DT Global

Rural Water Clustering

Case of Community-Based Water Supply Organisations in Tanzania

Introduction

The Clustering in Tanzanian Act (URT 2019) defines "clustering" as the merging of two or more water authorities or community organizations into one water authority or community organization to achieve commercial viability, efficiency, and economies of scale for water supply and sanitation services. This approach, sometimes referred to as aggregation, has been used in other rural development contexts. The goal of the approach is the economic sustainability of water project management (Lockwood and Smits 2011, WaterAid 2018, WB 2017).

Given the Government of Tanzania's decision to move towards a clustering approach, it is important to understand how to implement clustering to attract professional service providers, consolidate diverse communities and systems, and improve efficiency. Based on a global literature review and research of Community-Based Water Supply Organisations (CBWSO) in Tanzania, this brief proposes best practices for implementing clustering of community water points in Tanzania and beyond.

Key Takeaways

- The Government of Tanzania, and the water, sanitation, and hygiene (WASH) sector globally, is shifting water point management models from full community ownership to more professionalized service delivery, with clustering water systems as one modality to increase economies of scale and improve sustainability.
- Under clustering modalities, governments must strike a balance between instilling a sense of project ownership with each community and incorporating professional inputs throughout the project.
- There is no one size fits all for clustering village water supply. Underlying conditions of respective communities and projects should dictate management models.

Context and Background on Clustering

As of March 2021, the Government of Tanzania estimated that 72.3% of Tanzania's rural population had access to drinking water while 86% of Tanzania's urban population had access to drinking water (an increase of 2.2% and 2% since March 2020 for rural and urban respectively) (Budgetary speech 2021/22). Despite the increased coverage, project sustainability has been a challenge, with reports that up to 20% of water points fail within the first year of operation (Joseph et al., 2019).

Joseph et al. (2019) have identified various factors that contribute to water point failure in Tanzania, including the observation that water point management by village committees has a much higher likelihood of failure than those managed by private operators or the water authority. In Tanzania, over 70% of rural projects are managed by village committees, as encouraged under the Water Sector Development Programme Phase 1. In addition, the quality and type of management and oversight mattered considerably more in the short- and medium- term. Because the technology deployed in most rural projects requires close and frequent monitoring and minor repairs, having the right skills in a management team is essential to ensure sustainability.

As consequence of these findings, the Government of Tanzania has recently shifted away from volunteer user management committees to professionalized water systems management (URT 2019). Professionalizing water schemes requires figuring out how to improve efficiencies of existing management arrangements while also attracting external parties (e.g., the private sector) to serve this function. One solution is to cluster water schemes to create economies of scale. Past studies on the potential for clustering recommended that criteria include geographical proximity, access to water resources, potential viability (RODECO-Dorsch 2011, WaterAid 2018, WB 2017). The studies also provided suggestions for better performance of the clusters.

Tanzania Institutional Framework for Water Service Delivery

In 1998, the Tanzanian government legally established urban Water Supply and Sanitation Authorities (WSSAs) as autonomous government institutions overseeing urban services. For rural services, the national water policy (MWLD 2002) outlines four components for success: social, economic, environmental and sustainability. Under the sustainability component, the government established Community-Owned Water Supply Organizations (COWSOs) to ensure community participation for management of rural water supply.

Between 2015 and 2020, the Tanzanian water sector underwent several reforms with the objective of improving institutional management and enhancing efficiency of water supply and sanitation. These reforms have included: policy reviews (still ongoing), enactment of the Water Supply and Sanitation Act No.5 in 2019 with new regulations, clustering of District and Townships Urban Utilities under Regional Water and Sanitation Utilities, the creation of Rural Water Supply and Sanitation Agency (RUWASA), transformation of COWSOs to CBWSOs, and researching recommendations (e.g., clustering) for commercial viability improvement of WSSAs and CBWSOs (MoW 2019). COWSOs were transformed to CBWSOs (URT 2019) to enhance sustainability of rural water supply and sanitation services through public involvement and private sector participation. Under the Act (URT 2019), the service authority for sustaining rural water supply services includes the Ministry of Water, RUWASA, and community water committees, while the service provider for rural areas is CBWSOs. The current institutional framework for rural water supply management is illustrated in Figure 1.

As an alternative to the CBWSO model, the government has most recently recommended adoption of the clustering concept. In 2020, this recommendation was formalized in the Tanzanian government water scheme guiding documents. Prior to its formalization in national guidance documents, various "clustering" efforts were tried in Tanzania. This DT Global research reviews these efforts.

