

# Participatory Irrigation Management: Understanding the Role of Cooperative Culture

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## ABSTRACT

Before 1960, traditional form of local management of water resources for different uses was prevalent in many countries around the world. In most of the developed countries like the Netherlands, France, Germany, Portugal, and Spain local management models had evolved through the social cooperative processes in overall governance. The 'Water Boards' of the Netherlands, is one such example of well-established organizations of participatory management of water resources. In developing countries like India, Iran, Indonesia, Sri Lanka in the absence of stable governance during the Medieval period, the local communities came together to develop local water resources and irrigation systems to ensure water availability for agriculture. Many of these systems were the outcome of cooperation between clusters of villages, sometimes supported by the local rulers.

Between the period 16th Century to first half of the twentieth Century, in the wake of development of large scale irrigation systems under the colonial governance, the onus of providing irrigation and ownership of infrastructure shifted to the governments. Even in the post-colonial periods in many countries, large number of public managed irrigation schemes built in the second half of the 20<sup>th</sup> century did not have their roots into the cultural and social perceptions of the people. Many imposed institutional reforms and strategies that were expected to improve the performance of the contemporary irrigation sector. Due to the deteriorating conditions of such infrastructure, one of the major institutional reforms introduced, especially by the financing agencies like the World Bank and Asian Development Bank in the eighties was "Participatory Irrigation Management" (PIM).

As the name suggests the philosophy of PIM is hinged around developing cooperation with and involvement of farmers in operation, management, and maintenance of the irrigation systems at secondary and tertiary levels through the "Water User Associations" (WUAs). During last three decades about 60 countries having significant irrigated area have adopted PIM in varying degrees and ways. The WUAs are considered as the most appropriate entity to bring together farmers being served by a given infrastructure and act as an interface between the farmers and the Irrigation Agency towards conflict resolution and cooperation and also to build synergy among all stakeholders.

Due to mixed results emerged from the experience gained from PIM approach using various WUA models, presently, there is a passionate debate about, the sustainability and viability of the PIM approach, including the suitability of various WUA models. Nevertheless, each country is trying to rectify the weaknesses and reforming the process within the limits of its social and political setup.

While the suitability of PIM approach in improving the efficiency and performance of irrigation systems is not in question, the mechanism through which cooperation between farmers and other stakeholders in irrigation infrastructures on one hand and among various institutions involved on the other need to be revisited. The goals and objectives in each case clearly defined and success and failures analyzed dispassionately. Various water related international organizations and national level institutions need to join their forces in undertaking this exercise

and facilitate a process that supports evolution of appropriate PIM process/ WUA model for each situation.

**Keywords:** Participatory irrigation management, water user associations, cooperation, financial viability

## 1. Introduction

1. Allocation of limited water resources, concerns regarding environmental quality and planning under potential climate change with its increasing variability and uncertainty, poses various kinds of challenges, by making the development process more complex. Integrated Water Resources Management for efficient, equitable and environmentally sustainable use of resources requires transparent and inclusive participation of all the stakeholders to avoid potential conflicts as the demands grow and resources dwindle. Managing water efficiently and effectively requires that all the stakeholders cooperate in jointly operating, managing, and protecting a common water resource.

2. With the latest global focus on the ‘the green economy’ and the challenge of meeting the global food demand by growing population, the need for addressing the efficient use of water in agriculture, particularly irrigated agriculture, the major user of freshwater worldwide has been emphasized. To improve efficiency and equity of water distribution in public irrigation systems the Participatory Irrigation Management is considered as an appropriate mechanism. As the pressure on reducing the water withdrawals for irrigation is continually rising, Participatory Irrigation Management through WUAs will have to play a major role in improving the efficiency and productivity of water in irrigated agriculture. Every irrigation scheme has its own socio-cultural, political, and institutional setting. There are many actors/ stakeholders and disciplines involved to make the process successful and sustainable.

## 2. Historic water and irrigation cooperatives

2. Before provision of irrigation through large scale irrigation systems started in the 19<sup>th</sup> Century in US and in British Colonies and subsequently as part of the Green Revolution, traditional form of local management of water resources for different uses through cooperation between various beneficiaries was prevalent in many developed countries like the Netherlands, France, Germany, Portugal, and Spain. The ‘Water Boards’ of the Netherlands (11<sup>th</sup> century), ‘Wateringues’ (polders/drainage boards) and ‘Association Syndicate d’ Agriculteurs’ (WUA) in France (around twelfth century), ‘Water and Land Associations’ (WLA) in Germany (13<sup>th</sup> century) are some of the examples of well-established cooperative organizations of participatory management of water resources in Europe (Brussel, 1998). These have played a key role in water management and resolving disputes among stakeholders.

