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Status of Irrigation Management Transfer in India

**Water Users' Association in
Phulewadi Lift Irrigation Scheme:
Farmers' Experience**

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Foreword

This booklet is one of the series of short narratives about farmers' efforts to create and manage water user associations. The purpose of the series is to provide other farmers in the state with succinct, readable, and interesting information about these efforts that might enable farmers to improve their access to the irrigation services. This study is being published in both Marathi and English. See the back cover for information about the other narratives in this series.

This narrative was written by Pritam K. Patle under the guidance of IIMA and IIMI team members. He lived with the farmers described here from October, 1994 to April, 1995. While there, he interviewed and observed the farmers in order to document the water user association and irrigation management transfer process at this site. The information presented here reflects the ideas and opinions of the farmers themselves.

Pritam K. Patle's effort was part of the study on Status of Irrigation management Transfer in India being carried out from 1993 to 1995 by the Indian Institute of Management, Ahmedabad, and the International Irrigation Management Institute, Colombo, with funding from the Ford Foundation. The study investigated and documented the policies and activities of agencies, non-governmental organizations, and others with regard to promoting irrigation management transfer from the government to farmers. The overall goal was to contribute to formulation of effective policies and programs with regard to irrigation management transfer in India. In addition to this series of short narratives, study results are reported in more traditional research reports and other forms.

The primary members of the IIMA/IIMI study team were Shashi Kolavalli, Amarlal Kalro, Gopal Naik, and S. Ramnarayan from IIMA, and Jeffrey D. Brewer, R. Sakthivadivel, and K.V. Raju from IIMI. Editing in Marathi was carried out by Sudhir Sevekar and Suryakant Saraf. The edited first draft was translated into English and reviewed by the study team, particularly by Amarlal Kalro and Gopal Naik.

The members of the study team, including Pritam K. Patle, wish to thank the people of Village Phulewadi, concerned government and non-governmental agencies who gave their hospitality and time to answer questions and explain how things work without expecting compensation. We sincerely hope that their experiences will be useful to others.

Jeffrey D. Brewer
IIMI

Gopal Naik
IIMA

Water Users' Association in Phulewadi Lift Irrigation Scheme: Farmers' Experience

Kolhapur was not so well developed when India became free. There were small residential colonies adjacent to the town. There was a large tract of barren land to the west of Rankala lake. Some farmers dwelt there. They were farming on the horizontal channel of Rankala lake, and had formed an association named "Rankala Adva Paat Shetkari Seva Mandal". The then Government of Bombay had already been attracted by the plight of these striving farmers. The farmers had raised their huts wherever they found a place to. When a city development programme was chalked out for Kolhapur with the initiative of Shri J.P. Naik in 1945, a suggestion was made to provide them a model colony. A cooperative housing society was therefore formed. When Independence dawned, a tiny but tidy colony stood near Rankala lake. The farmers who had grown up during the reformation movement of Mahatma Phule, named the colony after him - "Phulewadi".

The same Phulewadi has today become a part of Kolhapur city. It is within Kolhapur Municipal Corporation limits and has developed considerably. It is marching towards progress and Mahatma Jyotirao Phule Cooperative Society is contributing to its growth.

To trace the roots of development in this region, one has to probe into the history of Chhatrapati Shahu Maharaj who was the epitome of reformation, development and education. For the welfare of farmers he had begun construction of Radhanagari dam on Panchganga river in 1908 with the farmers' help. The government then took over and completed it gradually. He never waited for the government to implement his well conceived plans. His development schemes were completed with cooperation from the people.

The extra water in the dam was released in Panchganga river. Shahu Maharaj planned to utilise this water. A Kolhapur Type Weir was constructed on Panchganga at a distance of thirty kilometers from

Radhanagari Dam. Built with stones, sand and cement, it is the first and unique example of such a weir in the world.

This weir was ready for use in 1928. It was named 'Rajaram Kolhapur Bandhara'. It is 126 mts long and 3.81 mts. wide. It has 58 doors for letting the water out. The storage capacity of the weir is 80 MC and it can irrigate 2700 hectares of land.

Surrounding farmers benefitted by adopting lift irrigation schemes on this weir. Several private and cooperative lift irrigation schemes were established to use the stored water.

