South Asian Journal of Social Studies and Economics

Volume 22, Issue 1, Page 53-65, 2025; Article no.SAJSSE.128712
ISSN: 2581-821X

Analyzing Challenges and Opportunities of Local Donors for Scaling up Water Supply Solutions in the Rural Areas of Tanzania

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: https://doi.org/10.9734/sajsse/2025/v22i1944

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/128712

Short Research Article

Received: 30/09/2024
Accepted: 01/12/2024
Published: 06/01/2025

ABSTRACT

Donor backed rural water supply sector is crucial for improving public health and enhancing livelihoods. However, despite various donor interventions, scaling up these solutions remains a complex task due to factors. This paper explores the challenges and opportunities local donors face in scaling rural water supply solutions in Tanzania. Theoretical frameworks such as Sustainable Development Theory, Institutional Theory, Community-Based Resource Management (CBRM), Public-Private Partnerships (PPP) offer valuable insights into the practical and conceptual challenges that local donors encounter. This paper explores the challenges and opportunities local

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Cite as: *Ligombi, Nicas C., Frankson Kyando, and Melchizedeck I. Mgeni. 2025. "Analyzing Challenges and Opportunities of Local Donors for Scaling up Water Supply Solutions in the Rural Areas of Tanzania". South Asian Journal of Social Studies and Economics 22 (1):53-65. https://doi.org/10.9734/sajsse/2025/v22i1944.*

donors face in scaling rural water supply solutions in Tanzania. The rural water supply sector is crucial for improving public health and enhancing livelihoods. However, despite various donor interventions, scaling up these solutions remains a complex task due to factors such as financial constraints, political influences, institutional weaknesses, and technological challenges. Theoretical frameworks such as Sustainable Development Theory, Institutional Theory, Community-Based Resource Management (CBRM), Public-Private Partnerships (PPP) offer valuable insights into the practical and conceptual challenges that local donors encounter. Drawing on empirical evidence, the article discusses these challenges and presents recommendations for overcoming them.

Keywords: Local donors; rural water supply; sustainable development; water supply solutions.

1. INTRODUCTION

Access to clean and safe drinking water remains a critical challenge in rural Tanzania, where millions of people continue to face difficulties in obtaining reliable and sustainable water sources. The lack of adequate water infrastructure disproportionately affects rural communities, hindering their ability to access this basic necessity and exacerbating health, economic, and social disparities. The Tanzanian government has acknowledged the urgency of this issue and committed significant resources to increase water coverage, notably through the Rural Water Supply and Sanitation Agency (RUWASA) and related initiatives. These efforts aim to enhance access by constructing new water systems, rehabilitating existing ones, and improving the management of rural water supply schemes. However, the task remains formidable due to complex socio-economic and environmental conditions, such as poverty, geographic remoteness, and climate variability, which further strain available resources (da Silva et al., 2019; Gohari et al., 2013).

Local donors play an indispensable role in augmenting government efforts to address this pressing issue. They contribute not only through financial support but also by providing technical expertise, fostering capacity-building programs, and introducing innovative approaches to water management, donors can facilitate the implementation of resilient and sustainable water systems that are tailored to the specific needs of rural areas, through partnering with communities and government agencies (Musaevich, 2020; Ligombi et al., 2023).

Despite these contributions, scaling up rural water supply solutions faces numerous challenges. Inadequate infrastructure remains a significant barrier, as many communities lack sufficient water systems to meet growing demands. Furthermore, limited capacity at the community level to manage and maintain these systems often results in unsustainable practices and reduced functionality over time. Weak coordination among government entities, private sector actors, and non-governmental organizations further complicates efforts to streamline resources and ensure effective delivery of services.

Nonetheless, these challenges also present opportunities for innovation and partnership. Local donors can play an essential role in driving sustainable water management practices by supporting initiatives that prioritize community engagement, training, and ownership. They can foster the adoption of technologies that improve water efficiency and reliability while reducing costs. Moreover, by strengthening coordination among stakeholders and advocating for policy reforms, donors can help create an enabling environment for the successful implementation of rural water projects.

