

Lift Irrigation Cooperative Societies

A case study from Gujarat, India

Panchamahals is a backward district of Gujarat state inhabited by peoples belonging to the Bhil tribe. The predominantly parched and gravelly soils of the district contrast with occasional green patches where surrounding water is trapped in the undulating terrain. The annual rainfall of 750 mm is not altogether meagre, but it is erratic. Tiny streams with small flows run all year except when drought is severe, as during 1985-87. Settled agriculture is possible only where stored water can be used for irrigation. Once covered with rich forests, the now barren lands stand testimony to ecological degradation. Migration for eight months in the year is a necessary survival strategy for the tribal people.

In this land of the poor, the specter of poverty, hunger or compulsory migration need not be the only reality. Water can be lifted from natural lakes and bunded streams to irrigate lands that are surprisingly fertile. The problem has not been with technology, but with organization,

investment, and management. Panchamahals farmers were unable to tap the local water resources without help from outside.

The answer came in the form of the Sadguru Water and Development Foundation (SWDF), formerly called the Sadguru Seva Trust. The Foundation, a voluntary organization, helped the tribal people to organize themselves to create and manage common resources to meet the high cost of lift irrigation.

In 1975-76 the Stanrose group of companies (Mafatal group) decided to initiate rural development activities in tribal areas of the Panchamahals. A social-economic survey revealed good potential for lift irrigation schemes. By 1980, four schemes were completed with a combined irrigated potential of 1800 acres (730 hectares). Impressed by the success of the schemes, many villages that had local water resources approached the Foundation for establishing lift irrigation schemes in their villages. In 1982, the Secretary of the Gujarat Department of Rural Development suggested that the state government encourage this approach on a large scale with funds available under an existing program. By the middle of 1987, 35 schemes had been completed bringing the total irrigation potential for one season to 840 acres.

The Foundation provides a package of services which includes assistance in finance, accounting and book keeping, maintenance of pumps and machines, billing and recoveries of dues, and agricultural extension. Since 1982-83, responsibility for running the scheme has been transferred to village cooperative societies. Members of a lift irrigation cooperative society (LICS) elect a Management Committee (MC) which in turn employs workers to perform numerous activities. The objective is to make villages independent of the mother organization so that in the future they can manage schemes on their own. This report is

based on data collected on a short visit to Village Shada in 1985 and a two day visit to villages Biamali and Shankarapura in 1987.

The Irrigation Systems

Water is lifted by electric pumps from bunded rivers, natural ponds, canals or reservoirs to a main chamber, which is located at the highest point in the commands. Outlets are connected to the main distribution chamber, through underground pipes. The outlets are masonry structures having two to three openings, each feeding open field channels.

It takes three to four months to complete a project in all respects including survey of the village, installation of pumps, construction of the pump house and distribution outlets, laying the underground distribution network, completing field channels and making the trial runs. Pumps of 25 HP to 50 HP are used to lift water depending on the area commanded and the lift required. A standby diesel set is also kept in case electricity supply is interrupted. The SWDF takes pride in using only the best quality material even if it is costly. Spare parts are kept in storage. As a result, breakdowns due to mechanical failure are rare.

In Biamali the irrigated command of 150 acres is owned by 138 farmers. A 25 HP pump has been installed with a standby diesel pump of equal capacity. The total cost of the scheme was Rs. 255,000 (roughly \$30,000 in 1987), excluding the cost of the check dam which the government constructed at an outlay of Rs. 100,000 (\$8,000). The distribution system has 7 outlets, including the main distribution point. Water output is 2.4 cusecs and the lift 80 feet. The scheme was completed in 1982.

Shankarapura has an irrigation command of 300 acres and 140 farmers. Two 50 HP motors are used to lift water some 140 feet to the main distribution chamber and then on to the 16 outlet points. A 50 HP diesel standby is provided for emergencies. The output is 3.5 cusecs which is adequate for the irrigation command. The total capital investment was Rs. 350,000 when the scheme was completed in 1976.

Village Shada is supplied water from the main canal of the Patadungri Tank which also supplies drinking water to Dahod town. Two pumps of 50 HP each are used to lift water to the 300 acres command owned by 150 farmers. A 50 HP diesel pump is kept in readiness, as in the case of Shankarapura. There are 16 distribution points in the command, all connected through underground pipes with the main distribution chamber.

Community Irrigation Management

A management committee chosen by the general body of all farmers in a village looks after each scheme. Each committee consists of between 7 to 11 members who are elected by consensus for a term of three years. Membership is renewable. The general body of all farmers meets at least once in July/August every year.

