Farmer Support (June 1-24, 1991). USAID Contract No. 386-0489-C- 00-1048. Sheladia Associates Inc., Rockville, MD.
20. Manzardo A.E. (1991): Farmer Organization Development in Himachal Pradesh: Consultants Field Report (February 23-March 13, 1991). USAID Contract No. 386-0000-C- 007625-00. Sheladia Associates Inc., Rockville, MD.
21. Manzardo A.E. (1990): Farmer Organizational Development in Himachal Pradesh: Status Report: September 1990. USAID Contract No. 386-0000-C- 00-7625-00. Sheladia Associates Inc., Rockville, MD.

22. Manzardo A.E. (1990): A Basic Approach to Farmer Organization Development in Himachal Pradesh. USAID Contract No. 386-0000-C-7625-00. Sheladia Associates Inc., Rockville, MD.
23. Manzardo A.E. (1990): Recommendations for Farmer Organization Development in Himachal Pradesh. USAID Contract No. 386-0000-C-00-7625-00. Sheladia Associates Inc., Rockville, MD.
24. Ratan R.S. (October 1991): Information dissemination : Field implementation procedure (FODP); HALWDP, Himachal Pradesh.
25. Saxena N.C. and Shah T. (1989): To the hands of poor water and trees, New Delhi: Oxford-IBH.
26. Singh K.K. (ed.) 1992: Farmers in the Management of Irrigation Systems, Stirling, New Delhi.
27. Singh K.K: Turn over of Irrigation System management to farmers: Note presented in India - ISPAN Review Workshop (Patna) December 1993.
28. WALMI-UP (1991): A report on project for study of state and farmer managed irrigation systems in district Almora in U.P Hills (1989-91).

CONTRIBUTORS

Agriculture Department, GOHP

B.D. Goma
O.C. Verma
R.S. Rattan
S.B. Saksena

Irrigation and Public Health Department, GOHP

A. Chouhan
C.L. Sharma
K.K. Mahajan
M.P. Sachdeva
R.K. Gupta
S.K. Gupta

ISPAN State Consultants

S.K. Gautam
P.K. Banerjee
B.H. Patil
C. Singh

ISPAN Central Consultants

K.K. Singh
N.R. Banerjee
Gokhul Prasad
Kamala Prasad
C.D. Thatte
Peter Reiss