# Policy Brief

# EXPLORING WATER GOVERNANCE POLICY FRAMEWORK FOR ENRICHING PARTICIPATORY IRRIGATION MANAGEMENT REFORMS

*Muhammad Arfan*

*(This document is unedited author's version submitted to RASTA)*

## KEY MESSAGES

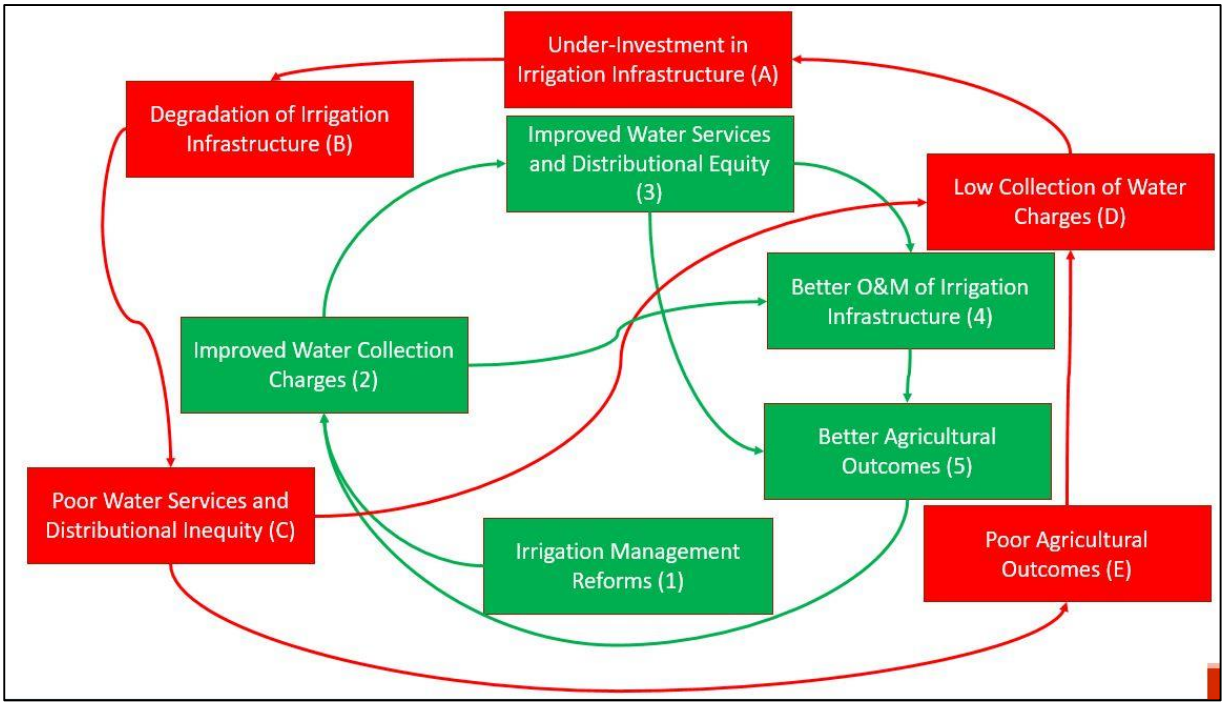
1. Canal water distributional inequity offspring economic inequity in irrigated irrigation schemes of the Indus Basin Irrigation System (IBIS).
2. Community participation in the participatory institutions (PIM Reforms) unable to overcome the canal water distributional inequity.
3. Land asymmetry has a significant negative relationship with per unit land productivity, irrigation management performance, and level of participation in WUAs activities.
4. Irrigation bureaucracy does an institutional mimicry under externally assisted push and PIM model not adequately tested and implemented.

