Balancing Formal Standards and Community Dynamics: Sustainable Strategies for Rural Hydration Systems in Punjab, Pakistan

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This study delves into the intricate balance between formal standards and community dynamics within Rural Hydration Systems (RHS) systems in Punjab, Pakistan. The research illuminates the collaborative frameworks established between Local Council Governments and the Punjab Housing and Urban Development Department (PHED) during RHS project transfers. It highlights how these institutional structures strive to cultivate compliance among diverse stakeholders, emphasizing the role of comprehension, commitment, and reliance in ensuring adherence. Examining four central themes, the study dissects the impact of physical environmental factors and sociopolitical characteristics on adherence to institutional norms. It navigates the dynamic nature of collaborative processes, focusing on trust, communication, shared understanding, and commitment. Furthermore, it outlines the facilitative role of the government and addresses cultural nuances affecting regulations guiding RHS users. Physical and sociocultural disparities in water management are explored, showcasing varying challenges across regions. From arid areas with limited governmental support to locations facing water quality issues, the study underscores the necessity for community-led RHS management. Social and political dynamics significantly influence LCG operations, where effective leadership becomes pivotal in mediating conflicts and ensuring operational efficiency. The study emphasizes challenges faced in water charge collection, unauthorized water use, and conflicting perspectives on water fees due to societal norms. Ultimately, the research delineates essential factors vital for effective communal facility management, emphasizing financial resources, leadership, trust-building, and transparency. It highlights instances of self-driven Local Council Governments ' commitment to communal well-being, exemplifying the impact of community contributions and donations in sustaining RHS systems. This comprehensive analysis provides insights into sustainable strategies for navigating the intricate interplay between formal standards and community dynamics in Punjab's Rural Hydration Systems systems.

Keywords: Local Council Governments, Sociopolitical Characteristics, Punjab Housing and Urban Development Department.

Abbreviations:
Rural Hydration Systems (RHS)
Local Community Groups (LCGs)
Operation and Maintenance (O&M)
Overhead Reservoir (OHR)
Punjab Public Health Engineering Department (PHED)
Institutional Analysis and Development (IAD)
Focus Group Interviews (FGI)

Introduction:

The provision of clean and sustainable water sources stands as a cornerstone of societal development, particularly in regions characterized by dual water zones like Punjab, Pakistan. In 1990, the provincial government of Punjab took a pioneering step by implementing a community-based water administration system within these distinct sweet and brackish water regions. This initiative led to the collaborative completion of the Rural Hydration Systems (RHS) project, subsequently handed over to LCGs. However, while the transfer of responsibility and the establishment of formal norms through agreements between these entities seemed promising, limited research has delved into the complexities that influence compliance with these formal standards. Moreover, the impact of informal norms on the Operation and Maintenance of RHS systems has remained largely unexplored. Globally, approximately 2.1 billion individuals lack access to safely managed drinking water services, predominantly affecting rural areas in the least developed countries. In Pakistan, the drinking water sector faces significant challenges, with less than 20% of water meeting safety standards for inhabitants. This trend extends to many developing nations, including Pakistan, marked by impracticality, inefficiency, and a lack of local engagement. The challenges related to access and scarcity of safe drinking water pose critical hurdles to the survival of the Pakistani population [1].

In Punjab, a substantial part of the populace residing in rural areas experiences limited access to safe drinking water, with about 35% of RHS schemes being non-functional, exacerbating the issue. Failures in numerous water supply schemes in developing countries stem from poor community management, insufficient community involvement, compromised water quality, and escalating disputes. Financial constraints, limited ongoing support, and service breakdowns further compound these issues. In Punjab alone, an alarming 80% of water supply sources are unreliable for consumption, indicating an urgent need for sustainable solutions. The sustainability of RHS schemes relies on their long-term functionality and the engagement of key stakeholders, including local communities. Effective participation by stakeholders, such as water user committees and institutional management units, has proven instrumental in enhancing access to safe water in various nations. The concept of community-based water projects, empowering local communities to oversee project initiation, implementation, and management, holds promise. However, these initiatives face challenges in maintaining sustainability without consistent support for operation and maintenance. Addressing these factors influencing the sustainability of community-managed Rural Hydration Systems projects is crucial. Failure to do so risks not only the loss of invested financial resources but also obstructs broader economic and health benefits achievable through improved health, reduced mortality, and poverty alleviation linked to reliable access to water within rural communities. This research investigates the collaboration between LCGs, families, and institutional support in managing RHS. It explores the degree to which these entities work together and receive government support. Achieving an optimal outcome within collective action scenarios may require cooperative methods that diverge from those proposed by the Nash equilibrium. Unlike the Nash equilibrium, which hinges on rational self-interest, this study operates within the theoretical framework of Institutional Analysis and Development [1].

