**SPCRD GLOBAL
PUBLISHING**
Sustainable Solutions

RAMSS Review of Applied Management
and Social Sciences

Journal homepage: <http://ramss.spcrd.org>

ISSN (Print): 2708-2024

ISSN (Online): 2708-3640

Community-Based Management Strategies in Sustainability of Rural Water Supply Schemes

Uzma Aashiq ^a, Aliya Khalid ^b, Muhammad Alam ^c, Syed Salman Hassan ^d

^a Assistant Professor, Department of Social Work, University of Sargodha, Sargodha, Pakistan

^b Assistant Professor, Department of Social Work, University of the Punjab, Pakistan.

^c PhD Scholar, Department of Social work, University of the Punjab, Lahore, Pakistan

^d Deputy Director ORIC, Virtual University of Pakistan.

Email: drsalman1826@gmail.com

ARTICLE DETAILS	ABSTRACT
History: Accepted 06 Sep 2020 Available Online 30 Sep 2020	<p><i>The sustainability of Rural Water Supply Schemes (RWSS), managed by communities, is a major concern in the developing world. A sustainable RWSS delivers safe and sufficient drinking water for a longer period to rural people. Community management was viewed as an accepted model that leads to sustainability, even though community management had difficulties and constraints in sustainability of RWSS due to social, technical, institutional and financial constraints. This paper reviews the sustainability factors of community managed RWSS. There is a need to take multi-stakeholder approach, a demand driven and community led approach, which ties these stakeholders like government, community and non-governmental sector for the effectiveness and sustainability of drinking water services. The synthesis evidenced that community management needs modifications, in terms of external factors, like, institutional support that include financial and technical support, trainings and administrative assistance to make RWSS sustainable. The community, like participation in all phases of planning, implementation, operation & maintenance, water tariff, sense of ownership, transparency, leadership and management are essential for the sustainability of RWSS. The participation by the community members in RWSS plays positive role for its sustainability. To conclude, analysis also highlighted commitment to community management should be pragmatic and rational. The scaling up of community management is an effective and efficient model to address the issues of sustainability in RWSS.</i></p>
Keywords: Community-Based Management, Rural Water Supply Schemes, Sustainability, Stakeholders	
JEL Classification: J53, Q56	
DOI: 10.47067/ramss.v3i2.63	

© 2020 The authors. Published by SPCRD Global Publishing. This is an open access article under the Creative Commons Attribution-NonCommercial 4.0

Corresponding author's email address: drsalman1826@gmail.com

1. Introduction

Globally 2.1 billion people do not have access to safely managed drinking water services (World Health Organization, 2017). The significant majority of the population, which has lack of

clean drinking water, lives in rural areas of the least developed countries (Chumbula & Massawe, 2018). In Pakistan, drinking water sector is ignored; as only less than 20 percent water is safe for drinking for inhabitants (Daud et al., 2017).

Many developing countries, including Pakistan, are facing appalling state of water supply in terms of impracticability, ineffectiveness and the lack of local involvement. The needs and expectations of local communities and government policies & services are wide-ranging (Andres et al., 2018).

Access and shortage to safely managed drinking water are the most important challenges for survival of Pakistanis. Major portion of population in Punjab, which has no access to safe drinking water, lives in rural areas of the Punjab province and about 35% of RWS schemes are non-functional; which lead to poor access to safe drinking water in rural sector (Government of the Punjab, 2015).

In developing countries, a lot of water supply schemes failed due to poor management by the communities, lack of community participation, poor water quality, and increased disputes (Rural Water Supply Network, 2010); lack of finance, lack of frequent support (Binder, 2008) and service breakdowns of water supply systems (Behailu, Hukka, & Katko, 2017). In Punjab, about 80%-sources of WSS are unreliable for water intake and 35% of the current rural water supply schemes are either non-functional or abandoned (Government of the Punjab, 2015).

Sustainability of a Rural Water Supply Scheme (RWSS) is related to its functioning over a prolonged period of time (Sara & Katz, 2004). A sustainable RWSS is capable of delivering safe and sufficient drinking water, based on participation of main stakeholders, including local community (Dhakal, Dahal, & Neupane, 2018), water user's committee (Adaka and Mugambi, 2018) and management units at institutional level (Dhakal, Dahal, & Neupane, 2018).

Stakeholder's participation has been an effective approach to increase access to safe water in several countries (Megdal, Eden, & Shamir, 2017; Usadolo & Caldwell, 2016). In addition, role of community management in ownership, cost recovery for operation and maintenance, selection of type of technology and buying spare-parts are vital for the sustainability of RWSS (Marks et al., 2018; Beyene, 2012).

