



CHALLENGES AND NECESSITIES OF APPLYING PARTICIPATORY APPROACHES AND MECHANISMS TO AGRICULTURAL WATER MANAGEMENT

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ABSTRACT

This paper provides an overview on the challenges and essentials for understanding the starting point of changing a top-down oriented water management towards participatory irrigation management (PIM) and also highlights the elements of the underlying concept and already achieved successes.

In recent years, agricultural water has helped meet fast-rising demand for food, and has contributed to the growth of farm profitability and poverty reduction as well as to regional development and environmental protection (Ward et. al, 2005). Irrigation provides some 40% of the world's food from only 17% of the global cropped area. At present, 2400 million people depend on irrigated agriculture for food and livelihood and with global population to increase to 7.9 billion in 2025; additional food will have to come from irrigated agriculture. Hence, water development is critical for food security in many regions of the world. Irrigated agriculture is dominant user of water accounting for 80% of water consumption. (Peter, 2004). According to recent reports, over 60% of the world's irrigation is in Asia. Since 1965, the irrigated area has almost doubled so that irrigated agriculture is now a main source of food security, higher farm incomes and increasing rural population's welfare in Asia (Barker, 2002).

CONCEPT OF PIM

Inappropriate management of irrigation has contributed to environmental problems including excessive water depletion, falling water tables due to excessive mining and water quality reduction, water logging and salinization, poor irrigation practices accompanied by inadequate drainage that have often damaged the soil build up. In the past the governments have been solely responsible for development of irrigation sector. The general trend toward decentralization, fiscal crisis in governments, inadequate maintenance on irrigation systems, the growth of private sector, focus on other social sectors and highly staffed bureaucracies has led governments to divest most of its roles

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to the private sector and to user organizations. At present WUAs, progressively take over responsibilities and the role of government and irrigation agencies through adopting community-driven approaches (Rosegrant and Ximing, 2001; Peter, 2004).

PIM is a key term in the toolbox of current approaches to improve the efficiency and performance of water resources management in the countries that are to cope with the issue of water scarcity, or problems associated with global and climate change in the foreseeable future (Regner et al., 2006). The term PIM refers to the participation of users – the farmers in all aspects and levels of irrigation management. All aspects include planning, design, construction, operation and maintenance (O&M), financing, decision rules and the monitoring and evaluation of irrigation system. All levels include the primary, secondary and tertiary levels. From another viewpoint, PIM usually refers to the level, mode or intensity of user participation that would increase farmer responsibility and authority in management process. A more comprehensive variant of PIM is Irrigation Management Transfer (IMT). IMT is the full or partial transfer of responsibility and authority for the governance, management and financing of irrigation systems from the government to water users associations (WUAs) (Vermillion, 2003; Peter, 2004). Groenfeldt (2003) states that PIM processes build two forms of capital: productive capital (better maintained irrigation infrastructure) and social capital (new institutions such as WUAs, skills, leadership and community action) (Peter, 2004). However, there is a growing concern on the need for PIM/IMT approaches due to their following advantages:

- Reducing financial and budgetary difficulties of government,
- Improving irrigation management efficiency,
- Better and timely Operation and Maintenance (O&M) of irrigation infrastructure,
- Changing farmer's attitude of over dependence on external assistance,
- Positive experience on new institutional arrangements that can be extended to other areas,
- Promoting community activities,
- Facilitating collection of water fees. (APO, 2002; Saleth and Dinar, 1999).

Apart from this, an appropriate PIM approach has to decrease risks of water supply and maintenance costs of the pressurized conveyance system, a higher security of water supply through improved reliability of the system and the increase of cultivated areas due to a lower share of buffer zones within irrigation plots which are apart of farmers reaction against the risk in water supply. In addition, PIM should be designed and implemented in a way to reduce conflicts between farmers. It is because improved and more transparent communication structures originated by adoption of PIM reduce a number of conflicts between farmers and the need for interventions of governmental authorities in local dispute (Regner et al., 2006).

A review on the various PIM approaches, adopted across the world indicate that establishing WUAs is central and crucial for ensuring the efficiency of these approaches.

