

IRRIGATION REFORMS IN PUNJAB: THE IMPLEMENTATION EXPERIENCE AND PERFORMANCE EVALUATION

By

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1. The Context

Agriculture is the mainstay of Pakistan's economy which contributes upto 25% of the Gross National Product (GNP). The major part (68%) of the 16 Million populations, in rural areas of the country, depend upon agriculture which employs over 45% of the labour force. The increasing population is putting major impact on food, power and domestic water requirements. Ninety percent of the agriculture produce is benefited from irrigation water supplies. The irrigated agriculture of Pakistan mainly depends on Indus River System and its tributaries. The annual flow of Indus River is 143 MAF out of which 103 MAF is diverted into different canal commands. Being semi arid-arid climate of the country, having an average annual rain fall of 240 mm, the 90% of the irrigated agriculture is being carried out in Indus planes. The 80% flow of the Indus River is generated during monsoon period i.e. from June - August, which necessitates the effective water management for sustainability of irrigated agriculture. The Indus Basin irrigation system comprises of three major reservoirs i.e. Tarbela, Mangla, and Chashma reservoirs, which accommodate 10% of the flow of Indus River. The other irrigation infrastructure includes 17 barrages and 44 main canal systems. The aggregate length of canals is 34834 miles while the watercourse and field channel cover another million mile.

The Punjab irrigation system consists of a major part of Indus Basin Irrigation system. It is a contiguous system and occupies a pivotal role in Pakistan's economy and accounts for 80% of the country's agricultural production. This system consists of 22 main canal systems and 13 barrages / headworks. The aggregate length of canals is 23000 miles with off-taking capacity of 1,30,000 cusecs. The Punjab irrigation system serves 26.78 million acres of cultureable lands and existing average cropping intensity is 130%.

The river supplies are distributed to agricultural fields through a network of main canals, branch canals, distributaries, minors and outlets / watercourse. Due to system constraints and water management problems, the efficiency of the system is ranging 35-40% in terms of efficient water use. The major problems being faced is reliability of irrigation supplies to farmers, equity and sustainability in physical and financial terms.

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2. Institutional Reforms in Irrigation Sector

The deficiencies in effective water resources management had been a matter of great concern for the Government which poses a major hindrance for the developments in the water sector. The Government feelings to adopt new improved practices to manage the water resources in the country, with respect to improvement in performance in service delivery and sustainability of the irrigation infrastructure, led the Government towards comprehensive Institutional Reforms in water sector to ensure effective planning, development and management of all water resources within the country. Accordingly, during 1995, the Government of Pakistan decided to introduce Institutional Reforms in the Irrigation Sector, so as to achieve equity in distribution of supplies, improve cost recovery and encourage participatory management of the irrigation & drainage system.

3. Institutional Reforms Framework

On cognizant of the problems in irrigated agriculture and water management in the province, the Govt. of Punjab decided to adopt the institutional reforms in irrigation sector. Hence, during June – 1997, the Punjab Provincial Assembly, passed the “Punjab Irrigation & Drainage Authority Act”. This was an important step in the process of implementing the necessary institutional reforms in the irrigation sector. The reforms area focused on the decentralization of the irrigation system management, through public and private partnership, participation of farmers and resource governance.

The Punjab Irrigation & Drainage Authority (PIDA) has been set up at provincial level with representation of farmers and the government representatives. The Act provides setting up of Area Water Boards at Canal Command Levels, including farmers and Government Representatives and establishment of Farmers Organizations at distributary levels, an entirely farmer based entity. Hence this Act provides decentralization of a centrally controlled irrigation system (Provincial Irrigation Department) into a three tier public private partnership based management system, as explained above.

The main objectives of PIDA Act are as follows:

- Implement the strategy of the Government of the Punjab for streamlining the Irrigation & Drainage system.
- To replace the existing administrative set-up and procedures with more responsive, efficient and transparent arrangements.;
- Achieve economical and effective O&M of the irrigation, drainage and flood control system.;
- To make the irrigation and drainage network sustainable on a long term basis; and

- Introduce the participation of beneficiaries in the O&M of the irrigation and drainage systems.

The new institutions shall broadly perform the following functions.