3. In some countries like India, Iran, Indonesia, Morocco, Philippines age-old cooperative systems of village level irrigation were practiced. In the Ilocos provinces of the northern Philippines, irrigation systems were managed successfully by small societies called ‘*zanjeras*’ for centuries where land is allocated among the farmers in parcels of equal size across the irrigation system. This system has survived several State interventions. UNESCO awarded ‘*Subaks*’ system in Bali, Indonesia is based on water diverted from rivers into small dams and further conveyed through the canals and aqueducts to the fields. The farmers who share the water are organized into cooperatives called *subaks*. There are now about 1,800 such self-organizing groups in Bali, each controlling irrigated field area ranging from 4 to 800 ha, comprising about 18% of the island’s area.

4. In Maharashtra State of India, '*phad*' system of irrigation by diverting water from series of small check dams constructed on rivers and the irrigation through several thousand small village tanks constructed some 350 years ago by irrigators' community deploying their own resources were functional until forties. Iran has a long-standing and successful model for farmer management in the millennia-old Miraab system '*Shaarebin*' used for managing the Karezes and Qanats in the arid and semi-arid regions. The operational system of Qanats has long history of cooperation among the beneficiary farmers without any governmental or institutional support and is still functional. The farmers used to distribute and use the water in a specialized cooperative method that guaranteed optimal water usage. In Morocco the '*khattara*' system of water distribution has been well operated for several hundred years.

5. National Federation of the Irrigators Communities in Spain (FENACORE), founded in 1955 as a non-profit association is dedicated to the management of irrigation in order to protect interests and rights of Irrigator Communities without any political implications and contribute to the Spain Water Policy. Presently, FENACORE has about 700,000 irrigators covering about 50% of the national irrigated area. The cooperative carries out a wide range of activities like representing irrigators' communities concerning the management improvement and modernization of organization, advising the Irrigators in judicial, practical and technical matters, information dissemination through brochures and circulars periodicals, training the irrigators in new technologies and international communication participating in International Forum.

### **3. New era of participatory irrigation management**

6. Between the period 16<sup>th</sup> Century to first half of the twentieth Century, and in the wake of development of large scale irrigation systems under the colonial governance, the onus of providing irrigation and ownership of infrastructure shifted to the governments. Even in the post-colonial periods in many countries, large number of public managed irrigation schemes built in the second half of the 20<sup>th</sup> century did not have their roots into the cultural and social perceptions of the people.

7. In most developing countries, large-scale irrigation (LSI) schemes have been managed by state bureaucracies and by rigid, formal irrigation institutions. Under such structures, system management often fails to respond to the needs of users, particularly of smallholders. Due to the lack of resources allocated to running and maintenance of LSI and their consequent deteriorating conditions, one of the major institutional reforms introduced, especially by the financing/donor agencies like the World Bank and Asian Development Bank in the eighties was "Participatory Irrigation Management" (PIM).

8. Participation is defined as a process through which stakeholders' influence and share control of development initiatives and of decisions and resources that affect them (ADB, 2012) and PIM approach is expected to deliver a number of positive outcomes and impacts like empowering farmers, better system maintenance and service, reducing cost of irrigation to the government, and higher water productivity and profitable agriculture. Gerrit van Vuren (1998) has discussed the key reasons behind 'participation' of stakeholders in water management from decentralization, financial, infrastructural, and societal perspectives.

9. The magnitude of such outcomes and impacts and the degree of PIM reform success and sustainability varied across settings and depended on a number of factors such as clarity and strength of institutional and legal framework, higher level political will and local level leadership, financial and technical resources, access to support services, incentive system, capacity building and training etc.

10. During last three decades many countries notably Bangladesh, China, India, Indonesia, Iran, Mexico, Nepal, Pakistan, Philippines, Thailand, Turkey, Senegal, South Africa, Sri Lanka, Vietnam took initiative in introducing participatory irrigation management (PIM) approach with an intension of turning 'vicious cycle' to 'virtuous cycle' in their public managed LSI. However, in many cases the concept of participation by farmers is considered as alien to the culture and is introduced as one of the many imposed institutional reforms and strategies that were expected to improve the performance of the contemporary irrigation sector.

#### **4. Water User Association (WUAs) and the cooperative principles**

11. The philosophy of PIM is hinged around developing cooperation with and involvement of farmers in operation, management, and maintenance of the irrigation systems at secondary and tertiary levels through the "Water User Associations" (WUAs). In most developing countries, the WUA is the first tier establishment covering an irrigated area delineated on a hydraulic basis which is administratively manageable.

12. The basic principle of Water User Association or any other farmer's organization with a different name, like any other cooperative, is the mutual self-help to benefit members in particular and the community at large. As co-owners farmer are involved in the functioning of the association and they manage its activities. Participating farmers in WUAs are expected to invest their time and labour for getting timely delivery of irrigation services which they perceive as the social responsibility of the governments. It is a challenge for WUAs to act both as clients as well as managers of irrigation.

