Pakistan Journal of Applied Social Sciences
Vol. 13(1), 2022, pp.65-78, ISSN: 2409-0077(Print), ISSN: 2663-8894(Online)

Role of Community Based Organizations in Sustainability of Community Managed Rural Water Supply Schemes

Muhammad Alam
Department of Social Work
University of the Punjab, Lahore

Abstract

Sustainability of community-managed rural water supply schemes (CM-RWSS) is a major challenge in rural settings. The functioning of community-based organizations (CBO) influences the functionality of CM-RWSS. The purpose of the present research was to investigate the role of CBOs in the sustainability of RWSS in the Gujranwala division in Punjab Province, Pakistan. The study was cross-sectional in nature and adopted the quantitative research approach. The data was collected from the beneficiaries of RWSS at the household level. A multistage random sampling technique was adopted. The districts for the study were selected purposively since they have more RWSS as compared to other districts. The six functional RWSS schemes were randomly selected from the Gujranwala division. An interview schedule was structured to collect data from the water users. Data was entered, summarized, and analyzed using SPSS version 22. A linear regression test was applied to assess the impact of CBOs' functioning on the satisfaction of water users. The study concluded that CBOs at community level were performing their role adequately to ensure the sustainability of water supply schemes. It was also indicated that water provided through these schemes was of good quality and adequate to meet community members' needs. It was also concluded that the functioning of CBOs was the initial, major, and significant source of quality water availability and RWSS sustainability.

Keywords: Sustainability, Community Based organisations, Rural Water Supply Schemes, Community managed.

تلخیص

دیہی ماحول میں کمیونٹی کے زیر انتظام دیہی پانی کی فراہمی کی اسکیموں کی پائیداری ایک بڑا چیلنج ہے۔ کمیونٹی پر مبنی تنظیموں کا کام کمیونٹی کے زیر انتظام دیہی پانی کی اسکیموں کی فعالیت کو متاثر کرتا ہے۔ موجودہ تحقیق کا مقصد پاکستان کے صوبہ پنجاب میں گوجرانوالہ ڈویژن میں کمیونٹی کے زیر انتظام دیہی پانی کی اسکیموں کی پائیداری میں سی بی اوز کے کردار کی چھان بین کرنا ہے۔ موجودہ سٹڈی کراس سیکشنل اور مقداری تحقیقی نقطہ نظر پر مبنی تھی۔ ڈیٹا گھریلو سطح پر دیہی پانی کی اسکیموں کے استفادہ کنندگان سے اکٹھا کیا گیا تھا۔ ایک ملٹی اسٹیج بے ترتیب نمونے لینے کی تکنیک اپنائی گئی۔ مطالعہ کے لیے اضلاع کا انتخاب مقصد کے ساتھ کیا گیا تھا۔ کیونکہ ان میں دیگر اضلاع کے مقابلے میں دیہی پانی کی اسکیمیں زیادہ ہیں۔ چھ فنکشنل آر ڈبلیو ایس ایس سکیموں کو گوجرانوالہ ڈویژن میں بے ترتیبی طور پر منتخب کیا گیا۔ پانی استعمال کرنے والوں سے ڈیٹا اکٹھا کرنے کے لیے انٹرویو شیڈول ترتیب دیا گیا تھا۔ ایس پی ایس ایس کا استعمال کرتے ہوئے ڈیٹا درج کیا گیا، خلاصہ کیا گیا اور تجزیہ کیا گیا۔ پانی استعمال کرنے والوں کے اطمینان پر سی بی اوز کے کام کے اثرات کا اندازہ لگانے کیلئے لینئیر ریگریشن ٹیسٹ کا اطلاق کیا گیا۔ مطالعہ نے یہ نتیجہ اخذ کیا کہ کمیونٹی کی سطح پر پانی کی فراہمی کی

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سکیموں کی پائیداری کو یقینی بنانے کیلے اپنا کردار مناسب طریقہ سے ادا کر رہے ہیں یہ بھی اشارہ کیا گیا کہ ان سکیموں کے زریعے فراہم کیا جانے والا پانی اچھے معیار کا اور کمیونٹی ممبران کی ضروریات کو پورا کرنے کیلے کافی تھا۔ مزید یہ نتیجہ اخذ کیا گیا کہ سی بی اوز کا کام معیاری پانی کی دستیابی اور آر ڈبلیو ایس ایس سکیموں کی پائیداری کا بڑا اور اہم زریعہ تھا۔

