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FARMERS' ENGAGEMENTIN WATER GOVERNANCE UNDER PARTICIPATORY AND NON-PARTICIPATORY IRRIGATION MANAGEMENT SYSTEM

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ABSTRACT

Irrigation reforms in Pakistan focused on participatory irrigation management (PIM) to include stakeholders in decision-making to effectively manage the system. Currently, two governance systems are in place in Pakistan. The irrigation department controls one and the other by PIM after adapting the irrigation reforms around twenty years back. This study has focused on comparative analysis of the users' experiences in both systems about governance in Sindh province of Pakistan by using good governance principles. The study used multistage cluster sampling technique and quota-based technique to select sample size for primary data collection. Four distributaries with location and PIM and non-PIM attributes were selected. A 5-scale Likert survey questionnaire was designed to find user experiences. To analyze the data and compare the performance of different systems, Kruskal-Wallis-H-Test and Post-Hoc-Mann-Whitney-U-Test were employed. Results show that both irrigation systems are not ideally working according to principles of good governance. PIM needs to abide and follow the established principles and practices to reap the benefits of the participatory system to contribute in the better governance and management of irrigation system.

Keywords: Participatory Irrigation Management; Good Governance; Water Reforms; Farmers Organizations

INTRODUCTION

Reforms in the irrigation sector started way back in 1859 in the areas now in Pakistan by the River construction of Central Bari Doab on Chenab began in 1859 (Bandaragoda, 2006). Till this time, 44 canals have been constructed in the country. The country claims to have the most extensive irrigation system in the world. The system

irrigates the command area of 35 million acres. The state has invested heavily in water engineering projects to establish the world's largest gravity-driven irrigation network on the Indus (Bandaragoda, 2006).

Despite early starter for development in the water sector, Pakistan faces many challenges such as numerous policy and operational problems, irrigation subsidies, cost recovery, inequitable water distribution, alleged corruption in water sector management, and so on (Memon, and Mustafa 2012). Other issues include the influence of influential farmers, unreliable water supply timing and volume, unlined waterways, poor infrastructure maintenance, poor water governance, etc. Such challenges and the other facets of problems had undermined the end-users confidence in the entire enterprise, resulting in poor water management and governance and inefficient use of water in consort with poor cost recovery.

These issues caused a gradual deterioration of water sector infrastructure and its efficiency. There is no lack of policies, agreements, and institutional arrangements regarding the management of the water sector; perhaps there are too many. Such as it has different levels of organizations at federal, provincial, large organizations, regional level, city level, and numerous laws. It is observed that there is no or least involvement of water users in decision-making regarding managing water resources (Bandaragoda, 2006) at almost all levels and all sort of organizations.

Approaching toward Participatory Irrigation Management: Understanding the context

To improve water governance and management, the national government of Pakistan introduced a new initiative of Participatory Irrigation Management (PIM) in 1997. This action was taken to remove certain glaring deficiencies of the prevailing traditional water management system. Reformers believed that PIM would improve the water governance, management, and farmers' willingness to pay for water provided to them by the state for agricultural use.

TABLE-1
MAIN FEATURES OF NON-PIM MANAGEMENT AND PIM SYSTEM

Non-PIM System	PIM System
Top-down decision making (Water Bureaucracy controls system and Officers are accountable to higher authorities)	Bottom-up decision-making for water management (Farmers control the system, and officers are responsible to them.)
Water distribution (No or low water share for small-land holders and tail-end users)	Equal water distribution
Cost recovery (Assessment of Crops and Cost Recovery)	Cost recovery through increased farmers' willingness to pay for irrigation services
Centralized O&M Decision Making	Farmers' decision for O&M.
Political interference (Elite Capture)	Democratic Norms (Mass Capture)

Implementation of PIM in Pakistan

Reforms suggested establishing a new organizational setup. A three-tier organization, Provincial Irrigation and Drainage Authorities (PIDAs), Area Water Boards (AWBs) at canal level, and Farmers Organization (FO) at distributary level and sub-part of PIM are Water Users Associations at the water-course level.

