"DECENTRALIZATION OF WATER RESOURCE GOVERNANCE AND AGRICULTURAL PERFORMANCE" (PAP005709)

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Abstract
To enhance the productivity of resources invested in irrigation sector, Government of India, as the case in other developing economies, has opted for paradigm shift in governance by forming the 'Water User Associations' and devolving the water governance. However, after a decade of its implementation, performance varies from place to place with a direct implication on income levels of agrarian community. In this study across three different states of India, results suggests that various factors such as a) lack of political will, b) capture of rural elite, c) lack of representation of all stakeholders, d) spread of Water User Association, e) leadership etc., are playing important role in either making or killing this meaningful shift. In this paper, we would like to discuss these aspects in detail.

Key Words
Irrigation, Participatory Irrigation Management, Factors influencing User Group Management

1.0 Introduction

Since its independence, India has made large investments in irrigation infrastructure – both in surface and ground water to facilitate irrigation to previously water-scarce areas. Accordingly, significant allocation of resources was made for this sector, for instance, about 22 per cent resources were allocated in First Five Year Plan. This has resulted in a dramatic economic growth in once rain fed and semi-arid areas. Positive consequences of these efforts were paid off both at national and regional level. Even the poor have benefited from it, especially in terms of wage rate and improved employment opportunity. The ultimate irrigation potential in the country has been estimated to be 139.89 mha (major & medium - 58.46 mha and minor - 81.43 mha), out of which irrigation potential to the extent of 99.31 mha has been created by March, 2005. But, on the other hand, *water consumed for producing a unit of food grain remained quite high in India. In other words, there is substantial scope of reducing water consumption and enhancing efficiency of irrigation projects. Presently the typical irrigation project functions at about 35-45% efficiency while it is possible to reach up to the 65% efficiency in an unlined open channel system. Seized of the issue, Planning Commission of India has fixed a target of 20% improvement in water use efficiency of the irrigation projects. In addition,* allocation for irrigation from First Plan to Tenth Plan has reduced from 22.5 to 5.9 per cent and *the Eleventh Plan has set the target of achieving 20% improvement in water use efficiency in all irrigation projects in the country. Thus, in a way, it made the State inimical to consider improving the performance of existing irrigation projects through better operation and maintenance and modernization (if required) along with creation of new irrigation projects.*

Background

Global experience show that investments in water resources development follow three stages, viz. a) First investment stage (Type 1) the challenges are predominantly engineering in nature. As the irrigation infrastructure gets built up challenges of operation and maintenance starts to emerge. This is the second investment stage (Type 2) investment in water management commences, but requirements of infrastructure development absorb most of the investments. The uni-functional irrigation engineering bureaucracy also gives priority to new construction at the cost of management of existing infrastructure. In the third investment stage (Type 3), when most of the opportunity for investment in fresh irrigation infrastructure is exhausted the focus shifts to investment in management including operation and maintenance and stakeholder participation. However, the success of this stage depends on the ability of the irrigation engineering bureaucracy to reform itself from its construction orientation to water management orientation (Fig 1).

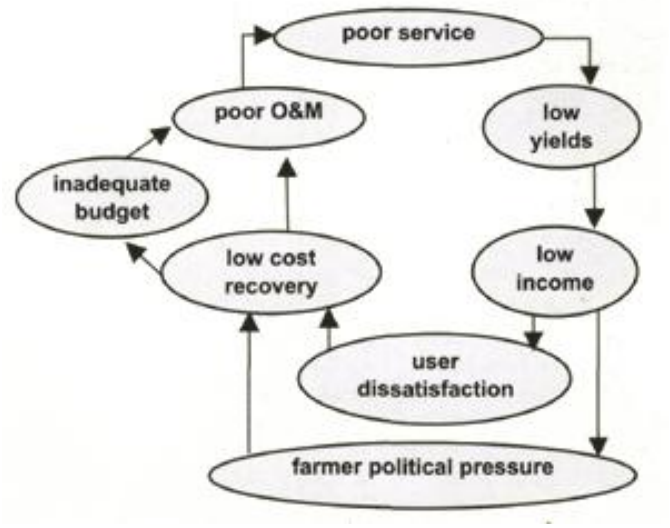

Fig 1: Vicious Cycle (Adapted from K. Oblitas. Making Irrigation Pay, World Bank Workshop on Agricultural Policy Reform in India, Dec.4,1992).