WATER USERS ASSOCIATIONS (WUAS)

The paradigms for rural development pursued and practiced in developing countries have transformed greatly since the 1950s. Failure to achieve intended result through transfer of technology policies caused shift towards a more user – centered approach to development and people first development model based on popular participation gained popularity in the 1980s and 1990s (Bukey, 1993; Chambers, 1997; Cernea, 1991; Khanal, 2003). Accordingly, the focus of water resource management has also shifted from technology transfer towards decentralized and user – centered approaches emphasizing participation and local organizational development (Clyma, 1986; Uphoff, 1986; Khanal, 2003). This change has happened through promotion of local water management by users organizations commonly referred to as water users association (Vermillion & Sagardoy, 1999; Meinzen-Dick et al., 2002; Johnson et al., 2002). Several countries, such as Mexico, Turkey, Indonesia, the Philippines, Colombia, India, Sri Lanka and Nepal, adopted policies to encourage greater management participation by water users since the mid-1980s. These experiences witness demonstrable improvements in economic water use efficiency, sustainability and a more responsible handling of water resources and public funded installations (World Bank, 2002).

In fact, WUAs are in charge of the maintenance of the conveyance system and bear the responsibility for the water distribution. The experiences of WUAs are important criteria to be considered for improvement in the functions and mechanisms of PIM approaches. For example, gained knowledge on traditional farmers association in irrigation management allowed for the identification of three core elements which characterize successful WUAs in the Jordanian context;

a) Farmers participate actively in the bodies which settle final decisions in water management but are hesitant to participate in purely consultative organizations.

b) A precondition for farmer's participation seems to be the accessibility of resulting benefits by the farmers in advance either by experience or by credible accord with the respective authorities.

c) A formal, transparent management system reduces or at least clarifies the impacts of informal power structures and relationship between individuals on the management of water resources. In brief, three years experience of WUAs in Jordan yielded the following indicators of success in the water management: a) regular distribution of water, b) increasing of WUAs control over water meters at regular intervals and c) a significant drop in the areas of destruction of water meters, valves and pipes. According to Jordan experience the outline of the WUAs should be based on the principle of:

- One voice per field with irrigation outlet,
- The election of a directorate for each WUA,
- The official registration of WUAs for embedding them in the legal framework of national development plans (Regner et al., 2006).

Since 1954 Turkey has had a legal framework allowing the transfer of management proceeded at a very modes pace until 1993, when the program received new impetus and the rate of transfers accelerated sharply. Since that time, the program has successfully transferred about one million hectares to local management. The PIM was

adopted in 1986 in Turkey for enhancing user's participation and their self-control in the irrigation management (Burak, 1999; Svendsen and Nott, 1998).

In India, a high level of efficiency in performance by WUAs in function like irrigation water distribution and resolution of conflicts is reported (Joseph, 2001).

The study of successful experiences of WUAs in different countries as mentioned earlier indicate that to achieve the successful and promising process of introducing participatory structures into irrigation schemes, the following points should be taken into consideration;

- Promotional programs for explaining the advantages of participatory irrigation management are essential initial activities for successful transfer programs. This can be done through meeting, workshop and the distribution of pamphlets.
- The election of a WUA is a critical action for the future of the association.
- Successful transfer requires an appropriate legal framework to clearly define the rights of water, forms of organization, the responsibility of each party and the manner in which activities should be regulated.
- Fiscal benefits must be considered for companies that manage the irrigation and drainage infrastructure.
- A transfer program should be accompanied by continuous training for both WUA directors and their operating staff.
- A simultaneous restructuring of the policy agency is required for transferring the responsibilities and tasks from governmental organizations to WUAs (Regner et al, 2006).

Facon (2002) believes that the sustainability of the WUAs depends on their capacity to provide an adequate water delivery service and control as well as improved service to allow the agricultural productivity to take place. In conclusion, efficiency of irrigation systems to enhance productivity can be better when local knowledge, labor, money and other inputs are mobilized through WUAs (Peter, 2004).

CHALLENGES FOR PIM APPROACHES

The current, technically sound approaches of management in water distribution face serious problems within the social and economic context, since they allow for significant incentives from illicit action by all concerned parties. Reported incidents range from deliberate damage of water meters to circumvent regular billing of water charges and temporary depressurization of the conveyance system by perforation of tubes for illegal water extraction up to informal lobbying that obstructs the performance of the administrative system (Regner et al., 2006). For example, in Philippines, irrigation administrations face constraints to perform their responsibilities. These constraints include: accelerated deterioration of irrigation infrastructure, lack of production capital, stringent bank lending procedures and directive political interventions (Avelino, 2002). Development of salinization and water-logging as well as reduction in irrigation water quality and efficiency are other problems of agricultural

water management in other countries (Khasankhanova et al., 2001; Khasankhanova, 2003).