The process of reforms implementation is slow. Reforms implementation in Sindh has completed only one task of formulating the authority and passed Sindh Water Management Ordinance 2002. It is well behind the other targets of the regulatory regime formulation is pending and SIDA is performing this role. Out of 13 targeted AWBs to be established by 2009, only three are formed. Only 25% (338 FOs out of 1,400) of FOs are established. Irrigation & Drainage Management Transfer (IDMT) to FOs have only achieved an 18% target at the provincial level and 73% under established AWBs (Memon and Mustafa, 2012).

LITERATURE REVIEW

World Bank (1992) defines governance as "the manner in which power is exercised in management in the country's economic and social resources for development". The EU (2001) defines governance

and principles of good governance by stating that the following elements are crucial to a complete understanding of governance: openness, participation, accountability, effectiveness, and coherence. United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) defines and focuses on the importance of the process of governance, "the process of decision-making and the process by which decisions are implemented (or not implemented)". Bevir (2012) takes into more depth defining governance and says "all processes of governing, whether undertaken by a government, market or network, whether over a family, tribe, formal or informal organization or territory and whether through laws, norms, power or language." Further, Hufy (2011) described and related it to decision-making processes involving all those actors facing a collective problem. As a result, these efforts produce or reproduce social norms and institutions. Above all, definitions have focused on interacting with people, society, and organizations and involving different stakeholders' decision-making processes.

Water needs to be managed and governed well for the survival and development of humanity. Rogers and Hall (2003) define water governance as follows, "Water governance refers to the range of political, social, economic and administrative systems in place to develop and manage water resources, and the delivery of water services, at different levels of society". Water governance has a broader meaning in a bigger context, but it broadly refers to how water supply services are delivered and managed (Ahmed, 2012).

The definition covers almost all ranges of the systems of any given society. In a country like Pakistan, water governance is directly related to the power corridors and power structure in the society. Therefore, water governance is not merely administratively managing water resources but invisibly other aspects of society such as political, social, and well-being. Sustainable water governance means supporting socio-hydro-ecosystems for future generations with coordinative actions of all stakeholders, whether water suppliers or users.

Countries are moving from traditional top-down water governance to bottom-up or participatory water governance (Batchelor, 2007); the shift towards bottom-up or participatory water governance has combined the experience, knowledge, and

understanding of different local groups and people (UNDP, 2007). PIM means that irrigation users - the farmers - participate in the management of irrigation system (Sun, 1997).

As discussed earlier, irrigation reforms have completed more than 20 years in Pakistan, particularly in Sindh. During this time, most of the studies carried out on Irrigation Management and Governance have focused only on the performance of PIM with no or less focused comparison with the traditional irrigation management system. Therefore the key objectives of this study is the analysis of comparative user experiences of both systems about governance by using the principles of good governance in Sindh province.

RESEARCH METHODOLOGY

To attain the objectives, this study opted Nara Canal Area Water Board. To compare the user experiences, this research selected four distributaries with the attributes of PIM (participatory) and Non-PIM (non-participatory) and location attributes of head and tail. The performance comparison has been carried out head with head and tail with tail distributary.

Sampling Strategy: Owing to the nature of the study, the multistage cluster sampling technique was applied for the sampling. The purpose of multistage cluster sampling is "to divide the area into smaller parts of the same or equal and then select randomly from the smaller units" (Berger, 2020). At the first stage, among three AWBs the study selected one AWB namely Nara Canal AWB, at second stage canal namely West Jamrao was selected, third stage four distributaries with attributes of location(head and tail of canal) and PIM and Non-PIM were selected (Daulatpur (PIM-Head), Khatian (PIM-Tail), Belharo (Non-PIM-Head), Mureed (Non-PIM-Tail), at fourth stage Khatedaars (Land Owners) were selected randomly.

Sample Size: Overall, four distributaries have 2712 khatedars. The study applied 5% of total population size which is 140. Further the study has applied quota-based sampling method for distribution of sample size at each distributary. The quota sampling is applied to ensure adequate representation of smaller groups (Berger, 2020). The sample of 140 was further equally divided at selected four distributaries.