In this study, the IAD framework and the concept of collaborative policy design are employed to delve deeper into the mechanisms through which LCGs effectively ensure adherence to institutional rules within the collaborative governance of Rural Hydration Systems (RHS). In rural areas, individuals engage in collective action by utilizing shared resources—be it for promoting local products, maintaining irrigation systems, or monitoring nearby forests—to ensure compliance with established regulations. This examination aims to illuminate how these collaborative processes shape and sustain effective governance practices within these communities [2]. Moreover, these groups collaboratively establish guidelines aimed at sustaining the shared facility. However, there are often challenges in effectively excluding individuals who

do not actively engage in the collective actions undertaken by the rest of the community [3]. Within the framework of shared resources, group members face a crucial decision where the optimal outcome arises from cooperative efforts aimed at maximizing the collective benefits for the entire group [4]. Since 1990, the management of RHS infrastructure, encompassing vital components like the pump house, water supply network, and Overhead Reservoir in certain villages of Punjab, Pakistan, has been entrusted to LCGs. This delegation has been facilitated through collaboration with the Punjab Public Health Engineering Department (PHED). Communities actively engage in various activities throughout the construction phase of these RHS structures. Upon completion of construction, the PHED extends training to LCG members in O&M practices, and self-organization techniques, and establishes formal agreements. Additionally, the PHED shares the Manual of Rules 2010, delineating guidelines for collaborative adherence with institutions overseeing RHS and sanitation, including the delineation of financial responsibilities [5].

This study aims to assess the level of collaborative compliance among chosen LCGs, PHED, and families in governing RHS by adhering to institutional directives. It hypothesizes that LCGs exhibit a capacity for the autonomous organization with minimal government intervention, all while adhering to established regulations [6]. Additionally, this study recognizes the substantial influence of local norms on shaping the "action situation" and consequent outcomes within these LCGs. Similarly, the innate capacity of local leadership to self-organize fosters trust between LCGs and the community, serving as a testament to the community's endorsement of the work conducted by these LCGs [7]. As per [5], the "action situation" within the IAD Framework characterizes a social setting wherein individuals with diverse preferences interact. This interaction involves the exchange of goods and services, conflict resolution, exertion of dominance, and engagement in various activities. The case study specifically centers on O&M tasks associated with RHS and sanitation [8]. These activities involve various critical elements, including regular water quality assessments conducted quarterly, communication of information to community members, handling and oversight of water fees, implementation of water metering systems, addressing challenges associated with free-riders, and resolving disputes. Within the context of action situations, institutions operate as regulatory frameworks that define acceptable, unacceptable, and obligatory behaviors for the involved actors [9]. Engaging in an active scenario involves several approaches, including adherence to institutional declarations. These statements encompass formal regulations present in legal frameworks, administrative directives, internal communications, and governmental strategies. They serve as guiding principles dictating acceptable behaviors and practices within a given system or organization [10].

The study embarked on a journey to unravel the intricate dynamics governing Rural Hydration Systems management, driven by fundamental questions. It sought to uncover how LCGs persistently maintain shared facilities even in the absence of substantial governmental support. Delving deeper, the study aimed to understand the motivating factors compelling these organizations to abide by regulations established through agreements with the PHED. Furthermore, it endeavored to gauge the typical extent of cooperation and support extended by the PHED in these endeavors [11]. Limited research exists that merges the IAD framework with collaborative governance theory to investigate how various stakeholders adhere to regulations in addressing collective action challenges. This approach offers a distinct lens for understanding communal issues. While there have been studies exploring the collaborative self-organization of rainwater harvesting systems and groundwater resources particularly in sub-Saharan Africa and Mexico, there remains a dearth of research delving into self-organization and collaboration within the sphere of regional water systems in South Asia. This gap highlights the need for a focused exploration within this specific context [12].