## INTRODUCTION

Participatory Irrigation Management (PIM) reform was conceptualized as a panacea for the inept management of the traditional irrigation bureaucracy in the late 1980s. Many developing countries introduced these reforms to overcome the vicious cycle of underinvestment in irrigation schemes. Third-world countries with economic dependence on the World Bank's lending face severe financial indebtedness challenges (Santiso, 2001). Pakistan introduced PIM reform in 1997 at the pilot scale with the traditional working of irrigation bureaucracy. Initial evaluation of the reform assessment showed promising financial recovery and distributional equity of irrigation water. In 2019 after almost two decades, Punjab province limited the participatory farmers' institutional working to the watercourse level. In Sindh, these reforms still practiced at the limited canal

schemes. The literature on participatory reform in Pakistan can be categorized into three strides: (1) reform outputs without the critical engagement with the local issues; (2) realizing the reform implementation challenges but only focusing on one reform player as a villain (i.e., irrigation bureaucracy or farmers agency); and (3) navigate between irrigation bureaucracy and development donor without engaging with policy problem critically. We attempted to critically engage with the reform process and look into the existing implementation challenges and how the issues associated with bureaucratic hurdles, community inefficacy, and donor participatory development approach reproduce each other in the reform process.

*Figure 1: Vicious Cycle of Irrigation Policy Problem and a "black box" Theory of Change*




This working paper explores the participatory irrigation management reforms in Pakistan and answers the following research questions systematically:

1. How does the reform impact the distributional equity of the system as compared to the non-reform area?

2. Is reform able to enhance agricultural productivity compared to the non-reform area?

3. If there is a difference between agricultural productivity, is it associated with community and institutional characteristics?

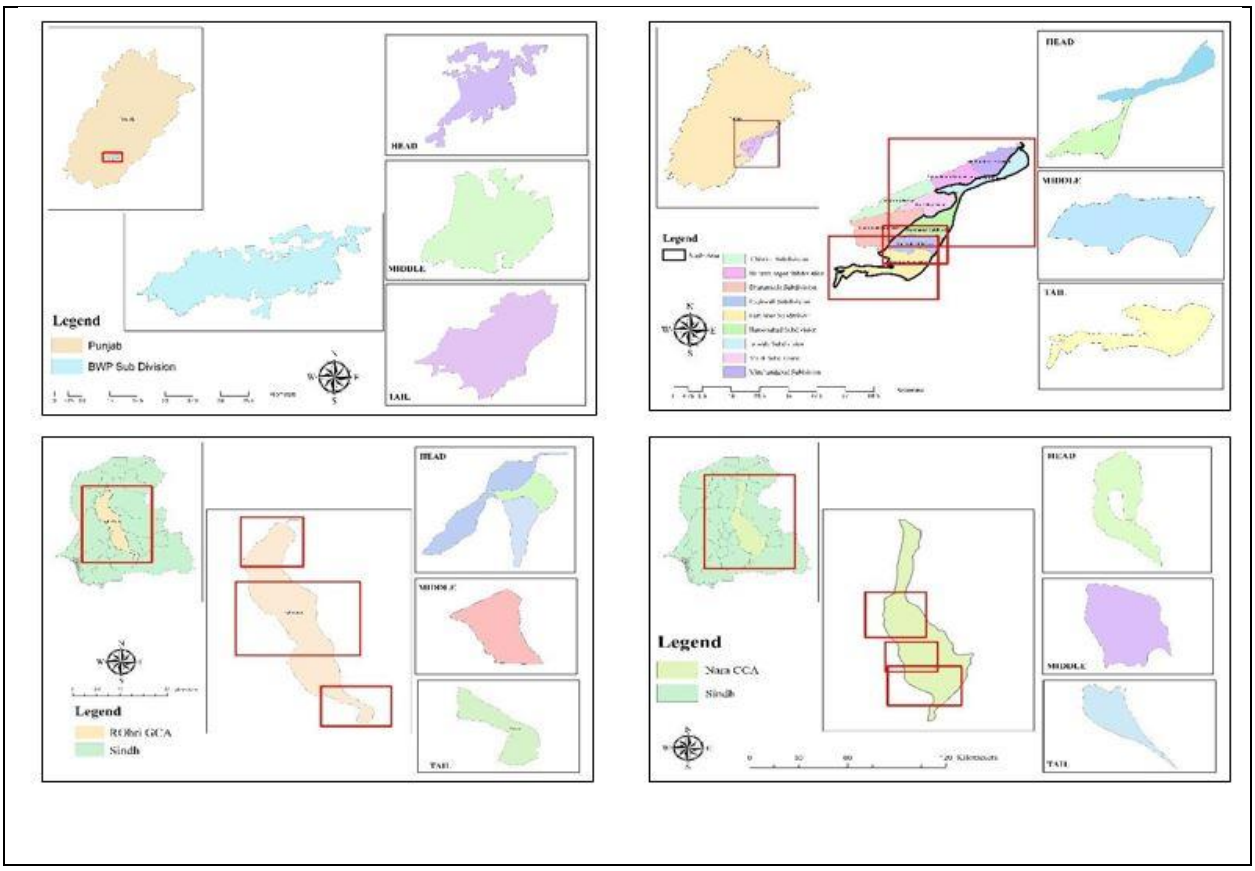
4. What sort of resource user and resource characteristics play a role in the community collective action?