- PIDA would carry out all the functions of the Irrigation Wing of the PID as an autonomous body, with independent revenue collection and purchasing authority. It would be responsible for policy formulation, legal enactment and supervision of the overall management of the irrigation and drainage system in the province, including the O&M of the irrigation system from the Headworks (i.e. barrages, storage reservoirs) to the head of the main canal systems;
- Area Water Boards (AWBs) as financially self- sufficient entities at the canal command levels with a functions similar to a utility company. There would be responsible for the irrigation and drainage management of the main canal system, including bulk water supplies to the head of the distributaries;
- Farmer – managed, financially autonomous FOs would be responsible for the O&M of the distributary canals as well as the assessment and collection of water charges including the equitable distribution of supplied canal water between all watercourses and other water users along the distributaries.

4. The Implementation of Reforms

The reforms in the province started with promulgation of the “Punjab Irrigation and Drainage Authority” PIDA Act 1997, by the Provincial Assembly of Punjab.

For implementation the reforms initiatives, a legal framework has been evolved by the PIDA which is based on the participation of farmers at all levels of irrigation management that is at provincial level, canal command level and at distributary level. This framework legitimizes the reforms process and set out the conditions for establishment of Farmers Organizations and Area Water Boards through Rules and Regulations under PIDA Act. The details of the legal frame work is as under:

- The Punjab Irrigation and Drainage Authority, Act 1997.
- The Area Water Board (Rules) 2005.
- Farmers Organizations (Rules) 1999, replaced with new Rules, 2005.
- FOs (Elections) Regulations 1999.
- FOs (Registration) Regulation, 1999.
- FOs (Financial) Regulations 2000.
- FOs (Conduct of Business) Regulations 2000.
- Irrigation Management Transfer Agreement between FO and AWB /PIDA.

Under this legal framework the existing management of irrigation system has been converted into multi-tier system for management of irrigation infrastructure.

Punjab Irrigation and Drainage Authority (PIDA)

- Chairman
(Minister for Irrigation, Punjab)
- Farmer Members.
(Six Numbers)
(Nominated by the Government)
- Non-Farmer Members
(Five Numbers)
Chairman P&D Board, Punjab
Secretary, Irrigation & Power, Department, Punjab
Secretary, Agriculture, Department, Punjab
Secretary, Finance, Department, Punjab
Managing Director PIDA.

Area Water Board (AWB) at Canal Command level

- Chairman
(Elected out of Farmer Members)
- 10 Farmer members
(elected out of Farmers Organizations)
- 9- Non Farmer Members.
(Representative of allied Government.
Departments and technical expert)

Farmer Organizations (FOs) at distributary level

- (a) Khal Panchayat
(at watercourse level)
 - Chairman: 1
 - Members: 4
(elected out of farmers of watercourse)
 - Farmers Organization
(General Body consist of Chairmen of Khal Panchayat)
- (b) Management Committee
(elected by General Body)
 - President: 1
 - Vice President: 1
 - Secretary: 1
 - Treasurer: 1
 - Executive Members: 5
(Three from tail reaches)

5. The Implementation Process

The process of Institutional Reforms commences with community development at village level so as to aware the farming community of Participatory Irrigation Management initiatives and to organize them for establishment of Farmers Organization. The details of the process is as under:

- Information dissemination among farming community for Participatory Irrigation Management.
- Social Mobilization of farming community at each watercourse level and in the area.
- Formation of Khal Panchayats and Farmers Organizations through election process.
- Capacity Building and Training of members of Farmers Organization and Provincial Irrigation Department staff.
- Dissemination through Workshops, Seminars and Media etc. to create awareness among farmers, public and other stakeholders.
- Operationalization and empowerment of Farmers Organizations
- Coordination and Institutional Support to Farmers Organizations for their efficient functioning.
- Monitoring and evaluation of Farmers Organizations and back up support in weak areas.

Capacity Building of FOs

The capacity building and training to Farmers Organizations are imparted through a comprehensive plan. This activity is carried out prior to Irrigation Management Transfer to Farmers Organizations, while continuous capacity development and support to Farmers Organizations in their functioning is provided by PIDA through its experts and conducting a series of events at Farmers Organizations level through class room lectures and on job trainings.