Consequently, in order to meet the challenges of safe drinking water, a modification in water supply management system is needed from the perspective of stakeholders (Porto, Khatri, & Vairavamoorthy, 2007).

The community-based water project is a unique rural water supply approach where local people are supported to undertake all responsibilities of the project, from initiation through designing to implementation and management continuing. Community management approach for rural water supply projects is viewed as a sound concept that leads to sustainability when communities are empowered to own, manage and make decisions regarding their own water projects; rural water supply sustainability continues to remain a challenge in most developing countries. Community managed rural water projects left on their own are unable to expand access or replace assets and need regular support on functionality issues, such as, operation and maintenance. This also means that Pakistan Vision 2030 and Sustainable Development Goals (SDG) targets to

ensure water availability and universal access to all, by 2030, will not be feasible unless factors influencing sustainability of community managed rural water supply projects in this region are unearthed and addressed. In addition, investment of financial resources in rural water sources in the country will continue to be lost due to unsustainable water projects. Other economic and health benefits resulting from better health, reduced mortality and morbidity coupled with a healthy lifestyle due to poverty reduction activities, rather than trekking in search of water, will remain unattainable unless rural community-run water supply projects in are not addressed.

The research paper focuses on the factors of sustainability of water supply schemes. It also studied the participation of community and institutional actors in sustainability of water supply schemes. By studying factors that affect the sustainability of community-based rural water supply projects, policy makers and communities will be aware of actionable strategies that will bring about positive change in rural areas through improved community management of rural water supplies.

2. Literature Review

Stakeholders have agreements and biases on operation of water supply services (Aslam, Adil, Mirza, & Frigon, 2016). This is one of the reasons that stakeholders must put effort and work collectively to address the gaps in policy for better delivery in water services (Chukwuma, 2018). Consequently, there is a necessity to take multi-stakeholder approach which ties these stakeholders like government, community and non-governmental sector for the effectiveness and sustainability of drinking water services (Landreth, 2015). The multi-stakeholder is demand driven and community led approach and government has to act accordingly on this approach to sustain WSS. Moreover, the governments must pursue a mechanism which enable and incentivize beneficiaries and also mobilize political will for all actors involved in RWSS (Landreth, 2015).

Community water projects that focus on day to day operations of the water schemes with minimal capital maintenance or system expansion may face sustainability challenge, sustainable water supply development constraint factors to include political factors, financial factors, institutional factors and technical factors. It was found by Adaka & Mugambi (2018) that where enhanced functionality occurred, it was due to a responsible O&M recovery mechanism and a working revenue payment system (Adaka & Mugambi, 2018).

In developing countries, due to failure of top down approach, community participation took its place as bottom-up approach as it enhanced the sense of ownership among members (Konde, 2016). Moreover, community participation is essential to outline the issues, problems and needs of local community as without their participation it is not possible to identify the same. Community participation is essential for sustainable RWSS from planning to operation and maintenance phase (Dhakal, Dahal, and Neupane, 2018).

Administrative aspects are crucial for sustainable RWSS to make sure the efficiency of scheme with the passage of time and at effective and reasonable cost (Dhakal, Dahal, & Neupane, 2018). Rural communities are operating and maintaining the RWSS without administrative, technical support and backup from the Government (Punjab Drinking Water Policy, 2011). In addition, there is deficiency in mechanism to rehabilitate and extend RWS service after the passage of the designed life of the scheme. Abdullahi & Abdu (2018) depicted that continuous support to rural communities from the institution for sustainability of water supply is needed. Further collaborative process in the form of policy, legal framework between communities and Government is the need of the hour to develop

a sustainable WSS (Musonda, 2009; Ademiluyi & Odugbesan, 2008).

Ignorance and non-participation of local community members lead to non-functioning of water supply system therefore; there must be a management committee that manages water supply systems for delivery of safe drinking water for a longer period (Adaka & Mugambi, 2018). In addition, effective water user committee was indispensable to ensure the efficiency of RWS system to ensure the efficiency over time (Dhakal, Dahal, & Neupane, 2018). Furthermore, strengthening of community-based water groups through technical skills and provision of spare-parts for their operations played significant role in water management (Ngile, 2015).

In addition, sustainability of RWS systems was also significantly influenced by capability of operators (Masduqi, Endah, Soedjono, & Hadi, 2010). Furthermore, training of community members, development of policy documents, strategy guidelines, and standards can be beneficial in dealing with problems that influence community from accessing adequate and clean water (Dhakal, Dahal, & Neupane, 2018).