5. What challenges did PIM reform face during the practice globally and locally?

**METHODOLOGY**

Two canals from each province were studied for comparative purposes; one was the area where the participatory governance regime is/was practiced, and one which where the provincial irrigation department solely manages. Hakra and Desert canals were selected in Punjab for PIM and Non-PIM respectively, whereas Nara and Rohri channels were selected in Sindh. We used quantitative and qualitative research methods for primary and secondary data collection. Performance indicators were calculated based on remote sensing data and direct production survey estimates. Best suited performance indicators applied at the spatial scale of canals (Head, Middle, and Tail) for assessing the distributional equity. A survey instrument was developed using ideas and specific question examples from the literature on community cooperation, collective action, technical rationality of irrigation infrastructure, and irrigation management performance. Different scale variables were constructed based on the survey tool responses for hypothesis testing. Moreover, key informant interviews, focus groups discussion, and textual analyses of the reform act/ordinances were used for a more holistic understanding of the reform process.

*Figure 2: Study Area Canals Selected*



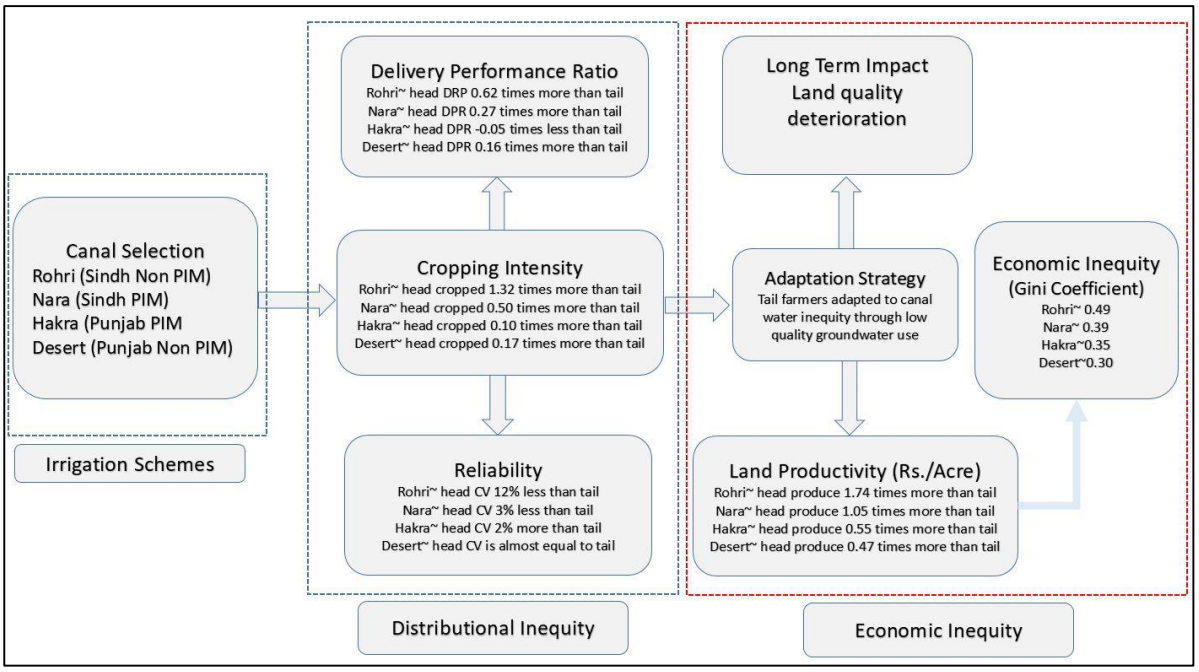

**KEY FINDINGS**

**Part-A: Reform Impact on the Distributional Equity and Farm Productivity**

1. From head to tail cropping intensity ratio perspective, the reform area in Sindh performs better than the non-reform site, whereas, in Punjab, both canals have performed within the permissible limits.
2. Equity in cropping intensity does not translate into water distribution equity between head and tail reaches of Nara and Rohri canal because head gets used more water for high delta crops than tail reaches.
3. The variation in crop choices between head and tail section leads to inequity in water distribution and agricultural economic returns per unit command area.
4. Overall, both in Nara and Rohri canal command, the area under cotton crop is decreasing substantially, and the area under sugarcane increases.

5. Distributional inequity of canal water offspring economic inequity. Rohri has more economic inequity as compared to Nara, whereas Hakra has more unfairness as compared to the desert canal.

*Figure 3: Summary Evidence How Distributional Inequity leads to Economic Inequity*