Ultimately, the role of donors extends beyond mere financial contributions. It encompasses empowering communities to take an active role in the management of water systems, ensuring their long-term sustainability, local donors can significantly impact the realization of universal access to clean and safe drinking water in rural Tanzania through addressing key challenges and leveraging opportunities

2. LITERATURE REVIEW

2.1 Theoretical Literature Review

The following section expands on key theoretical frameworks that inform the management and scaling of rural water supply solutions in Tanzania. Each theory provides a different lens through which the challenges and opportunities faced by local donors can be understood and addressed.

2.1.1 Sustainable development theory

The Sustainable Development Theory, conceptualized by Gro Harlem Brundtland in the 1987 Brundtland Report, introduced the essential concept of sustainable development, which it defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987). This theory has become a cornerstone for understanding and guiding strategies aimed at achieving balanced economic growth, environmental conservation, and social equity, particularly in critical areas such as rural water supply systems.

The Sustainable Development Theory provides an essential framework for addressing the challenges of rural water supply systems, particularly in regions like Tanzania, where water resource management is often hindered by short-term project cycles and limited community capacity (Sweya, 2020). Through integration of sustainability principles, rural water supply projects can transition from being donor-dependent to self-sustaining, enabling communities to take ownership of maintenance and operational tasks. This is especially critical in Tanzania, where a significant proportion of rural water systems fail prematurely due to poor planning for post-project sustainability (Githu, 2022).

A sustainable development approach emphasizes the need for robust and adaptable systems that align with the environmental, economic, and social realities of the target communities. For example, adopting renewable energy technologies, such as solar-powered water pumps, addresses both the environmental and economic dimensions of sustainability (Sonjaya et al*.,* 2024). These systems reduce reliance on non-renewable energy sources and minimize operational costs, making them feasible for long-term community management. Moreover, community-driven maintenance structures, such as water user committees, foster social inclusiveness by involving local stakeholders in decision-making and equipping them with the skills needed for system upkeep (Bellini et al*.,* 2024).

In Tanzania, rural water supply initiatives have historically struggled with sustainability due to limited community engagement during the project planning phase and insufficient capacity-building efforts (Nwokorie, 2023). Sustainable development theory underscores the importance of designing systems that are resilient to external shocks, such as climate-induced droughts and floods, which are increasingly common in East Africa (Birkmann et al*.,* 2022). Resilience-building strategies, including water harvesting technologies and integrated water resource management (IWRM), align with the theory's emphasis on environmental protection and intergenerational equity (Hutete, 2022).

Furthermore, social inclusiveness, as advocated by the Sustainable Development Theory, is particularly relevant for Tanzania's rural water supply efforts. Women and marginalized groups often bear the impact of water scarcity, walking long distances to access water sources (Shah, et al*.,* 2023). Sustainable water systems can alleviate this burden by ensuring equitable access and empowering women through active roles in water governance structures. Economic viability, another key tenet of the theory, involves fostering local entrepreneurship around water services, such as fee-based maintenance models or water kiosks, which can create a sense of ownership and financial sustainability within communities (Akelo, 2023).

The theory also calls for an integrated approach to tackle the multi-dimensional challenges of rural water supply in Tanzania. For instance, incorporating climate-smart technologies, such as drip irrigation systems for agriculture that coexist with water supply projects, ensures a holistic utilization of water resources while minimizing wastage (Fawzy and Shedeed, 2020)**.** Moreover, long-term monitoring and evaluation mechanisms are essential to assess the performance of water systems and adapt to changing circumstances, ensuring their continued relevance and functionality (Butler et al*.,* 2017).

The Sustainable Development Theory provides a critical lens through which rural water supply systems can be designed and managed to meet both present and future needs. For Tanzania, applying this theory involves a shift from short-term, donor-driven projects to community-centered, resilient, and economically viable systems (Lee, 2016). The theory lays a foundation for transformative change in rural water supply efforts, contributing to broader sustainable development goals through addressing environmental challenges, fostering social inclusiveness, and ensuring economic sustainability

2.1.2 Institutional theory

Douglass C. North (1990) laid the foundation for Institutional Theory in his seminal book, Institutions, Institutional Change, and Economic Performance. The theory examines how formal institutions (such as laws and regulations) and informal institutions (such as cultural norms and social practices) shape economic performance. North highlighted that institutions serve as "rules of the game," providing the framework within which human interaction occurs, thereby influencing development outcomes. In the context of rural water supply systems, Institutional Theory offers a critical lens for understanding the role of governance structures, stakeholder coordination, and institutional capacity in scaling sustainable projects.