Data Collection Tool: A structured questionnaire was developed to assess the governance experiences of the users of both systems to

collect primary data. The questionnaire consisted of the respondent profile, variables with regard to principles of good governance, and other water governance related issues. The indicators and problems were presented in statements on 5-point Likert scale from strongly disagree to strongly agree. The Likert scale is effective method to find about human attitudes and the factors that influence them (Pimentel, 2010).

TABLE-2
KEY PRINCIPLES OF GOOD GOVERNANCE AND VARIABLES

S. No	Key Principles of Good Governance	Variables/Indicators
1	Openness/Transparency	Water distribution decision making,
2	Participation/ Decentralization	Frequency & participation in meetings, communication
3	Accountability	Accountable leadership, following the set rules, compliance
4	Decision Making	Participation in the decision-making process, meetings among stakeholders
5	Predictability	Compliance, violations, and penalties
6	Effectiveness	Compliance, leadership, fees (water tax) collection, following the set rules

Prior to data collection, the questionnaire underwent pilot testing. The pilot testing was designed to identify missing items, assess content validity, and ensure those questionnaire items were clear and understandable. The findings and ambiguities were removed from the tools after pilot testing.

Data Analysis Technique: Due the non-parametric nature of collected primary data, non-parametric tests such as Kruskal-Wallis H Test and Post Hoc Mann Whitney U Test are used to analyze the governance indicators. Kruskal-Wallis H test is applied when there three or more independent groups (Nussbaum, 2014). Mann Whitney U test is applied when there are two independent groups (Nussbaum, 2014) and this has applied it as Post Hoc test. Further this study applied descriptive statistics (frequency analysis) on some indicators related water problems.

Kruskal-Wallis H Test: Kruskal-Wallis H test is a non-parametric test. It was carried out to analyze the difference between farmers of PIM and Non-PIM in head and tail distributaries at Nara canal giving preference to indicators.

$$H = \left[\frac{12}{n(n+1)}\sum_{i=1}^{k}\frac{R_i^2}{n_i}\right] - 3(n+1) \quad (1)$$

Where k is the number of populations, $n_i$is the number of observations in sample i, n is the total number of all the samples, and R_i is the sum of the ranks for sample i.

Post Hoc test (i.e., Mann-Whitney U test) was performed to those indicators that were statistically significant in the Kruskal-Wallis H test to analyze the difference between selected farmers groups.

$$U = R - \frac{n(n-1)}{2} \quad (2)$$

Where R is the sum of ranks in the sample, and n is the number of items in the sample.

A Kruskal-Wallis H test was carried out to analyze the difference between farmers of the PIM head (Daulatpur), PIM tail (Khatian), non-PIM head (Belharo) and non-PIM tail (Mureed) distributaries at Nara canal giving preference to governance indicators. And a Post Hoc test (i.e., Mann-Whitney U test) was performed to analyze the difference between farmers of the PIM head (Daulatpur), PIM tail (Khatian), non-PIM head (Belharo), and non-PIM tail (Mureed) distributaries at Nara canal, giving preference to those governance indicators that were statistically significant in the Kruskal-Wallis H test. In the Post Hoc test each statistically significant variable was pair-wise compared between different farmers groups (i.e., PIM head with PIM tail, PIM head with non-PIM head, PIM head with non-PIM tail, PIM tail with non-PIM head, PIM tail with non-PIM tail, and non-PIM head with non-PIM tail).

RESULTS AND DISCUSSION

Participatory irrigation management system claims the inclusion of farmers/users in the decision making to improve the performance of irrigation system, thus this study has selected all those predominant characteristics of PIM and compared those with the non-PIM to evaluate the governance performance of both PIM and non-PIM systems. Nevertheless, all these variables informally exit the non-PIM system as well. The key difference in both systems is that these characteristics are formally incorporated in PIM and are supposed to be adopted in a systemic way and frequently executed and on the other

these characteristics are informally exist in non-PIM with no formal obligation. Therefore this study has taken common characteristics of both systems to evaluate and compare the governance performance of both systems.