Financial factors such as the capacity to sustain the cost of maintenance and capacity to pay for services are indispensable to sustain the RWSS (Musonda, 2009). Furthermore, lack of project maintenance, setting of water prices, and absence of payment receipt for the service was affecting the sustainability of Water project (Chumbula, 2016). Water supply sector was also facing the challenges of financial constraints (Ngile, 2015) unwillingness to pay (Panwar & Antil, 2015) and aging of water supply pipelines and infrastructure are major issues in water supply services as community do not have adequate financial resources like collection of revenue to replace and repair the infrastructure (Panwar & Antil, 2015).

In developing countries, Community Management (CM) is a primary and leading idea for the implementation of projects in water supply sector (Schouten & Moriarty, 2003). Chowns (2015) stated that reforms were executed in state-run RWSS with replacement of decentralized community management in 1990s with hope to improve sustainability at local and district level.

Water sector reforms in developing countries tracked the implementation of the CM approach to strengthen the water systems and service delivery (Opare, 2011). At the beginning CM was considered as an alternative to the fiasco of RWS service while CM had difficulties and constraints in sustainability of RWSS due to social, technical, institutional and financial constraints (Harvey & Reed, 2006). Similarly, CM was also overwhelmed by internal differences, lack of technical skills, and insufficient administrative expertise (Opare, 2011).

The CM Model places a plentiful responsibility on the community as a one of the main stakeholders which consequently made poor financial & technical performance of community. Due to which community management was weak in maintenance, repairs, non-collection of funds and savings. Therefore, alternative framework for sustainable RWSS needed to tackle the failures of community management (Chowns, 2015).

The fusion ratifies the proposition that community management needs modifications, in terms of institutional support that include financial and technical support, trainings and administrative advice to make RWSS sustainable (Schouten & Moriarty, 2003; Harvey & Reed, 2006). Communities performed better with institutional support in WSS. Scaling up of community

management model address the sustainability and coverage within the such framework (water aid 2001; Atnafe, 2005)

Baumann (2006) characterized this as CM to “community management plus” in which author explained that sustainability as well as scalability can only be attained if community members as a stakeholder gets appropriate institutional support as a plus to community management. The author further explained that scale-up of CM needs attention of community with the enabling environment, policies, institutional actors, who support and build capacities of community members.

The CM is an established phenomenon in drinking water supply schemes which plays vital role to sustain the water supply schemes in India. Further the CM model in developing countries like India, should now adjust to meet the policy demand and with ever growing technical sophistication with the need of hour. Furthermore, executing agencies must take proper responsibility in the context of CM to provide support to functional service delivery (Hutchings et al., 2017). While the concept of co-production is more suitable for the definition of types of service provision that are required, such as community management plus, in the sense of greater focus on extra-community aspects of Community management. Finally, even outside India, such ideas would also argue that they are normally relevant, as they stress more specifically the role of governments and other supporting agencies in the delivery of services.

Hutching (2018) elucidated that the modes of service delivery practiced in India under the guise of community management can be more usefully referred to as co-production which is the collective responsibility of communities and supporting agencies.

Aasim et al. (2016) studied that in Punjab, empowerment of local people in community management increase the ownership of water supply schemes which sustain the water supply schemes. Further, lack of support and interest of the institutional actors dissatisfied the community members in practices which make the water supply scheme dysfunctional.

Scholarly literature had noted that sustainability of water projects without active participation of stakeholders was not possible (Chukwuma, 2018; Kativhu, 2016).

3. Discussion

The community-based water project is a unique rural water supply approach where local people are supported to undertake all responsibilities of the project, from initiation through designing to implementation and ongoing management. The former literature obtained from the secondary sources elaborated that many community managed water supply schemes have failed due to poor community management, lack of community participation, lack of institutional support in administration and technical training to the CBOs, lack of finances, absence of functional CBOs poor quality of water, non-collection of funds and poor operation & maintenance.

There is a need to adopt a strategy which bonds the water supply schemes stakeholders effectively to sustain the drinking water projects. Therefore, it is the need of the hour to be more pragmatic towards the community management model, which needs modifications to sustain the water supply schemes. The scalability of community management or community management plus model can attain the required results of sustainability in water supply schemes at rural level. In these community management approaches, community members as a stakeholder gets appropriate

institutional support as a plus to community management. scale-up of CM needs attention of community with the enabling environment, policies, institutional actors, who support and build capacities of community members. Moreover, within this context community sense of ownership would enhance. The scaling up of community management is an effective and efficient model to address the issues of sustainability in RWSS.