In Jordan, Low participation of water users in the irrigation water management makes governmental administrative bodies to be confronted with many challenges. A study shows economic and social consequences of this approach in Jordan as follows:

- Increased maintenance costs for the JVA (Jordan Valley Authorities) due to manipulations of water meters and valves and therewith connected destruction of concrete boxes and illegal tapping of the pressurized pipe.
- Loss of public funds through unaccounted water extraction by manipulated or destroyed water meters and uncontrolled water extraction of surface water from the King Abdullah Canal via the illegal use of mobile pumps.
- Additional investments by farmers in private ponds and pumping equipment to store water in order to counteract potential disruption of the irregular water supply by the system of the JVA.
- Further additional costs for farmers through opportunity costs from combinations that renounce on parts of profit margins in favor of risk reduction and by introduction of uncultivated buffer zones in the irrigation plots in order to cope with unreliable water supply.
- An increased social cost due to social strives in the farming community as well as between aggrieved farmers and the administrative authorities that are responsible for the timely provision of water.

Hence, the Jordanian government decided in 2001, to counteract these problems by gradually introducing new participatory elements into the water management of the Jordan Valley Irrigation Scheme (Regner et al., 2006).

Transfer of irrigation management in Turkey faces the following challenges:

- The difficulty in reducing staff levels,
- The absence of a changing mechanism for bulk water supply to irrigation associations,
- The indistinct vision of a new role for the agencies in supporting the existing irrigation systems in the post-transfer era,
- The undefined nature of water rights and subsequent insecurity of their claims on irrigation water,
- Restricted options for obtaining maintenance equipment by WUAs,
- Lack of legal basis to form federations for WUAs (Svendson and Nott, 1998).

According to the experiences gained in Asia, in spite of many successes PIM approaches still face following constraints:

- Inadequate knowledge of officials as well as farmers about management transfer,
- Limited coordination between farmers organizations (FOs) inadequacies in government support and difficulties in sharing power,

- Inadequacies in legislation and regulatory mechanisms,
- Lack of incentives for the government agency staff to effectively involve in PIM,
- Price and market problems and resulting decline in farmer profits. (APO, 2002).

In investigating challenges faced by PIM approaches, Khanal (2003) found that hierarchical organizational structure, lack of organizational learning, shorter time frames, and failure to link the project while the broader development objectives all pose barriers in maintaining participatory processes for irrigation management. Moreover, lack of knowledge on water resource system was reported to be a major constraint in embedding participatory approaches in water management which comes from lack of initial learning of the system environment both by the users and outside facilitators. It should be considered that irrigation systems are sociotechnical systems and technology of the system is shaped by ecology and society. Hence, it has both human and physical dimensions (Khanal, 2003). Lack of financial sustainability is another major constraint to remote resource mobilization for operation, maintenance and improvement of the irrigation systems (Peter, 2004).

NECESITIES FOR SUCCESS OF PIM APPROACHES

For PIM approaches to be efficient, necessary preconditions should be provided. Some of the most important ones are as follows:

CAPACITY BUILDING:

Supporting WUAs through participatory design process to build up the capacity to manage water and provide better working conditions through more compatible technologies and water management practices is highly important. It should not be merely viewed as a training program aimed at bridging gaps in knowledge and skills among farmers and agencies but also as facilitating the change process (Peter, 2003; Bryan and Helmi, 1996; Khanal, 2003).

REGIONAL COOPERATION:

Since most Asian countries have a similar context in irrigation, regional cooperation by sharing of experiences and study tours could prove invaluable. A powerful mechanism by which this could be achieved is the creation of farmer networks at the national level or through PIM chapters. PIM chapters are non profit organizations and comprise of membership of WUAs, irrigation engineers, researchers and farmers (Peter, 2004).

ESTABLISHING FARMER NETWORKS

Farmer networks and federations could provide a platform for debate on water sector and irrigation reform issues, so that farmers get an opportunity to take part in policy formation and receive intense consultation (Peter, 2004).

ADAPTATION TO THE LOCAL SETUP:

Experiences from several countries indicate that introducing participatory elements in the relationship between mostly governmental decision makers on water resources and end users of water is an essential, but neither detached nor standardized process in the complex setup of successful water resources management. The differences between the applied participatory approaches support the assumption that PIM cannot be transferred from one situation to another without modification, but the successful implementation of PIM in a specific case, crucially depends on its sensible adaptation to the local situation (Regner et al., 2006).

IMPROVED SERVICE DELIVERY:

The sustainability and efficiency of a WUA depend to large extent on its services to the members. Most of the irrigation systems are quite old and require rehabilitation and modernization in order to be capable of providing easy-access, reliable and equitable services to their users (Peter, 2004).