**Part-B: What Resource Characteristics Explain the Farm Level Economic Divergence and Farmers Participation in Participatory Institutions?**

6. Canal regulation related variables explain 38% variance in the farm level economic divergence, whereas institutional and community characteristics don't significantly contribute the agricultural farm productivity.
7. Institutional performance of Area Water Board (i.e., empowering farmer organization and rent-seeking of irrigation department) having a significant positive relationship with Irrigation Management performance.
8. Land asymmetry has a significant negative relationship with land productivity irrigation management performance and reduces the farmers' participation in participatory institutions.

9. Based on the emic perspective, 56% of farmers considered large landholding members are dominant in the decision-making of Water Users Associations (WUAs) and Farmers Organization (FOs).

**Part-C: What are the challenges that PIM reform faced during the practice globally and locally**

10. Political demand from below for the PIM reforms were missing from the mainstream political party's electorate agenda and farmer's organization charter of demand.
11. Farmers' proactive participation remained low in the decision-making due to several reasons, i.e., lack of; clarity in the authority and power, financial incentive, knowledge, the civic habitus of marginalized sections, and scant understanding of reform bylaws.
12. Irrigation bureaucracies hijacked the reform process and amended the initial idea. Irrigation staff does not cooperate with farmers' organizations and undermines the power and authority of new institutions.

**Part-D: Content Analysis of SWMO 2002**

13. Regulatory Authority was never formed. The formation of tribunal for dispute resolution has not formed since two decades passed.
14. SIDA/PIDA never took control of the barrages/headworks for canal regulation, hence completely dependent on the irrigation department.
15. Establishment of Water Allocation Committee (WACs) never fully operationalized: irregular meetings, no meeting minutes, and no publicly posted water schedules. Still, canal officers (ex-irrigation department officials) prepare water schedules rather than WACs.
16. SWMO (2002) is silent over the issue that how SIDA and AWBs officials are made accountable to farmers' bodies in lower tiers. Farmers' representative tiers (WUAs/FOs) have more responsibilities than power and authority. There is no financial incentive for farmers' representative functionaries in tiers (WUAs/FOs). There are no behavioral nudges for tier (WUAs/FOs) for irrigation service fee collection.

