

EFFECTIVE WATER MANAGEMENT THROUGH FARMER PARTICIPATION

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ABSTRACT

The Indus Basin Irrigation System (IBIS), commanding an area of 15.08 million hectares (ha), is Pakistan's century old and largest contiguous irrigation system in the world. The main problem facing the system is lack of equitable and reliable delivery of water in the tails of the channels to almost 1.4 million small farmers (landowners of less than 2 hectares). Its mismanagement occurs due to pressure of influential big land owners and head reach farmers and rent seeking by the irrigation officials. Consequently, small farmers and tail enders of the irrigation system are unable to cultivate their lands and suffer from extreme poverty. To address this issue, institutional reforms have been introduced aiming to improve the water management. Through these reforms, irrigation management has been transferred to farmers groups called Farmer's Organizations (FOs) initially introduced by the Nara canal area water board (AWB) in Sindh .

The paper describes the involvement of empowered and organized members of 3,217 watercourse associations (WCAs) and 166 farmer organizations (FOs) at Nara canal system for the social and economic justice to the suffering farming community. About 55% is water equitably distributed through FO managed channels and 15% of irrigation water is saved to irrigate land to combat the poverty. In all 762 issues relevant to water distribution have been resolved through the conflict resolution committees in their respective distributaries. Interestingly, 30% new chairmen of FOs has been inducted in the organizations through democratic process of election after the completion of first tenure of the

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elected board of management of Farmers Organizations. This has been possible as 16,557 pertinent members of these organizations have been imparted relevant trainings. In addition the crop assessment and water charges recovery has been increased sufficiently to operate and maintain the farmer managed irrigation system to support institutional reforms process. In order to create effective linkages and coordination among organizations and with other line agencies and national and international organizations, farmer organizations council (FOC) has been established by these organizations. This paper also suggests policymakers to support institutional reforms on other canals to replicate the model of Nara Canal area water board.

INTRODUCTION

Water for agricultural use accounts for 96 percent of the Pakistan's available water of 170 billion cubic meters (BCM). Its use is increasing day by day and around 160 million people of the country are dependent on irrigation for food and livelihood. Around 70% of population irrigates their lands through the Indus Basin Irrigation System commanding an area of 15.08 million ha. It is the century old and largest contiguous irrigation system in the world. The main problem facing by the country's irrigation system is delivery of water to the small farmers (land owner of less than 2 hectares) and tail enders of irrigation channels in particular. The mismanagement occurs due to pressure of influential big land owners and head reach farmers and rent seeking by the irrigation officials whose salary is not commensurate with their living standard. Resultantly, small farmers and tail enders of the irrigation system are unable to cultivate their lands and they are suffering from extreme poverty. Water management crisis has led to wide spread conflict between different stakeholders (Dupont 2000) in the country. Therefore, effective water management system has been suggested through participatory irrigation management in the country to overcome the major problem of equitable water distribution.

In fact the system has been with multiple problems, including inefficient, unequal and unreliable delivery of water. This is considered to be due to the lack of users' participation in the decision of water management at all levels (watercourse, distributary, canal and river).

The participatory irrigation management (PIM) is described as transferring of irrigation canal management to farmers groups called Farmer's Organizations (FOs) from state control to common property resource (Bandaragoda 1999).

The paper describes the involvement of members of farmer organizations for the social and economic justice to the farming community in general and small and tail end farmers in particular to deliver their due share of water to irrigate land to combat the poverty. In addition these organizations have made commitment to strength their organizations at other part of the system through joint efforts and

support institutional reforms process. The paper also presents some of the suggestions for the planners and policy makers to replicate the model to other areas.

Management of Water Resources through Participatory Irrigation Management

In Pakistan the issue of management of water resources through participatory irrigation management was addressed by the World Bank sponsored National Drainage Project (NDP) Program during 1998. The institutional reforms program in irrigation and drainage system was envisaged to form watercourse associations (WCAs) and federate them as farmer organizations (FOs) at distributary canal level. In addition at main canal level, canal area water boards (AWBs) and for river basin Provincial Irrigation and Drainage Authority (PIDAs) were established in their respective four provinces (Punjab, Sindh, Northern West Frontier Province, and Balochistan) of Pakistan. Accordingly in 1997, the Sindh Assembly passed Irrigation & Drainage Authority (SIDA) Act. And after two years first canal area water board was established at Nara Canal command area. Nara Canal offtakes from the Sukkur Barrage (3 barrages in Sindh province at Indus River). This is the largest off taking canal of Sukkur Barrage system in terms of design discharge (13,600 cusecs) and second largest in terms of culturable command area (1.02 million hectares)

Irrigation management transfer (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 user associations (Vermillion 2003). PIM usually refers to the level, mode, or intensity of user participation that would increase farmer responsibility and authority in the management process (Svendsen et. al. 2002).