Indian Context

Inadequate funding for O&M over years has resulted in the neglect of maintenance and upkeep of the irrigation system leading to deterioration in the quality of irrigation service. Physically, the irrigation and drainage system is not able to receive and deliver the planned quantity of water matching with the demand pattern. Poor irrigation service, often not matching with the crop water requirements over space and time, results in low productivity of crops and income to the irrigators. Resultant dissatisfaction coupled with weak institutional linkage leads to under assessment of demand for water rates as well as low recovery of whatever is assessed. Progressive fall in the cost recovery increases revenue deficit causing adverse impact on O&M funding for maintenance works. Deferred maintenance of surface irrigation infrastructure over years has led to further deterioration of its physical service. This is witnessed by stagnating or falling irrigation coverage affecting agricultural growth in several regions. In this backdrop, Government of India (GOI) adopted PIM in the National Water Policy in 1987. The GOI issued guidelines towards farmer's participation in water management for centrally sponsored Command Area Development Programmes in April 1987. Later, the coverage increased across different states with official recognition of farmer's participation in irrigation management. This led to the formation of around 56,539 Water Users Associations (WUAs) in the country covering 13.16 million hectares of cultivable land (GoI, 2008). To create a sense of ownership of water resources and the irrigation system among the users, so as

- To promote economy in water use and preservation of the system.
- To improve service deliveries through better operation and maintenance.
- To achieve optimum utilization of available resources through sophisticated deliveries, precisely as per crop needs.
- To achieve equity in water distribution.
- To increase production per unit of water, where water is scarce and to increase production per unit of land where water is adequate.
- To make best use of natural precipitation and ground water in conjunction with flow irrigation for increasing irrigation and cropping intensity.
- To facilitate the users to have a choice of crops, cropping sequence, timing of water supply, period of supply and also frequency of supply, depending on soils, climate and other infrastructure facilities available in the commands such as roads, markets cold storages, etc., so as to maximize the incomes and returns.
- To encourage collective and community responsibility on the farmers to collect water charges and payment to Irrigation Agency.
- To create healthy atmosphere between the Irrigation Agency personnel and the users.

Provision in National Water Policy (2002)

Following modifications were made in the National Water Policy (2002) regarding the participatory approach to water resources management: "*Management of the water resources for diverse uses should incorporate a participatory approach: by involving not only the various governmental agencies but also the users' and other stakeholders, in an effective and decisive manner, in various aspects of planning, design, development and management of the water resources schemes. Necessary legal and institutional changes should be made at various levels for the purpose, duly ensuring appropriate role for women. Water Users' Association and local bodies such as municipalities and Gram-Panchayats should particularly be involved in the operation, maintenance and management of water infrastructures/facilities at appropriate levels progressively, with a view to eventually transfer the management of such facilities to the user groups/ local bodies*"

Provisions in PIM Acts

Recognising the need for sound legal framework for PIM in the country, the Ministry of Water Resources, Government of India brought out and circulated in 1998 a model act to be adopted by the State Legislatures for enacting new irrigation acts/amending the existing irrigation acts for facilitating PIM. In accordance with the model act eight State Governments, namely, Andhra Pradesh, Goa, Madhya Pradesh, Karnataka, Orissa, Rajasthan, Tamil Nadu and Kerala have enacted new acts. The legal framework provides for creation of farmers organisations at different levels of irrigation system as under:

a. **Water Users' Association (WUA):** will have a delineated command area on a hydraulic basis, which shall be administratively viable. Generally a WUA would cover a group of outlets or a minor.
b. **Distributary Committee:** will comprise of 5 or more WUAs. All the presidents of WUAs will comprise general body of the distributary committee.

c. Project Committee: will be an apex committee of an irrigation system and presidents of the Distributary committees in the project area shall constitute general body of this committee. The Associations at different levels are expected to be actively involved in: (i) maintenance of irrigation system in their area of operation; (ii) distribution of irrigation water to the beneficiary farmers as per the warabandi schedule; (iii) assisting the irrigation department in the preparation of water demand and collection of water charges; (iv) resolve disputes among the members and WUA; (v) monitoring flow of water in the irrigation system etc.