13. Water User Associations have certain fundamental differences vis a vis other cooperatives. Unlike other cooperatives where the members join with the objective of creating wealth on a voluntary basis, success of WUA members would depend on the participation of all the beneficiaries with the objective to distribute the delivered water. The members within the Association conceive their interests to be conflicting, particularly between the upstream users who often appropriate larger share of water and the downstream users are deprived of their allocations. As such the WUA have to play an arbitration role resolving conflicts and making efforts to share the irrigation water equitably among the upstream and downstream farmers in various distributaries and the project as a whole. In the success of WUA, the benefit to the farmers in downstream is substantial, while benefits to the upstream farmers are perceived as nominal, as they, in any case are getting the desired amount of irrigation water. Consequently, the upstream farmers have little incentive to join WUA. As such, the very nature of activity that WUAs are supposed to cooperate towards is at tangent to the accepted principle of cooperative – voluntary participation. Only if the concern for community is made the prime benefit, with individual benefit flowing through community benefit, the upstream farmers can be convinced to participate in the process.

14. Another difference between WUAs and the cooperatives arise from a financial perspective. In most WUAs, due to the economic backwardness of the farmers, the capital investment cannot be expected directly from members. As against the benefits that all the rain-fed agriculturists participating in an irrigation development schemes as in the past, the WUA farmers are not equally motivated. Therefore, contributions from members in terms of capital or share money can be expected only if the WUA, apart from equitable distribution of water, also carry out activities that generate other benefits or services. Surpluses can be generated by the WUAs if the assets such as land associated with the irrigation systems is also leased or rented to the WUAs to enable them to generate income by raising horticulture crops or pisciculture activities.

## 5. Lessons Learned

15. FAO study (2007) has pointed out key weaknesses of the present model of PIM as poor service delivery, excessive layers and high transaction costs, poor cost recovery, financing of WUAs, lack of upgrading of the main system, blurred/ skewed management responsibilities, and acute need to develop capacity at all levels of professionals. IWMI and FAO have recommended a five pronged strategy for revitalizing Asia's irrigation (Mukehrji *et al.*, 2009). Of these three strategies relate to PIM viz., modernizing irrigation systems both technically and institutionally, managing groundwater use, opting for public-private partnership, and providing incentives to irrigation officials in achieving better irrigation performance. Based on the recent experiences collated through various ICID workshops (1998, 2007) and authors own field experience pertaining to the PIM, the following are the key lessons learned on the success or otherwise of WUAs.

### **Sense of ownership**

16. Real participation of farmers comes from a sense of ownership. Unfortunately, governments are still perceived as the owners of the irrigation infrastructure and water. WUAs are perceived as government initiative, imposed from top without much of a dialogue between farmers and irrigation departments, where the responsibility of irrigation departments is being passed on to WUAs. As such a sense of ownership of the objectives of WUAs is often missing. A change in this attitude is required and the necessity and objectives of participation in the management of irrigation systems needs to be conveyed. Such an approach requires engagement with the stakeholders in a long patience-demanding process.

### **Cultural factors**

17. The rules of engagement among various stakeholders in water management and agricultural practices should be based on the culture of cooperation in the region, which in turn is based on past experiences and practices. These have to be appropriately incorporated into the WUA model – physical, administrative and financial. The new institutions should be based on a thorough analysis of the construct of the social, cultural and political relationship among various actors in the existing irrigation water management practices.

### **Legal framework**

18. To be sustainable, WUAs should have adequate legal footing and be professionally managed. The most common areas where supporting legislation for PIM is needed are: formal adoption of the PIM policy, status of the WUA (cooperative or company), rights and duties of its members, relationship between the irrigation departments and the WUAs, water rights, ownership and responsibility for maintenance of irrigation infrastructure, etc. Transparent and responsive governance structure is an important aspect of WUAs which is necessary for conflict resolution and accountability. It should spell out the possible sources of income, including water charges, subsidies etc. At the same time the WUA model should be flexible enough to accommodate wide range of cultural, financial differences as well as the possible future changes.

### **Financial viability**

19. Another key aspect that can draw the interest of WUA members is the economic participation of its members. Government Agencies are required to invest in system rehabilitation/ upgrading prior to handing over of the system to WUAs. Even after the handing over, most WUAs are not able to achieve the required 'financial viability' so as to cover their operation and management costs fully. Development of a successful WUA will require both a strong organization and business plan. It is important to give a fresh look at the business or financial model of WUAs.