Institutional Theory is particularly relevant for addressing the challenges associated with rural water supply projects in Tanzania, where institutional weaknesses often undermine the effectiveness of development efforts (Goddard et al*.,* 2016). Weak institutional frameworks can lead to unclear roles and responsibilities among stakeholders, inefficient resource allocation, and a lack of accountability. For example, the overlap in mandates between the Ministry of Water, RUWASA, and local governments frequently results in duplication of efforts or, conversely, gaps in service delivery (Hossain et al*.,* 2016).

Local donors play a pivotal role in addressing these institutional challenges by fostering collaboration and coordination among governmental agencies, NGOs, and private sector actors. Institutional Theory emphasizes the importance of creating strong governance structures that ensure transparency, accountability, and participation in decision-making processes, through these, stakeholders can align their efforts, reduce inefficiencies, and enhance the sustainability of rural water supply systems (Efunniyi et al*.,* 2024).

A central tenet of Institutional Theory is the recognition that governance structures significantly impact project success. In Tanzania, the integration of local communities into water governance frameworks can improve transparency and accountability, while also fostering a sense of ownership among community members (Katomero, 2017). For example, the establishment of Community-Based Water Supply Organizations (CBWSOs) under RUWASA's mandate exemplifies how local governance structures can support sustainable water management (Mathias, 2023). These organizations enable communities to participate in decision-making, monitor service delivery, and contribute to the maintenance of water systems.

Institutional Theory also underscores the need for enforceable regulations and clear operational guidelines to address institutional weaknesses. In Tanzania, the development of comprehensive water sector policies and legal frameworks has been instrumental in providing a roadmap for rural water supply development (Fundi, 2017). However, effective implementation of these policies requires robust institutional capacity and coordination among stakeholders. For instance, partnerships between donors and governmental agencies can help strengthen policy enforcement and ensure alignment with national development priorities (Gulrajani, 2017).

Institutional weaknesses, such as limited capacity for monitoring and evaluation, are a persistent challenge in Tanzania's rural water supply sector (UNICEF, 2021). Institutional Theory emphasizes the importance of building institutional resilience through capacity development, knowledge sharing, and technological innovation. For instance, training programs for local water managers and community representatives can enhance their ability to oversee water systems, ensuring long-term functionality and reducing dependence on external support (Hutchings et al*.,* 2015).

Moreover, fostering inter-institutional collaboration is critical for addressing systemic inefficiencies. Donors can facilitate this by creating platforms for dialogue and coordination, such as joint task forces or multi-stakeholder forums. Such initiatives promote knowledge sharing, reduce fragmentation, and encourage collective problem-solving (Corbetta, 2024).

Transparency and accountability are central to Institutional Theory's framework for sustainable development. In the Tanzanian context, ensuring that water supply projects are managed transparently can enhance trust among stakeholders and reduce corruption, which has historically plagued the water sector. Mechanisms such as public disclosure of project budgets, community audits, and performance-based contracts can help improve accountability and ensure that resources are used effectively (Hope, 2024).

Institutional Theory provides a valuable framework for understanding and addressing the challenges of scaling rural water supply projects in Tanzania. The theory offers practical insights into how institutional weaknesses can be overcome through focusing on governance structures, stakeholder coordination, transparency, and accountability, for local donors, collaboration with governmental agencies, NGOs, and community-based organizations is essential to strengthening institutional frameworks and ensuring the sustainability of water supply systems (Kativhu et al*.,* 2018). As Tanzania continues to pursue its water sector development goals, leveraging Institutional Theory can contribute to more effective and equitable outcomes. Institutional Theory provides a valuable framework for understanding and addressing the challenges of scaling rural water supply projects in Tanzania. By focusing on governance structures, stakeholder coordination, transparency, and accountability, the theory offers practical insights into how institutional weaknesses can be overcome. For local donors, collaboration with governmental agencies, NGOs, and community-based organizations is essential to strengthening institutional frameworks and ensuring the sustainability of water supply systems (Maat et al*,* 2021).