This discussion centers explicitly on Pakistan, aiming to draw valuable insights from community experiences. Ultimately, leveraging these insights contributes significantly to refining collaborative processes, particularly in emerging nations [13]. The paper's subsequent section offers a succinct analysis of the theoretical underpinnings of the IAD Framework and collaborative policy design theory. This is followed by a detailed depiction of selected examples in the third section, elucidating the technique employed. Moving forward, the fifth section encapsulates the presentation and discussion of the acquired results, culminating in the formulation of conclusions, recommendations, and suggestions for future research endeavors [14].

The second consideration revolves around the discussion of two pivotal concepts in public policy, the IAD Framework and Collaborative Policy Design Compliance. The IAD Framework, short for the Institutional Analysis and Development Framework, serves as a theoretical construct employed to analyze and comprehend individual and organizational behavior within specific institutional contexts. It offers a systematic approach to studying and understanding these behaviors. This study merges the collaborative governance theory, as proposed by [10], within the context of collective action, intertwining it with the IAD framework [15]. The IAD framework, as proposed is compatible with numerous hypotheses. The IAD framework provides guidance for situating a problem inside an action situation, where the outcome is a result of interactions among several players. The recognition of action situations holds significance for analysts due to the involvement of various actors engaging in interactions that ultimately result in outcomes [16]. The acts, interactions, and outcomes of action situations are influenced by a collection of official and informal institutions that dictate the participants, processes, and conduct of collective action. Governance refers to the establishment of collectively agreed-upon rules and standards that are intended to govern the behavior of both individuals and groups [17]. The theory of collaborative governance encompasses the identification of the collaborative process and its essential components, such as self-organizational capacities, trust in leadership, shared understanding, and user commitment. Furthermore, it has been shown that both social and physical factors play a significant role in shaping the extent to which individuals engage in collaborative compliance with institutions aimed at ensuring the sustainability of collective resources [18].

The IAD framework recognizes the intricate nature that influences and encompasses the decision-making process within institutions. This framework enables analysts to focus on specific aspects of the policy process while allocating less attention to others. This analysis provides a comprehensive framework for understanding the influence of institutions on the behavior of individuals. It highlights the key attributes of actors, including their ideas, knowledge, and resources, which drive their behaviors. Additionally, it predicts the circumstances in which these actors engage with one another. However, it fails to adequately reflect the intricacies of the policy subsystem and the resolution of conflicts within the policy process, particularly at the operational level [19].

The research conducted highlights the self-organizing capabilities of LCGs in collaborative processes, wherein they effectively utilize local resources and norms. These capabilities play a significant role in shaping compliance behavior within communities. However, studies conducted by [10] indicate that marginalized communities face challenges in their connection with government organizations, resulting in limited control over resolving collective action issues. Support is necessary to facilitate the establishment of trust among crucial individuals [20]. The involvement of stakeholders is crucial for ensuring successful collaborative compliance. In this regard, it is important to consider the government's role in establishing, facilitating, and maintaining a collaborative process. This is because service users are assigned shared duties, which encourage cooperation and compliance within a social network [21].

The collaborative process at the operational level for voluntary involvement and compliance with institutions is seen as yielding collective reward by a group, even in the absence of significant government facilitation. Households adhere to regulations with the expectation of receiving piped water conveniently delivered to their residences, and the remittance for its consumption is regarded as a social responsibility rather than a mandatory requirement. There are several factors that contribute to voluntary institutional compliance, including the social obligation of individuals and groups, as well as the sociological characteristics of the village and water quality. In this particular scenario, adherence to institutional norms is achieved through the utilization of negotiated rule-making and collaborative procedures, or by accepting regulations established by the government [22].

Collaborative governance, as discussed, entails the involvement of users and other actors within a specific domain in both the policy-making process and its subsequent implementation. Additionally, collaborative spaces are created to facilitate this collaborative approach. However, it is often observed that service users in poor nations are rarely included at the policy design level, leading to a lack of responsiveness to change. In a theoretical framework, it is essential to involve users in all stages of decision-making in order to achieve the intended outcomes [23]. The integration of the IAD framework with collaborative policy design offers a more comprehensive understanding of the collaborative process and the extent to which institutions are adhered to. In addition, the provision of assistance by the government, the presence of effective community leadership, and the ability to self-organize all play a role in fostering the collaborative process. Furthermore, adherence to institutional norms is crucial for the long-term sustainability of a collective facility [24].

