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The Community-based Rural Water Governance and Institutional Compliance

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Abstract:

In 1990, the government of Punjab, Pakistan introduced community-based water governance in dual water zone areas (sweet and brackish). The jointly completed rural water supply (RWS) was handed over to a community-based organization (CBO) accompanied by training of CBO members and signing of the agreement for adherence with rules by the CBOs and the government. There has been little investigation as to why and how the CBOs tend to comply with rules-in-form and how do the informal rules influence operation & maintenance (O&M) of RWS. The results of focused group interviews with CBO members, community, and government officials reveal that the formal institutions partially adhered but the self-organizing capabilities of the CBOs sustain the RWS. Some of the households are unwilling to get water connection and pay charges. While others with water connections are unwilling to pay. These are some of the challenges in the O&M of RWS and reasons for the CBOs financial deficit which, however, are being covered through philanthropic donations, a predominant local value. The study proposes a water metering system, payment for consumption, and mandatory water connections for the RWS.

Keywords: Rural Water Supply, Institutional Analysis and Development Framework, Collective Action, Collaborative Design, Collaborative Compliance

I. Introduction

This research understands the collaborative compliance with institutions by community-based organizations (CBO) and households with government support in managing the rural water supply (RWS). The socially optimal outcome could be achieved in collective action situation if those involved "cooperated" by selecting strategies other than presented by Nash equilibrium, which is predominantly based on rational self-interest (Ostrom, 1990). The study is framed in Institutional Analysis and Development

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(IAD) Framework (Ostrom, 2011) and collaborative policy design (Ansell and Gash, 2008, Siddiki, et al., 2017) to comprehend the self-organizing capabilities of CBOs in ensuring compliance with institutions in a collaborative process for RWS governance. People living in rural areas engage in collective action when they use a common facility for marketing their products, maintain a local irrigation system or patrol a local forest to ensure rules are adhered to and together decide on rules to maintain the collective facility. Oftentimes, however, it becomes difficult to exclude nonparticipants from the collective action of others (Ostrom, 1990). For a group to solve shared resources the members in a group are faced with the choice that the best outcome is when they cooperate to maximize group benefits. Since 1990 the completed infrastructure of RWS, including a pump house, water supply network, and an overhead reservoir (OHR) in some villages, are self-governed by CBOs in Punjab, Pakistan with Punjab Public Health Engineering Department (PHED) support. Communities engage in many ways in the construction of RWS, and after completion, PHED trains CBOs members in O&M, self-organization, signs an agreement, and shares the Manual of rules 2010 for collaborative adherence with institutions in managing RWS and sanitation including financial responsibility.

This paper seeks to understand the collaborative compliance with institutional statements of selected CBOs, PHED, and the households to govern RWS. We argue CBOs self-organize with the minimal support of government while adhering to formal rules, local norms also influence 'action situation' and outcome. Relatedly, local leadership's self-organizing capacity engenders trust between CBO and the community and expresses support to CBO's work. In IAD Framework the 'action situation', is a social space where actors with "diverse preferences interact, exchange goods and services, solve problems, dominate one another, or fight" (Ostrom 2011, p 14). The action situation in the instance research is O&M of RWS and sanitation, which include, testing water quality every three months, informing community members, collecting and raising water charges, water meter installation, dealing with free-riders, and resolving conflict. Institutions are prescriptions that tell what is allowed, prohibited, and mandatory for actors in an action situation. One of the many ways to interact in an action situation is compliance with institutional statements. Institutional statements are formal rules embodied in laws, regulations, office memos, and public policy (Lynn, Heinrich, and Hill 2001).

Individual selfish self-interest or altruistic interest may constrain or help collective action problems in compliance with institutions during interaction in a distinctive way and outcome. In the light of this argument, the paper asks the following research questions: with little support from the government how do CBO members maintain the shared facility? What motivates CBOs to comply with rules agreed at the time of agreement signing with PHED? What cooperation is received from PHED? Focus group interviews (FGI) with CBO members, of the three selected RWS, maintained for more than 20 years were undertaken. The study contributes to the existing scholarship and practice in three ways. First, very few studies combine the IAD framework and collaborative governance theory to study the compliance behaviour of actors to resolve collective action problems. This is an innovative approach to study the collective problem. Second, a few studies are available (Joubert and Summers, 2018; Pell in Emerson and Nabatchi, 2015) addressing collaborative self-organization of RWS and groundwater resource and these are from sub-Saharan Africa and Mexico. Very few studies address self-organization and collaboration in RWS in the South Asia region,

particularly Pakistan. Lastly, learning from communities' experiences helps improve the practice of collaborative process in the developing countries. The second part of the paper gives a brief discussion on the theoretical perspective of the IAD Framework and collaborative policy design theory; the third part presents the description of the selected cases, followed by methodology. The fifth part presents results and discussion, and finally the conclusions, recommendations, and future research.