Nara Canal is the first in Sindh, Pakistan to come under IMT. The Nara Canal is a sort of natural river and was termed as Hakro River in olden times. It is 375 km long, traversing a zigzag course from the northern part of Sindh and culminates desert portion of South Eastern Sindh. The entire Nara Canal system comprises of three (03) main canals, ten branch canals, 166 distributaries, 4,317 watercourses (3,217 watercourse offtake from distributaries and 1,102 offtake direct from main and branch canals). It is divided into two (02) parts the upper part which runs from Sukkur barrage to Jamrao Head, 190 km long. The second part runs from Jamrao Head to its end Nara Tail, 183 km long. The Nara Canal system was accompanied with natural drainage infrastructure and fresh water bodies supplied water through escape canals off taking from Nara.

It is widely assumed that irrigation management transfer (IMT) to the farmers through institutional reforms will manage the water equitably to the tail enders and small farmers to improve the efficiency, productivity, and sustainability of

irrigation to combat the poverty (Vermilion, 1991). Several countries have experienced the positive results of the IMT, such as the USA, Turkey, Mexico, Australia, Sri Lanka and Nepal. A farmer-controlled community irrigation system was found to have led to a better design of the irrigation system and to have increased the problem-solving capabilities of local farmers (Alfonso, 1981).

Establishment of Farmer Organizations (FOs)

To implement the reforms, initially International Water Management Institute (IWMI) was contracted under the National Drainage Program (NDP) for pilot action research in Sindh province. It aimed to test the viability of farmer managed irrigation system. The IWMI successfully formed 330 watercourse associations (WCAs) at the watercourse level, and federated them as farmer organizations (FOs) at fourteen (14) distributary/ minor canal level using the extensive well tested social mobilization process (Memon et. al. 2000). After some time efforts were made by other organizations like On-Farm Water Management (OFWM) of Sindh Agriculture Department, Sindh Agriculture and Forestry Workers Coordinating Organization (SAFWCO) – an NGO and Sindh Irrigation and Drainage Authority (SIDA) to form FOs on additional distributaries and minors in Nara Canal Area Water Board command area. Consequently, by the end of year 2002, watercourse associations on 3,217 watercourses and 162 farmer organizations were formed and registered under SIDA Act 1997. In all 141 FOs have been able to sign irrigation and drainage management transfer (IDMT) agreement during 2001-03 and took over responsibility of distributing water equitably from head to tail of distributaries and watercourses and operating and maintenance of distributaries.

Empowerment of FOs

Empowerment denotes an increase in the power an actor or group of actors commands. Power is defined here in relational terms, as a capacity that actors have or lack in the transactions between themselves. Anthony Giddens (1979) has defined power as transformative capacity, the ability to bring about changes in the state of things and relations among actors. Through the exercise of power, actors seek to get others to comply with their wants. Giddens argues further that power engenders relations of autonomy and dependence.

FOs were empowered through proper legislation and transfer of functions of distributaries, to help them play their due role in water management.

Capacity is the ability of the person or organization to do things with maximum competence. The organization needs to be effective in the delivery of the services and efficient use of resources (Alaerts et. al.1991). Enhancing the abilities of the leaders to smoothly establish the institution and perform the designed functions is essential. Human resource development and capacity building program ensures

sustainability of the institution, laws and regulation can efficiently be used, and more resources can be mobilized.

Capacity building must 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. A blend of skills and attitudes needs to be imparted at all levels which also includes policy makers (Peter 2003).

The training needs of the members of farmer organizations through intensive interaction by convening individual and organizational meetings, and participatory rapid appraisal were assessed. The capacity building program was identified and initiated after the formation of FOs on distributaries and watercourses. It was designed to form and strengthen the farmers' institutions as well as develop the necessary skills particularly water management among the leaders of these institutions.

Particularly training on the following fields was imparted for enhancing the capacity and awareness of the members of organizations:

- Discharge measurement and water management at watercourse and distributary canal level;
- Organizational set up and rules and regulations;
- Crop assessment, and collection of water charges; and
- Operation and maintenance of distributaries and minors;
- Financial Management , business plan and book keeping
- Conflict resolution

The training program in the above fields was organized for the 16,557 pertinent members of watercourse and distributary canal organizations. Teaching methods include: theoretical concepts, hands-on-practice and interaction discussions and field exercises.