Phulewadi villagers too were tempted to use this Panchganga water. Rankala lake water could not fulfill the requirement of their advanced agriculture. Some villagers gathered on 1st March 1958 and "Mahatma Jyotirao Phule Vikas Sanstha" was founded on that day. The leading people were - Balvant Abaji Koranne, Shreepat Shankarao Bondre, Pandurang Dadoba Mane, Haribhau Divase, Shamrao Jadhav, Bhagaji Patil, Dattaba Desai and Shankar Jadhav.

Membership of the society increased fast. Every land owner within ten kilometers of Kolhapur Municipal area who applied for membership was granted membership. Their residence in Kolhapur was essential for this membership. The society helped members by granting agricultural loans, supply of fertilizers, advanced agricultural equipment etc.

The Mahatma Jyotirao Phule Cooperative Society decided to get water with lift irrigation scheme from Rajaram Weir in 1960. Water was carried to the farmers field with the help of a 5500 ft long pipeline. Kolhapur District Cooperative Bank offered its help initially. A loan worth Re. One lakh and twenty five thousand was obtained from the Government also. Major part of these have already been repaid. The plan was implemented from 1963. Inadequacy of water from Rankala lake had kept the land thirsty for a long period. This lift irrigation scheme made cultivation possible.

Phule Seva Sanstha not only supplied fertilizers, provided loans and market facilities, but also gave a new life to the farmers' lands. It gave water. Progress was accelerated with the help of the society.

Phulewadi is a model village in the eyes of the surrounding people. Many persons deserve credit for this achievement. Many people contributed their valuable time and hard work. The younger generation of the village is now reaping the benefits. They can now do new experiments, implement new schemes, and add to the glory of their village.

Such Was the Situation

Kolhapur is situated on the southern border of Maharashtra quite close to Karnataka. Phulewadi is on the western side of Kolhapur. The soil here is black fertile, red as well as mixed type. Rarely plain, the topography is steep and hilly. Average rainfall is 900 to 1000 mm. Climate is hot and damp.

Phulewadi had 25,000 people then. Marathas constituted major part of the population. Eighty percent people lived on farming (and marathas were in majority there too). Only fifteen percent of farmers could be called rich and economically stable.

The farmers used to wait for rains each year to raise their crops. They had no other way. Radhanagari dam water came into use in 1908, but it could not help the people of Phulewadi. How could one build canals on that undulating land? How could Phulewadi receive water which was far away from it? Wells had very little water, and their depth created further problems. Using them for irrigation was not possible.

Rajaram Kolhapur Type Weir was completed in 1928. It was a large weir. The water storage was quite big. But the water was to be used for drinking, for industries and then for irrigation. This was the order of preference. Therefore the farmers had to continue to wait for the rains inspite of the newly constructed weir. That was their fate. The common

farmer could never think beyond getting jowar, bajri, wheat or rice for his maintenance. Sometimes, he had to face drought and famine also.

However they had thought of a new way to get access to water. Many rivers and streams flowed in that hilly area. They were full of water during the monsoon. A number of farmers tried to impound and utilise this water, and it gave good results. Many farmers raised annual cash crops with the help of that stored water. Sugarcane cultivation became popular, thereby increasing the income of farmers. But the success was short lived.

The farmers had used earthen weirs to impound the water, and these had a very short life. The weir stood the whole year and helped in storing water, but during the monsoon the gushing stream of water would break the earthen weir. The farmers had to make a fresh start each year and construct a new weir again. This was a big blow to them. They had to spend practically the whole amount that they earned from sugarcane cultivation in order to construct another weir. Sometimes they required even more money. The situation took them back to the old condition of despair.

Rich farmers found a better way to prevail over the situation. Rajaram Bandhara had given considerable relief to the farmers. Radhanagari dam was taken up by the Government in 1954 for further construction of the Radhanagiri Hydro Electric Project. The water, after passing through the turbines, was to be released in the river for irrigating downstream areas of rivers Bhogavari and Panchganga. But the Government had no scheme for irrigating the undulating land in the surroundings of Phulewadi. The farmers were tired of the recurring washing away of earthen weirs. A group of farmers therefore came forward with a lift irrigation scheme, and the Irrigation Department gave their clearance.

A new journey started in a new direction with this scheme. It was the dawn of a new era.

It Began Thus But!

Some farmers installed their private lifts. They lifted water from the Rajaram K.T. Weir reservoir with electric motors. Water was carried through pipe lines for application in their fields. But this was a tedious, time consuming job. It was leading to high costs and was difficult to manage as well.

