



## **PARTICIPATORY IRRIGATION MANAGEMENT (PIM) IN MAHARASHTRA STATE, INDIA – A CASE STUDY**

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### **ABSTRACT**

Maharashtra has long tradition of farmers' participation in irrigation management in the form of Phad systems and Malgajari tanks. In the nineties, the first Co-operative Water Users Association (WUA) was established in the Mula Irrigation Project. With its success, Government of Maharashtra (GoM) has been promoting PIM in the State.

WUA are responsible for the operation, maintenance and management of the area and receives the prescribed water quota in the form of bulk volumetric supply along with the freedom to grow crops of their choice. Over last 10-15 years, there was appreciable growth in WUAs. There are number of success stories, underlining the importance of WUAs. On the other hand, there are also some instances of no appreciable improvement in performance of irrigation projects with WUAs.

To evaluate the actual performance of WUAs a study was conducted, which covers WUAs from various parts of the State. The paper discusses the outcome of this study, reasons for good or poor performance, difficulties in functioning, area which needs attention, challenges in up-scaling etc and steps taken by GOM to solve the difficulties in progress of PIM. The paper also discusses future course of action to strengthen PIM initiatives in the State.

### **1. INTRODUCTION**

Maharashtra State is situated in the southwest of India. It is the third largest State (30.8 Mha) with the second largest population (97 million) in the country. Agriculture has been the prominent occupation to provide food and fiber to the growing population of the State. The State economy is dependent upon agricultural production. Irrigation facility is regarded as the key element of irrigated agriculture. The modern agriculture and irrigation practices play a key role in alleviating rural poverty.

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## **2. CLIMATE AND RAINFALL**

The State has a tropical climate. The annual rainfall varies from 400 mm to 6000 mm. The average rainfall of the State is around 1300 mm of which 88% falls during June to September and remaining between October to December. It has therefore a greater impact on State's water resources planning.

## **3. SURFACE WATER RESOURCES**

The geographical area of the State is divided into basins of Krishna, Godavari, Tapi, Narmada and narrow basins of west flowing rivers of Konkan. The average annual availability in above basins is anticipated as 163.82 BCM, out of which permissible use as per interstate tribunal award is 125.94 BCM.

### **3.1 IRRIGATION POTENTIAL CREATED**

Irrigation potential of hardly 0.274 Mha was created in the State during pre-plan period i.e. prior to 1950. As agriculture is the prominent occupation, the State has concentrated upon construction of irrigation projects. There was manifold increase in irrigation potential creation. By 2005, the State has created 4.0Mha irrigation potential using surface water resources. The State has constructed almost 2700 major, medium and minor irrigation projects, which is around one half of the country's total population of dams. The ultimate irrigation potential, through both surface water and ground water resources, has been estimated as 12.6 Mha.

## **4. HISTORICAL DEVELOPMENT OF PIM**

Maharashtra has a long tradition of participatory irrigation management. Phad systems in Northern Maharashtra and Ex-Malgujari tanks in Eastern Vidarbha are living examples of it.

### **4.1 PHAD SYSTEM**

The Phad system on canals has been implemented since the medieval period on Panzara, Girna, Mosam & Burai Rivers, which flow through Nasik & Dhule districts. Water was diverted by constructing bandharas across these rivers. Several beneficiaries belong to a single Phad. A sole type of crop is used to be harvested in a Phad. They use to cultivate perennial crops in the first Phad, two seasonals in the second, seasonals in the third whereas a crop would be grown in the fourth in case water is available. The crops are rotated in different phads in a 4-year cycle.

### **4.2 MALGUJARI TANKS**

The tenure of Gond kings saw the creation of series of tanks in Vidarbha. It is given to understand that nearly 10,000 tanks had been constructed nearly 300 to 350 years back in the districts of Chandrapur, Gadchiroli, Bhandara & Nagpur in Wainaganga Basin through the entirely private enterprise of the Kohali community i.e. by deploying their own money and efforts.

#### 4.2.1 Development in post-independence period

To encourage participation in irrigation management by farmers, the then Bombay Province in 1947 had created canal advisory committee, block level water committee and corporate body of landowners.