**KEY POLICY RECOMMENDATIONS**

Based on the extensive literature review for global case studies and local level policy implementation, key issues were identified based on data evidence and key informant interviews with stakeholders. We are proposing a set of recommendations for each policy issue that need to be considered for improving the PIM.

**Issue 1. Weak enforcement of the law, including the Sindh Water Management Ordinance (2002)**

Participatory Irrigation Management (PIM) reform has not been fully implemented, and its full implementation requires some adjustment and innovation at the local level, which includes:

**1-A**. The Sindh Water Management Ordinance (SWMO 2002) has not been fully implemented. So we recommend the establishment of regulatory authority for dispute resolution and an oversight role on the working environment of SIDA.

**1-B**. Irrigation department personnel who come under the jurisdiction of FOs or clusters of the FOs need to be accountable to FO's chairman.

**1-C**. There is a need to introduce some changes in the water rights regimes. The clustering of FO's/WCA's can establish the local water markets and share the water rights accordingly to improve the canal schedule.

**Issue 2. Institutional integration, pooling of resources, and revitalization of irrigation departments**

**2-A**. Agriculture extension department has a union council level presence, and this staff is underutilized, and its scope of work is saturated. It needs to be revitalized as a "water and agriculture extension service" provider with an updated curriculum. It needs to couple with participatory institutions for a better outcome.

**2-B**. The existing functions of key departments, including PIDs, should be restructured and reformed via a transition from an engineering-only solution to water resources, engineering, and management approach through induction of experts of diverse backgrounds and the development of cross-sectional/inter-organizational coordination. The monolithic structure of the human resources of these institutions limits their working efficacy; thus, these departments must be diverse professionally.

**Issue 3. The maintenance of information management and sharing systems is an important pillar of PIM that appears to have been neglected.**

**3-A**. There is a need to introduce the behavioral nudges in SWMO 2005 for the better performance of FOs in irrigation service collection. Different slabs need to present on a pilot scale.

**3-B**. The digitization of the canal network needs to augment with the real-time maintenance of canal flow data for transparent monitoring purposes.

**3-C**. Localized decision-making might be difficult in a contested environment; irrigation officials must build capacity to encourage the FO's inputs and collaboration with FOs.

**Issue 4. Problems with direct outlets, lift machines, changing cropping patterns, and distributional inequity**

**4-A**. The practice of direct outlets and lift machines is not allowed in any case, and existing facilitation needs to be incorporated within the irrigation network. These political bribes ultimately cost the poor and marginalized.

**4-B**. It was observed that changing cropping pattern towards high delta crops leads to distributional inequity between head and tail reaches of the main canal and even distributary. This distributional inequity aspect is easily managed by fixing the agro-ecological crop zoning in each region with stakeholders' consultation and its compliance through FOs.

**Issue 5. Land asymmetry affects irrigation management performance and the institutional working environment of participatory institutions**

**5-A**. There are historical and institutional reasons for the elite capturing phenomenon, which manifest mainly due to the passiveness of the small peasantry. To effectively handle this situation, there is a need to introduce a more politicized participatory model for community mobilization and participation, challenging the social and institutional hierarchy.

**5-B**. WUA's/WCA's need to provide more institutional support like community-owned agricultural implements cooperative, small storage house for harvested commodity handling, collective marketing of agricultural produce in the market, small loan schemes through WUA's/WCA's, and other community services to improve collective action and trust among different groups. These

trust-building measures enhance community integration which ultimately enhances the irrigation governance at a local level.

**5-C**. On a more radical note, targeted land reform (for optimal farm size) needs to be introduced to overcome the consequences of exceptionally large and small farm size negative impacts on-farm productivity.