PARTICIPATORY IRRIGATION MANAGEMENT IN CHANGING TIMES – CAN ONE SIZE FIT ALL?

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Development Support Centre

- Started in **1994** under the leadership of its late founder Chairman Mr. Anil C Shah
- Directly implements & Provides knowledge based support to institutions involved in promoting sustainable livelihoods and PNRM
- Governed by a 12 member Board and Chaired by Shri V.B.Patel
- **Partnerships**:
- Collaborated with the Gujarat State Watershed Management Agency **(GSWMA)** for CB inputs in rainfed areas of Gujarat.
- Collaborated with the Water and Land Management Institute **(WALMI)** for CB inputs in irrigated areas of Gujarat.
- Collaborated with the Rajiv Gandhi WSD Mission for CB inputs in rainfed areas of **Madhya Pradesh**.
- Collaboration with the World Bank for providing CB inputs on **PIM in U.P., Odisha, West Bengal and Ghana**

- Works with more than **1 lakh** farmers in 8 districts of Gujarat, 4 districts of MP, 3 districts of Maharashtra and 1 district of Rajasthan.
- **Closely partnered with the Govt of Gujarat to introduce PIM in the State since 1995**
- Directly promotes PIM in 4 Major and 4 Medium Irri. Projects in Gujarat & M.P in collaboration with State Govt, SSNNL & NVDA
- Provides capacity building support to 7 states. Conducted 74 studies and produced 11 films
- Hosted visits for 10.000+ delegates from 18 states & 21 countries
- Has received recognition for its contribution in Water Management through the India Power Award and more recently the Water Award.

Main Reasons for introducing PIM

- There is widespread deterioration of the canal network and it increases as one travels from the main canal to the minor/sub-minor canals.
- Water delivery is inefficient, unreliable and inequitable.
- Service to farmers is marked by insensitivity and very little accountability.
- Levy of water rates and the recovery has no relation to actual cost of water.
- There is weak linkage between the Irrigation Department and Agriculture Department.
- There is hardly any participation of farmers in the management of irrigation systems.

Legal reforms for mitigating problems in MMI schemes in India

- National Water Policy of the GoI (1987) advocated the involvement of farmers in management of irrigation systems, particularly in water distribution and collection of water rates.
- Model Act in 1998 to be adopted by state legislatures for enacting new Irrigation Act/ amending the existing Irrigation Acts for facilitating Participatory Irrigation Management.
- Andhra Pradesh one of the first states to enact the PIM Act in 1997. Since then 15 out of 29 States and 93,000 Water User's Associations have been formed covering about 15 Mha.
- Formation of **Water User's Associations (WUAs)** at Minor, Distributary and Project Level.

Functions of WUAs

- Regular Operation and maintenance of canals
- Equitable water distribution amongst the farmers in the command area
- Maintenance of records (irrigation and financial)
- Recovery of water charges (wherever levied)
- Conflict resolution amongst members

The Impact of PIM on Economic Growth

Sixteen successful WUAs promoted by NGOs and the Irrigation Department in these four states (A.P, M.P, Maharashtra and Gujarat) were studied. Key impacts:

- WUAs carry out O & M, undertake crop planning, ensure equitable water distribution and resolve conflicts amicably.
- Increase in irrigated area in the range of 10% to 36%.
- Increase in area under food grains such as wheat and paddy
- Introduction of new crops such as onions, grapes, sugarcane and G.M.Cotton.
- Change in crop productivity – wheat, soyabean, maize, cotton and pulses.
- Dairying - Increase in fodder availability and income (about 47% increase in net income through dairy in M.P.)
- In all the four states increase in employment generation and wage rates was observed post PIM.

Key Challenges

- Sustaining the gains wherever it is implemented successfully.
- Scaling up PIM to irrigation projects where it is not currently implemented even though there is an Act in place.

Favourable conditions for Canal Irrigation

According to Dr Tushaar Shah canal irrigation is best suitable when:

- There are small number of farmers with large landholding .
- There is homogenous cropping, planting and irrigation schedules in the command area.
- The IB commands the power to enforce operational discipline on users.
- The IB holds irrigators captive to an “irrigation culture” and creates and “irrigation community”.