In 1976, Maharashtra Irrigation Act-1976 has come into force. The chapter III, section 60, of the act provides for modalities in which water committees are proposed to be formed and to whom water is to be supplied on volumetric basis.

Considering National Water Policy-1987 and Maharashtra Irrigation Act-1976, the Government of Maharashtra initiated pilot project of establishing water users' associations. In 1989, on Mula project Shri. Datta Sahakari Pani Wapar Sanstha has been established in Nevasa Taluka of Ahmednagar District. The same year 3 WUAs were established in Waghad project of Nashik District.

### 5. STATUS OF PIM IN MAHARASHTRA

The State has broadly divided into six regions viz. Konkan, Western Maharashtra, North Maharashtra, Marathwada, Nagpur and Amravati. These regions have different geographical, social, agro-climatic scenario, which certainly has had an impact on PIM development in the State. The progress of development of WUAs in the State is given below.

Sr. No	Region	Functioning		Agreement is over but yet to start functioning		Registered but yet to sign agreement		Proposed (Under various stages of formation)		Total	
		No.	CCA (ha)	No.	CCA (ha)	No.	CCA (ha)	No.	CCA (ha)	No.	CCA (ha)
1	Konkan	8	958	5	604	18	2863	59	12829	90	17254
2	Nagpur	37	12955	112	48403	207	90014	549	275478	905	426850
3	Amravati	178	51361	86	26548	309	86914	589	251356	1162	416179
4	North Maharashtra	190	66492	142	41272	195	64086	73	21460	600	193310
5	Western Maharashtra	309	73027	30	3600	267	69372	1958	482599	2564	628598
6	Marathwada	138	63321	87	37965	272	135394	67	20851	564	257531
	Total	860	268114	462	158392	1268	448643	3295	1064573	5885	1939722

### 5.1 SUCCESS STORIES OF PIM

There are many success stories of PIM. Waghad Project, Nashik is a medium project having CCA 9642 ha. As stated earlier, PIM started with 3 WUAs in tail end, now WUAs are formed all over the command area. The WUAs have formed project level federation, which is successfully managing irrigation of the entire project. Similarly, Katepurna Project, (Akola), Manar Project, (Nanded), Kukadi Project, (Pune) and Choolband Project, (Gondia) have shown remarkable improvement in project performance with PIM. The Pimpalnare Project, (Nashik), Tekepar LIS, (Bhandara) and Bramhanwada Project, (Buldhana) are successful examples, exhibiting improvement in utilisation and diversification as a result of practicing PIM.

### 5.2 EVALUATION OF WORKING OF WUAS FUNCTIONING IN THE STATE

Directorate of Irrigation Research and Development (DIRD), Pune is established in 1969. It is a state-level organisation dealing with research in irrigation management and drainage works. DIRD has field offices throughout the State. This organisation is also entrusted with work of monitoring and evaluation of WUAs in the State.

In order to know the working of WUAs in the State, GoM has carried out evaluation of functioning WUAs in the State. Total 439 WUAs throughout the State have been taken up for the study. The regional breakup of these WUAs is as follows 8 from Konkan, 64 from Marathwada, 139 from Western Maharashtra, 150 from North Maharashtra, 8 from Nagpur, 70 from Amravati. For this purpose information was collected through specially designed questionnaires. The DIRD has compiled all the information and analysed it. The analysis came out with the following findings.

### 5.3 GENERAL FINDINGS

The general findings of the evaluation study are summarised below. Konkan region is coastal region having plentiful rainfall. However, it is backward in irrigation and PIM development is negligible. The Western Maharashtra's north part is drought prone and is irrigationally developed. It shows significant development in PIM. It is also worth to take note of Amravati region where PIM movement is gathering momentum in recent time due to appreciation of benefits of PIM, by the farmers.

There are WUAs having:

- CCA between 100 to 250 ha 42 %
- Chairman aged above 40 years 77 %
- Chairman working for more than 2 years 79 %
- Irrigation throughout the stretch of the canal 69 %
- Users numbering between 100 to 200 51 %

Evaluation of WUAs brought to the fore following facts:-

- After transfer of management to WUAs, it has shown that there is
- Improvement in irrigation efficiency in 66 % WUAs.
- 34% WUAs have diversified their cropping pattern by growing wheat, sunflower, cornflower, soybean, sugarcane, banana, gram, orchards and flowers.
- Watercess recovery in 34 % WUAs has increased due to establishment of WUAs.
- The management grants and O & M grants are partially disbursed to 48 % of WUAs.
- As much as 31% of WUAs have balance amount at their disposal and accounts of 40% WUAs have been audited.