Study Sites:

The third consideration delves into the contextual backdrop for this study, specifically the selection of cases within Punjab, Pakistan. Notably, approximately 62% of Punjab's population resides in its rural regions. This province is characterized by arid and semi-arid conditions, leading to variable water quality, quantity, and access due to climate-induced fluctuations and extensive groundwater extraction. The study zones in three districts Layyah, Hafizabad, and Sialkot, were chosen for implementing operational Rural Hydration Systems (RHS) systems. Exploring the social characteristics of these rural settings, findings reveal that 29% of households display illiteracy, while 60% fall within the 20-40 age bracket. Additionally, 32% of households are involved in small-scale businesses and 59% consist of 5-9 family members. Moreover, these village communities reflect diverse socio-economic landscapes, encompassing both affluent and impoverished individuals, along with varied political affiliations and dominant castes [25].

Layyah, a city in Punjab, Pakistan, is situated in the southern part of the province. Geographically, Layyah is located on the bank of the Indus River and lies in the plains region of Punjab. Its coordinates are approximately 30.9672° N latitude and 70.9540° E longitude. The city's landscape predominantly comprises flat and fertile plains, conducive to agricultural activities. Layyah experiences a predominantly arid climate with scorching summers and mild winters. Agriculture forms the backbone of the local economy, with crops like wheat, cotton, sugarcane, and vegetables cultivated in the region. The Indus River contributes significantly to the irrigation system, supporting agricultural production in the area. The brackish groundwater accessible at a depth of 90 feet is deemed unsuitable for human consumption. There exists a significant regional variability in both the quality and amount of groundwater within the region. Frequently, in impoverished communities, there is a need to excavate multiple boreholes in order to identify sources of potable water situated at depths ranging from 250 to 350 feet. However, this undertaking necessitates substantial financial resources that are beyond the capabilities of these disadvantaged populations.

Following the acknowledgment of the RHS project by provincial legislators, the PHED engineering team undertook the development of technical and financial feasibility reports for official endorsement. This collaborative endeavor between PHED and LCGs resulted in the establishment of the Layyah RHS in 1980. However, challenges surfaced for the LCG, including diminished revenue due to inadequate collection methods, consistent water rates, and the presence of individuals exploiting services without contributing. A study conducted by FGI in 2019 highlighted a prevalent perception among the populace that the uniform rates were unjust, leading to an expectation of complimentary water services from the government, considering water's inherent accessibility without charge. In a different case, Chak No. 90/M.L. stands as a village nestled within the Karor Lal Easan Tehsil, part of the Layyah District in Punjab, Pakistan. Positioned along the Thal canal, this village boasts fertile lands attributed to the British Indian Government's construction of the canal during the 1940s, a project finalized towards the decade's end. Despite being a part of the Provincial legislative program, the RHS installation in 1987 ceased after two years due to unsettled electrical bills. However, in 1993, as part of the Punjab Community Water Supply and Sanitation project, efforts to revive the RHS commenced. This revival necessitated a contribution of nearly Rs 150,000 from the LCG out of the total project cost of Rs 6,300,000. Subsequently, the project was completed in 2007, accompanied by comprehensive training for LCG members in various operational aspects before the RHS's transfer of responsibility.

The village's access to the RHS catered to only 7% of its population, with each water connection serving 3-4 households and offering free water. Despite a standardized rate of Rs 150, the fixed monthly pricing structure for water consumption failed to discourage excessive usage or resource wastage. Mundair Kalan, commonly known as Mundair Sharif Syedan is a village situated near Sahowala, between Ugoki and Sambrial in the Sialkot District of the Punjab province of Pakistan. It is situated between two canals. Sialkot, known for its average annual precipitation of 1000 mm, experiences a distinct climate from April to June, marked by high temperatures, aridity, and humidity. Subsequently, from July to September, temperatures soar to 420 degrees Celsius. Winter records an average minimum temperature of 20 degrees Celsius. Unfortunately, water contamination due to poor waste management in industrial sectors has altered its taste, giving it a sweet flavor. Sialkot, a district renowned for affluence and autonomous administration, houses a private airport and airlines managed by the local business community. The hamlet hosts two autonomous rainwater harvesting systems, one funded by local donations and the other through a legislator grant in 1988. The latter ceased operations temporarily due to outstanding electricity bills but resumed activities in 1999 under the PCWSS initiative, reflecting the attributes of these three RHS projects.