The farmer had to apply to the irrigation department for permission to lift water. An engineer from the irrigation department would survey the land and determine the quality. He would also decide the cropping pattern. His report would be sent to the Deputy Engineer. The application and the report would then travel to the higher officials - Executive Engineer and the Superintending Engineer, for further consideration. After evaluating the proposal and report, permission was granted for lifting water in the ratio of the horse power of the motor. However, this was not the end. Farmers were required to obtain power permission also. Travelling through all rungs of the Electricity Board, the farmer somehow got the permission. Then only the water lifting process could begin.

These technical formalities discouraged the farmers. Uneducated farmers were utterly confused by this process. Educated, rich farmers used to go through it successfully. They could get water, but it was still not very easy inspite of completing all formalities. In the hope of future benefits the farmer had to spend a considerable amount of money for the pipes and machinery. Irrigation department further charged water tax taking into account the irrigated area and crops grown. He had to pay the electricity charges as well.

Efforts were made by some small landowners to implement lift irrigation schemes on contract basis, as they could not depend on rainfall totally. A single farmer alone could not bear the initial expenses. Complying with both the department procedures was a tiresome job for him. His ignorance came in the way many times. He found a midway and decided to "buy" water from the contractor or any rich farmer.

The small farmer could get a better crop with this water. He could have an annual crop now. It added to his income. But he could not reap the benefits fully. He had to pay heavily for the water. The contractor or the rich farmer dictated the terms of sale. There were no fixed rules. The small farmer had to submit to the dictates of the "seller". His needs compelled him to submit. Twenty five per cent of his produce was to be given away to his benefactor as the price of the water. Otherwise he would be deprived of the benefits. Without grumbling he had to sacrifice the produce earned from his hardwork. This was not all. Irrigation authorities used to visit the field and he was charged a tax for using the water, as per the Government rule.

Precious little profit would therefore remain with the small farmer. Farmers would be categorised in three different groups depending upon their land holding, viz., small farmers holding an acre or two, medium farmers having upto five acres of land and big farmers cultivating more than five acres of land. Most of the farmers in Phulewadi came under first two groups. They could not afford to have their own lift irrigation system. They were unable to look after the technical aspects and incur the required expenditure. As there was no sugar factory in the Kolhapur area, production of jaggery increased. This was the only remunerative market for farmers then, and therefore small and medium farmers tried to get access to water at any cost.

Landless farm workers had little chances of employment. As enough water was not available for sugarcane cultivation and jaggery production became the monopoly of the rich farmers. The small farmer began to lose hope and courage. He could neither get economic stability nor social status. Ever worried, he was always surrounded by problems. He wanted a change for the better. He was striving for that change.

Change Occurred This Way

Shreepatrao Bondre - the MLA representing Phulewadi had been observing the sad plight of the farmers, and was deeply moved by their condition. He himself had a big piece of land along with the other

farmers. He convinced them about the importance of cooperation, and founded Mahatma Jyotirao Phule Cooperative Society in 1958. He was successful in raising capital from the members, and Kolhapur District Cooperative Bank also helped the society with a loan.

Members developed confidence and faith in the working of the society during first five years. They were certain that the society had come into being for their welfare.

After working satisfactorily upto 1960, the Society's attention was drawn to the water problem. Difficulties in getting access to water were resulting in a great loss to farmers. This realisation led them to a new idea. The founder member of the society, Shri Bondre, thought of starting a water supply scheme through the society.

A retired engineer Mr. Y.S. Sohoni was asked to prepare a suitable scheme. Considering the topography and the need for irrigation, he made a plan. Under his guidance work commenced on 15th August 1960. A similar proposal, prepared by Shri Bondre, had been unsuccessful. His idea was innovative. He had planned to bring water from the weir by a pipeline. It was to be stored in a tank at a height of 200 ft. Then it would be easy to supply it to thousands of acres of adjoining land. Nobody was sure of its technical feasibility, and several persons considered it to be insane. Government procedures were as usual an obstacle. The Experts had observed that a tank at a height of more than eight feet was not at all advisable. With such a remark, permission could not be granted to the project. Recurring visits to Government offices proved futile.

Continuous and firm negation from the Government however strengthened the determination of the society and it decided to implement the scheme independently. People were convinced of its importance and something needed to be done urgently about the water supply. Though difficult and seemingly impossible it was the only thing they could do for water supply.

An amount of three hundred rupees per acre was collected as irrigation deposit from the concerned members. Total 1380 acres of land was to be irrigated and Rs.4,02,343.66 was the irrigation deposit collected from farmers. The remaining required amount was borrowed from Kolhapur District Central Cooperative Bank as a loan.