#### **5.4 LEARNINGS**

Some important lessons learnt are as follows:

- WUAs are generally formed in tail areas. For success of PIM, it is necessary that WUAs be formed throughout command area.
- WUAs are still reliant on the Government, for want of management and maintenance subsidy.
- It has seen that there is no sufficient increase in membership after formation of WUAs.
- In majority cases, canal systems are transferred without rehabilitation of the system. Also there is no fixed time schedule for completion of rehabilitation work, which is generally subject to availability of funds. The condition of canal many times restricts sustainable development of WUAs.
- The WUAs are registered under the Co-operative Act. As Co-operation Department is loaded with their own work, least attention is being paid on sustainable development of WUAs.
- WUAs have apprehension about securing due water quota provided in the agreements.

#### **5.5 REASONS BEHIND SLOW PROGRESS OF WUAS**

Some of the basic reasons for slow progress are given below:

- Canal system needs to be rehabilitated before transfer to a WUA. However, deferred maintenance due to inadequate O&M funds deteriorated the canal system, prolonging its transfer to WUAs.

- Farmers had a feeling that Government is completely responsible for supply of water to them and thus forgo any help in maintaining it.
- Lack of funds caused untimely or sometimes no disbursement of grants to WUAs slowed down the growth of WUAs.

Inadequate training and capacity building of members of WUAs and lack of understanding and enthusiastic support from the Department officials causing meager progress in the objective of spreading the WUAs across the State.

## 5.5 CHALLENGES

Government of Maharashtra (GoM) has now made mandatory to supply water for irrigation through WUAs only. So far 2590 WUAs are registered on 875 Thousand ha, while 3295 WUAs covering 1064 Thousand ha are under various stages of formation. GoM has prepared Master Plan for formation of another 7500 WUAs on remaining 2.7 Mha area in coming 5 years. The real challenge however lies in making WUAs self-sustainable.

It is observed that impact of PIM is restricted to few success stories. It is our objective to upscale it without losing its quality and impact. There are challenges in upscaling, some of which are as below.

### 5.6.1 Challenges in up scaling of PIM

- Simple procedure for formation of WUAs
- Time bound rehabilitation of canal system before transfer to WUAs
- Huge requirement of funds for rehabilitation
- Training and capacity building of members of WUAs as well as field officers
- Re-engineering of lower level management staff
- Political will and commitment of the Department
- Self-sustainable design of WUAs
- Conflict management among WUAs and with canal officers
- Monitoring and evaluation

## 5. REFORMS INITIATED BY THE GOM

The GoM has been pioneer in implementation of PIM. There are number of successful examples of PIM. The approach of Maharashtra has been gradual but convincing. During last 3-4 years, GoM has initiated a number of reform measures supporting PIM.

In July 2001, GoM has taken policy decision to supply water for irrigation through WUAs only (with a timeframe). The supply of water will be on bulk volumetric basis. The volumetric measurement of water for irrigation is in vogue in Maharashtra since 10-15 years. The farmers are well aware about volumetric measurement. Farmers have freedom to grow any crop within the water quota given to WUA.

The charges of water are also increased in 2001 to meet O & M of the canal system. The increase is almost 1.5 to 2 times of previous water charges. To clear arrears from farmers, innovative scheme has been launched. The participation of farmers is not only sought for management but farmers are involved in planning, construction of minors also. It has been made mandatory to form WUAs before construction of minors.

The GOM has also decided to set up the Maharashtra Water Resources Regulatory Authority (MWRRA) to regulate water resources within the State. It will facilitate and ensure judicious, equitable and sustainable management of water resources of the State.

## **6.1 MAHARASHTRA MANAGEMENT OF IRRIGATION SYSTEM BY FARMERS**

To empower WUAs, the GoM has enacted the Maharashtra Management of Irrigation Systems by Farmers (MMISF) Act 2005.