Figure 1: The rural water supply management structure

DT Global Study on Clustering Initiatives in Tanzania

Mode of study and participants

Using the competency model approach—which ranks governance, technical, financial management, and operational domains to reflect their level of operationalisation in a respective COWSO—the DT Global study evaluated COWSOs in two ways:

- The study analysed data on COWSO operation collected by Oikos (a Tanzanian natural resource management NGO) from 2016 to 2018 in two districts: Singida and Karatu.
- The study undertook interviews with District Managers and CBWSOs for 11 clustered examples across regions of Dodoma, Iringa, Kilimanjaro, Morogoro, Njombe, Rukwa, and Singida, during a four-month period between November 23, 2020, and February 23, 2021. The consultant prepared two kinds of open-ended questionnaires to gather feedback from District Managers and operators of CBWSOs on the management and operations of clustered CBWSOs. The consultant collected responses from 10 District Managers and 17 CBWSOs operators, including technicians, managers, secretary, chairperson, deputy secretary, accountants, and villagers. The study areas represented areas with low, medium, and high coverage of water supply and sanitation services.

Results and Discussion

Karatu Multi village Scheme – Oikos Data

Data from Karatu showed that multi-village COWSOs, namely Kaviwasu, performed better as compared to single-village COWSOs. Less than 15% of COWSOs were fully operational in each domain (Table 1). Kaviwasu was the only multi-village COWSO that was fully operational.

Table 1: Karatu COWSOs competencies in respective domains

Domain	Competency	Score
Governance	Fully Operational Partially Operational Minimally Operational	13% 64% 23%
Technical	Fully Operational Partially Operational Minimally Operational	5% 68% 27%
Financial Management	Fully Operational Partially Operational Minimally Operational	5% 45% 50%
Operational	Fully Operational Partially Operational Minimally Operational	5% 36% 59%

A variety of factors influenced COWSO performance:

- Having varied types of customers had significant positive implications on revenue collection as price rates escalated.
- Multiple sources of income, other than tariffs, was critical for stabilizing a COWSO operations.
- A larger customer base was beneficial in terms of earnings and increased consumption.
- The presence of skilled personnel for essential roles, such as technical repair, maintenance, and financial management, increased the earning and saving potential of COWSOs.
- Stable revenue increased staff satisfaction by ensuring good salary, incentives, reward packages, and conducive working conditions.

Summary of District Managers and CBWSOs Operators Interviews

Most clustering activities began in mid- to late-2020 and remain in the learning phase. The study interviews with District Managers and CBWSOs operators revealed the following:

- Clustering criteria do not account for population size; thus, a cluster of smaller villages doesn't necessarily imply a sufficient population based to achieve economies of scale.
- Private CBWSO operators are limited in number, with several hired from outside the community.
- For the majority of CBWSOs, the decision on cluster composition is based on ease and timely maintenance of water infrastructure, number of households, CCWSO operational challenges, and questions around economies of scale.
- Operational challenges and the nature of projects seem to be key factors influencing whether to cluster; RUWASA is the key player behind most clustering decisions.
- Clustering seems to be progressing well for communities with shared resources, especially when villages are close to each other and when communities have historically good relations.
- A lack of documentation and guidance on clustering modalities—roles and responsibilities of parties, technical and economic implications and modalities, involvement of external parties—inhibits progress.

Lessons Learned and Recommendations for Clustered CBWSOs

Criteria for Clustering

While no specific criteria are followed to determine whether CBWSOs should be clustered, the study revealed potential criteria, outlined in Table 2.

Table 2: Recommended criteria for clustering CBWSOs

Criteria	Descriptions
Common or shared resources or water supply infrastructures	Having a common water resource/infrastructure is a significant basis for combining CBWSOs, as it implies a prior existing relationship between the communities. The desired level of service should be able to be met for all involved communities.

Criteria	Descriptions
Infrastructure/Technology type	An overly sophisticated technology may not be favorable for CBWSOs due to the resulting higher skill level skills required for maintenance and impact on pricing for water. The technology choice also has implications for the skills necessary to manage and appropriately price service delivery.
Income Levels	Relative income is important for guiding tariff setting and reflects the ability of CBWSOs to meet operations and maintenance costs in water service delivery.
Geographic proximity	The geographic proximity of communities sharing a CBWSO is essential for facilitating monitoring and supervision of service delivery. Maximum distances between villages for clustering considerations should be specified.
Population size and number of villages involved	In villages with low population size, it is more economical to form one clustered CBWSO. The more villages involved, the more economical in operation and maintenance, ultimately contributing to low water tariffs.
Sociocultural factors	Similarity in cultural beliefs, practices, and traditions is a key parameter for guaranteeing smooth operation of clustered CBWSOs.
Historical background of project or location	Conducting a background check of an area or a scheme in question may inform the decision to cluster. For example, it could reveal the status of existing relations between nearby communities being considered for forming a cluster and readiness of the community.