II. IAD Framework and Collaborative Policy Design Compliance

The collaborative governance theory (Emerson and Nabatchi, 2015) in collective action is combined with IAD in this study (Figure 1). Many theories are compatible with the IAD framework (Ostrom, 2011). IAD framework guides to situate the problem as an 'action situation' where interaction among actors results in an outcome. The identification of action situation is important for the analyst because here multiple actors engage in interaction which leads to outcome (Ostrom, 2005). The actions, interactions, and outcomes of action situations are shaped by a set of formal and informal institutions which determine who, what, how collective action will be conducted. Governance, according to Ostrom (1990) is an aspect of jointly determined rules and norms designed to regulate individual and group behaviour. Collaborative governance theory identifies the collaborative process and its necessary elements, like, self-organizing capabilities, trust in leadership, shared understanding, the commitment of users. Moreover, social and physical conditions influence collaborative compliance with institutions for a sustainable collective resource (Ansell and Gash, 2008).

Figure 1: Conceptualizing Literature Review

IAD acknowledges the complexity which shapes and surrounds the institutional choice process, allows analysts to give attention to particular features of the policy process while giving less attention to others. Offering rigorous conceptualization of institutions that shape actions of actors, points out the properties of actors (beliefs, knowledge, and resources) which motivate their action, and projects the conditions under which they interact. It, however, cannot capture the structure of the policy subsystem and the conflict resolution in the policy process (Cairney and Heikkila, 2019) and more so at the operational level.

The self-organizing capabilities of CBO in collaborative process harness local resources and norms (Laerhoven and Barnes, 2014) which help shape compliance behavior in communities, however studies also show marginalized communities (Sarr, Hayes & DeCaro. 2021) are disconnected from a government organization, have little control to resolve collective action. They require support for trust-building among key

stakeholders for effective collaborative compliance, therefore, eliciting the government's role in initiating, facilitating, and sustaining a collaborative process, because service users are assigned joint responsibilities to show cooperation and compliance nudged in a social network.

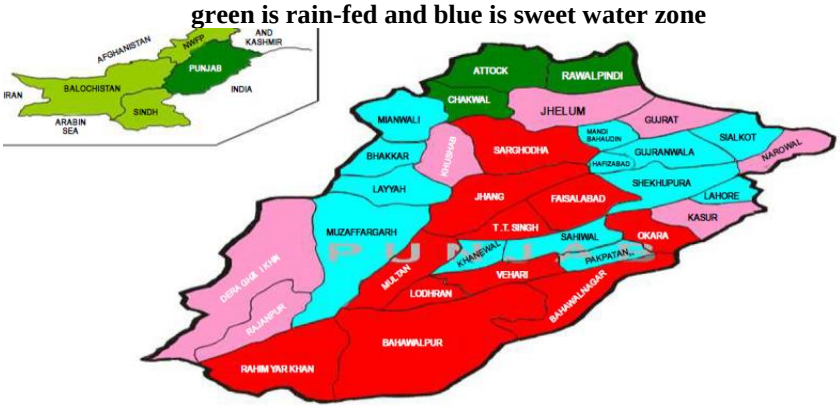
With little government facilitation, a group recognizes collective payoff in *the collaborative process* at the operational level for voluntary participation and compliance with institutions (Scott and Thomas, 2016). Households comply with rules in the promise of piped water at the doorstep and the payment for its use as social obligation and not a binding. Among many reasons, the drivers of voluntary institutional compliance are individual and group's social obligation and the social characteristics of village and water quality. In such a situation, compliance with institutions emerges through negotiated rule-making and collaborative processes (Langbein and Kerwin, 2000) or accepting government produced rules.