### **6.1.1 Salient Features of MMISF Act**

MMISF has various innovative provisions to strengthen the PIM initiative. The MMISF act lays down simple easy procedure for formation of WUAs. The registration of society shall be done by the Water Resources Department itself. Salient features of the Act are as follows :

- Water for irrigation shall be supplied to WUAs only
- Water will be supplied on volumetric basis
- WUAs have freedom of cropping pattern
- Adequate representation to tail enders and women members is provided in the management committee of WUA
- Time bound programme of completion of rehabilitation works before transfer to WUAs
- All landholders or leaseholders must be member of WUAs (unlike earlier 51% of landholders or 51% users).

### **6.1.2 Process adopted for enactment of the Act**

The draft of bill has been prepared taking into consideration the best practices available in the PIM. The draft is discussed among users, NGOs, experts at various regional centers before translating it into a bill.

The bill was introduced in assembly for approval. Considering the importance of bill, joint select committee of legislative members of all major parties from both the houses is formed. The joint select committee has deliberated clause-by-clause provisions and suggested suitable changes therein. Any act should reflect the people's common feeling which make the act acceptable to masses.

The MMISF Act will go a long way in strengthening the PIM cause. The enactment of MMISF Act 2005 has cleared the way to go in for PIM in full swing.

## **6.2 STEPS TAKEN BY GOM TO STRENGTHEN PIM**

Maharashtra has a long tradition of co-operative movement in the State. The co-operative movement has been very successful in finance sector (e.g. banking) as well as industrial sector (sugar factories). The co-operative movement is a way of life for everybody in Maharashtra.

There is consensus among all political parties to adopt participatory approach in irrigation management. The MMISF bill is thoroughly discussed with all party members of the legislature. Minister for the WRD has headed the committee and taken lead in forging ahead the PIM movement in the State.

In irrigation management, farmers have already welcomed PIM approach but it has not so far been adopted on big scale due to limitations discussed earlier. But with assured flow of funds for rehabilitation, an exclusive act for PIM on scene, there will be no difficulty in mass implementation of PIM. There are number of good examples of WUAs promoted and supported by field officers. Top level as well as middle level officers is convinced about PIM and there will be positive support from the Department's side.

GoM has taken a number of initiatives to facilitate effective and speedy implementation of PIM. Some important initiatives are as follows:

### **6.2.1 WUAs model**

As described earlier, MMISF bill has taken utmost care to provide WUAs model, which will be self-sustainable and also have adequate authority to discharge functions smoothly. There will be a legal agreement between WUAs and competent authority, safeguarding due interest of WUAs with commitment to provide bulk water use entitlement. The appropriate powers of canal officers (Section Officers, Deputy Engineers and Executive Engineers) are delegated to WUAs as per provision of the bill. WUAs will now have to deal with only WRD for day-to-day functioning as well as, registration, auditing etc. WRD will provide full technical support in initial years to facilitate working of WUAs.

The adequate representation is being provided in managing committees of WUAs to members from tail, middle and head alongwith due representation to women. The WUAs will be allowed to keep certain portion of water charges for management,



operation & maintenance of the canal system. The effort has been made to adopt best practices in this or other sectors within the State as well as in other states.

The bill provides clear and fair arrangement for conflict resolution among WUAs and canal officers. Due opportunity is given to aggrieved party to place their grievances before an impartial forum.

#### **6.2.2 Effective communication with WUAs**

An utmost care is taken in developing effective communication with WUAs. The dialogue between WUA and Department as well as with other WUAs is vital for success of PIM. Therefore it is planned to have workshop twice a year, wherein difficulties and possible solutions are discussed vis-a-vis WUAs, field officers and policy makers. The feedback of the workshop will be used for under taking suitable corrective measures in implementation of PIM.

It is also planned to publish newsletters fully devoted to PIM to appraise the developments taking place in PIM in different parts of the State. It will help in exchanging information as well as sharing experience in order to take this movement ahead. It is also under active consideration to institute an award for best performing WUAs to appreciate their effort and motivate others to work better.