Recommendations for Clustering

Though most of the studied CBWSOs are newly established, the study found nine recommendations for clustering:

- Increase investment from RUWASA to CBWSOs to build capacity both technically and financially.
- Set a budget within RUWASA to support CBWSOs, starting with a certain sum for operational expenses (salaries, minor repair and maintenance, supervision, and monitoring) for a certain period so that CBWSOs could have time to draw an income.
- Create standards and manuals by RUWASA to guide operations.
- Conduct additional research to guide clustering options, criteria, driving factors, enabling conditions, working conditions for all involved, potential management options, and best working models.
- Prioritize monitoring, including creating a checklist to evaluate accessibility, acceptability, availability, affordability, and quality and safety.
- Install water meters and bulk meters to be used as water control measures by CBWSOs.

- Increase household and private connections to boost revenues and improve sustainability and stability of CBWSOs moving forward.
- Deploy Water Institute professionals for CBWSOs management. To date, the Tanzanian Water Institute is addressing the human resources gap in water project implementation. Its graduates can support the CBWSOs through applying for individual technician posts, or by registering as private entity (company/ NGO/Trustee). Graduates could also mobilize themselves as a group of professionals available for hire by CBWSOs to operate and maintain projects, with their salaries paid through profit generated. Empowering and involving the Institute could be one way of sustaining the rural sector moving forward.
- Categorise projects based on management model features, including the selection of interested candidates for respective CBWSO management and the allocation of CBWSO management team. Given the rural water supply management structure outlined in Figure 1 above, Table 3 summarizes considerations for determining the right management model for a given water scheme.

Table 3: Guide for selecting CBWSO Management Model

Management Model	Features
Individuals such as Technicians, Accountants, Community Development Officers	Simple scheme, more for public water points, high gender representation, simple technology, funding sources could be limited to water tariffs and charges, zero to partially metered schemes, low or no risk to environment. **Advantages:** Low tariffs, capacity building for young professionals. **Disadvantages:** Fund collection may be insufficient to meet routine repair costs, provide sufficient salaries, and stimulate new investment plans; low profit margin; and unstable market demand.
Company/NGO/Trustee	Complex scheme, more for private connections, low to high gender representation, advanced technology, funding sources other than just water tariffs and charges, fully metered schemes, high risk to environment. **Advantages:** Fund collection may be high enough to meet routine repair cost, provide sufficient salaries, and stimulate new investment plans; higher profit margin; and low effect by market demand variation. **Disadvantages:** higher tariffs.
Group of professionals	Simple to complex scheme, public and private connections, low to high gender representation, simple to advanced technology, partially to fully metered schemes, low to high risk environmentally. **Advantages:** Fund collection may be high enough to meet routine repair cost, provide sufficient salaries, and stimulate new investment plans; high profit margin; and capacity building to young professionals. **Disadvantages:** high tariffs, low to high effect by market demand variation.

Conclusion and Way Forward

Sustainable rural water management is a challenge. Different attempts to increase sustainability include the following: having villagers contribute a percent of capital cost, government taking full ownership and management, engaging foreign investors, and partnering with private operators. Most recently,

professionalization of service delivery has shown promise, including by incorporating private sector principles into community management and/or fully privatizing operation and maintenance of water points. Clustering, as practiced in Tanzania and globally, is one attempt to leverage economies of scale for improved water service delivery by bringing multiple systems together under one professionalized management structure.

In Tanzania, the current research on clustering uncovered some key lessons that can be applied as the global water sector continues to professionalize water service delivery in rural areas:

- Considering the enabling environment that supports clustering management models or helps them to work more effectively is an important part of broader investment in water supply and sanitation sector.
- Securing a stable market/customer base and centralizing management through clustering is important for addressing economic challenges.
- Ensuring operational quality control is an essential parameter that could guarantee a boost of revenue, through incorporation of metered connections and routine water quality monitoring.
- Preparing and communicating operation manuals and guidelines for operators and communities is essential.

Selected Resources

- *Budgetary Speech 2021/22. Minister for Water Speech on Ministry of Water Revenue and Expenditures for the year 2021/22, Parliamentary Sessions, Dodoma.*
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