Meetings and Decision Making: Result revealed no statistically significant difference in the frequency of meetings, it seems that FOs are not active. There is no statistically significant difference in meetings are organized except during when there is a shortage of water. It looks that FOs are unsuccessful in playing their role in organizing farmers to work together for their common goal. Statistically insignificance difference in terms of dissemination and communication of decisions to concerned department shows that there is communication and coordination gap between farmers and government officials in both PIM and non-PIM systems. The results shows that transparency in decision making is statistically insignificant, the reason could be no frequently organization of meetings. Therefore no platform to discuss the problems and share decisions with all stakeholders. None of the systems shows transparency in decision making. Further results shows that tail end farmers are not have their say and any role in decision making, which seems to be the point of concern for PIM.

TABLE-3
MEETINGS AND DECISION MAKING

Variables	Mean Rank				Chi-Square	p-value
	PIM Head	PIM Tail	Non-PIM Head	Non-PIM Tail		
Meetings are frequently organized	52.54	50.83	46.29	46.24	1.168	0.761
Meetings are organized only when we have shortage of water	47.24	62.11	44.83	45.32	6.467	0.091
Decisions are properly communicated to concerned department	46.24	52.9	48.67	40.17	2.884	0.41
There is the transparency in decision making	49.62	54.4	45.23	43.42	2.461	0.482
Tail-end people have their say in water management	40.96	56.7	49.5	52.38	4.497	0.213

Water Distribution

Results shows no statistically significant difference in warabandi (water distribution) decisions are made by farmers; further, results reveals that according to farmers warabandi decisions are made by irrigation department in both systems. Regarding communication of decisions with regard to warabandi non-PIM tail results shows statistically significant difference as compare to distributaries at head. Further the study asked regarding monitoring of warabandi by water users and results shows statistically insignificant difference in warabandi monitoring is carried out by water users. Probably the no monitoring of warabandi by water users is because there is less tendency of breaking rules and regulations. Mean ranks of PIM tail and non-PIM are higher than PIM head and non-PIM head suggesting that the farmers at PIM tail and non-PIM tail do not frequently break water management rules and regulations as compared to farmers at PIM head and non-PIM head. Unexpectedly the farmers at tail distributaries are more sensitive towards the following and implementation of set rules and regulations as compare to the head distributaries. The results discloses that traditional centralized irrigation management system is still plays pivotal role in water distribution.

TABLE-4
WATER DISTRIBUTION

Variables	Mean Rank				Chi-Square	p-value	Post hoc
	PIM Head	PIM Tail	Non-PIM Head	Non-PIM Tail			
Warabandi decisions are made by Farmers	49.7	49.62	50.63	46.16	0.555	0.907	
Warabandi decisions are made by concerned department	41.85	48.11	50.1	58.4	7.237	0.065	
Warabandi decisions are made only by powerful	41.87	50.74	46.65	57.5	4.902	0.179	
Communication of decided warabandi	36.57	46.25	45.35	60.81	11.771	0.008	$a^{n.s}$, $b^{n.s}$, c**, $d^{n.s}$, $e^{n.s}$, f*
Warabandi monitoring is carried out by water users	44.44	53.74	47.13	51.74	1.859	0.602	
The rules and regulations for water management are not frequently broken by farmers	36.83	58.45	40.92	63.54	16.85	0.001	a**, $b^{n.s}$, c**, d*, $e^{n.s}$,f**

a = Difference between PIM Head and PIM Tail; b = Difference between PIM Head and Non-PIM Head; c = Difference between PIM Head and Non-PIM Tail; d = Difference between PIM Tail and Non-PIM Head; e = Difference between PIM Tail and Non-PIM Tail; f = Difference between Non-PIM Head and Non-PIM Tail.
* significant at 0.05; **significant at 0.01; n.s = Not significant