The capacity building and skill development includes the following main areas:

- Need for institutional changes and its legal aspects (Canal and Drainage Act, PIDA Act, Farmers Organizations Rules and Regulations.)
- Organizational Development and Management Skills, Conduct of Business of FO.
- Social aspects, Dispute Resolutions and communications skills.
- Capacity development for system management and record keeping.
- Technical issues of Canal operation, Regulation of water, maintenance of works and contract management
- Equitable Distribution of water and control over water theft.
- Financial management i.e. maintaining accounts and audit.
- Water charges assessment and collection, procedures and other issues of water management.

6. Performance of Farmers Organizations

(I) Operationalization of FOs

The first Area Water Board (AWB) was established in Lower Chenab Canal (East) Canal Command Faisalabad on Pilot basis in February 2000 under PIDA Act 1997. Accordingly, establishment of eighty five Farmers Organizations (FOs) and Irrigation Management Transfer (IMT) of distributaries to them was completed by the end of year 2005. The Irrigation Management was transferred to 85 FOs in three phases. Ist group of 20 FOs signed IMT agreement on 8th March 2005, the IInd Group of 49 FOs on 28th June, 2005 and for IIIrd group of 16 FOs, it was completed on 8th December 2005. The FOs start their functioning as soon as transfer agreement is signed between PIDA and management committee of FO. The sustainability of FOs has been ensured by providing coordination and institutional support in technical, revenue, operation and maintenance of infrastructure and organizational setup by PIDA. Further monitoring and evaluation of the performance of the FOs is being regularly carried out so as to assess the performance of FOs and to provide back up support in weak areas. Continuous skill development and training in deficient areas is being provided through extra trainings, workshops and FO to FO dialogues.

(II) Performance Evaluation

Monitoring and evaluation is an important tool for policy makers, planners and management for assessing the performance of Farmers Organizations against the entrusted functions, impacts and outcome etc. The PIDA has planned a monitoring and bench marking system to evaluate the performance of Farmers Organizations.

Performance key indicators

The broader performance key indicators for conducting monitoring and evaluation of PIM (including input/ process, output and outcomes/ impact indicators) are presented in Matrix Box-I.

Thus, based on the roles and responsibilities of various entities at different tiers, i.e. PIDA, AWB and FOs, the following specific indicators have been considered under the monitoring and evaluation of FOs performance:

- (i) **Organizational Development** - Constitution of Standing Committees, conduct of meetings (General Body & Management Committee), training & capacity building, inter-community visits, preparation of annual business plan/budget, water scheduling, record keeping, understanding & commitment regarding roles and responsibilities, cohesion amongst the FOs members, AWB & PIDA as well as other stakeholders.

Box-1: Performance Key Indicators

Objectives	Input / Process Indicators ¹	Output Indicators ²	Outcome & Impact Indicators ³ (Monitorable Indicators)
Decentralization and management transfer of irrigation system in the pilot AWB LCC (East) Circle and strengthen capacity and improve efficiency of decentralized institutions (Farmers Organizations)	<ul style="list-style-type: none"> ❖ Number of supported staff (community mobilization, training & capacity building and coordination) deployed ❖ Provision of office, furniture & fixture for Organizational development ❖ Provision of equipment/ machinery including computer & related accessories ❖ Provision of financial support for organizational development ❖ Funds allocation, release and utilization for O&M of channels ❖ Provision of stationary for water charges assessment & billing ❖ Capacity building & training, support & coordination of FOs/staff 	<ul style="list-style-type: none"> ❖ Number of FOs established & functioning ❖ Number of training conducted and FOs/ staff trained ❖ Organizational development and No. of meetings (MC & GB) conducted by FO and maintaining record ❖ No. of coordination meetings among FOs, AWB, PID&PIDA ❖ Maintaining accounts and auditing ❖ Business, workplan and annual budget prepared & approval ❖ Walk thru of the channel for examining the physical condition of the channels ❖ O&M works executed by the FOs ❖ Reduction in canal breaches/ cuts/ water theft cases ❖ Equitable distribution/DPR enhanced in outlets located at different reaches of the channels, i.e head, middle & tail ❖ Conflicts resolution relating to water distribution & publishing the scheduling of water (warabandi) along watercourses ❖ Assessment of water charges & improved recovery ❖ Water supply measuring, recording, maintaining water account & reporting ❖ Control over water theft and punitive actions ❖ Utilization of FOs funds 	<ul style="list-style-type: none"> ❖ Area (ha) managed by decentralized institutions such as PIDA, AWBs and FOs ❖ Water charges (Abiana) collection performance - % improvement in abiana collection after IMT ❖ Improving abiana collection performance - % of abiana collection of the assessment of particular crop ❖ % increase in the revenue assessment ❖ % of FOs budget spent on O&M Works ❖ % of budget of FOs spend on staffing and other recurring expenses ❖ Extent of improvement in provision and quality of service delivery FOs. Indicators would include delivery efficiency of water, delivery of water to tail-enders, effective functioning of canals (% performing to designed levels), extent of farmers satisfaction with services provided, etc. ❖ Extent of transparency in financial and operational performance ❖ Improvement of internal process and procedures, including decentralization in FOs (performance of standing committees etc.) ❖ % reduction in deferred maintenance ❖ % reduction in allocation of M&R budget ❖ % reduction in conflicts ❖ Physical condition of channels, banks, innersection, structures & attendance to emergencies & their frequencies ❖ Efforts to maintain equity, control over water theft & punitive actions ❖ Execution of M&R works ❖ Accounts record maintenance