Collaborative governance (Kallis, Kiprasky, and Norgaard, 2009;), and collaborative spaces involve users and other domain actors in the policy process and implementation. But at the policy design level in developing countries service users are seldom engaged and resultantly, unresponsive to change. Theoretically, the involvement of users at every stage of decision-making is necessary for desired outcomes. Combining the IAD with collaborative policy design better helps understand the collaborative process and compliance with institutions (Dujn and Poering-Verker, 2018) in the action situation. Moreover, government facilitative support, communities' leadership, and self-organizing capabilities contribute to the collaborative process (Edelenbos et al. 2018) and compliance with institutions to sustain a collective facility.

III. Contextualizing the Study: Case Selection

Around 64 % of the population of the Punjab, the largest province of Pakistan, lives in rural areas. The climatic variations and unabated groundwater abstraction characterize Punjab as arid and semi-arid region with varying water quality, quantity and accessibility.

Figure 2: Map of the Province of Punjab. Red = brackish, mauve = mixed, green is rain-fed and blue is sweet water zone



From the three districts of Punjab, Sokar from Dera Ghazi Khan (DGK) district, Chak 101 N, Sargodha district, and Marakiwal, Sialkot district operational RWS were selected (Figure 2). The social characteristics in the sample rural cases present 35% of households as illiterate, 60% are between the ages 20-40 years, 37% are in small businesses, 55% of households have 6-10 family members and the village community has a mix of rich and poor with different political affiliation and dominant castes. A brief description of the three selected cases is presented

A. Case Description 1

Sokar, located 90 km from Dera Ghazi Khan (DGK) District in tehsil Taunsa, comprises five hamlets each having its RWS, the five RWS provide water to 90% population of Sokar village (2600 connections) serving more than 18000 population. We included Sokar North in our study with 300 water connections. The rainfall in the area varies from 310 mm in the North-Western hilly region to 200 mm in the South. The average annual rainfall of the area was 144.2 mm. Temperatures rise from 45^0C in summers to 4^0C in winters. July- August brings heavy hill torrents (*rod kohi*) from Koh-i-Suleman which fills dry streams. Brackish groundwater available at 100 ft is unfit for human consumption. There, however, is a huge spatial variation of groundwater quality and quantity in the area. Oftentimes, repeated boreholes are dug for locating sweet water found at 300-400 ft depth requiring large investment beyond the means of poor communities.

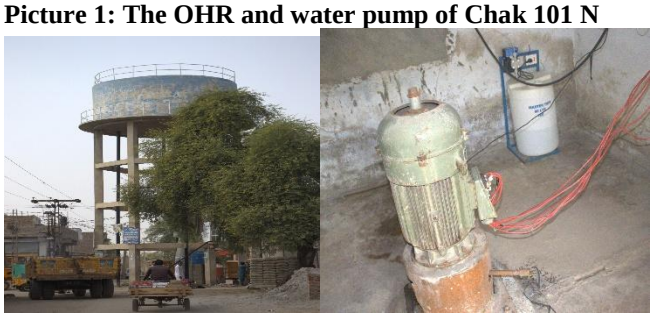
Resultantly, provincial legislators identify RWS, and the PHED engineering staff after the survey prepares the technical and financial feasibility for approval. The approved RWS is constructed by PHED and CBO collaboration. The Sokar RWS was constructed in 1980. Low collection, uniform water rate, and free-rider result in low revenues for the CBO. Uniform rates are perceived as unfair (FGI, 23 April 2019). Moreover, the users expect free water service from the government as it is available free in nature

B. Case Description 2

Chak 101 N Sargodha district is situated at 180 km towards the northwest of Lahore city, the Provincial capital. River Jhelum flows on the Northern and Western sides of the district and River Chenab on the Eastern side. 70% of the district has piped water, the rest rely on hand pumps and individual motor pumps. *Chak 101 N, is located 30 km away from Sargodha city center*.

Chak 101 N was developed in 1901 as a canal irrigation colony. The village retains some colonial features including the square shape and 12 parallel streets. The village has 400 houses. Half of the village has brackish water and the other half sweet water. The RWS was installed in 1987 under the Provincial legislator program. After two years of operation, due to the non-payment of electricity bills, the RWS closed. In 1993 under the Punjab Community Water Supply and Sanitation (PCWSS) project the CBO Chairman approached the tehsil executive engineer (XEN) to restart the RWS after paying Rs, 200,000 mandatory contribution (the total cost was Rs 7,700,000). Under the project, the overhead reservoir (Picture 1 A& B) was also constructed. The water pump was constructed near the Lower Jhelum canal because the water near the canal is sweet (Picture 2 B). The project was completed in 2005 and its members before handing over the RWS to CBO, were trained in O&M, record keeping, meetings, and other procedures.