Violation and Compliance

There is statistically significant difference in proper mechanism for registering complains at PIM head and non-PIM tail. But results further reveal that mean rank of non-PIM tail is higher as compare to PIM head regarding existence of mechanism for registering complains. There is statistically significant difference identification of violators. Mean rank of non-PIM tail is higher than PIM head and non-PIM head suggesting that there is proper mechanism for identifying violator at non-PIM tail as compared to PIM head and non-PIM head. Furthermore, there is statistically significant difference regarding use

of powers of water management committee for compliance of the rules. Mean ranks of PIM tail and non-PIM tail are higher than PIM head suggesting that the water management committee at PIM tail and non-PIM tail uses its power to bring compliance to the rules as compared to PIM head. Moreover, results also shows the statistically significant difference imposing penalties and fines by committee for breaking of rules, damage, non-payment and non-participation. Mean ranks of non-PIM head and non-PIM tail are higher than PIM head suggesting that the committee at non-PIM head and non-PIM tail imposes fines for breaking of rules, damage, non-payment, and non-participation as compared to PIM head. There is statistically significant difference in farmers recognize the authority of the committee to impose penalties. Mean ranks of non-PIM head and non-PIM tail are higher than PIM head suggesting that farmers at non-PIM head and non-PIM tail recognize the authority of the committee to impose penalties as compared to famers at PIM head. There is statistically significant difference in the committee encourages a culture of compliance. Mean rank of PIM tail is higher than PIM head suggesting that the committee at PIM tail encourages a culture of compliance as compared to PIM head. Mean rank of non-PIM tail is higher than PIM head and non-PIM head suggesting that the committee at non-PIM tail encourages a culture of compliance as compared to PIM head and non-PIM head. There is statistically significant difference in the committee encourages farmers to report non-compliance. Mean ranks of PIM tail and non-PIM tail are higher than PIM head suggesting that the committee at PIM tail and non-PIM tail encourage farmers to report non-compliance as compared to PIM head. Almost all above results indicates that informal institution of water management prevails as more powerful institution among farmers.

TABLE-5
VIOLATION AND COMPLIANCE

Variables	Mean Rank				Chi-Square	p-value	Post hoc
	PIM Head	PIM Tail	Non-PIM Head	Non-PIM Tail			
There is a proper mechanism for registering complains	41.28	47.41	48.25	61.42	8.015	0.046	$a^{n.s}$, $b^{n.s}$, c**, $d^{n.s}$, $e^{n.s}$, $f^{n.s}$
There is a proper mechanism for identifying the violator	40.57	51.81	44.71	59.86	7.977	0.046	$a^{n.s}$, $b^{n.s}$, c**, $d^{n.s}$, $e^{n.s}$, f*
The water management committee uses its powers to bring compliance to the rules	35.3	58.05	45.77	60.9	14.319	0.003	a**, $b^{n.s}$, c**, $d^{n.s}$, $e^{n.s}$, $f^{n.s}$
Penalties and fines are imposed by committee/community for breaking of rules, damage, non-payment & non-participation	36.79	46.58	50.94	57.98	8.503	0.037	$a^{n.s}$, $b^{n.s}$, c**, $d^{n.s}$, $e^{n.s}$, $f^{n.s}$
Farmers recognize the authority of the committee to impose penalties	35	49.3	52.29	62.66	14.296	0.003	$a^{n.s}$, b*, c**, $d^{n.s}$, $e^{n.s}$, $f^{n.s}$
The committee encourages a culture of compliance	31.71	57.14	44.4	64.24	24.316	0.000	a**, $b^{n.s}$, c**, $d^{n.s}$, $e^{n.s}$, f**
The committee encourages farmers to report non-compliance	32.54	59.57	46.9	61.46	19.767	0.000	a**, $b^{n.s}$, c**, $d^{n.s}$, $e^{n.s}$, $f^{n.s}$

a = Difference between PIM Head and PIM Tail; b = Difference between PIM Head and Non-PIM Head; c = Difference between PIM Head and Non-PIM Tail; d = Difference between PIM Tail and Non-PIM Head; e = Difference between PIM Tail and Non-PIM Tail; f = Difference between Non-PIM Head and Non-PIM Tail.
* significant at 0.05; **significant at 0.01; n.s = Not significant