20. A viable capital financing plan that identifies the amount of money needed to establish and maintain the functions of WUA, with potential sources of the necessary capital coming directly from members themselves, from surpluses generated by its activities, or from outsiders, needs to be developed. In most cases, governments provide the initial start-up costs. WUA may also get involved in activities like procuring seeds, fertilizers in bulk, hiring farm machineries, post-harvest processing and marketing of farm produce, etc. However, one of the dangers of other sources of monetary benefit is the possibility of equitable distribution of irrigation water under the system taking a back seat as compared to other financial benefits. It must also be ensured that such WUAs do not get politicized. Introduction of private sector/ third party in the PIM is also being proposed to overcome some of the weaknesses of the present WUA model. But how to ensure its effective and transparent involvement is yet to be fully understood.

#### **Initiatives and incentives**

21. There are no clear/ transparent incentives for both the irrigation bureaucracy and farmers to genuinely promote and make the WUAs successful. In most of the cases, WUAs are established owing to external agency / donor's compulsion. Such push usually has short life. Neither the irrigation departments nor the farmers are clear about their roles and objectives. Unless 'win-win' situation is clearly visible to both, the WUAs will not be able to deliver their objective. WUAs established through top-down or forced approach does not become sustainable. Both 'top down' and 'bottom up' approaches are required in establishing and effective functioning of the WUAs.

#### **Capacity development**

22. WUAs managing the activities of cooperatives require skills in certain degree of financial and administrative management and should be backed by technical know-how. Most of this technical know-how is expected to be provided by the irrigation engineers working in irrigation departments. However, lack of interest on part of irrigation departments that perceive WUAs as adversaries and at the same time lack of confidence from WUAs make the present arrangement untenable. Capacity development and training of farmers, WUA functionaries, and irrigation agency staff is required on continuous basis. There is need to explore other mechanisms to develop capacity of WUAs to deal with technical issues related to their area of activities. Farmers should be able to participate in the decision making process. At the same time the cooperative attitude is mostly driven by a dedicated and exemplary leader within a society. Such leaderships can and should be nurtured through various leadership building programs.

#### **Integrated approach**

23. Due to increasing trend in decentralization of various governmental activities and the desired participation of the farmers on a variety of national or international driven projects e.g., HIV, public health, sanitation, climate change, educational etc, there is a greater pressure on the time of the farmers. Further, most water resource schemes besides irrigation have multiple objectives and there are competing interests mainly from domestic, industrial, hydropower, and environmental uses. Thus the participation of WUAs in such schemes shall be made simpler by integrating similar functions. This also helps in keeping the interest of irrigators alive even during the rainy or non-agricultural seasons. WUAs can act as agents of cooperation among all stakeholders and could explore further dimensions of cooperation.

#### **Replicability**

24. There is no blueprint of successful WUA and each one has its own strength and weaknesses. Social engineering plays a dominant role in successful functioning of WUA than civil engineering. PIM involves interaction between different social groups, farmers, villagers and government. Since these interactions and their historical backgrounds differ among

different societies, applying the successful WUA model of a given country may not necessarily lead to success in other. WUA structure therefore has to be tailored giving due consideration to hydrological, political, economic, social and cultural circumstances of the area.

### **Smallholder agriculture**

25. Intervention through the top-down approach in small holder irrigation development generally face difficulties like too many implementing agencies and long delays caused by bureaucratic procedures. It becomes much more complex to organize and deal with large number of smallholder farmers. Smallholders often face constraints like weak property rights, resource poverty, lack of access to markets and financial services, and limited ability to tolerate risks.

## **6. Conclusions**

26. There is a growing recognition that PIM through WUAs is a complex and a slow process. In most developing countries, there is lack of strong, continuous, and genuine 'political commitment' in PIM. So one can find a 'rise and fall' of WUAs. The PIM is a slow process demanding patience and perseverance and the models adopted needs to be revisited, reviewed, reoriented and refined from time to time.

27. At the same time development of a successful WUA will require a strong organization, business plan, legal backup and an institutional support. Institutional arrangements through legal framework should be established so that the role played by WUAs in this regard is appropriately respected within the local legal setting.

28. In resolving conflicts WUAs require collaboration and cooperation at various levels between farmers under a canal command, among WUA within a project, between WUAs and the engineering departments, between the irrigation and agriculture extension services on one hand and the various administrative units that may encompass the project on the other.

29. In canal irrigation schemes, many WUAs are functioning satisfactorily at tertiary level but due to poor operation and maintenance of the secondary and main systems, their sustainability is jeopardized. So the Irrigation agency should give due focus in modernizing operation of the main conveyance system and secondary distribution network.

30. There is a need to tackle '*second generation*' issues of WUAs such as formation of their federations, innovations in irrigation financing, charging and cost recovery, impact assessment vis-à-vis the perceived objectives, multi-functionality, technology transfer, asset management in transferred schemes, agency personnel changes, and development of private sector support services.

31. All water related international organizations and national level institutions need to join their forces in evolving fitting PIM process/ WUA model to each situation by laying down the basic principles. The key features of successful WUAs in countries of Europe, America, and Asia may be amalgamated and applied in the new model of WUA.

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