Picture 1: The OHR and water pump of Chak 101 N



A B

The 5% population of the village was connected to the RWS. From each approved water connection, 3-4 families use free water. The uniform water rates (Rs 200 / month) do not discourage overuse or waste of water. (FGI 20/5/2019).

C. Case Description 3

Marakiwal in Sialkot District is located North-East of Lahore, near Line of Control bordering Jammu-Kashmir, India. Sialkot receives 1000 mm average annual rainfall. From April-June summers are hot, and dry, and humid and from July-September temperatures rise to 42^0 C. Average minimum temperature in winter is 2^0 C. Due to unmanaged waste from industries water is contaminated but the taste is sweet. It is the third richest district of Pakistan and is known for its self-governance, philanthropy, and charity work, including a private airport and private airlines operated by the Sialkot business community. The two RWS in the village, one constructed from the local donation and the other under legislator grant in 1988 are self-organized by the community. The latter closed few months after due to non-payment of electricity bills and restarted in 1999 under the PCWSS project. The characteristics of the three RWS are given in Table 1.

Table 1: Characteristics of the three selected cases from the Province of Punjab

	Sokar village/ Taunsa Functional	**Marakiwal/ Sialkot Functional**	**Chak 101 NB Sargodha Functional**
CBO	Yes	yes	Yes
Water quality	brackish	sweet	Sweet and brackish
Rainfall (mm) annual	210	300	400
Canal	Chashma right bank canal/ river Indus	River Chenab/ Marala headwork	Lower Jhelum canal
Source of water	Groundwater	Groundwater	Groundwater
Oxidation pond	no	no	No
Community composition (Caste/clans)	homogeneous	heterogeneous	heterogeneous
Number of water connections	300	900	135
Water meter	no	no	No
Income source for CBO for O&M	Billing/donation	Billing/ donation/ charity	Billing/donation/ charity
Rate/ month	Rs. 360	Rs. 170	200
OHR	no	no	Yes
Water depth (ft)	500	450ft	100

Source: Developed by the authors from the field notes

IV. Methodology

The FGI, are particularly used for conservation research where communities are collectively confronted with a collective problem (Nyumba, et al. 2017). FGI is invariably used in a variety of research including public health, communication, and ethnographic studies to name a few. FGI is commonly used to collect in-depth knowledge about perceptions, behavior, and phenomenon in a small group, or to help in interpretation, a critical appraisal, or survey feedback (Kumer and Urbanc, 2020).

To answer the research questions interview guide was developed consulting *The Operational Manual (2010)* World Bank and Asian Development Reports, and preliminary open discussions with the community. It incorporated institutional statements from the Manual 2010. After the trial run the template was modified. The FG comprised of CBO members, users of RWS, and one operational staff of the PHED. Each FGI lasted two to three hours. To understand the communities' experience in collaboratively operating the RWS with PHED, and community members, as well as their understanding of the rules framed by the PHED, questions, were asked in a non-threatening manner. (Picture 2 A and B).

Picture 2: Sokar FGI (A). RWS (B)

A B

A. Transcription and data coding

The team members, including the authors, transcribed the recorded interviews, individually and later compared field notes and transcriptions. Data coding was done in multiple stages, that is, listening, transcribing, then listening and correcting. The transcription was divided into codes and themes. Dividing the text into small units (sentences, phrases, and paragraphs) is coding (Creswell and Plano, 2018). In vivo coding was adopted. The codes were grouped into themes and the themes into perspective. From the initial fifty-three themes, we reduced them to 21 themes. Some of the themes were: *social characteristics, trust-philanthropy, leadership, political power & conflict, government inefficiency, water meter installation, shared meaning of water, commitment to the CBOs' work, O&M challenges, etc.* The data were analyzed using NVivo 12. The Cohen Kappa score and overlapping Kappa scores yielded agreement and disagreement in coding strategy, determined 0.80 inter-coder reliability.

V. Results and Discussion

Table 2 presents a summary of institutions agreed between CBO and PHED at the time of handing over of RWS, for compliance among actors. The PHED role is facilitative whereas CBOs beg voluntary compliance from the communities. The formation of CBOs though constituted by PHED is influenced by local politics with a chance of salience collective action including effective communication, shared

understanding, commitment, and trust (Ostrom, Gardner and Walker, 2006) in ensuring compliance with institutions. The effective CBOs collect bills, deposit collection in the bank, and maintains the RWS. It, however, neither fines free-riders nor disconnect the water connection of chronic defaulters.