The scheme was completed by 1963. It was formally inaugurated on 26th January 1964 and farmers started getting water from 27th January 1964.

The scheme envisaged an investment of rupees fourteen to sixteen lakhs for its completion. Its working was smooth, and operation stabilised by 1966. Loan repayment was regular. The society then thought of implementing the second phase. Government of Maharashtra offered its help for the next stage. It granted Rs.7,25,000 for the work. The society also availed the benefit of subsidy worth Rs.1,75,000 on the loan. This was the fruit of faith and determination of the initiators. Government authorities who scoffed at the technical feasibility of the scheme were convinced later within five years.

Much of the credit for this water supply scheme goes to Shripatrao Bondre, MLA. There are many others who contributed to its development. Shri Shivajirao Mane had supported him during this period. He was Chairman of the water supply section of the society.

Water supply was one of several activities of Mahatma Jyotirao Phule Cooperative Society, Phulewadi, which was registered as a multipurpose society. Successful implementation of the water supply scheme was another feather in its cap.

There was no special executive body for the water supply section. A Chairman and some members were responsible for its operation. The society had only one executive body consisting of nine members for all sections. This executive council meets every month. In that meeting, the total working of the society is discussed. Water supply section gets a new Chairman every year, he is appointed by rotation without holding elections. Thereby everyone becomes familiar with the working of the

society. It helps in retaining the feeling of cooperation and enhances effectiveness. Because of the different schemes the society is handling, the beneficiaries of this command area also get profits from these other activities of the society.

The Chairman of the water supply section is essentially a farmer from the command area. He too abides by the rules, regulations and conditions. The Executive Council takes action if anyone is found violating rules.

Special staff is appointed to deal with field work in the water supply section. They receive a salary according to their grade, and other benefits such as Provident Fund. For technical and non-technical responsibilities the society has appointed the following personnel.

Joint Secretary	He supervises water supply section and reports to the executive council.
Overseer	The highest technical office bearer
Accountant	Maintains accounts
Electric Motor Operator	Responsible for technical operation
Patkari	Responsible for field channel operation
Peon	

Water tax (rates) are determined after considering all the expenses that include expenditure on machinery, electricity charges, staff and miscellaneous expenditure. As the expenditure varies every year, the water tax amount too has to be changed. A specific amount is collected from each member depending on his irrigated land. It is deposited with the society as a fixed deposit. If sugarcane ratio is large in the crop pattern, then most of the farmers choose to have their own jaggery production. The jaggery produce is sold in the market through the society shop. The society in this way can collect the remaining water tax or any loan due from the amount to their credit in the shop.

Cement pipeline runs throughout the command area and at places there are valves for water supply.

The society has a system of field channels for water distribution. The farmer uses water as per his need and gets required amount of water. The supervisor explains the water distribution schedule to the Patkari. The Patkari opens the outlet valves and from these outlets, water flows into the field channels and then to farmers fields. Water is supplied to members by turn. A timetable for water distribution is carefully prepared depending on the crop requirements.

The society members are given freedom to choose any crop and the society gives an assurance to supply the required water for the crop. Field channels are maintained by the society whereas the field outlets are to be maintained by the concerned farmers. This is a rule. Pipe leakages, machine repairs are attended to by the society regularly and it keeps the water supply system in operation. A general body meeting is called once a year and all problems are discussed there. The society functions under the overall supervision of the Sub-registrar, Cooperative Societies. The society has framed some rules about water distribution for the members too. They abide by these rules. These rules are in conformity with the byelaws of the society.

The Technical Side of It

The distance from the reservoir to the water distribution tank is 5,500 ft approximately. Water is drawn from an intake well in Panchganga river. The jackwell is at a distance of 700 feet from the intake well. The intake well is fifteen feet in height and six feet in diameter. Jackwell goes sixty feet deep and has a diameter of fifteen feet. Water reaches the jackwell through a pipeline which has a diameter of 34 inches. Three electric motors - each of 125 HP are installed here. Two of them are kept in operation at any time, and the third one is kept as a standby. Water is lifted through the rising pipes from the jackwell. This 4800 feet pipeline is of twenty one inches diameter. 3500 feet length of pipeline is of pre-stressed pipes and the rest is 'C' class.

The water distribution chamber is eighteen feet deep and its sides are 12 feet x 14 feet. Besides this, water reaches this chamber by one more way.