As a result of various conferences/ seminars organised by the Ministry, there has been an increased consciousness in States about the need for actively involving farmers in management of irrigation system and acrrodingly, they formulated state legislation (**Table 1).**

Table-1: State-wise Position of Enactment of New Act / Amendment of existing Irrigation Act

Sl. No.	**Name of State**	**Position of issue / amendment of Irrigation Act**
1.	Andhra Pradesh	Enacted "Andhra Pradesh Farmers' Management of Irrigation Systems Act, March, 1997"
2.	Assam	The Assam Irrigation Water Users Act 2004
3.	Bihar	"The Bihar Irrigation, Flood Management and Drainage Rules, 2003" under the Bihar irrigation Act, 1997
4.	Chhattisgarh	Enacted "Chhatisgarh Sinchai Prabandhan Me Krishkon Ki Bhagidari Adhiniyam, 2006".
5.	Goa	Enacted "Goa Command Area Development Act 1997 (Goa Act 27 of 1997)"
6.	Gujarat	Gujarat Water Users Participation Management Act, 2007
7.	Karnataka	Promulgated an Ordinance on 7th June 2000 for amendment of the existing Karnataka Irrigation Act 1957.
8.	Kerala	Enacted "The Kerala Irrigation and Water Conservation Act 2003".
9.	Madhya Pradesh	Enacted "Madhya Pradesh Sinchai Prabandhan Me Krishkon Ki Bhagidari Adhiniyam, 1999" during September 1999.
10.	Maharashtra	"The Maharashtra Management of Irrigation Systems by Farmers Act, 2005"
11.	Orissa	Enacted "The Orissa Pani Panchayat Act, 2002".
12.	Rajasthan	Passed the "Rajasthan Sinchai Pranali Ke Prabandh Me Krishkon Ki Sahabhagita Adhiniyam, 2000".
13.	Sikkim	"Sikkim Irrigation Water Tax 2002" and "Sikkim Irrigation Water Tax (Amendment) Act 2008"
14.	Tamil Nadu	Enacted the "Tamil Nadu Farmers' Management of Irrigation Systems Act, 2000".
15.	Uttar Pradesh	Enacted the " Uttar Pradesh Irrigation Management Act, 2009"

With promoting the formation of User Groups, as of 2008, there are 56539 WUAs were formed covering the area of 13.156 million hectares in various states (Table 2).

Table 2: Number of WUAs and Area Covered by WUAs across States in India

State	Number of WUAs	Area covered ('000. Ha)
Andhra Pradesh	10800	4169.00
Arunachal Pradesh	39	9.02
Assam	720	47.04
Bihar	46	147.76
Chhatishgarh	1324	1244.56
Goa	57	7.01
Gujarat	576	69.68
Haryana	2800	200.00
Himachal Pradesh	876	35
Jammu & Kashmir	1*	1.00*
Jharakhand	NA	NA
Karnataka	2515	1295.19
Kerala	4126	255.27
Madhya Pradesh	1687	1691.80
Maharashtra	1593	667.00
Manipur	73	49.27

MeghalayaS	123	16.45
Mizoram	NA	NA
Nagaland	23	3.15
Orissa	16196	1537.92
Punjab	957	116.95
Rajasthan	506	619.65
Sikkim	NA	NA
Tamil Nadu	1310	787.96
Tripura	NA	NA
Uttar Pradesh	245	121.21
Uttranchal	NA	NA
West Bengal	10000**	37.00**
Total	56539	13155.89

Source: Ministry of Water Resources, Government of India (*under verification; ** under MI, RIDF scheme)

Brief description about study states

PIM in Andhra Pradesh

Irrigation in Andhra Pradesh was under immense pressure to meet the rise in wate demand during early 90s. At that point of time, AP Government prepared a 'White Paper' identifying and addressing key problems in the irrigation sector (APERP, 1998) and outcome of this exercise was enactment of 'The Andhra Pradesh Farmer Management of Irrigation System Act (APFMIS) 1997' empowering farmers to undertake responsibilities of irrigation management. The progress of the PIM was based on 'Big Bang' (about 10,000 WUAs were formed at one point of time), The structure of WUA depends upon the scheme size: one-tiered WUA for minor irrigation; two-tiered WUA and DC system for medium irrigation, and three-tier – WUA, Distributory Committee (DC) and Project Committee (PC) system for major irrigation. PIM in Karnataka State also follows the similar model.