Table 2: Summary of Institutional Collaborative Compliance in the Selected Cases

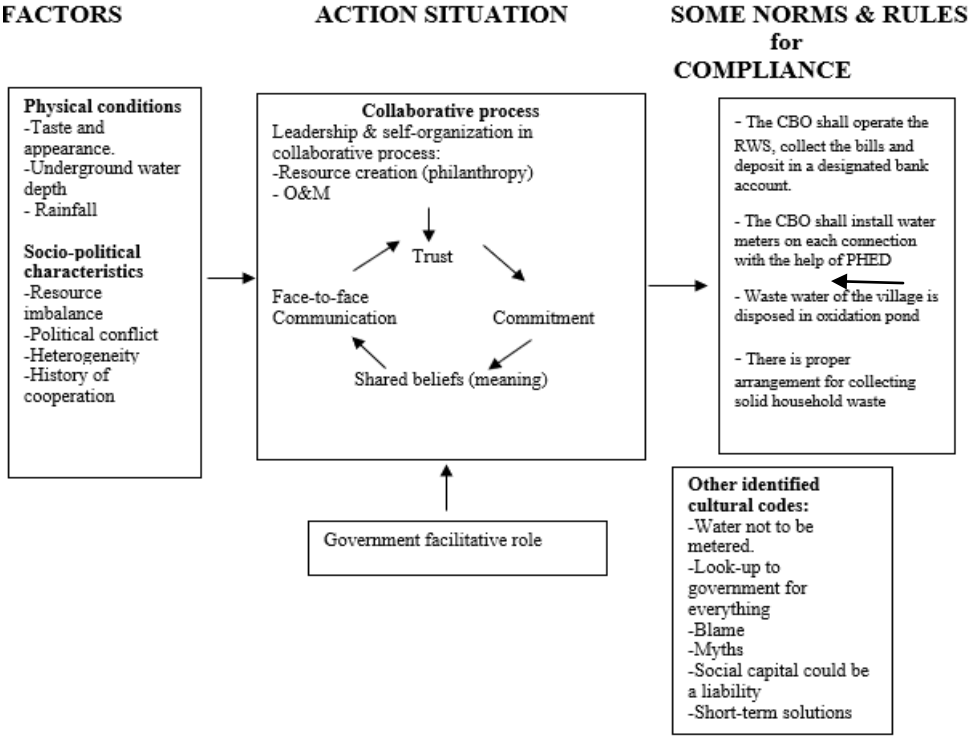
	Sokar village/ Taunsa Functional		**Marakiwal/ Sialkot Functional**		**Chak 101 NB Sargodha Functional**	
Institutions	Two actors' collaboration		Two actors' collaboration		Two actors' collaboration	
	CBO	PHED	CBO	PHED	CBO	PHED
CBO constituted and members trained	√	√	√	√	√	√
The water supply scheme is handed over to CBO by PHED	√	√	√	√	√	√
An agreement is signed between PHED and CBO at the time of handing over the RWS	√	√	√	√	√	√
PHED shall take all measures to ensure services for the consumer.	na	Partial compliance	na	Partial compliance	na	Partial compliance
The CBO shall, under the supervision of PHED-CDU, operate the RWS, collect the bills, and deposit them in a designated bank account.	√	Partial compliance	√	Partial compliance	√	Partial compliance
The CBO shall collect the monthly bill and maintain a record of receipts. It shall fine non-paying households and if non-payment continues, the CBO shall disconnect the water connection	The first part of the institution is complied	na	The first part of the institution is complied	Na	No compliance	na
The CBO with the help of PHED shall install water meters on each connection	No compliance	No compliance	No compliance	No compliance	No compliance	No compliance
water samples collectors shall come every three months to test water	na	Partial compliance	na	Partial compliance √	na	√ Partial compliance
Wastewater of the village shall be disposed of in an oxidation pond	No compliance	No compliance	No compliance	No compliance	No compliance	No compliance
There is a proper arrangement for collecting solid household waste	No compliance	No compliance	Compliance	No compliance	Compliance	No compliance
Visits of CBM& sub-engineers of PHED	CBO contacts when needed	Almost no visit	CBO contacts when needed	Almost no visit	CBO contacts when needed	Almost no visit