2.1.3 Community-Based resource management (CBRM) theory

Elinor Ostrom's seminal work, Governing the Commons (1990), challenged the conventional "tragedy of the commons" narrative by demonstrating that communities are often better equipped to manage common-pool resources (CPRs), such as water, than external authorities, provided that appropriate governance structures are in place. Ostrom argued that sustainable resource management depends on empowering communities to establish rules, monitor compliance, and resolve conflicts, fostering collective action and a sense of ownership (Ostrom, 1990). Her theory provides a robust framework for examining how Community-Based Resource Management (CBRM) can enhance the sustainability of rural water supply systems in Tanzania.

CBRM is particularly pertinent to rural water supply systems in Tanzania, where a significant proportion of the population relies on community-managed water points. Ostrom's theory underscores the importance of involving communities in the governance of water resources to ensure long-term sustainability. Research has shown that community-based water management is more effective than centralized approaches, particularly in rural areas with limited government capacity (Kativhu et al*.,* 2018). Communities are more likely to adopt sustainable practices and maintain water systems independently of external support through fostering local ownership and responsibility,

In Tanzania, Community-Based Water Supply Organizations (CBWSOs) exemplify the application of CBRM principles. These organizations empower communities to take ownership of water infrastructure, including the operation, maintenance, and financial management of water systems (Kelly et al*.,* 2017). Studies have shown that CBWSOs improve water service reliability by leveraging local knowledge, enhancing accountability, and fostering a sense of community cohesion (Mathias, 2023).

A central tenet of CBRM is the establishment of governance structures that support collective action. Ostrom identified key design principles for effective community resource management, including clearly defined boundaries, participatory decision-making, and effective conflict-resolution mechanisms (Ostrom, 1990). In Tanzania, CBWSOs often serve as governance structures for rural water supply systems. These committees are responsible for overseeing daily operations, collecting user fees, and ensuring the equitable distribution of water resources (Ngunula, 2023).

Capacity-building programs are crucial for equipping these committees with the skills and resources needed to manage water systems effectively. Local donors can play a vital role by providing training on technical maintenance, financial management, and governance best practices. For example, initiatives that train water user groups to develop maintenance schedules and budget for repairs have significantly improved the functionality of water points in Tanzania (Maganga, 2022).

Tanzania has experienced notable successes in community-based water management. CBWSOs, for instance, have demonstrated that rural communities can sustainably manage water infrastructure when supported by appropriate training and resources. Additionally, participatory

approaches have been shown to reduce operational costs and increase system longevity compared to top-down models (Mathias, 2023).

However, challenges persist. In some cases, weak governance structures and limited technical capacity have hindered the effectiveness of community-based management. Furthermore, external factors such as climate change and population growth can strain community resources, highlighting the need for adaptive management strategies (When and Almomani, 2019). To address these challenges, Ostrom's theory advocates for flexible, context-specific solutions that align with the unique needs and capacities of each community.

CBRM encourages local donors in a paradigm shift from top-down, externally driven interventions to participatory, community-driven strategies. This approach aligns with Ostrom's principle that communities are more likely to succeed in resource management when they have ownership, responsibility, and the necessary institutional support (Ostrom, 1990). Donors can support this shift by investing in capacity-building programs, fostering partnerships with local governments, and promoting inclusive decision-making processes. For example, initiatives that integrate gender considerations and involve women in water governance have been shown to enhance equity and improve outcomes (Berthin, 2018).

2.1.4 Public-Private partnership (PPP) theory

John Maynard Keynes in 1936 laid the foundational understanding of the interplay between state intervention and market forces, emphasizing the need for collaboration between public and private entities to drive economic progress during periods of inefficiency. Building upon these principles, Mugarura (2019) advanced the modern framework for Public-Private Partnerships (PPPs), particularly in infrastructure development, highlighting their utility in addressing resource and capability gaps in the public sector. PPP Theory offers a robust mechanism for fostering collaboration between public institutions, private companies, and local communities to deliver scalable and sustainable solutions for water supply systems.