کلیدی الفاظ: پائیداری، سی بی اوز، آر ڈبلیو ایس ایس، کمیونٹی کے زیر انتظام

Introduction

According to UN estimates (2018), over 79 percent of those without access to better drinking water sources live in rural regions, and water scarcity affects 40 percent of the global population. A sustainable supply of adequate safe water is fundamental to a healthy, productive, and dignified life for rural communities (Aslam, 2013). Achieving sustainable water supply remains one of the goals of developing and underdeveloped countries (Pereira & Marques, 2021). In terms of water services, Pakistan faces significant challenges. Despite the governments and development partners' efforts to invest in the past years, existing facilities have continued to deteriorate and fail to meet the increasing population's water demand, particularly in rural areas (Padawangi, 2010).

Safe drinking water and basic sanitation are considered basic human rights and should therefore be accessible and affordable to all (Khan & Javed, 2007). The sustainability of rural water facilities is hindered by limited community ownership and insufficient maintenance, and as a result, some of them rely on donor assistance to address issue of water projects. Stakeholders' limited participation also has an impact on sustainability (King, 2008).

Water points (WPs) that are broken or underperforming are not a new issue, with large-scale analyses and anecdotal evidence dating back to the 1980s. Despite widespread recognition of the threat that this problem provides to the long-term viability of rural water delivery projects, the concept of 'functionality' as a focal point has just arisen in the last ten years or so, notably in developing and underdeveloped countries(Whaley & Clever., 2017).

Community Based Organizations (CBOs) are non-profit, local and national organizations that facilitate community activities for the development of communities. CBOs function through people-centered development models such as the availability of financial resources and community participation in the development of infrastructure that improve over time (Daluwatte, 2018).

In the rural sector, CBO is essential to strengthen and sustain the established water supply schemes and services. The CBO is important to enable detailed monitoring and functioning of rural water supply schemes (RWSS) at community level. In this perspective, members of the CBO are elected to manage RWSS on behalf of the community (Adaka & Mugambi, 2018).

The Government of the Punjab, Pakistan introduced community-based water governance in dual water zone areas (sweet and brackish) in 1990 (Government of the Punjab, 2015). The jointly completed rural water supply (RWSS) was handed over to a 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 RWSS (Waheed et al., 2021).

The Public Health and Engineering Department (PHED) established Rural Water Supply Schemes (RWSS) in order to serve the rural communities (Government of the Punjab, 2015). CBOs carried out the operation and maintenance of these schemes (Waheed et al., 2021). CBOs manage these schemes with limited financial resources and inadequately skilled personnel (Whittington et al., 2009). The sustainability of these RWSS was no longer a government priority and the responsibility was left to the project beneficiaries eventually. The CBOs were not adequately trained and ill prepared to take over the management of these water supplies and could not maintain the schemes. As a result, most of the RWSS were rendered operational for some minor repairs and for others requiring complete rehabilitation (Aashiq et al., 2020).

Community managed RWSS (CM-RWSS) in Punjab has defined CBO as the representative of the community regarding RWSS. Therefore, the CBOs are answerable and accountable to both the community and the executing agency (Adaka, & Mugambi, 2018). The CBOs specifically manage, prepare, and submit project progress reports to the village council and advisory council committee. Communication between water users and the executing agency by the CBOs must be two-way traffic. It requires trust, commitment, and openness (Ahmad & Talib, 2015).

CBO deals with issues such as management of RWSS in reference to collection of water tariff, formation of rules, record keeping, and operation and maintenance of RWSS (Chowns, 2017). Moreover, CBOs exist to design, implement, and monitor social and economic development programs, as well as to give technical and financial assistance to communities with the help of executing agencies (Aasim et al., 2016).

The research paper focuses on the performance of CBOs in delivering water services to water users at household level. In addition, it also elaborates the satisfaction of water users from the services of CBOs in the Gujranwala division. The findings will help to improve our understanding of how to effectively implement community management in rural settings as well as provide context for future management decisions for rural water projects. As a result, this paper explores community water delivery schemes as a case study of CBO performance and RWSS problems and finds the elements influencing RWSS sustainability. The study examined the management of RWSS by the

CBOs from the perspective of water users at household level and problems with community-managed RWSS.