¹ **Input indicators** measure the quantity (and sometimes also quality) of resources provided for project activities. **Process indicators** measure the effectiveness and timeliness with which a project's inputs are being procured, used or deployed to generate outputs.

² **Outcome indicators** measure the quantity (and sometimes also quality) of goods and services that have been created or provided through the use of inputs.

³ **Outcome indicators** measure the quantity (and sometimes also quality) of direct results that have been achieved through the provision of project goods and services. **Impact indicators** measure the degree to which wider sector / project objectives are being achieved through the direct outcomes of project activities.

- (ii) **Management of Physical Conditions** – walk thru the channel, identification and execution of physical/ O&M works, maintaining of hydraulic structures (bridges, falls, head regulators etc.) and inner sections of the channel to design parameters.
- (iii) **Efficient Service Delivery** - responsiveness to emergency calls relating to breaches, cuts, water theft, water related disputes etc.; maintenance of outlet structures to design parameters, watch and ward of the channel, reduction in canal breaches/ cuts as well as water theft cases; methods of irrigation, efficient use of water, water measurements, increase in delivery efficiency/conveyance losses etc. at watercourse level.
- (iv) **Regulation and Water Accounting** - delivery performance of outlets at different reaches, observation of gauges at various reaches of the channel including water delivery, accounting etc.
- (v) **Equity in Water Delivery** - water measurements at various reaches of the channel, actual discharge against the sanction, checking of gauges, checking of outlets, and control over water theft.
- (vi) **Revenue Management** – assessment and collection of water rates (abiana), utilization of funds on the operation & management of the distributary sub-system.
- (vii) **Dispute Resolution & Disposal of Revenue Cases** – resolution of conflicts related to water allocation, distribution, and revenue & unauthorized irrigation/water theft cases (initiation, action & finalization)
- (viii) **Farmers/ Community Participation** – works carried out on self-help basis regarding repair of breaches/ cuts, desilting of channel, repair & maintenance works as well as several others.
- (ix) **Accounts Management** – management of accounts (procurement of goods & services, execution of works, assessment, collection & utilization of funds) as per the procedures laid out in the financial management guidelines of PIDA.
- (x) **Coordination amongst the Stakeholders** – interaction/ cohesiveness between PIDA, AWB, FOs, IPD, Agriculture Department, NGOs as well as other stakeholders. Works carried out in collaboration/ or with the assistance of stakeholders relating to the irrigation/ water management, agriculture, marketing and other activities.
- (xi) **Self Monitoring & Progress Reporting to PIDA/AWB** – FO system of monitoring to improve performance w.r.t agreed parameters and monthly & periodically progress reports submission on prescribed formats/forms.

Evaluation Criteria

The evaluation of performance of FOs has been standardized into four broader legends as under:

Standard	FOs performance	Marks
Poor	FO is not performing adequately in this aspect and requires support and guidance, the PIDA/AWB should intervene to investigate and boost performance	Less than 50
Adequate	FO has reached the minimum acceptable standard in this aspect, but remains vulnerable and their progress should be monitored	50-65
Satisfactory	FO is performing well in this aspect, and needs no further support, FO in this category is considered to be sustainable	65-85
Good	FO performance very good, achieved by mature and fully sustainable, FO able to develop further or accept additional responsibilities	Greater than 85

To assess the performance of FO as per standardization the performance key indicators has been weighted into scores relating to functioning under following major heads.