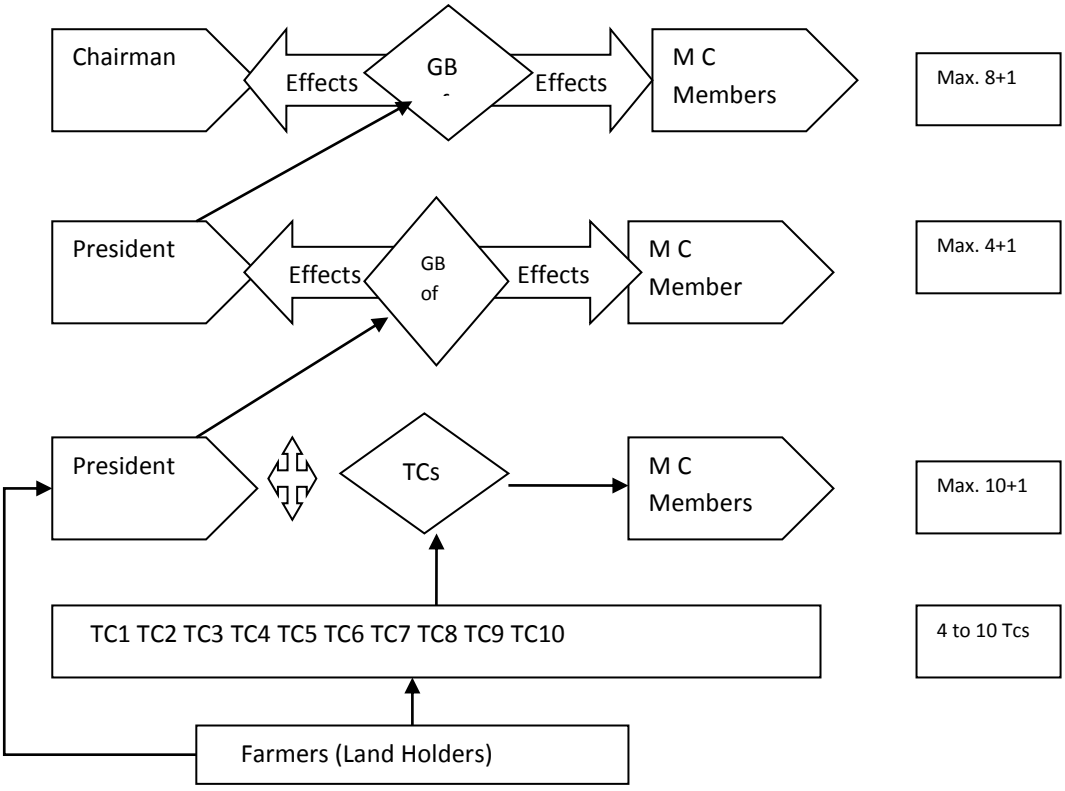

Fig 2: WUA Structure - 3 Tiers

Source: Irrigation and Command Area Development Department,GoAP

PIM in Madhya Pradesh

Government of Madhya Pradesh enacted the legislation 'Madhya Pradesh Sinchai Prabandhan Mein Krishkonka Bhagidhari Adhiniyan 1999', facilitating democratic election for WUAs, with the main focus on

transferring of responsibilities of management to users. It is is the second state after Andhra Pradesh to enact the Farmer Management Irrigation System Act. Currently, there are a total of 1,687 WUAs in the state.

Table: Number of WUAs in the state and their coverage across systems

Irrigation systems	Number or WUAs formed	Area Covered (Million ha)
Major	542	0.894
Medium	209	0.225
Minor	936	0.573
Total	1687	1.692

Source: Irrigation and Command Area Development Department, GoMP, 2010

Madhya Pradesh opted for three tier model of farmer organization demarcated as Water User Association (WUA), the Distributory Committee (DC), and the Project Committee (PC) as legal entities. It envisages a three tier structure for all the major and medium irrigation projects while minor irrigation projects will have two tier structures. The WRD Engineers is the secretary of the farmer's organization at different level as presented below:

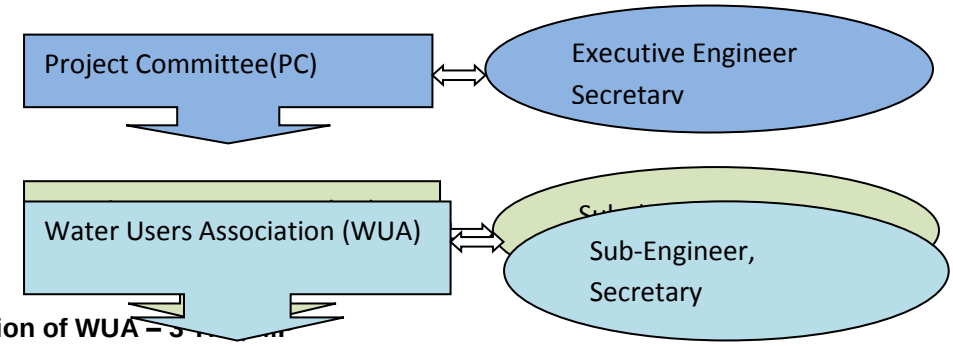

Fig 3: Organization of WUA – 3 T

Brief Description Study Projects

Sree Ram Sagar Project (SRSP), Andhra Pradesh was formed in the year 1997 and it belongs to D 74/3 channel of Nizam Sagar Project (NSP). Earlier, command area of this Association got water supplied from the NSP to meet irrigation requirements and was categorized as a tail end. It has 1398 hectares of land by covering 4 villages. The average landholdings size is around 5 acres while few of them own upto 20 acres. There is significant present of marginal farmers owning 1 acre land too. Paddy, Maize and Sunflower are the major crops and vegetables (Tomato, Ladies Finger, Brinjal, Cucumber etc) are minor crops. Paddy is the major crop grown (60 per cent) in the Kharif and less (30 per cent) in the Rabi. With formation of WUA and its later connection with Sree Ram Sagar Project (SRSP) (distance wise close to SRSP (15 Km) compared to NSP (120 km), this has become one of the well performing WUAs in Nizamabad district, Andhra Pradesh.

Madhya Pradesh is the third largest state of India. It has a total potential irrigable area of 6.72 million hectare, but only 2.09 million ha has been realized. **Samrat Ashok Sagar Irrigation Project (SAS)**, named after Emperor Ashok, has its command area in Vidisha and Raisen districts. River Halali, tributary of Betwa river was harnessed. Its command area falls in parts of Vidisha and Raisen districts. The dam constructed on the Halali River, which is a tributary of Betwa River about 40 km. from Bhopal (capital of Madhya Pradesh). Construction work was commenced in 1973 and completed in 1977 and main canal is in 1978. Envisaged gross command area is 37,419 ha and the culturable command area is 27,924 ha. After its completion, its O&M was with the Water Resources Department of the Government of Madhya Pradesh. However from July 2000 the responsibility of operation and maintenance has been transferred to the newly formed Water User Associations. Soya bean is main crop in Kharif while Wheat, Gram and some pulses are grown in Rabi with average land holding is 2 hectares.

Karnataka: Bhadra

Methods

To evaluate the overall performance of the Water User Association, we have chosen three categories of indicators, viz. a) Process Indicators, b) Impact Indicators, and c) Environmental Indicators and details are given graphically in Fig 4.