Table 1: Overview of Districts and Rural Hydration Systems Projects in Punjab, Pakistan

District	Location	Characteristics	RHS Project Information
Layyah	Southern Punjab, on the bank of the Indus River	- Arid climate with scorching summers and mild winters, Agriculture-based economy, Brackish groundwater unsuitable for human consumption, Significant regional variability in groundwater	- RHS established in 1980 through collaboration between PHED and LCGs, - Challenges: Diminished revenue, inconsistent water rates, service exploitation by individuals
Chak No. 90/M.L.	Karor Lal Easan Tehsil, Layyah District	- Fertile lands due to the Thal canal construction, RHS	- Revival initiated in 1993 through the Punjab Community Water Supply

		ceased in 1987 due to unsettled electrical bills	and Sanitation Project, LCG contributed Rs 150,000 out of Rs 6,300,000 project cost, Completed in 2007, served 7% of the population
Mundair Kalan	Sialkot District	- Distinct climate with high temperatures, aridity, and humidity -Water contamination from poor waste management in industrial sectors	- Rainwater harvesting systems funded by local donations and legislator grants in 1988 - PCWSS initiative reinstated operations in 1999 - Reflective of RHS projects in the area

Methodology:

Research Design and Data Collection:

The study employed a qualitative research design, predominantly utilizing Focus Group Interviews (FGI) to investigate the interaction between formal standards and community dynamics within Rural Hydration Systems (RHS) systems in Punjab, Pakistan.

Interview Guide Preparation:

An interview guide was developed, referencing reputable sources such as the Operational Manual (2010) of the World Bank and Asian Development Reports. Preliminary discussions with community members assisted in refining the interview structure to ensure alignment with institutional guidelines and inclusivity of diverse viewpoints.

Composition of Focus Groups:

Focus groups were strategically formed, incorporating key stakeholders including LCGs members, RHS users, and a representative from the PHED. This diverse composition aimed to capture a comprehensive range of perspectives related to governance, compliance, and operational aspects of RHS.

Data Collection Process:

Focus group interviews, each spanning two to three hours, served as the primary data collection method. Recordings of these sessions were meticulously transcribed by team members and cross-referenced against field notes to ensure accuracy and completeness.

Data Analysis Techniques:

Data analysis commenced with an iterative process of data coding, employing methods such as in vivo coding to capture nuanced information within the collected data. The initial set of fifty-three topics was refined to twenty-one overarching themes, covering various aspects including social dynamics, leadership, governance challenges, and community commitment.

Utilization of NVivo 12 Software:

NVivo 12 software was utilized for in-depth data analysis, facilitating a structured approach to analyze and categorize themes, ensuring a rigorous and comprehensive examination of the obtained data.

Evaluation of Inter-Coder Reliability:

To ensure the reliability of findings, the study conducted an evaluation of inter-coder reliability using Cohen Kappa and overlapping Kappa scores. This assessment yielded an established dependability of 0.75, highlighting both consensus and discrepancies in the coding approach.

Findings and Analysis:

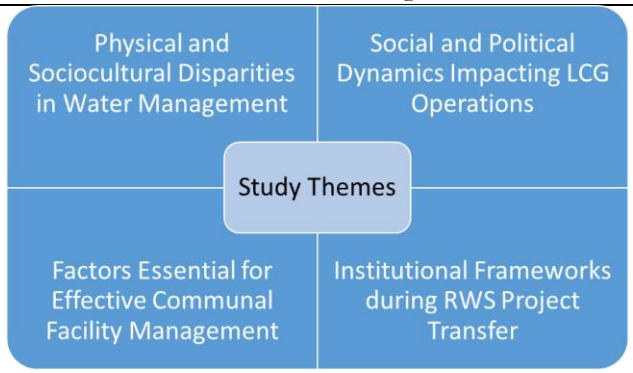

Figure 1: Central Themes of this study

A succinct overview delineates the agreed-upon institutions between the LCG and the PHED during the RHS project transfer. These institutional frameworks are aimed at fostering compliance among diverse stakeholders. PHED adopts a facilitative role, whereas LCGs depend on voluntary compliance from communities. Notably, while PHED initiates the establishment of LCGs, their functionality can be influenced by local political dynamics, fostering collective action and resource sharing. The argument asserts the criticality of comprehension, commitment, and reliance to ensure adherence to institutional frameworks. Proficient LCGs are engaged in bill collection, fund deposition, and maintenance of records related to revenue and RHS systems. However, penalties for non-contributors or discontinuation of supply for consistent bill defaulters are not imposed. Key insights from focus group interviews underscore two primary aspects: the perceived divine attribute of water and the hindrance posed by excessive familiarity in enforcing regulations. Water, perceived as divine, flows freely in various natural and artificial channels, albeit with energy costs in pumping. Moreover, in tight-knit rural communities, social networks and relationships often overshadow formal regulations, impacting the efficacy of enforcement. The delineation of rules reveals a spectrum where some regulations apply solely to PHED while others encompass both PHED and other entities. PHED's compliance, primarily partial, is characterized by responsiveness triggered by LCG-initiated contact, lacking consistent engagement otherwise. Detailed schedules of operational personnel visits and comprehensive focus group interviews facilitated deeper insights into participant perspectives on institutional compliance, societal norms' impact on adherence, and collaborative factors influencing compliance. The study's topics stemmed from FGI and pertinent literature, enabling a comprehensive grasp of the issue at hand.

The study comprises four central themes. Firstly, it explores the influence of physical environmental factors and sociopolitical characteristics on adherence to institutional norms. Secondly, it delves into the dynamic nature of collaborative processes, emphasizing trust, communication, shared understanding, and commitment. Thirdly, it outlines the facilitative role of the government, highlighting its integral components. Lastly, a section addresses cultural nuances that encompass specific regulations guiding users of RHS. LCGs enforce various regulations regarding bill collection, fund deposits, and water meter installation. These regulations are subject to modifications during discussions and interactions. The subsequent section provides a detailed analysis of these core themes. The study investigates the connection between physical conditions and sociocultural traits, revealing disparities across cases in water quality, groundwater levels, rainfall patterns, taste, and appearance. Arid regions with minimal rainfall, deep aquifers, contamination issues, and prevalence of brackish water underscore the need for community-led RHS management, albeit with limited governmental support, as evident in the documented case studies. Mundair Kalan, nestled in a region with abundant freshwater and favorable rainfall, grapples with the challenges of contaminated shallow water sources and high extraction costs from deeper wells, prompting community-driven initiatives. The Chairman of the LCG reported water accessibility at 55 feet but unsuitability for consumption due to

contamination from a sewage system at 10-15 feet. Pesticide and fertilizer overuse were identified during water testing in Jalalabad, compromising water quality to a depth of 150 feet. These physical and chemical aspects influence LCG adherence to regulations, motivating them to encourage RHS connections despite incomplete remuneration [26].

Social and political diversities often breed conflicts, yet effective leadership can mediate and resolve such disputes. A recounted incident by the Chairman of 90 M.L. highlighted a situation marked by intense animosity between two political factions. This discord significantly impeded the operations of the LCG. As elections loomed closer, tensions escalated. A collaborative effort involving myself, the treasurer, and another member was initiated to reconcile these factions. It was an arduous task, but through mediation and discussions facilitated by our mutual contacts, we successfully reconciled the conflicting groups. Presently, these groups participate harmoniously in our sessions. Operational dynamics within LCGs and their interaction with households utilizing water resources are crucial. Effectiveness in adhering to institutional regulations, ensuring household compliance with water service payments, promoting remuneration from non-contributing individuals, conducting water quality tests, facilitating meter installations with the PHED, and maintaining robust communication with both the community and PHED operational staff are essential aspects. An ongoing challenge is collecting water charges from non-contributing individuals, categorized into two groups: those using the RHS system without payment and those accessing water through unauthorized connections or alternative sources. The LCG explained that sharing water is a societal norm, leading to less resistance toward unauthorized water use (FGI, 1 May 2019). Among individuals not paying for water services, differing perspectives emerge. One viewpoint regards water as a natural endowment, resisting the imposition of water fees. Conversely, another viewpoint deems the uniform water rates unfair, particularly for smaller households (FGI, December 3, 2019). However, the LCGs cannot terminate water connections due to a collective agreement affirming shared access to water resources.