Key Factors influencing PIM

- Type and Physical condition of the Water distribution network
- Groundwater regime in the command area.
- Land use and cropping pattern in the command area
- Investments for Operation and Maintenance of the system for awareness creation, capacity building and institution development.
- Water rates & recovery
- Social fabric and aspirations of communities in the command area

Key Stakeholders influencing PIM

- Irrigation Department
- Farmers
- Other Water Users

What has changed?

Then

- Distribution Network -Only open canals. Relatively in good shape.
- Groundwater Regime in the Command area – relatively less developed.
- Land use in the command area - largely for agriculture purposes
- Cropping pattern – mono-cropping, food grains such as wheat and paddy and cotton and sugarcane.

Now

- Distribution Network – Schemes having open canals, canals and UGPL, lift irrigation, canals and UGPL. Open canals largely deteriorated
- Groundwater Regime in the Command area – Highly developed with wells and borewells. The total number of pumps in the country has grown from 5 million to about 30 million.
- Land use in the command area - reduction in agriculture land and per capita landholding, increasing urbanization and industrialization.
- Cropping pattern – high value and diversified crops such as horticulture, floriculture requiring precision agriculture

What has changed?

Then

- Investments in O &M & for capacity building - inadequate .
- Water rates & recovery – major source of revenue for the state, water rates covered some portion of O & M.
- Social Fabric – cohesive, motivated for collective action. Contented.

Now

- Investments in O & M – inadequate except in case of modernization. Investments for capacity building remain inadequate except in some states.
- Water rates & recovery – very low rates and lower recoveries. Variation within the state and amongst states.
- Social Fabric – increasingly fragmented on caste, religious and political lines. High aspirations.

What has changed?

Then

- Irrigation Department – adequate staff, PIM Champions within the Dept who pioneered the concept.
- Farmers – traditional methods, flood irrigation, had time for meetings and collective action.
- Other Water Users – relatively less number for domestic and other users including industry.

Now

- Irrigation Department – inadequate staff, vacancies at the field level, little orientation to PIM.
- Farmers – use of modern irrigation methods such as piped water, drips and sprinklers, on farm storage, farm mechanisation, recharging water bodies, less time for meetings and collective action.
- Other Water Users – most schemes providing water supply to urban areas or the industry. A major portion of their revenue is also through these sources than from farmers.

Can one PIM Act serve different types of Irrigation Schemes in a State?

One PIM Act in a State but variations in Irrigation Schemes in terms of:

- Quantum of water stored – Water Surplus and Water Deficient.
- Location – situated in undulating Tribal areas, some in flat Coastal areas.
- Groundwater availability in command areas - Some have shallow water tables and some deep, alluvial and hard rock aquifers.
- Development of command area: Some have high cropping intensity with a variety of crops and some provide only support irrigation for Kharif at most Rabi .
- Community in command areas: Tribal communities, first time irrigators with small landholding and Patidars having large landholding.

Characteristics of schemes where DSC promoted PIM

	Gujarat	Madhya Pradesh
Location	North Gujarat & Saurashtra	Dhar district
Area	60977	25000
No. of Farmers	45667	13251
Villages	154	77
WUAs	230	16
Area/WUA	300 – 500 ha	1000-1500 ha
Members/WUA	200-350	700-800
Villages / WUA	1-3	4-5
Social Structure	Non-Tribal, over-irrigated	Tribal, 1st time irrigators
Membership	Fee based, selection and less political	No fees, election and more political
Water Charges	162 /200 per ha now about 388/ha/watering	Free initially

Different Scenarios require different strategies and approaches to PIM

WATER RESOURCES

	Surface Irrigation System (Public)		
	Characteristic →	**Surplus**	**Deficit**
Ground Water table & source (Private)	**High** ↓	Possible scenario : Water logging Possible Intervention: need drainage, land development, agriculture development	Possible Scenario: High tailend deprivation, low water demand. Possible Intervention: Conjunctive use, introduce drip
	Low	Possible Scenario: High dependence on surface water, overuse Possible Intervention: Groundwater recharge, increase command area through piped water supply	Possible Scenario: high tailend deprivation. Ground water exploitation Possible Intervention: water harvesting, ground water monitoring and recharge, conjunctive used demand side mgt through drips, low water use crops