The management committee (MC) is responsible for the entire irrigation system - the machines, materials, employees and users. It employs a secretary, a pump operator, a water distributor and a watchman. All employees are paid by the society. The MC takes decisions regarding the operation and maintenance of the irrigation system, crops and time of sowing, settlement of disputes, if any, supervision of the staff, fixing the rotation between outlet points and between farmers, and the purchase and replacement of machines and spares. A particularly important function is

establishing water charges and recovering these charges from the water users.

The Secretary of the LICCS is an employee of the MC, and belongs to the local area. He acts as a link between the village and other institutions. Whereas the tribal people have traditionally practiced low investment rainfed agriculture, he has to orient their thinking to the requirements of irrigated agriculture and to the benefits of balanced application of seeds, fertilizers and water, irrigation by turns and the changing demands of the market economy. He also has to implant the concept of cost of irrigation and recoveries so that creditors are paid, and the challenges of collective self-management are met. In short, the secretary is more than an ordinary employee of LICCS. He is a leader, a guide and a link with the rest of the world. The following are the functions expected of him:

- > Calling meetings of the management committee;
- > Distribution and accounting of water;
- > Recoveries of water charges;
- > Bank loans and repayments
- > Account of pump operation, and expenditure;
- > Arrange for seeds and fertilizers through the multipurpose cooperative society;
- > Extension to farmers about crop seeds, and credit.

The SWDF has developed a system of identifying and training the secretary. First, it selects an educated young man from the neighborhood at a salary considered attractive by village standards. Second, on-the-job training is given. All secretaries meet once a week with officers from SWDF Headquarters to review the functioning of the village societies and discuss any problems.

Social Structure of Management.

The population of a typical village is dispersed in small units of a few families each. Several of these units, called Falias, comprise a village. Sociologically, the falia and not the village is the more important social unit; falias are represented in the LICS.

Water distribution. In all villages the schedule for the operation of the outlet points is fixed in advance; usually two outlets operate at a time with each serving several field channels. The farmer and the distributor together apply water to fields. Coordination between the pump operator, the distributor and the farmers is important for efficient use of water. An irrigation cycle of 21 days is followed.

Agriculture Production. Wheat and gram are the preferred crops, the former occupying as much as 80 to 90 percent of the cropped area. Other crops having marketing potential such as maize and potatoes are grown by a few farmers. Since all fields cannot be irrigated at the same time, staggered sowing is practiced. The management committee, in consultation with the farmers, plays a constructive role in this regard.

Maintenance. The main responsibility for maintenance rests with the management committee. However, the pump operator is responsible for the routine maintenance of the pumps. In case of major breakdowns, the services of the Foundation are readily available. The operation of the field irrigation system is looked after by the management committee and the secretary. Carrying out repairs and keeping the field system in good condition is the responsibility of the farmers.

In Shankarapura village, where the lift irrigation scheme has been operating since 1979, a system of collective

maintenance has been developed. Three to four days before the start of the irrigation season, the members of the MC study the state of field channels and the repairs required. Members divide themselves into groups since the command is fairly large. The secretary of the LICS also joins. An assessment is made of how much work has to be done and where repairs have to be undertaken immediately the responsibility for cleaning the several main channels (each up to 0.5 km in length) is assigned to farmers. It is here that the importance of the falia and the ability of its members to cooperate with each other comes into play. Falia representatives on the management committee take responsibility for organizing their people. Operations involve removal of grass, scraping and sometimes restoration of channel banks damaged by rains and animals.

Employees. The secretary is the principal employee of the LICS. Sometimes two cooperative societies may share a secretary. Other employees are the pump operator who also maintains the equipment, the Chowkidar who guards the pump house, and the water distributor. His duty is to operate the outlets. He is responsible for regulating the flow of water in channels, and seeing that field applications are adequate and not wasteful. The Secretary is paid between Rs. 500 to 600 per month, the operator Rs. 300 to 400 per month and the Chowkidar around Rs. 250 per month. The water distributor is a seasonal employee and is paid Rs. 300 per month during three months in the year.

Economic Aspects

The total cost of irrigation is divided equally among the users so that there is no distinction between those who may use water more economically or whose fields are irrigated more speedily due to

locational advantages. By and large 100 percent recoveries have been reported. Should difficulties arise, adjustments are made to suit individual conveniences. Generally, farmers make payments soon after harvests.