4. Conclusion

Community management (CM) for the implementation of water supply schemes is a central and leading concept. The successful and sustainable water supply schemes are driven by effective community management with institutional stakeholder. The literature review of studies determined that CM can be effective and sustainable if it is modified as an institutional support framework for the community in water supply services. Therefore, to bring success in community managed RWSS, scaling up community management is needed to empower community in the operation, maintenance and management to work in partnership with governments and other stakeholders for sustainable RWSS. This supports the assumption that conventional community management methods are no longer enough to sustain the water supply schemes and that community management needs a long-term support with efficient management.

The scaling-up community management strengthened to make sure that water services managed by the community are functioning properly with making it sustainable with suitable institutional support. CM is an appropriate model for scaled-up service provision in rural areas. In conclusion, the analysis highlights that a community management responsibility for rural water supply should be fully pragmatic and realistic.

With the worldwide growth of personal and public finances, properly financed government or private sector models may be feasible, but scaling up community management model is likely to remain a suitable and successful delivery model. It has been recognized that executing agency as a stakeholder needs to play wide ranging roles in efficient manners with stakeholders with a continuous process and lasting commitment and support.

The study recommended that the executing agency must ensure the participation of all stakeholders in all phases of RWSS. The community participation should be done effectively at all stages to make it functional and sustainable in better way. Further, institutional support in operation & maintenance enhances capacity building of community-based organizations (CBOs). The executing agency should give administrative and technical training to the CBOs to address disputes or other technical problem and to maintain a functional and enduring water supply scheme. The executing agency should also provide the CBOs with financial assistance for substantial repairs requiring high reconstruction costs as some communities have no capacity to repair major failure of water components. The financial assistance would eventually lead to sustainability of water facilities.

References

- Aasim, M., Mahmood, B., & Sohail, M. M. (2016). Sociological Analysis of Community Participation in Sustainable Water Supply in Rural Areas of Punjab, Pakistan. *Mediterranean Journal of Social Sciences*, 7(2 S1), 448-448.
- Abdullahi, A., & Abdu, A. (2018). Household Water Conditions in Gombe: A Profile of Water Scarcity in Nassarawo, Palliative and Mitigation Measures. *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)*, 43(1), 227-240.

- Adaka, V., & Mugambi, M. (2018). Factors influencing sustainability of community managed rural water supply projects in pastoralist areas of Kenya. A case of Merti sub county, Isiolo county. *Journal of Developing Country Studies*, 3(1), 16-40.
- Ademiluyi, I. A., & Odugbesan, J. A. (2008). Sustainability and impact of community water supply and sanitation programmes in Nigeria: An overview. *African Journal of Agricultural Research*, 3(12), 811-817.
- Andres, L., Chellaraj, G., Gupta, B. D., Grabinsky, J., & Joseph, G. (2018). Why are so many water points in Nigeria non-functional? An empirical analysis of contributing factors.
- Aslam, M. S., Adil, M., Mirza, M. S., & Frigon, D. (2016). Sustainable community-based drinking water systems in developing countries: stakeholder perspectives. *Journal of Water Supply: Research and Technology-AQUA*, jws2016088.
- Baumann, E. (2006). Do operation and maintenance pay?. *Waterlines*, 25(1), 10-12.
- Behailu, B. M., Hukka, J. J., & Katko, T. S. (2017). Service Failures of Rural Water Supply Systems in Ethiopia and Their Policy Implications. *Public Works Management & Policy*, 22(2), 179-196.
- Beyene, H. A. (2012). Factors Affecting the Sustainability of Rural Water Supply Systems: The Case of Mecha Woreda, Amhara Region, Ethiopia (Doctoral dissertation, Cornell University).
- Binder, (2008). User Satisfaction and Sustainability of Drinking Water Schemes in Rural Communities of Nepal.
- Chowns, E. (2015). Is community management an efficient and effective model of public service delivery? Lessons from the rural water supply sector in Malawi. *Public Administration and Development*, 35(4), 263-276.
- Chukwuma Obeta, M. (2018). Rural water supply in Nigeria: policy gaps and future directions. *Water Policy*, 20(3), 597-616.
- Chumbula, J. J. (2016). Sustainability of water projects: a case of selected projects in Iringa District, Tanzania (Doctoral dissertation, Sokoine University of Agriculture).
- Chumbula, J. J., & Massawe, F. A. (2018). The role of local institutions in the creation of an enabling environment for water project sustainability in Iringa District, Tanzania. *Environmental & Socio-economic Studies*, 6(4), 1-10.
- Daud, M. K., Nafees, M., Ali, S., Rizwan, M., Bajwa, R. A., Shakoore, M. B., ... & Malook, I. (2017). Drinking Water Quality Status and Contamination in Pakistan. *BioMed Research International*, 2017.
- Dhakal, D. P., Dahal, K. R., & Neupane, M. (2018). Sustainable Community Water Supply System with Special Reference to Nepal. *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)*, 45(1), 108-119.
- Government of the Punjab. (2015). Punjab Sector Development Plan 2014-2024: Drinking Water, Sanitation and Hygiene. Retrieved from <http://pnd.punjab.gov.pk/system/files/Punjab%20WASH%20Sector%20Development%20Plan%202014-24.pdf>
- Harvey, P. A., & Reed, R. A. (2006). Community-managed water supplies in Africa: sustainable or dispensable?. *Community Development Journal*, 42(3), 365-378.
- Hutchings, P. (2018). Community management or coproduction? The role of state and citizens in rural water service delivery in India.
- Hutchings, P., Franceys, R., Mekala, S., Smits, S., & James, A. J. (2017). Revisiting the history, concepts and typologies of community management for rural drinking water supply in India. *International Journal of Water Resources Development*, 33(1), 152-169.
- Kativhu, T. (2016). An analysis of sustainability of communally-managed rural water supply systems in Zimbabwe.