The study assumed that, the communities would be willing to participate objectively in the study. Therefore it was also assumed that functioning of CBO and community participation leads to sustainability of RWSS. Therefore the study focused on the house-holds heads which uses communal water points. The present study on performance of CBOs and sustainability of RWSS was restricted to three Districts of Gujranwala Division. The target respondents were 348 from six RWSS of the three Districts. The findings of this research may help the executing agencies in water projects to run RWSS and policy formulation. It may also assist the social development stakeholders of Punjab in selecting and developing specific strategies for optimization of community participation in rural water projects. The findings of this study may also form a basis for further research geared towards improving engagement in rural development.

Research Objectives

i. To study the role of community based organisation in sustainability of rural water supply schemes
ii. To study the satisfaction of water users from the functioning of community based organisation

Literature Review

Community-based water management systems evolved in the 1980's. They were established in response to the international crisis of water scarcity and dwindling resources (Chowns, 2015). Water supply projects with participatory approaches empower communities to manage and safeguard their rights to safe drinking water. From this perspective, community-managed RWSS are concerned with the participation of the community in planning, designing, implementation, and maintenance of water projects (Von et al., 2012). This participatory approach enhances the chances of effectiveness, efficacy, functionality, and sustainability of the RWSS (Chowns, 2015).

Many schemes fail operationally due to limited financial resources and extra expenses of RWSS. Further, communities did not feel a sense of ownership towards RWSS due to frequent breakdowns. According to Waheed et al. (2020), community participation in community managed RWSS fails when the executing agency leaves over the RWSS, and the CBO members from community then loses their interest, which creates a problem in the sustainability of the RWSS (Whittington et al., 2009).

According to Khan and Khan (2021) several community-managed RWSS are poorly managed or inefficient by the water users association, but they are sometimes the sole accessible source of potable water for local rural communities (Khan & Khan, 2021). Community schemes represent a

different, promising methodology: they are small, local, community-driven initiatives with low-technology solutions and require low capital costs with the potential to become self-sufficient (Daluwatte, 2018).

Wijesinghe (2019) stated that communities have more direct involvement in the definition of problems and planning of solutions, with theoretically better tailored, efficient solutions for water projects. Yet these schemes are still faced with challenges that threaten their effective and efficient operation in the long term. Some schemes suffer from irregular water supply; untreated water, and others find it difficult to truly be financially and operationally viable (Behailu, 2017). These are important consequences for understanding progress toward attaining the Sustainable Development Goals (SDGs) 6 (Whaley & Cleaver, 2017). The achievement of SDG 6 is dependent on part of the performance of community water schemes and their ability to offer beneficiaries long-term improvements in potable water supply.

Poverty is one of the biggest challenges in Pakistan's development in rural areas. These issues may jeopardize the long-term viability of user fees or community contributions among the poorest water users, particularly in the Arid and Semi-Arid Lands (Chaudhry et al., 2006). Development initiatives in the communities require resources for development and operation of water projects (Wallace & Coles, 2020). Due to the high rate of illiteracy, community members' knowledge and abilities have been limited, limiting community engagement in rural water development and prolonging the shortage of safe and clean water in many places (Thwala, 2010).

Rural communities must have access to resources if they are to participate actively in community development. The low financial status of local communities limits not just their ability to participate in development projects, but also their ability to pay for water services (Cosgrove & Loucks, 2015). Water user associations, according to Ananga et al. (2017), include community members in water tariff fees in order to raise a sense of duty and ownership within the community in rural water projects. Furthermore, according to Moriarty et al. (2013) the executing agency believes that better access to water and community participation in resource management will strengthen their position in the community. Moreover, Neuhaus (2021) explained that the implementing agency's community management method of including community organizations in water supply-related activities has a strong empowering effect because they regard this as an essential community duty.