COPING WITH THE COMPLEX INCENTIVE SYSTEMS:

One of basic needs of efforts towards an improved utilization of water by introducing participatory elements in water resources management is to cope with the complex incentive structures of individuals on the levels of farmer's communities and within the administration (Regner et al., 2006).

ACCESS TO ASSURED WATER SUPPLIES:

In order for farmers to participate in the process of irrigation management they should be provided with water entitlement as well as efficient input and output markets (Ward et al., 2005)

ANALYZING TRADITIONAL MANAGEMENT MODEL:

In order to come out with an efficient PIM, the first attempt is to analyze traditional management models within irrigation communities and to identify informal management approaches of country to acquire basic knowledge on more suitable starting points. This proved to be a successful measure in Jordan (Ghneim et al., 2005).

SECURING WATER RIGHTS:

For WUAs to be successful, they need to be vested with a clear water right to give the right incentives for improvement of the irrigation system. Secure water right also protects the WUAs from infringements of its allocation and share of water to other powerful interest such as industries and municipalities (Peter, 2004; Bryan and Helmi, 1996).

DEFINING A LEGAL FRAMEWORK FOR WATER USER ASSOCIATIONS

WUAs should be empowered through well defined legal frameworks that specify clear roles and responsibilities among agencies, WUAs and governments. This legal framework gives WUAs a fair degree of freedom and power to exercise its authority (Peter, 2004; Bryan and Helmi, 1996; Burak, 1999).

REQUIRING TECHNICAL ASSISTANCES AT INITIAL YEARS OF THE TRANSFER

WUAs need technical assistance by central government to repair and maintain water structures with equipment. This support can be gradually decreased over the years. This is a crucial issue in the case of small WUAs which are weak and face challenges to fulfill their tasks properly (Burak, 1999).

Other essentials for successful PIM approaches are as follows:

- Identifying socially acceptable mechanisms,
- Evaluation of former – less successful approaches,
- To reduce the cost of irrigation management for the government (Vermillion, 1997).
- Defining the rights and duties of all the parties involved under PIM approach,
- Flexibility in the operation of the irrigation system (Lele and Patil, 1999),
- Attempt to consider end users demand in irrigation management,
- providing farmers and WUAs with appropriate subsidies and financial supports (Wijayaratna, 2002),
- Profiting farmers by subsidies, improved irrigation management and additional training (Regner et al., 2006),
- Strengthening the managerial capacity of FOs or WUAs,
- Establishing multi-functional business organizations where in irrigation management is an integral part of the overall business,
- Full transfer of responsibilities,
- Provision of technical assistance and skill development,
- Establishing transparent and people-centered M&E system based on a set of objectively verifiable indicators (Wijayaratna, 2002),

CONCLUSION

Irrigation water management is a dynamic and complex process containing various stakeholders. Adoption of any participatory process such as PIM/IMT should be practiced beyond an instrumentalist perspective but rather based on a transformative perspective. A successful PIM approach should be based on complete involvement and cooperation of various stakeholders at different levels and from different sectors ranging

from top governmental body to the end users. Particularly, the role of water users is crucial because they can help in establishing realistic water price and implementing water protection and distribution measures. Involvement of water users in the decision-making processes is essential to prevent or settle conflicts among themselves. For improving the role of WUAs, it is essential to take constituent factors into considerations which are: laws and policies of the country and its irrigation agencies, size and complexity of the irrigation systems, physical condition of the irrigation systems, size of irrigated farm holdings, farmers net income, capability and organizational arrangements of WUAs, local politics, local social customs and practices, frequency of natural disasters and environmental problems (Benjamin and Bagadion, 2002). According to APO (2002), PIM can be enhanced further by facilitating the process of strengthening FOs, WUAs and similar organizations, assisting in capacity building, supporting through other services such as timely supply of complementary inputs, regulating credit facilities, providing legal support, appropriate policy changes and political supports.

For PIM to be succeeded, farmer's income and benefits should be taken as a critical factor to improve their capacity to meet irrigation costs. In addition, PIM models should be matched against socio-political and economic environment of the country. PIM has to infuse a sense of ownership to the users. It would be necessary for countries experiencing initial stage of PIM to follow a gradual process of withdrawal of government control and intervention on irrigation management. A legal framework is also required for well-functioning of PIM which covers formulating of supportive policy and environment. Klozen (2002) call it as "institutional engineering". However, it should be noted that full participation of farmers in irrigation management will be achieved just when they involve in setting priorities for agricultural policy.

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