At a different place in Panchganga river bed water is lifted and stored in a well with the help of a 75 HP electric motor. From that well it is brought to the distribution chamber with the help of another 60 HP electric motor. Actual water distribution takes place from this chamber. The water is taken to the fields at a distance of four kilometers with siphon pipes. There are twenty six valves in this 4 km. long pipeline. Water is supplied to the fields by field channels at some places and by cement pipes at other places.

By this scheme one thousand three hundred and eighty acres of land from the villages Karveer, Nave Balinge, Shinganapur, Padali can receive irrigation. Government approved crop pattern is - Kharif 500 acres, Rabi 600 acres and Annual 280 acres.

With assured and regular water supply, there were no conflicts between farmers over water. The feeling of cooperation and understanding started to grow among them. If any quarrel arose, the society would look into the matter.

Freedom to decide cropping pattern made the farmers very happy. Jaggery produce has a favourable market and the farmers are inclined to grow sugarcane crop in the field. As there is no sugar factory nearby, everyone has his own jaggery production unit. Naturally the unemployed youth in the area are benefitted. They get a means to earn their livelihood. Water supply section of society has thus helped to improve economic standard of the farmers as well as farm labourers.

Mahatma Jyotirao Phule Cooperative Society also offers other services to members. Sugarcane producers are very much troubled by uncontrollable growth of weeds. The society provides weed killer to the members. The farmers are provided fertilisers too. The society grants emergency loans to members at times. These activities add to the society's income.

Another major service the society provides its members is the marketing of jaggery. It had been decided in the very beginning that the jaggery produce would be marketed by a society shop. The farmers did not have

to worry about the marketing of their produce as the society had a major store of jaggery. This gave immense assurance to the farmers. This business also helped in water tax collection.

The society requires a large complement of staff to manage its activities. For marketing business and the transport therein, the society needs many labourers and vehicles. Unemployed youth in the village or from the nearby villages are employed for this work. The society could get assured local labour and the youth got jobs without leaving their villages. Children and relatives of the beneficiaries also could get employment with the society. About ninety persons are employed by the society and that is an additional benefit to the people in the area.

It Proved a Boon This Way

The farmers were busy throughout the year because of the annual crop. An understanding had developed to encourage unity and cooperation to solve mutual problems. They believed in cooperation as an easy means to progress. Education, village development were the things they dreamed of earlier, and were now becoming a reality. The ignorant, poor and diffident farmer of the past was changing into a happy, contented and well informed farmer. He was becoming confident of his future.

The society managed a cooperative consumer's store for a short period. It intended to supply the farmers articles of daily consumption. A cloth shop was also opened and it proved to be a good experiment. A housing scheme for lower and middle income groups was also developed and some societies were registered during 1979-80. There has been some progress in building multistoried residential complexes.

Cause of the Problems

Usually the Government does not interfere in the working of any water user's association once its operations stabilise. But water in Radhanagari reservoir reduced due to scanty rainfall. The government therefore reduced the quantum of water that the society could lift. In successive

years, the government has been reducing the water ratio during January to June. Strict implementation affects the crops seriously, and farmers cultivating annual crops get offended. The sanctioned water level fixed in the beginning has changed significantly. There is no water supply during water scarcity. Only on alternate weeks water can be lifted. Sometimes the society has to use a double lift system using different electric motors at different places. The society has to bear double expenses for the same quantity of water and still the water supply is not enough.

This had a very bad impact on the farmers attitudes. Many farmers who were not members of the society continued to lift water from the river with their individual electric motors. Non members also benefitted from water percolation which recharged their wells, and they used this well water for irrigation. Several farmers also dug wells in the command area. They lifted water from the wells not only in an emergency but also throughout the year sometimes. Further, they did not pay any water tax to the society. The society faced a great monetary loss by this, with some members following their example and resigning from membership. As a result the command area decreased. The society therefore decided to charge 50 per cent water tax to these farmers also, and gradually received their compliance.

Phulewadi is today a part of Kolhapur Municipal Corporation. Population of the city continues to increase. As the need for housing increases, the land prices increase accordingly. Many farmers have started selling their land to property developers, as farming was difficult compared to selling the land and investing the money in other activities. Consequently, the number of members is decreasing day by day.

The situation is certainly discouraging for the members and the society. The loss so far has been compensated by other activities.