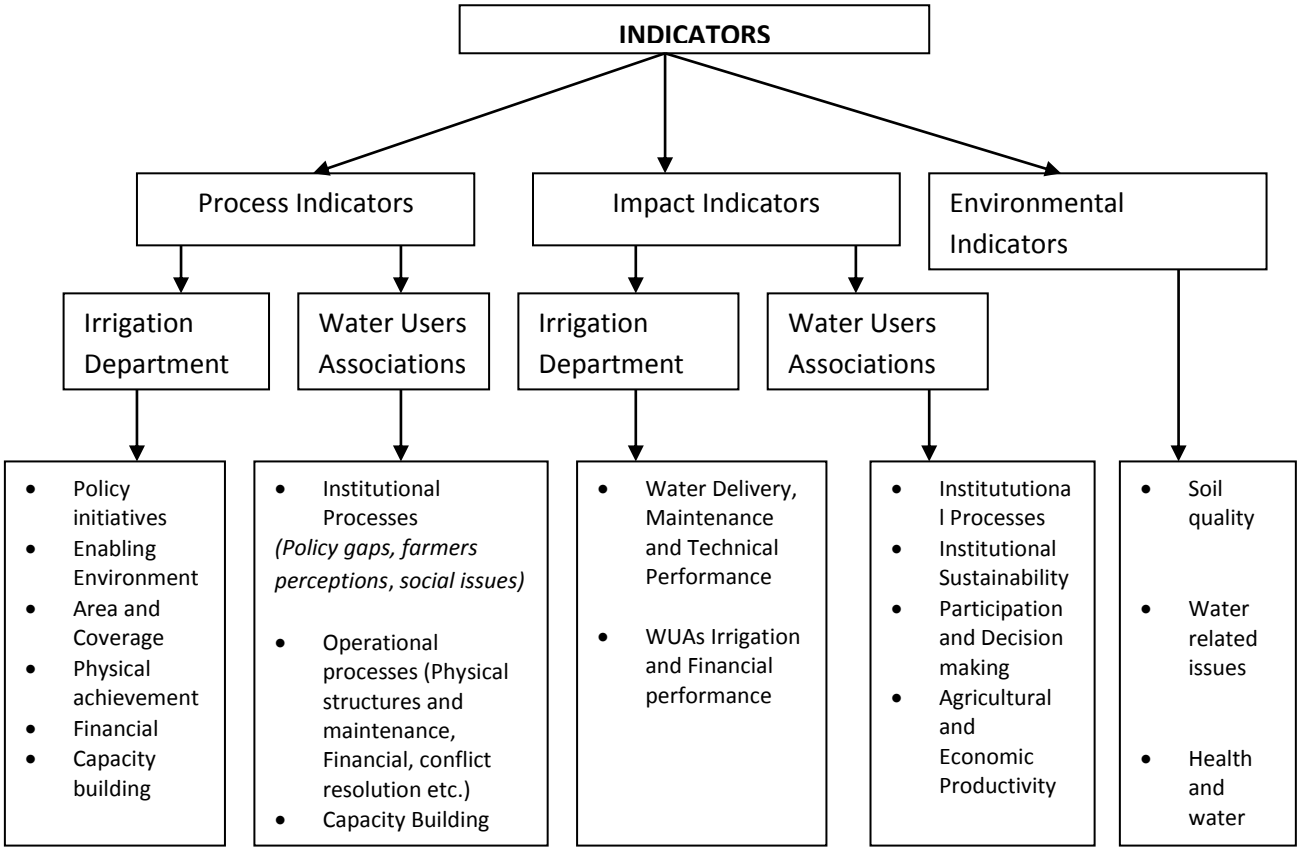

Fig 4: Indicators Type

Across the study sites in three states, discussions with individual members and officials from irrigation Department were carried out. Structured questionnaire was used to elicit the information. As mentioned in Fig 4, while collecting information, stress was given to the indicators selected. Information from about 50 WUAs across the study projects, spread over head reach, mid reach and tail end were collected and analysed.

Findings and discussion

Crop productivity is a function of several variables such as climate, pest incidence, time and extent of irrigation, fertilizer application. Thus productivity is influenced by several factors. Assuming that the other components are similar across two situations (before and after) and the difference, if any, is largely due to improved irrigation management, a majority of user-farmers are of the opinion that with the presence of WUAs, they could take effective decisions at the local level, for instance, the collective decision of weed removal in sub-minors or even minor repairs of canal structures resulting in an increase in crop productivity. Thus increase in agricultural productivity has led to an improvement resulted in more production and thereby, positively influencing household incomes. However, in the larger context of meeting the designed targets, the process of PIM needs to be further strengthened. Some factors that needs to be focussed are

Inequity in water distribution: One of the vital factors determining effectiveness of PIM is equity in water distribution through WUAs. Unless this is ensured, participation will remain limited to a small elite group with other user-members remaining outside the process. It has been observed that due to technical problems involved and illegal diversion of water to fields falling outside the command area, tail enders are not getting sufficient water. As observed in the Rajghat Canal Project, earlier the tail end user-farmers used to blame their own fate, but now they blame the irrigation department and illegal extraction of water by farmers in the head reaches. This is a shift in the perception observed and in years to come, they may get their due share of water due to the emphasis on two aspects –a) illegal extraction of water, and b) proper maintenance of canal network.