FOS ACHIEVEMENTS

To make the institutional reforms a success, the following efforts are being made by the watercourse associations and farmer organizations:

- Water users irrespective of land holding, tenancy status and social and financial status, have been able to sit together and discuss common issues breaking the skepticism that big landlords and privileged water users can not sit together with smaller deprived land owners. This new friendship among farmers has created the cohesion among various segments of society and communities.
- Responsible members of FOs are maintaining record of water availability in the channel by measuring the flow of water in watercourses as well as

in the distributaries through calibrated gauges and using float method. And distribute water according to the due share of the water users.

- Collective efforts utilizing human and capital resources are being made by these organizations for de-silting their distributaries and watercourses particularly during the canal closure period. During the last four years 162 FOs have successfully desilted 13.76 million cubic meters of silt at self help basis/ donations from 40% share of water charges collected by FOs. This action is a substantial saving for the government who would otherwise had to pay from their treasury.
- Proper assessment of crop command area and recovery of water charges from respective landowners is being done by the responsible members of organizations on regular basis and so far from (2001 to 2004), 141 FOs have deposited Pak Rupees 70 million (1.16 Millions US \$) in the account of Nara Canal Area Water Board as 60% share of water charges where about 20 million Pak rupees are retained by these organizations for maintenance of the channels and operational expenditures.
- Almost all organizations have constituted conflict resolution committees; having by and large elder and reputable members on these committees with the main purpose to resolve the conflicts mostly on water issues.
- The elected members of farmers organizations are regularly involved in the decision making processes at canal area water boards and irrigation & drainage authority boards by participating regularly. Election process to support democracy in the organizations is transparently accomplished. Out of 162 FOs successfully completed their first tenure have entered into re-election process and so far 141 have completed the process of re-elections. These re-elections resulted 30% new faces as leaders of FOs.
- FOs have joined hands together by establishing the farmer organizations Council (FOC) involving almost all farmer organizations mainly for coordinating and linkages within and outside organizations.
- To strengthen organizational role of FOs, under the World Bank funded irrigation rehabilitation project, FOs have been assigned the role of employer and all construction contracts were designed, supervised and implemented under the instructions of FOs. Presently 10 FOs are managing the rehabilitation works of irrigation channels amount to Rs.73.5 million. Out of these, one contract is a community managed contract, the first of its kind, where the FO has awarded the contract, is making payments and finalizing the work done. This had greatly boosted the confidence and capacity of the FO in technical matters as well.

Impact of Institutional Reforms on Water Management

The efforts made by the organizations have brought following impacts on the small farmers and tail enders are:

- Frequently discussions by the members of organizations for equitable water distribution, almost 70 percent (1.4 m small farmers and 44 (26%) tail end distributaries) water is equitably distributed; consequently 20% of cultivation intensity as compared to the pervious years (1999 to onwards) has increased. Additional 0.37 million hectares of land has brought under cultivation.
- With the efforts of organizations, the overall equity of water situation at the tails of channels has been improved by 55%, measured by FOs and AWB staff.
- Since last 3 years, almost all watercourses and distributaries are being de-silted by utilizing human and capital resources of organizations to save around 15% of irrigation water to cultivate more land by the members.
- The responsible members of the organizations are instrumental in properly assessment of crop command area (20 % more as compared to base year of 1999) and recovery of water charges increased by 17 %. Legally 60 % of water charges collected are being paid to Nara Canal area water board for service delivery, whereas the rest collected charges (40%) are being retained by the organization for operation and maintenance of their distributaries and organizational expenses.
- In all 762 issues relevant to water distribution have been resolved through the constituted conflict resolution committees in their respective distributaries.
- One case can be quoted that: FO works in the command area of Sanhro distributary off taking from jamrao Canal in Mirpurkhas irrigation sub division. After the re-election of FO in March 2005 the Board of Management (BoM) was replaced with a new body. This BoM consist of members of group belonging to the opponent group of the previous body. With the taking over of the system by the newly elected body incidents of outlets tempering increased causing shortage in the tail of the channel. The tail end growers started protesting against the shortage of water in the tail of the channel in front of AWB engineers. The newly elected body of FO headed by its Chairman - Mr. Saleem Khan Malkani arranged general body meetings of the FO to sort out more reasons for the shortage of water in the tail of the channel, monitoring committees for formed, fine was imposed on the owners of the tempered outlets and water availability in

the tail portion was restored through indigenous efforts of the FO and conflict resolution mechanism embedded in the social set up.