The effective administration of a communal facility necessitates several key factors: financial resources, leadership, trust-building, transparency, dedication, regular communication, and technical support. The collaborative process signifies a reliable connection within a community, managed by a LCG with active government support. Self-driven LCGs actively engage in the O&M of RHS and tackle various collective action challenges. According to FGI Chak No. 90/M.L., community gatherings are held annually to update members on welfare initiatives. A community contribution of Rs. 390,000 was gathered and allocated to procure classroom furniture and laboratory equipment worth Rs. 90,000. Donations predominantly fund these collective initiatives, with contributions typically around Rs. 3500; however, overseas citizens often contribute over Rs. 1500,000. The absence of a road to the cemetery prompted citizens to seek lawmaker input, eventually receiving a substantial donation of $250,000 from a generous community member. Driven by their faith, individuals willingly donate, emphasizing their motivation to serve Allah rather than seeking personal recognition. This selflessness reflects a long-term commitment, unlike transient selfish interests. The Mundair Kalan community similarly utilizes resources from Zakat and charitable donations, showcasing the LCG's ability to generate significant local funds. FGI reports from Chak No. 90/M.L highlighted meticulous property records and payment logs maintained by the community. Each street has a dedicated committee overseeing water and garbage collection, managing monthly collections of Rs. 49,000 with a surplus from previous collections totaling Rs. 117,892. Expenditures for maintenance, staff salaries, and miscellaneous costs are covered by household receipts and donations, resulting in a current surplus budget. Despite limited government assistance, Chak No. 90/M.L. has made considerable contributions to the community. While the RHS initiative started in 2014 with PHED training, subsequent PHED visits became infrequent. The community's dedication to service transcends financial gain, rooted in their commitment to humanity and devotion to Allah.

An incident recounted during an FGI showcased the generosity of an overseas villager who fully funded a communal tractor upon learning about the community's need, highlighting the LCG's commitment to communal well-being. Factors like surplus donations, self-organization, effective leadership, transparent record-keeping, frequent communication, commitment to welfare, and information sharing motivate collaborative compliance among LCGs and users (FGI, 2019). This collaborative process demonstrates the community's capabilities in self-organization, transparency, trust-building, and commitment, fostering philanthropy and resource generation. Understanding the challenges posed by collective action, the community recognizes the physical and emotional strains involved.

Conclusions:

This study employs a combined framework of the IAD framework and the Collaborative Compliance Theory to analyze the interplay between the PHED, LCGs, and user households. It delves into factors impacting collaborative compliance with institutions, focusing on the action situation and behavior of involved actors. Findings reveal reduced PHED interaction post LCGs' training in RHS O&M, placing collaborative compliance responsibility on the community. This results in continuous LCG-user interactions for conflict resolution, resource generation, and RHS upkeep. In our Punjab study, collaborative compliance and LCGs self-organization, service dedication, and water quality emerge as key action influencers. LCGs' self-organizing role is pivotal in financial resource generation, relying on trust, transparency, and constant communication. The absence of self-organizational skills and financial resources poses challenges, hindering RHS's operation. Instead of user payments, LCGs seek funds from local benefactors due to low feasible connections and missing mandatory RHS links. Philanthropic norms, varying across regions, offer opportunities for capable LCGs. The perception of water as a divine gift hampers institutional compliance; despite non-payment, the water supply remains uninterrupted. This belief, coupled with social obligations, allows free water access, particularly for drinking, obstructing institutional compliance. The absence of metering and uniform rates leads to water overuse and free-riding. Despite challenges, LCGs' self-organizing prowess ensures minimal government support for successful operations. The study suggests consumption-based charges, universal metering, mandated RHS connections to curb groundwater abstraction, and reinforcing legal protections for PHED and LCG actions, currently lacking legal cover and relying on executive orders. Informal norms dominate interactions, overshadowing written regulations. This research offers a theoretical contribution to collaborative theory by examining LCGs' local capacity in mobilizing finances for collective facility governance, tackling free-rider issues, and ensuring continued RHS operation. It prompts further research avenues in the field.

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