Source: Developed by authors

Two important factors revealed from FGI: 1) water is believed as a divine attribute. Water flows free in rivers, canals, and groundwater except for the pumping cost, and 2) too much familiarity hinders sanctions/ enforcement. In villages, everyone knows each other well, and the social network and relations take preference over rules. Table 2 shows that some rules apply to PHED and some to both. Where it applies to both, excluding the first two, PHED's compliance is partial in majority of the rules. Partial means PHED responds only when the CBO approaches, otherwise, there is no regular

schedule of the visits by operational staff. The in-depth FGI helped understand the perspective of the participants on compliance with institutions, the social norms which constrain/ help compliance, and factors that influence collaborative compliance with institutions were identified. All themes were drawn from the FGI and literature (Figure 3) (Ansell and Gash 2008). An overall perspective of the problem was also understood.

Figure 3: Codes drawn from FGI and modeled to understand the community compliance behaviour



The four themes are:1. physical conditions and sociopolitical characteristics, which are important factors for institutional compliance, 2. collaborative process, in the action situation comprising trust, communication, shared meaning and commitment, 3. government facilitative role, and 4. other contextual cultural themes (Figure 3). A box presented on the extreme right of Figure 3 contains selected rules for compliance by users of RWS. Some of the rules are, CBO collect bills and deposit in a bank, CBO shall install water meters, etc. these rules get reshaped during the interaction. The main themes are discussed below:

A. Physical Conditions and Sociocultural Characteristics

Each analyzed case is diverse in water quality, groundwater depth, rainfall, taste, and color (Table 1). The arid zone, low rainfall, deep aquifer, contamination, and brackish water compels community to self-govern RWS with minimal government support. This was observed in the three case studies. Marakiwal is in a sweet water zone and receives good rainfall, however, water at less depth was contaminated, and pumping water at greater depth was costly which motivated collective action. According to the

Chairman of the CBO, “Water is available at 60 ft, but it is not potable, because sewage system is at 15-20 feet which contaminates water quality. Moreover, excessive fertilizer and pesticide use contaminates water. We went to Lala Musa for water testing there the pesticides and fertilizers effect was found at 170 ft”. Thus, physical characteristics and chemical of water motivates CBOs to comply with rules. It also urges CBO to motivate communities to connect to RWS and adhere to payment charges. But all users do not pay.

Socio-political diversities may show serious conflict; however, sane leadership resolves it. Chairman 101N narrated the incident: “There were two political groups who had intense animosity. This animosity hindered the CBO's work. The elections were near and things worsened. The three friends (I, the treasurer, and a member) decided to make peace between the groups. It was almost next to impossible to resolve conflict. We approached them through our common friends, who agreed to bring the two groups together. After considerable discussions, conflict was resolved. Now, these groups sit together in our meetings".

B. Operational Action Situation

The operational action situation in the instance is the interaction among CBO and water user households. The competency of CBO to comply with institutions and ensure compliance by households to paying water charges, incentivize free-riders to pay, ensure water testing, install meters with the help of PHED, communicate with community and PHED operational staff. One of the key challenges is collecting water charges from free riders. The free-riders are of two types. One who is connected to RWS and others who use someone else water by connecting to a water pipe or fill their small containers. This was explained by CBO as “sharing water is a social norm and people usually do not disallow free water use" (FGI, 1 July 2019). Among those who have water connections and do not pay are two views: one, water being the gift of nature and the other is water charges are unfair because large and small families pay uniform rates (FGI, 3 March 2019). CBOs, however, cannot disconnect water connections owing to an accepted shared understanding about water.

Self-governance of collective facility requires a financial resource, leadership, trust-building, transparency, commitment, regular communication, technical resource a prerequisite for a relationship among actors to manage collective resource (Naderhan, et al.2016). The collaborative process is a trusted interaction of community members with CBO facilitated by the government’s engagement. Self-motivated CBOs engage not only in RWS O&M but other collective action problems. The FGI Chak 101N, shared, “Every year we gather community and inform on welfare work undertaken”. It was further added, “We collected Rs. 450,000 from the community and purchased school furniture lab equipment worth Rs. 100,000. Donations are the main source of collective work. The community contributes generously. Rs 4000 donation is a norm but residents who work abroad donate above100,000. We had no road to the cemetery. We asked local politicians who were reluctant, but one community member donated 350,000 for the road construction. If you want to do something for Allah people willingly donate. We don’t work for self-projection we work for Allah. Selfish interest will not last long and people will soon discover”, likewise, the Marakiwal community-generated resources through *Zakat* and charity. To generate a large sum of money within the community over a long period illustrates the competencies of the CBO. Chak 101N FGI noted, "We have a street-wise list of houses and keep written record of payment received against each house

for water and garbage collection. For bill collection, we constituted a committee for each street. The record of the receipt and disbursement is accessible to the committee and the water users. We collect Rs 51,000 each month under the sanitation head from all streets. We have Rs 126,745 carry forward from the previous collection.