Sr. No.	Indicator	Weightage (Marks)
1	Organizational Development	15
2	Management of Physical Condition of Distributary	20
3	Irrigation Service Delivery	10
4	Regulation and Equity in Water Delivery	20
5	Monitoring and Water Accounting	15
6	Dispute Resolution and Disposal of Revenue Cases.	5
7	Water Charges Assessment and Collection	15
	Total	100

(III) Monitoring & Evaluation of FOs

Monthly and periodic progress report on defined formats is being regularly submitted by each Farmers Organizations. Further Field Inspectors of M&E Cell PIDA visit the specified Farmers Organizations at least quarterly as per approved action plan and report of performance of FOs as per performance key indicators. The progress reports submitted by FOs and inspection reports of FOs are evaluated against performance standards and weak areas are identified, conveyed to FOs and support provided by PIDA to improve functioning.

The first group of 20 FOs which completed their first year of operation during June 2006, has been evaluated against performance key indicators and standards. While performance of other 65 FOs have also been continuously monitored. The performance ranking of Ist group of FOs after their first year of functioning in Area Water Board in LCC(East) Canal Circle is illustrated as below;

Performance Rating	No. of FOs	%age of FOs
Good	Nil	Nil
Satisfactory	9	45%
Adequate	6	30%
Poor	5	25%

- The improvement in water charges collection by the FOs is very encouraging during first crop Rabi 2005. Average collection of water charges is more than 80% against an average 50% pre- IMT period. While 50% FOs collected 100% water charges. During second crop Kharif 2005 – 2006, so far 70% water charges has been collected and expected to have more than 80% upto December 2006.
- Improved maintenance irrigation infrastructure observed. 85 FOs spent Rs. 12 million on maintenance works out of their share of water charges during first year of their working. Further these FOs spent Rs. 2.0 Million on self-help basis on desilting and emergent repair of banks and canals.
- Equitable distribution of water among farmers is being ensured through rectification of defective and tampered outlets. Effective efforts have been made to control over water theft and in 50% FOs water theft has been 100% controlled.
- Decisions on disputes are much faster and frequency of disputes has been reduced.
- The farming community has been fully aware and taking interest in functioning of FOs.
- Interaction and communication between farmers and irrigation staff has been improved.
- Confidence and transparency over the assessment and collection of water charges has been observed.
- The Farmers Organizations are found weak in organizational development and record maintenance which require more support and continuous capacity building.

7. Way Forward of Reforms

- Government of Punjab intends to extend the Reforms initiatives in all the twenty two (22) Canal Commands by formation of about 1500 Farmers Organizations and twenty two Area Water Boards so as to ensure the participation of the farming community in the Participatory Irrigation Management of the channels.
- One canal command of LCC Area Water Board (AWB) already established in February 2000 and 85 FOs formed and IMT signed by 31-12-2005.
- Three Area Water Boards of LCC (West), LBDC and CRBC notified by the Government and would be made operational by the end of December 2008.
- The balance 18 AWBs will be notified and operationalized by December 2020.
- After complete decentralization and transformation into new entities, the service delivery, collection of water rate, equity and efficiency will improve thereby leading to the self-sustenance of the irrigation management of the irrigation channels.

8. Concluding Remarks

- Participatory Irrigation Management (PIM) assists farming community to participate in the irrigation management in a consultative mode right from the initial stage of planning and development of channels, O&M, dispute resolution, equitable distribution of water and water rate collection etc.
- This is an excellent set up of public private partnership where by the farmers manage their channels transparently and efficiently.
- Government financial burden is reducing gradually as the new entities are managing their channels through the share of water rate at their level.
- FOs are managing their channels at half strength as was being done previously by the Government.
- Farmers are empowered through legal framework to take decision on dispute resolution, water distribution, and financial management. Accordingly there have been 50% reduction in the disputes, theft of water and defaulters of water rates and tail shortages.
- PIM has created confidence among farmers through empowerment.

- PIM is also promoting the improvement of service delivery with the assistance of agriculture extension and with the assistance of other allied departments.
- Third party evaluation on the reforms provides a corrective feedback on the performance of the existing set up of the new entities. The impact evaluation is also recommend after every three years on the assigned parameters of performance.
- Sustainability can further be improved through proper training and capacity building as a continuous support to the new organization.