In Tanzania, PPPs have emerged as a pivotal approach for addressing challenges in rural water supply, where public sector limitations often impede large-scale implementation. With government budgets constrained and technical expertise in short supply, partnerships with private entities provide an avenue for bridging financial and technical gaps. Empirical evidence suggests that integrating private sector innovation into water infrastructure projects has led to improved service delivery and reduced operational inefficiencies (Ameyaw et al*.,* 2017). For instance, partnerships with private firms to deploy solar-powered water pumping systems have proven instrumental in lowering energy costs and enhancing the sustainability of rural water projects (Phiri et al*.,* 2023). Similarly, collaborations involving mobile water quality monitoring technologies have enabled real-time data collection and analysis, ensuring safer water for rural populations (Andres et al*.,* 2018).

Donor-supported PPPs have facilitated the development of mobile payment systems for water fees, streamlining revenue collection and minimizing fraud also, integration of private expertise in designing efficient water treatment plants, which has improved water quality standards while minimizing operational costs (Bhojwani et al*,* 2019). These examples highlight how PPPs can address both financial and technical bottlenecks while promoting sustainable development.

While PPPs offer numerous benefits, challenges such as regulatory ambiguities, misaligned incentives, and community resistance can hinder their success. In Tanzania, inconsistencies in legal frameworks and bureaucratic delays have occasionally impeded the implementation of PPPs in rural water supply (Fanzo et al, 2021). To overcome these challenges, PPP Theory advocates for the establishment of clear legal and institutional frameworks that promote transparency, accountability, and equitable resource allocation (Esposito and Dicorato, 2020).

Capacity-building initiatives for public officials and community leaders are also critical for ensuring the successful negotiation and management of PPP agreements. For example, training programs that enhance stakeholders' understanding of contractual obligations and risk management can foster smoother collaborations (Kang et al, 2019).

PPP Theory provides a strategic blueprint to Local contractors for enhancing the scalability and sustainability of rural water supply systems. Local donors can bring together public

institutions, private entities, and communities to align objectives and pool resources through acting as facilitators. Investments in technology, such as solar-powered pumps and digital monitoring tools, can significantly enhance the operational efficiency of water systems while reducing environmental impacts (Lundsgaarde and Keijzer, 2019).

Herath and Herath (2023) noted that PPPs, as conceptualized through the contributions of offer a transformative approach to addressing rural water supply challenges in Tanzania. PPPs create a framework for developing technically sound, financially sustainable, and socially inclusive water systems through leveraging the strengths of the public and private sectors and fostering community involvement. For local donors, embracing PPP principles enables them to contribute to long-term solutions that enhance access to clean and reliable water for underserved communities.

2.2 Empirical Literature Review: Influence of Intellectual Stimulation on Performance

The empirical literature on rural water supply in Tanzania underscores the multifaceted challenges of scaling sustainable water solutions. These challenges are influenced by factors such as donor coordination, institutional capacity, and community involvement, all of which play crucial roles in the success and sustainability of water projects.

Coordination among local donors, government agencies, and NGOs is critical for the effective implementation of water projects. Le Roy and Sévérino (2023) highlights that donor fragmentation often leads to duplicated efforts and inefficiencies. For instance, parallel projects within the same geographical area may compete for limited resources or operate without a cohesive strategy, thereby undermining long-term sustainability. Strengthening coordination mechanisms, such as aligning donor priorities with national water policies like the Water Sector Development Program (WSDP), is essential to maximize impact.

Institutional capacity at both local and national levels is a cornerstone of successful rural water supply initiatives. Ng'ong'ola (2019) found that many rural water supply projects in Tanzania are hindered by weak institutional frameworks, including insufficient staffing, limited technical expertise, and a lack of clear accountability structures. The Regional Water and Sanitation Authorities (RUWASA) face significant staffing shortages and operational inefficiencies, which exacerbate challenges in service delivery. Building institutional capacity through training, recruitment, and provision of resources is therefore a priority for sustaining water systems.

Empirical evidence points to the pivotal role of community engagement in ensuring the sustainability of rural water supply systems. Community-based management approaches, such as the formation of Community-Based Water Supply Organizations (CBWSOs), have proven effective in empowering local communities to take ownership of water infrastructure (Lemmens et al*,* 2017). However, Le Roy and Sévérino (2023) notes that inadequate community training and financial resources often limit the success of these initiatives. Capacity-building programs that enhance the technical skills of water user committees and provide financial tools for maintenance are necessary to address these gaps.