Leadership Role

Leadership plays vital role in water availability, without respecting the governance system rather it depends the location of distributary. This shows the more water availability at head as

compare to tail and leadership at head has no role to play in making water available as compare to tail. However, regarding the transparent leadership the responses show no statistically significant difference in both systems. With regard to elite capture or influential person as leader there is statistically significant difference in it. The mean rank suggests that there is powerful person leader at PIM head who controls the water as compared to PIM tail and non-PIM head. The mean rank suggests that at non-PIM tail there is powerful person as leader who controls the water as compared to non-PIM head. There is statistically significant difference in we have system where we can hold leader accountable. Mean ranks of PIM tail, non-PIM head and non-PIM tail are higher than PIM head suggesting that farmers other than PIM head have system to hold leader accountable. The results suggest that there is elite capture across the systems on leadership positions. This may be the result of no regular meetings coupled with transparency issues and decentralization.

TABLE-6
LEADERSHIP ROLE

Variables	Mean Rank				Chi-Square	p-value	Post hoc
	PIM Head	PIM Tail	Non-PIM Head	Non-PIM Tail			
Leadership plays vital role in water availability	37.09	57.05	40.04	65.34	18.493	0.000	a*, $b^{n.s}$, c**, d*, $e^{n.s}$, f**
We have transparent leadership at our water course / distributary	42.07	55.2	47.96	53.98	3.686	0.297	
We have always powerful person as leader and he who controls the water	58.98	42.45	39.56	55	8.941	0.03	a*, b*, $c^{n.s}$, $d^{n.s}$, $e^{n.s}$, f*
We have system where we can hold leader accountable	35.74	56.8	52.5	55.06	9.803	0.02	a**, b*, c*, $d^{n.s}$, $e^{n.s}$, $f^{n.s}$

a = Difference between PIM Head and PIM Tail; b = Difference between PIM Head and Non-PIM Head; c = Difference between PIM Head and Non-PIM Tail; d = Difference between PIM Tail and Non-PIM Head; e = Difference between PIM Tail and Non-PIM Tail; f = Difference between Non-PIM Head and Non-PIM Tail.
* significant at 0.05; **significant at 0.01; n.s = Not significant

Water Charges

The payment of water charges is an important indicator which shows the effectiveness of the governance model. Farmers at both systems were of view that water charges are reasonable. There is statistically significant difference in farmers follow the rules about payment of water fees. The mean rank shows that distributaries at tail are more followers of water charges as compare to head distributaries. This result shows that the governance model has no impact on payment of water charges. However it may be connected with shortage of water at tail end and farmers pay water charges to ensure the water availability.

TABLE-7
WATER CHARGES

Variables	Mean Rank				Chi-Square	p-value	Post hoc
	PIM Head	PIM Tail	Non-PIM Head	Non-PIM Tail			
The water tax charges are reasonable/ (not too high)	40.13	57.02	46.65	55.74	6.7	0.082	
Farmers follow the rules about payment of water fees and water extraction/use	39.48	58.16	42.88	59.06	10.318	0.016	a^{*}, $b^{n.s}$, c^{**}, $d^{n.s}$, $e^{n.s}$, f^{*}

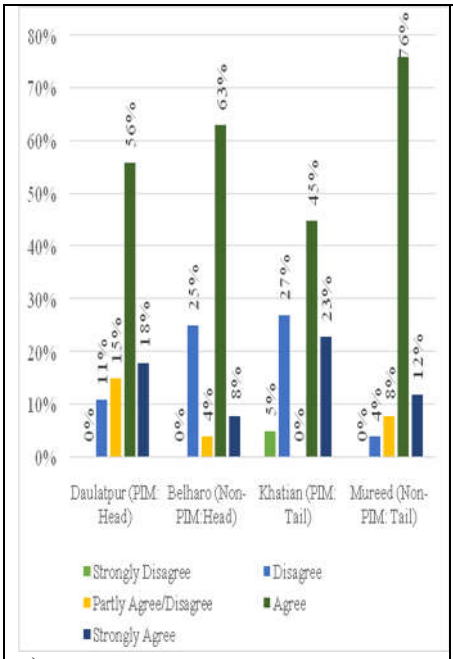
a = Difference between PIM Head and PIM Tail; b = Difference between PIM Head and Non-PIM Head; c = Difference between PIM Head and Non-PIM Tail; d = Difference between PIM Tail and Non-PIM Head; e = Difference between PIM Tail and Non-PIM Tail; f = Difference between Non-PIM Head and Non-PIM Tail.
* significant at 0.05; **significant at 0.01; n.s = Not significant