Designed area Vs actual area irrigated: It has been pointed out several researchers that there exists a clear gap between the area designed for irrigation and the actual area irrigated. This stems from two facts that head reach farmers indulge in a) violation of cropping pattern, and b) irrigation of area falling beyond the command area. These two factors, cumulatively affect the availability of water at tail end reaches. Earlier, as reported by user-farmers, although it was the responsibility of the irrigation department to ensure a proper

water supply, no remedial action had been taken against such violations. However, with the formation of WUAs, at least some pressure is being exerted by user-members against such violations

Operation and Maintenance: In the initial stages of WUA formation, it had been envisaged that the Irrigation department would hand over the distributory canal network to farmer association after completing necessary repair works and also that user-member associations would take over the O&M thereafter. However, that this was not adhered to has been borne out by the fact that most of the canal network needs extensive restructuring and user-member associations are not aware of the technical requirements either. Further, for user-members, it becomes evitable to depend on the irrigation department for necessary steps, failing which the consequences could be adverse. Thus, O&M as well as coordination with Irrigation Department form an intricative factor of the performance of PIM. To ensure proper O&M, it had been decided by the respective state governments to release a fixed amount of money to user-member associations for carrying out physical works through the irrigation department. Here we present some ground realities in this respect based on our field observations. In field studies, several scenarios were: a) presidents of WUAs have been using force to collect money from the Irrigation Department for sub-standard physical works that they have carried out as contractors, b) grants are released by the Irrigation Department at inappropriate times, thus hampering the physical works to be undertaken, c) user-members contribute money to get some physical works carried out by themselves. These observations suggest that the process of physical works undertaken needs proper attention for ensuring better performance of WUAs.

Co-ordination with the Irrigation Department: Although there prevail several snags with regard to coordination between ID and the farmers, there are some good signs also indicating some improvements. It is expected that the Irrigation Department and WUAs work in partnership towards establishing PIM as a process. With respect to the irrigation management transfer at the field level, one of the significant aspects observed after WUAs formation relates to the date of water release. Earlier, it was solely the Irrigation Department which used to fix a certain date for water release into canals depending on the volume of water available in the reservoir. As observed in the case of Distributory 48 in KC canal (after the formation of WUAs), the Distributory Chairman is consulted and the information regarding water release is then passed on to WUA chairman who in turn disseminates the information to user-farmers. This enables user-farmers to be better equipped, besides increasing water use efficiency.

Sustainability: There have been instances observed of good leadership in various project areas that indicate higher levels of motivation of elected members. Those WUAs with motivated members have invariably performed better. However, the motivation of elected members may stem from various factors such as overall community benefits, trickling benefits, good will, political aspirations etc. Observations made during field visits indicate that it is mostly farmer members are quite enthusiastic and motivated.

Transparency and Accountability: Transparency and Accountability are crucial for the success of PIM. Understanding the importance of user-members in the process of WUAs, be it elections for WUAs, or financial book keeping, is essential for successful operation and sustainability. Estimating the required quantum of finances for upkeep of various structures, close monitoring of financial expenses, funds generated and other related activities by user-members ensure transparency and accountability. It has been observed that this aspect requires a significant input. It is also observed that general awareness across various projects is poor and context specific. For instance, in Rajghat project area, where feudalism is prominent, the rich land owners are very much aware of WUAs, while the other stakeholders, mostly marginal and small farmers are not. On the other hand, in KC canal, where average land holding is more than 2 ha, farmers are more aware of WUAs than farmer members in MP and Orissa. Further, tail enders have evinced less interest in WUAs as some of them feel that formation of WUA has not helped them get adequate water. One interesting factor observed across all project areas is that wherever, the president of a WUA is pro-active, the interest of user-farmers in WUA/ PIM happens to be significant.
If an enabling environment by empowering farmers with information regarding the purpose and other aspects of PIM is created, WUAs can be successful. In reality, WUA process is new to user-members and to overcome these shortcomings, several training programs/ awareness programs were conducted for user-community. It has been observed during field work that user participation is limited on account of four factors namely a) they are meant only for elected members, b) communication gap with respect to dissemination of conducting training programs, c) unfavorable timings, d) overcrowding in training programs.

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