Expenditure for repair and maintenance, staff salary, and other expenditures are met from household receipts and donations. The budget is in surplus. Chak 101 N did remarkable work in the community without much government support. During the FGI it was stated, “The RWS started in 2012, and training was provided in record keeping, and O&M by PHED later their visits became infrequent. Service motivation does not come from paid staff. It is imbued with the spirit of helping humanity, and the love of Allah ". Another FGI noted, “Let me tell you an incident. We wanted to purchase a tractor for garbage collection. We had collected money for its purchase but we were short of some amount. A village resident who lives abroad came on a short visit. We went to see him and also told him that the purchase of a community tractor had a shortfall in the amount. On seeing the work of CBO in the village he agreed to pay the entire amount.".

The surplus donation, self-organization, leadership, transparency in record keeping, frequent communication and information sharing, high commitment to welfare are some factors that motivate collaborative compliance among CBO and users (FGI, dated 20/5/2019). The collaborative process and compliance with institutions in operational RWS amply demonstrate the community self-organization competencies, transparency, trust, and commitment which engenders philanthropy and resource generation from within the community. The collective action problems are sustainably afforded by the community realizing that this work is physically and emotionally tiring.

VI. Conclusions

The research combines the IAD and collaborative compliance theory to understand the interaction among PHED, CBO, and user households. Moreover, it identifies factors that influences collaborative compliance with institutions and collective action, particularly describing the action situation and studying the behavior of actors. It is found CBOs after receiving training in O&M of RWS, the interaction, supervision, and monitoring from PHED became less frequent. The government's nominal role in knowledge dissemination for social change leaves collaborative compliance with institutions as a community responsibility. The CBOs and users repeatedly interacted to maintain and resolve conflict, generate resource for sanitation, and O&M of RWS.

In our study in the context of Punjab, Pakistan we found that CBOs and communities’ self-organizing capacities, service motivation, water quality were the major factors in collaborative compliance with institutions in the action situation. The self-organizing capacity establishes financial resource generation which is contingent on the trust of the community, on CBOs, as well as CBOs transparency, and continuous communication. The study shows that self-organizing competencies and financial resources being a major challenge in O&M of RWS which makes it inoperable. Instead of meeting expenditure from user payments, which are meagre due to less than feasible water connections, and also RWS connection not mandatory, CBOs seek financial support from local philanthropists. Philanthropic value as an informal social norm, being more common in certain regions than others is an opportunity for competent CBOs.

The shared belief about water as a divine gift, is a constraining factor in compliance with institutions and despite non-payment water supply is not disconnected. The same belief, social obligations, and kinship in rural areas allows free access to water particularly drinking water and is a constraint to institutional compliance. Further, absence of water metering and uniform rates increases the likelihood of water overuse and free-rider. Despite many challenges in the O&M of RWS, however, the self-organizing competency of CBOs makes them successful, with minimal support from the government. This research, suggests consumption-based water charges, metering domestic water supply both in rural and urban areas, mandatory water connection from the RWS to reduce unregulated groundwater abstraction. The research also recommends strengthening collaborative approach and protecting enforcement actions under law. Presently, PHED, and CBOs actions have no legal protection and are operating under the executive order. The drivers of most interaction are informal and social norms prevail over written norms.

The theoretical contribution of the research to the collaborative theory is the local collaborative capacity of CBOs to raise financial resources necessary to govern collective facilities, especially when a free-rider problem is challenging. Instead of letting RWS become in-operational the CBOs use all resources to maintain the collective resource. This study proposes future research in collaborative policy design, implementation and enhancing facilitative role of government. The future research is suggested on why government remains on the back foot? Is the internal organizational arrangement of the government supportive of collaborative implementation? and, synchronization between operational and collective choice level policy needs to be understood for better comprehending the collaborative approach. Furthermore, a study on philanthropic behaviour and self-governance of collective facilities requires attention.

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