Violation, Conflict and Predictability

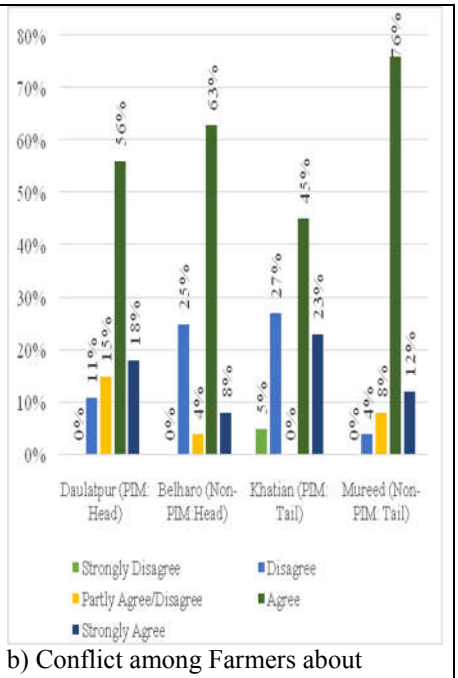
The conflict resolution is also one of the key indicator of effectiveness of good governance. The farmers were asked regarding penalties on violators and conflict on water. The majority of farmers at PIM and non-PIM systems were of view that no action is taken against violators (Figure 1a).

About 56% of farmers at PIM head were of view that there is conflict among farmers about timing and quantity of water, while the

64% of farmers at PIM tail reported oppositely. However, 50% of farmers at non-PIM head responded that there is no conflict among farmers about timing and quantity of water and 72% of farmers at non-PIM tail were of view that there is conflict among farmers about timing and quantity of water (Figure 1b).



a) Nothing Happens to Violators



b) Conflict among Farmers about Timing and Quantity of Water

FIGURE-1
PERCENTAGE RESPONSES OF THE FARMERS RELATED TO CONFLICT RESOLUTION

CONCLUSION

The irrigation reforms have completed more than 20 years in Pakistan, particularly in Sindh. During this time, most of the studies carried out on Irrigation Management and Governance have focused only on the performance of PIM with no or less focused comparison with the traditional centralized irrigation management system. Therefore, this study "User experience survey of water governance under participatory and non-participatory irrigation management system" have focused on comparative user experiences in both systems about governance by using the good governance principles in Sindh province. The key indicators for good governance are openness,

transparency, participation, decentralization, accountability, decision making process, predictability, and effectiveness. A survey was carried out with farmers experiencing both governance models at Nara Canal Area Water Board.

The farmers reveals that no regular meetings are being organized on either systems and this leads to no openness and transparency in decision making process. Farmers were of the view point that water distribution decisions are just communicated to them rather deciding by themselves. On the leadership role it depends on water situation on the distributary as results shows distributaries at tail are performing well as a leadership role in making availability of water, in compliance, penalties on violation and following the set rules and regulation. PIM tail, non-PIM head and non-PIM tail have system to hold leader accountable. Further, it is also revealed that at leadership there is still elite capture across the systems. This may be the result of no regular meetings coupled with transparency issues and decentralization. It also indicates that informal institution of water management prevails and plays vital role among farmers.

The study concludes that PIM needs to be more vibrant through organizing frequent meeting among farmers to have their say in decision making and following the principles of good governance and democratic norms, help farmers in planning, mobilizing, organizing, and implementation for effective and efficient water management including conflict disputes resolution.

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