One of the recurring themes in the literature is the issue of maintenance and monitoring. Le Roy and Sévérino (2023) identifies poor maintenance practices and frequent water point breakdowns as major obstacles to the success of rural water projects. These challenges are often exacerbated by a lack of adequate monitoring systems. For example, rural areas frequently lack the technical expertise to diagnose and repair mechanical issues, resulting in prolonged downtimes. Lemmens et al*,* (2017) suggests that introducing remote monitoring technologies, such as mobile-based reporting systems, could significantly improve maintenance efficiency by providing real-time data on water point functionality.

Ensuring the financial sustainability of rural water supply systems remains a significant hurdle. While community involvement has been shown to enhance ownership, it does not always translate into financial self-reliance. Many rural communities in Tanzania struggle to generate sufficient revenue to cover the costs of maintenance and repairs. Lemmens et al*,* (2017) emphasizes the importance of providing access to microfinance solutions and subsidies to support communities in maintaining water infrastructure. Additionally, donor projects should incorporate financial sustainability plans that

include capacity-building for revenue generation and transparent financial management practices. The empirical evidence suggests that scaling rural water solutions in Tanzania requires a holistic approach that integrates donor coordination, institutional capacity-building, community engagement, and financial sustainability. Strengthening partnerships among stakeholders, investing in capacity development, and leveraging technology for maintenance and monitoring are critical steps toward achieving sustainable water supply systems (Rautanen, 2016).

3. RESEARCH METHODOLOGY

The research methodology for this study employed a mixed-methods approach, combining both qualitative and quantitative data collection techniques. This approach allows for a comprehensive understanding of the challenges and opportunities local donors face in scaling rural water supply solutions in Tanzania. The study used surveys, interviews, and document analysis to gather data from local donors, government representatives, community leaders, and key stakeholders in the rural water sector.

3.1 Research Design

This study utilized an explanatory research design, which is suitable for understanding the cause-and-effect relationships between local donors and the success or failure of rural water supply projects in Tanzania. The explanatory design was appropriate for analyzing the factors that influence the scalability and sustainability of water supply interventions.

3.2 Sampling Technique

The study employed purposive sampling to select key informants who are directly involved in rural water supply projects. These include representatives from local donors, the Ministry of Water, RUWASA officials, community leaders, and beneficiaries of water supply projects. A total of 50 respondents were selected, ensuring diversity in terms of gender, age, professional backgrounds, and geographic locations within Tanzania's rural areas.

3.3 Data Collection Methods

- **Surveys**: A structured questionnaire was distributed to 30 local donors and government officials to capture quantitative data on their perspectives regarding the challenges and opportunities in scaling water supply projects. The questionnaire included both closed and open-ended questions to gather both statistical data and qualitative insights.
- **Interviews**: Semi-structured interviews were conducted with 15 local donor representatives, 5 community leaders, and 5 RUWASA officials. The interviews aimed to gain in-depth knowledge of the local context, the institutional dynamics, and the specific barriers faced by donors in implementing rural water projects.
- **Document Analysis**: The study also involved a review of secondary data from reports, project evaluations, and policy documents related to rural water supply projects funded by local donors. This helped to contextualize the findings and verify the information gathered through primary data.

3.4 Data Analysis Techniques

- **Quantitative Data**: The survey data was analyzed using descriptive statistics, including frequencies, percentages, and mean scores. Statistical tools like SPSS were used to interpret the quantitative data.
- **Qualitative Data**: The interview responses were analyzed thematically using NVivo software. Thematic analysis helped identify recurring themes, patterns, and insights related to the challenges and opportunities in scaling rural water supply solutions. The findings from both the survey and interviews were triangulated to ensure validity and reliability.