According to Manikutty (1997) depicted that executing agencies use participatory approaches (i.e. involvement of the community, trainings etc.) to create a sense of responsibility and ownership among the community in rural water projects. However, the technocracy and usage of blueprint approaches in order to complete the project in the given time and financial frame doesn't ensure a long-term operation of the water supply system. Furthermore Oino et al. (2015) stated that the executing agency assumes that the improved access

to water and the involvement of community in the resource management will strengthen their standing in the community. According to Tantoh, and Simatele (2017) community management approach by executing agency to involve community organisations in water supply related duties has a significant empowering effect because for them this was seen as a necessary service for the community.

In a study by Waheed et al. (2021) depicted that the formal institutions partially adhered but the self-organizing capabilities of the CBOs sustain the RWSS in Punjab. CBO face the challenges from some community members in respect to unwillingness to get water connections and pay charges. While, others with water connections are unwilling to pay. These are some of the challenges in the O&M of RWSS and reasons for the CBOs financial deficit which, however, are being covered through philanthropic donations, a predominant local value.

According to Naderhan, et al. (2016) self-governance in RWSS is a collective action approach from the community and executing agency which required 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 collective 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.

Moriarty et al. (2013) stated that in RWSS expenditure for repair and maintenance, staff salaries are met from household receipts and donations by the water user association. Further it was explained by Kinyua (2015) that self-organization, leadership, record-keeping transparency, frequent communication and information sharing, and a strong commitment to welfare are some of the factors that encourage CBO and water user cooperation. The collective process and institutional compliance in operational RWSS exemplify community organization competencies, transparency, trust, and commitment, all of which foster philanthropy and resource generation within the community.

According to a study by Tadesse et al. (2013), community organisations' self-organizing capacities, service motivation, and water quality were the major factors in collaborative compliance with institutions in the action situation. Moriarty et al. (2013) also stated that community management capacity establishes financial resource generation, which is dependent on community trust, water users' committee transparency, and continuous communication. According to the study, self-organizing competencies and financial resources are a major challenge in RWSS O&M, rendering it inoperable. CBOs seek financial support from local philanthropists rather than relying on user payments, which are limited due to

inadequate water connections and the lack of a mandatory RWS connection (Whaley & Cleaver, 2017).

The satisfaction of user participation is significant in the sustainability of RWSS (Daluwatte, 2018). The satisfaction of users depends on the quality, adequacy, and reliability of water supply schemes ((Daud et al., 2017). The sense of ownership is also related to the satisfaction of users of the community drinking water if it is competing with the needs and expectations of community members (Binder, 2008). Water user's satisfaction is derived from quality and adequacy. However, proper functioning of CBO also adds value and ensures the satisfaction of the community (Mekuriaw & Gurmessa, 2020).

Research Methodology

The study was carried out in three districts of Gujranwala division of Punjab. The Districts for the study selected purposively since they were have the more RWSS as compared to other districts. It was a cross-sectional study that employed a quantitative research approach to collect the data from the users of RWSS. A multistage random sampling technique was adopted. Therefore, it was considered appropriate to have a representative sample by using scientific techniques. The six functional RWSS schemes were randomly selected from the Gujranwala division. Keeping in view the objectives of the study, an interview schedule was structured to collect data from the water users. For the process of data collection, researchers visited the houses of the respondents after prior consultation with the community key people. Data was entered, summarized, and analyzed using SPSS version 22. A linear regression test was applied to assess the impact of CBOs functioning as an independent variable on the satisfaction of water users as a dependent variable.

Results

For the current study different indicators were established to assess the performance of the CBOs.

Table 1 revealed in the study that majority of the respondents (A=49.1%, SA=25.6%) thought that CBOs were functioning adequately and actively. Another indicator was whether CBO was managing record system properly or not, it was identified that most of the respondents were agreed with the statement (A=41.4%, SA=28.7%). Study also depicted that 23.3% respondents were agree and 14.4% strongly agree that CBOs had the arranged skilled operators to operate the RWSS in professional manner. However data also elucidated that majority of the respondents (D=50.3%, DS=8.3%) were of the view that CBOs had not established any formal rules to operate water supply schemes. Majority of the respondents thought that CBOs were properly collecting water tariff (A=48.6%, SA=17.8%).