#### **6.2.3 Training and Capacity Building**

Training and Capacity Building plays crucial role in taking ahead the PIM movement. Water And Land Management Institute (WALMI) will act as nodal institute in training, which will impart training to officers, member of WUAs, Trainer of Trainers (TOT) and will also play role of mother NGO. As WALMI infrastructure may not be sufficient to conduct training of field officers as well as members simultaneously. It is proposed to carry out training with trainers' team consisting of experts from irrigation, agriculture and social sciences. These trainers' team will be trained at WALMI, which in turn trains functionaries and field officers at field level. The training activity is designed as continuous wherein training will be provided as per needs and with the development of PIM. It has also been planned to take help of NGOs to nurture the WUAs and facilitate WUAs in discharging their functions.

#### **6.2.4 Maharashtra Water Sector Improvement Project**

To carry out rehabilitation of canal system in time bound manners, the GOM has taken up Maharashtra Water Sector Improvement Project (MWSIP). The MWSIP envisages transfer of management to WUAs after adequate rehabilitation. To inculcate ownership among farmers, farmers have to contribute 500 Rs. /Ha in rehabilitation of the canal system. The system will be rehabilitated to carry the designed discharge, through the canal and disnet.

### **6.2.5 Monitoring and evaluation of WUAs**

Last but not of the least importance is, monitoring and evaluation of WUAs in the State. It is very important in case of any developmental activity, particularly in social development, wherein timely monitoring evaluation and undertaking corrective action is necessary. If right action is not taken at right time, there will be a lot of damage to the development accomplished and sometimes it would be difficult to move ahead. Therefore, it is proposed to have monitoring and evaluation through third party directly reporting to decision-making level. The consultant will collect information through well-designed questionnaire and through Management Information System. The corrective action will be taken based on timely feedback. A co-ordination committee is established, consisting of WUAs from different regions, NGOs, policy makers and few field officers, to facilitate working of WUAs. The coordination committee will meet at least once in a quarter.

## **7. WAY AHEAD**

The GoM has also enacted Maharashtra Water Resources Regulatory Authority Act to regulate water resources within the State. It will facilitate and ensure judicious, equitable and sustainable management of water resources of the State. It provides water use entitlement to individual farmers. Conferring water use entitlements to individual farmers will be path-breaking development in irrigation sector in India. There is also a provision of transfer of water use entitlements for maximizing irrigation use efficiency. Therefore, MMISF Act coupled with MWRRA Act will consolidate PIM and will ensure the sustainable development and management of water resources in the State.

## **SUMMARY AND CONCLUSIONS**

Maharashtra has long tradition of Participatory Irrigation Management. In nineties, Water Users Associations (WUAs) are formed in irrigation projects on pilot basis, but as of now WUAs are formed in length and breadth of the State. A study was conducted to evaluate performance of WUAs functioning in the State. The aim of the study was to find out improvement in performance before and after transfer of irrigation management to WUAs. The study has provided insight into hindrances in functioning of WUAs and measures to improve its effectiveness, which in turns improves the performance of irrigation projects. It reveals the reasons behind the slow progress and also highlights important learning and challenges to upscale PIM in the State. GoM has initiated series of reforms to strengthen PIM. A stand-alone act (MMISF Act - 2005) has been enacted to provide legal backing to WUAs. The water for irrigation will be supplied volumetrically through WUAs only and there will be legal agreement between WUA and competent authority. The act adequately empowers WUAs to discharge their functions with delegating appropriate powers of canal officers to WUAs. The State has gone further in providing water use entitlement to individual farmers and establishment of independent water resources regulatory authority to ensure judicious, equitable and sustainable management of water resources of the State.

It is observed that Irrigation management transfer improves the service delivery as well as financial performance of the Project. It is not time to discuss whether to go in for

PIM or not, but to up-scale it without losing its quality and impact. There is need to have committed support from WRD and timely efforts to build WUAs to shoulder the responsibility. It is also essential to strike harmony between goal and efforts of Govt., NGO and Community.

The Maharashtra case study would provide insight into important aspects of PIM and possible measures to strengthen WUAs movement. Though Maharashtra approach to PIM is gradual, but with reforms in place and changed mindset of officers of WRD and farmers, PIM could lead to sustainable irrigation management.