- Within last four years, two times elections have been held at the watercourse and distributary level. At several places new leadership have been inducted. Around 70 % same leadership has been elected considering their motivated efforts for the organization.
- By August 2005, Sindh province local bodies elections were held, a sizeable number of FO office bearers (total 137) were elected for different tiers of Local Government system. This reflects the confidence of the population in the FO leaders for representing them at more enhanced level and emergence of a new class of local leaders through the institutions of FOs.
- In order to create effective linkages and coordination among organizations and with other line agencies and national and international organizations, Farmer Organizations Council (FOs) have been established. The organization has done:
 - Providing a platform for member FOs to have a united voice on the matters of interest of farming community and agriculture .
 - Established linkages with national and international organizations like Global Water Partnership, International Network for Participatory Irrigation (INPIM), etc. to strengthening the concept of PIM
 - Arranged capacity building and awareness raising programs for the member FOs and coordinating them with AWBs and SIDA activities.
 - Members of FOC have got opportunity to participate in national and international forums such as: global water partnership, country and regional water partnership.

Suggestions for Sustainability and Replicating

In order to replicate the Nara Canal Area Water Board model, following suggestions are made:

- Policymakers to support institutional reforms on other canal area water boards may create influences and pressures to replicate the model of Nara Canal area water board on other canals of IBIS system. FOs should be provided enabling environment, political support and their capacity building.
- Since the introduction of institutional reforms, farmers have been mobilized to form FOs. Through its legal and technical component, FOs have been able to:

- Equitably distribute water as per share
 - Realistically assess the crop cultivated and collect water charges
 - Timely maintain the irrigation channels for better service delivery
- When compared with the channels, where FOs are not functional, it is observed that there is serious mismanagement of water resources and water delivery is badly affected and small farmers and tail enders are not getting their due share of water. Thus the promise of institutional reforms seems largely fulfilled through the FOs achievements.
 - To get the full benefit of institutional reforms and increasing the income of farmers agricultural support services for the organizations would be required to give advice on crops, pesticides, corporate management methods, market intelligence and development of an agribusiness plan.
 - Through institutional reforms process of FOs formation should be expedited on the canals which are working under the traditional bureaucratic mode of management.
 - There should be proper monitoring of the institutional development of FOs and area water boards and they should provide technical support for their organizational strengthening.
 - Political will is must for successful replication of reforms.

REFERENCES

Alaerts G. J., T.L. Blair, H. Saveniji, M.W. Blokland and P. Van Hofwegen.1991. Procedures and Partners for Capacity Building in the Water Sector. In A strategy for Water Sector Capacity Building, *Proceedings of the UNDP Symposium, Delft*.

Alfonso, F.B. 1981. 'Assisting Farmer Controlled Development of Irrigation Systems' in David C. Korten and Felipe B. Alfonso (eds) *Bureaucracy and the Poor: Closing the Gap*. Singapore: McGraw-Hill.

Bandaragoda, D.J., 1999. *Institutional change and shared management of water resources in large canal system : results of an action research in Pakistan*, 36, International Water Management Institute, Colombo.

Bank, W., 2001. 'Electronic learning guidebook for Participatory Irrigation Management', (5/9/01)

Dupont, A., 2000. 'Food, water and security: what are the connections?', *Food, water and war: security in a world of conflict*, ACIAR, Canberra.

Gidens, A., 1979. *Central Problems in Social Theory. Action, Structure and Contradiction in Social Analysis*. Barkeley: University of California Press.

Memon, Y., M. Talpur and H. Murray-Rust, 2000. Capacity Building for Participatory Irrigation Management in Sindh Province of Pakistan. *Farmer Managed Irrigated Agriculture Project. IWMI Pakistan National Program Research Report*.

Raymond , Peter J. “*Capacity Building for PIM – The case of Andhra Pradesh*” paper presented at the FAO/ICID International Workshop on capacity Building for Irrigation and Drainage, Montpellier, France 2003.

Sindh Irrigation & Drainage Authority. 2005. Monthly Progress Report. Social Mobilization Group, Sindh On Farm Water Management Project. April,

Svendsen M., and G. Nott. 1997. Irrigation Management Transfer in Turkey: Early Experience with a National Program Under Rapid Implementation. *Short Report Series on Locally Managed Irrigation. International Irrigation Management Institute. Colombo, Sri Lanka. Report No. 17*

Vermillion, D.L., 1997. *Impact of irrigation management transfer: a review of evidence, 11*, International Irrigation Management Institute, Colombo.
Vermillion, D.V., 2000. *Guide to monitoring and evaluation of irrigation management transfer*, The Japanese Institute for Irrigation and Drainage, Tokyo.

Vermillion, Douglas L., 1991. "The Turnover and Self Management of Irrigation Institutions in Developing Countries", a discussion paper, IIMI, Colombo.