The scheme originally aimed at irrigating 1380 acres of land. In the year 1963-64 only 123 acres of land could be irrigated. It gradually increased and during the year 1969-70, 559 acres of land was irrigated. In 1993-94

only 425 acres land was irrigated under the scheme. This lift irrigation scheme still stands as the biggest lift irrigation scheme in Maharashtra. The scheme is working satisfactorily though the ratio of the land has changed many times. According to the annual report, the society earned a profit of Rs.51,000 from the water distribution section.

The farmers were charged only Rs.300 per acre per year as water tax for annual crops in the beginning. For Kharif, it was only Rs.30 per acre and the Rabi season charges were Rs.150 per acre only. These charges increased gradually because of increase in electricity charges, machine repairs and replacement of pipes, etc. Presently farmers pay Rs.300 per acre for Kharif season and Rs.700 per acre for Rabi and Rs.1500 per acre for annual crops.

The irrigation department rates for water charges are Rs.468.75 per hectare for sugarcane, Rs.37.50 per hectare for rabi, Rs.25 per hectare for kharif. The government authorities from the irrigation department collect the water tax as well as a twenty per cent surcharge as Zilla Parishad tax. The society pays its dues in good time and avails 10% discount from the irrigation for timely payment of water tax.

Every year the society makes a fresh application for the quantity of water to be lifted. The canal inspector measures the land under irrigation. The society is penalised if it exceeds the permitted land ratio. The extra land is charged at three times the usual water tax and the amount is immediately recovered. The Irrigation Department authorities have a good opinion about the society because their water tax is paid promptly.

The society pays electricity charges to the state electricity board. According to the existing rules, the electricity board charges Rs.300 for each HP used. The old meter system has been changed and this new method was introduced by the state government. This is convenient for all the cooperative societies.

The Future

With increasing urbanisation and growth of Kolhapur city, several members have sold their land to property developers. As such, the number of members is decreasing, but the cost of running the scheme is only increasing. Therefore, water charges have also increased over time. Despite satisfactory functioning of the society, the future for irrigation activity of the society is not rosy. Ultimately, agriculture in this area will be replaced by housing colonies and urban development. With an initial investment of Rs.16 lakhs, the founders of the society have achieved much. The society has made modest profits in this activity in the past, but the writing on the wall is clear. This activity of the society will come to an end, sooner or later.

List of case studies published in local languages under Irrigation Management Transfer Project

Case Studies conducted in Gujarat and published in Gujarati

1. Water Users' Association in Anklav Subminor, Mahi Kadana Project: Farmers' Experience
2. Water Users' Association in Right Bank Canal of Pingot Medium Irrigation Project: Farmers' Experience
3. Water Users' Association in Left Bank Canal of Baldeva Medium Irrigation Project: Farmers' Experience
4. Water Users' Association in Bhestan Minor (Mohini), Ukai Kakrapar Project: Farmers' Experience
5. Water Users' Association in Bhima Lift Irrigation Scheme: Farmers' Experience

Case Studies conducted in Maharashtra and published in Marathi

1. Water Users' Association in Phulewadi Lift Irrigation Scheme: Farmers' Experience
2. Water Users' Association in Kadoli Lift Irrigation Scheme: Farmers' Experience
3. Water Users' Association in Minor 7, Mula Project: Farmers' Experience
4. Water Users' Association in Parunde Minor Irrigation Project: Farmers' Experience
5. Water Users' Association in Hadshi Minor Irrigation Project: Farmers' Experience
6. Water Users' Association in Minor 17, 18, 18A, 19 and Distributary 1, Waghad Project: Farmers' Experience
7. Water Users' Association in Minor 10, Bhima Project: Farmers' Experience

Case Studies conducted in Tamil Nadu and published in Tamil

1. Water Users' Association in XIth Branch Canal, Periyar Vaigai Project: Farmers' Experience

2. Water Users' Association in Kedar Tank: Farmers' Experience
3. Water Users' Association in Dusi Mamandur Tank: Farmers' Experience
4. Water Users' Association in 28L and 29R Outlets of Mettupalayam distributary in Lower Bhavani Project: Farmers' Experience
5. Water Users' Association in Malayadipalayam Distributary of Parambikulam Aliyar Project: Farmers' Experience
6. Water Users' Association in A9 Mahilanchery Channel (Saliperi), Cauvery-Valappar Project: Farmers' Experience
7. Water Users' Association in Panchanhangipatti Tank: Farmers' Experience
8. Water Users' Association in Pillayarkulam Tank: Farmers' Experience
9. Water Users' Association in Vagaikulam Tank, North Kodaimelalagian Channel, Tambraparani Project: Farmers' Experience

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