Growth of groundwater and its impact on PIM in Dharoi Command Area

- Dharoi one of the successful models for PIM in the country with robust WUAs facilitated by DSC and the WRD Dept.
- In one of the Branch canals the command area increased from 22500 ha to 36412 ha after canal rehabilitation and PIM i.e. increase of 61.74 %
- A case study of 24 WUAs having command area of 5808 ha shows the following changes from 2006-07 & 2016-17:
  - No. of Wells increased from 1054 to 1629 (55%) and Tubewells increased from 384 to 844 (120%)
  - Area irrigated through wells from 1906 ha to 3858 (102%) and that from tubewells from 3675 ha to 4666 ha (27%). Overall there was an increase of 53% in area irrigated through groundwater.
  - During the same time period the canal command area decreased from 4051 ha to 2280 ha i.e. by 40%.
  - The fixed cost for tubewell connection and almost no difference between the costs of groundwater and surface water led to a decrease in the demand for surface water. This in turn impacted the revenues to the WUAS

Social Cohesion

	Physical System		
	Characteristic →	**Good condition**	**Deteriorated**
Community & leadership	**homogenous/dynamic** ↓	PIM likely to succeed	canal rehab, PIM difficult but possible
	fragmented/weak	intensive efforts for community mobilization ,encourage new leadership	PIM very difficult,+++ inputs in physical system & com. mob

Status of Irrigation System & WUAs

	Surface Irrigation – Construction of Minors & Sub-Minors		
	Characteristic →	**Constructed**	**Not Constructed**
Status of WUAs	**Formed & functioning to some extent**	Involve NGOs/WALMI to strengthen WUAs, Form federations till distributory level, have Farmer Training Centres -upscale	Prioritize & expedite canal rehabilitation, involve WUAs for subminor construction, supervision
	Not Formed or functioning	Involve NGOs/CSR to form WUAs, sensitize Dept staff to facilitate WUAs on a priority basis	Difficult to promote PIM in such a scenario. Construction & facilitation need to be carried out simultaneously

Way Forward

1. Reassess the command area of irrigation systems as the land-use pattern has changed considerably over the years.
2. Reassess the policy for pricing of electricity charges for pumped water supply as it can prove to be deterrent for use of surface water.
3. Formulate a legal framework that provides autonomy for the WUAs; allowing WUAs to set, collect and manage service fees, separating WUA governance and management and allocating water rights/entitlements to WUAs/water users.
4. Modify the current PIM Acts so as to make the WUAs more inclusive (Sujal Samitis) and involve women, tenant farmers and all Water Users not just farmers in the command area.
5. Formulate, fund and implement a National PIM programme based on tried and tested PIM principles and practices. This would include conjunctive use of ground water, lift irrigation and agriculture development. The approx. cost would be about Rs 10,000/ha.

Way Forward contd…

6. Assess and develop different strategies for different physical and social conditions

7. Develop a participatory methodology for hydrological assessment of the command area through water budgeting exercises.

8. Develop and nurture a cadre of village para-professionals (Jaldoots) having knowledge of the canal systems, groundwater and agriculture.

9. Provide incentives to the ID staff and WUAs for judicious use of water through better O & M of the distribution system and on-farm water management practices.

10. Collaborate with other Government Depts, NGOs, Agriculture Universities and Private sector for maximising the benefits of irrigated agriculture "More crop per drop"

Key Recommendations of the XIIth Five Year Plan

- Focus on Command Area Development from reservoir to the farm gate and not just the outlet.
- Promote PIM at the outlet and distributory level.
- Enhancing the resources available to MMI Departments for improving O&M of irrigation systems.
- Creation of National Irrigation Management Fund (NIMF) to incentivize states to collect Irrigation service fees.
- Broadening the profile of human resources in irrigation dept by including disciplines such as social sciences, management, agronomy,
- Establish centres of excellence in irrigation management to undertake research, education and training for MMI staff at all levels as well as the staff of WUAs and federations .
- Build management information systems for MMI schemes with the specific purpose of generating real-time information on their working and performance.

Conclusion

- With increasing water scarcity and the gap between demand and supply (about 250 BCM for irrigation by 2050), irrigation systems can no longer afford to operate in isolation.
- They are a part of a larger ecosystem of water resources and should be seen in conjunction with surface water bodies and groundwater.
- PIM as currently practiced seems to be a "one size fits all" approach and therefore there is a need for re-conceptualizing and contextualizing the same.
- A contingency model taking into account the groundwater, agriculture and energy aspects needs to be developed for each command area.

Thanks…