Table 1

Functioning Of Community Based Organizations (CBOs)

	Items	SA (%)	A (%)	N (%)	D (%)	SD (%)	Mean	Std.Dev
1.	Functioning of CBO is adequate	25.6	49.1	4.3	17.5	3.4	2.24	1.12
2.	Record keeping	28.7	41.4	4.6	20.4	4.9	2.31	1.22
3.	Skilled Operators	14.4	23.3	2.6	40.2	19.5	3.27	1.38
4.	Availability of Rules	2.3	31.0	8.0	50.3	8.3	3.01	1.08
5.	Water Tariff Collection	17.8	48.6	2.6	25.3	5.7	2.02	1.08

Note: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD= Strongly Disagree

Table 2 depicts the satisfaction level of respondents with RWSS which further leads towards its sustainability. Due to the performance of CBOs respondents had high level of satisfaction with the quality of water (A=48%, SA=20.1%). Respondents were also asked about the adequacy of the water to meet their needs, it was expressed by 39.1% of the respondents that water provided by the RWSS was adequate to meet their needs, while 22.1% respondents were strongly agreed. At the same time 35.6% respondents were satisfied with the working hours of the schemes and 26.1% strongly satisfied. A huge majority of respondents were quite satisfied with the performance of CBOs to sustain the water supply schemes (A=55.7%, SA=22.7%).

Table 2

Satisfaction of Water Users

	Items	SA (%)	A (%)	N (%)	D (%)	SD (%)	Mean	Std.Dev
1.	Quality of water for day-to-day use	20.1	48.0	5.7	20.1	6.1	2.43	1.19
2.	Adequacy/quantity of water to cover the needs	22.1	39.1	2.0	25.6	11.2	2.64	1.36
3.	Daily working hours RWSS	26.1	35.6	2.6	31.3	4.3	2.52	1.28
4.	Performance of CBO	22.7	55.7	6.3	11.8	3.4	2.17	1.02

Note: SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD= Strongly Disagree

Table 3 shows that the impact of CBO working on sustainability of rural water supply schemes. The R^2 value of 0.44 indicated that the predictor variable explained 44% variance in the outcome variable with F (1,346 = 150.07, p<.001. the findings revealed that CBO participation positively predicted improvement in sustainability of rural water supply schemes (B=.66 , p<.001).

Table 3

Regression coefficient of CBO Functioning on sustainability of water supply schemes

	B	β	SE	Sig
Constant	0.44		0.13	0.001
CBO Functioning	0.78	0.66	0.05	0.000
R^2	0.44			

Note: N=348: P<.001

Discussion & Conclusion

The current study was conducted to evaluate the role of CBOs participation in the sustainability of rural water supply schemes. The study concluded that CBO was operational and responsible for the operation and maintenance of RWSS in the study area (Waheed et al., 2021; Aslam et al., 2016). Furthermore, it was determined that the CBO's record-keeping and collection of water tariffs from water users were adequate (Kativhu, 2016). The majority of community members polled were satisfied with the CBO's performance in providing clean drinking water through RWSS (Mah, 2016).

The findings of the current study are consistent with Aslam (2013) and Bhandari and Grant (2007), who found that proper functioning of water user committee member satisfies the community. This study supports Yalegama et al. (2016)'s findings that if a CBO manages daily operations and services properly, the CBO would be able to manage RWSS. It is the reason for RWSS's functionality and long-term viability. On the other hand, RWSS would fall apart in days if the community did not participate in its daily management (Waheed et aal., 2021). Yalegama et al. (2016) also claimed that active water user committee members will ensure participation and would be interested in financial contributions, design and planning, and monitoring (Dhakal et al., 2018; Ademiluyi & Odugbesan, 2008). Study concluded that CBOs at community level were performing their role adequately to ensure sustainability of water supply schemes. It was also indicated that water provided through these schemes was of good quality and adequate to meet community people needs. All these factors contributed towards sustainability. It was also concluded that CBOs participation was the initial, major and significant source for availability of quality water and sustainability of schemes.

The research recommends that strengthening of CBO will enhance the sustainability of RWSS. In addition, CBO participation should be done effectively at all stages to make it functional and sustainable in a better way. Technical training should be launched to enhance the capacity building of CBOs, which will enhance sustainability.

Future research on a study of philanthropic behaviour and collective facility self-governance require attention. Further a collective action approach may also be studied with the perspectives of stakeholders.

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Muhammad Alam is affiliated with Department of Social Work, University of the Punjab, Lahore