- Konde, E. K. (2016). Factors Influencing the Sustainability of rural water projects: a case of kalongoni water project in kilifi county, Kenya.
- Landreth, S. (2015). Achieving Universal Access to Water and Sanitation Services: The Role of Political Will in Implementation Practices, a Study of Pakistan and India.
- Marks, S. J., Kumpel, E., Guo, J., Bartram, J., & Davis, J. (2018). Pathways to sustainability: a fuzzy-set qualitative comparative analysis of rural water supply programs. *Journal of Cleaner Production*, 205, 789-798.
- Masduqi, A., Endah, N., Soedjono, E. S., & Hadi, W. (2010). Structural equation modeling for assessing of the sustainability of rural water supply systems. *Water Science and Technology: Water Supply*, 10(5), 815-823.
- Megdal, S. B., Eden, S., & Shamir, E. (2017). Water governance, stakeholder engagement, and sustainable water resources management.
- Musonda, K. (2009). Issues regarding sustainability of rural water supply in Zambia (Doctoral dissertation).
- Ngile, M. R. (2015). Assessment of Stakeholder Participation in Water Resources Management in Machakos Sub-County, Machakos County, Kenya (Doctoral dissertation, Kenyatta University).
- Opare, S. (2011). Sustaining water supply through a phased community management approach: lessons from Ghana's "oats" water supply scheme. *Environment, Development and sustainability*, 13, 1021-1042.
- Panwar, A. M., & Antil, M. S. (2015) Issues, Challenges and Prospects of Water Supply in Urban India. Google Scholar.
- Porto, M., Khatri, K., & Vairavamoorthy, K. (2007, June). Challenges for urban water supply and sanitation in the developing countries. In Proceedings of the International Symposium "Water for a Changing World Developing Local Knowledge and Capacity", Alaerts GJ, Dickinson NL (eds.), Delft, The Netherlands.
- Punjab drinking water policy (2011). <https://hudphed.punjab.gov.pk/system/files/1Punjab%20Drinking%20Water%20Policy%202011.pdf>
- Rural Water Supply Network. (2010). Sustainable Rural Water Supplies. Rural Water Supply Network, St. Gallen. 7pp.
- Sara, J., & Katz, T. (2004). Making rural water supply sustainable. World Bank (WB), Water and Sanitation Program, Washington, DC.
- Schouten, T., & Moriarty, P. (2004). Scaling up the community management of rural water supply. *Waterlines*, 23(2), 2-4.
- Schouten, T., Moriarty, P., & Postma, L. (2003). Scaling up community management.
- United Nation (2018). Sustainable Development Goal 6: Synthesis Report on Water and Sanitation.
- Usadolo, S. E., & Caldwell, M. (2016). A stakeholder approach to community participation in a rural development project. *Sage Open*, 6(1), 2158244016638132.
- World Health Organization, 2017. Safely Managed Drinking Water – Thematic Report on Drinking Water. Geneva, Switzerland.