The cost of installing the scheme including the pump is met by the state government under the Drought Prone Area Programme. Working capital is provided through the Foundation as soft loans to the cooperative societies. Technical support necessary for maintenance and repairs is also provided through the Foundation. In all schemes financial assistance towards the payment of salary of the secretary is initially provided by the Foundation.

Cost of Irrigation 1986-87 (Rs.)

	<u>Biamali</u>	<u>Shankarapura</u>
Power	13,400	18,500
Repairs	2,000	3,500
Salaries	15,500	14,000
Water/acre	574	517
Farmers	138	140
Command area (acres)	150	300
Irrigation cost/ac	60	80

The cost of irrigation per acre for the rabi (winter) season ranges from Rs. 60 to 80 per watering. Three waterings are usually done. The expenses come under three major categories: 1) electricity/diesel; 2) maintenance, repair, and credit for the pump; and 3) salaries and wages of employees. The cost of irrigation water per acre comes to Rs. 50 in Biamali and Rs. 71 in Shankarapura. However, the charges made were Rs. 60 and 80 respectively, in order to build up reserve capital for repairs. The figures for village Biamali and Shankarapura are given above.

A fifty percent subsidy is available as crop loan to tribal people under government policy. This covers seeds and fertilizers. Some farmers also deal with the commercial Agricultural

Marketing Produce Society which gives crop loans and purchases farm produce. The scale of commercial transactions in terms of crop loans has been modest.

Irrigated agriculture has had a definite impact on incomes. The net value of produce in 1986-87 was placed at Rs. 190,000 in Biamali and Rs. 430,000 in Shankarapura. Net income per family from irrigated agriculture was Rs. 1400 in Biamali and Rs. 3100 in Shankarapura. The per acre net income comes to around Rs. 1550 (\$124) in Biamali and Rs. 1650 (\$132) in Shankarapura. Differences are perhaps attributable to the fact that villagers in Shankarapura sell their produce to the cooperative society whereas those in Biamali sell it in the market where they get lower prices.

Role of the Foundation

The Sadguru Water and Development Foundation receives financial support from the Stanrose group of mills (Mafatlal) to meet its managerial, establishment and overhead expenses. The state government under its DPAP programme supports capital expenses on pumps, machines and the completion of the irrigation system. The headquarters organization of the SWDF is small, but provides essential technical and organizational support to the cooperatives. Three units within the organization deal with irrigation activities:

- Cooperative cell. Two cooperative officers monitor the cooperative activities. Two fitters carry out repairs and make replacements to help keep the lift irrigation schemes working.
- Lift irrigation construction cell. One consulting engineer visits Dahod for 12 days per month and four technical staff help in construction activities.

Portable pump sets maintenance cell. Two fitters, replace and repair pumps that may go out of order.

The system of weekly meetings of secretaries has helped SWDF keep well informed about the happenings in each village. The activities of the secretaries are closely monitored with regard to irrigation, agriculture, loans and recoveries. Over the years, the visits of officers from headquarters to villages have decreased, and the system of decentralized management has proved quite effective.

Conclusions .

The fact that the tribal people have taken up irrigated agriculture and have been pressing for more lift irrigation schemes in the area confirms the program's success. Farmers have paid irrigation charges and have contributed to the working capital. They have developed a group approach to maintenance which is perhaps the single most important indicator of the success of the scheme as an enterprise. The question to be asked now is whether the schemes are farmer-managed and to what degree. If the Foundation were to withdraw, could the cooperative societies sustain themselves?

Though there is at present a demand to triple the number of lift irrigation societies, just eight years ago when the Sadguru Seva Trust first initiated the LI scheme convincing the people was difficult. Only the goodwill earned by the local promoters as social workers helped the Foundation gain acceptance. Even after the first lift irrigation scheme had been demonstrated, many villagers were not convinced, the value of the technology took time to gain acceptance. In the initial years, the Foundation established and managed lift irrigation schemes itself with help from farmers. This arrangement continued until 1982-83,

when the first cooperative society was formed. Thereafter all schemes have been converted into cooperative societies and new schemes have been started as cooperative ventures.

The case of tribal cooperative lift irrigation societies raises a larger question of the amount of support in terms of resources and skills that are required in FMIS assistance. For example, some working capital is required along with spare machinery and the services of skilled mechanics.

The resource requirements of lift irrigation technology and the high cost of its operation challenge the ability of these tribal people for self-management. In the short run, assistance by the Foundation can be continued. But in the long run, dependence on others for services is bound to create an unstable relationship. The key issue is whether the cooperative societies can consolidate their gains to become healthy, self-governing, and sustainable organizations.

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