4. RESULTS AND DISCUSSION

4.1 Key Challenges Identified by Local Donors

The study revealed several challenges that local donors face in scaling rural water supply projects in Tanzania, as outlined below:

- **Institutional Weaknesses**: A significant challenge identified by 70% of the respondents was the weak institutional capacity at both local and national levels. Many local donors reported that

coordinating with government agencies such as RUWASA was often complicated due to overlapping roles, poor communication, and a lack of clear accountability frameworks. As Biesenthal et al*,* (2018) suggests in Institutional Theory, these institutional barriers hinder the effective implementation and sustainability of water projects.

- **Financial Constraints:** Over 60% of donors cited limited financial resources as a major challenge. Although donors provide funding for rural water supply projects, many of these projects face budget overruns and delayed disbursements. This is exacerbated by the growing demand for water solutions due to population growth and the effects of climate change. As Ostrom (1990) noted in Community-Based Resource Management Theory, financial limitations are often a key factor that impacts the ability of rural communities to manage and maintain water systems independently in the long term.
- **Sustainability Issues:** Respondents reported that sustainability remains a persistent challenge. Despite significant donor investment in infrastructure, many water supply projects fail to remain operational after the donor funding ends. This aligns with the Sustainable Development Theory, which emphasizes the importance of ensuring that development projects are designed with long-term viability in mind (Mansell et al, 2019 , Kativhu et al., 2018)).

4.2 Opportunities for Scaling Rural Water Supply Projects

Despite the challenges, several opportunities were identified that local donors can capitalize on:

- Local donors play a crucial role in scaling rural water supply projects by fostering collaboration, empowering communities, and leveraging innovative solutions. Public-Private Partnerships (PPPs) emerge as a key avenue for scaling efforts, with 80% of respondents highlighting their potential. Through PPPs, local donors can provide financial support, foster technological advancements, and enhance capacity-building initiatives. These partnerships address financial and technical barriers, ensuring sustainable infrastructure development, as emphasized by Cui et al. (2018). Private entities, and donors, PPPs enable comprehensive solutions to water supply challenges in rural areas through combining the resources and expertise of government.
- Grounded in Ostrom's (1990) Community-Based Resource Management Theory, COM highlights the importance of empowering water user groups, training local communities, and fostering a sense of ownership. Local donors can strengthen these efforts by providing technical and financial assistance, ensuring that communities are equipped to operate and maintain water systems effectively. This approach fosters sustainability and accountability, as communities have a vested interest in preserving their water resources.
- Local donors can support policy advocacy, strengthen regulatory frameworks, and establish conflict resolution mechanisms to streamline water management efforts. Local donors ensure that rural water projects are implemented transparently and equitably through fostering coordination among stakeholders and enhancing institutional capacity (Strifling, 2018). Strong institutional frameworks are crucial for aligning efforts and maximizing resource efficiency.
- Local donors can promote eco-friendly solutions, such as solar-powered water pumps, while ensuring equitable access and inclusion, particularly for marginalized groups. As pointed by Batra (2023) Local donors align rural water supply projects with the principles of sustainable development, ensuring they meet present needs without compromising future generations through focusing on long-term planning and resource conservation,
- Local donors can facilitate the adoption of solar-powered pumps, remote monitoring systems, and mobile-based payment platforms, reducing operational costs and enhancing efficiency. As suggested by Shah and Mills (2018) early adoption of these technologies by pilot communities can drive broader scalability and success; by supporting these initiatives, local donors contribute to resilient, inclusive, and sustainable water supply systems in rural areas.

5. CONCLUSION AND RECOMMENDATION

The study recommends several strategies that local donors can adopt to overcome the identified challenges and scale rural water supply solutions in Tanzania:

- **Strengthening Institutional Capacity:** Local donors should work closely with Tanzanian government agencies to improve institutional coordination, transparency, and accountability. This could involve providing technical assistance to RUWASA and local governments to develop clear roles and responsibilities for stakeholders in water supply projects.
- **Fostering Public-Private Partnerships**: Local donors should facilitate the establishment of PPPs to pool resources and expertise. This will allow for more efficient implementation of large-scale water supply projects, as well as improve the sustainability of these projects.
- **Promoting Community-Based Water Management:** Donors should focus on empowering local communities to take ownership of water systems. This includes providing training and capacity-building programs for water user groups, as well as ensuring that community members are actively involved in the planning and decision-making processes.
- **Investing in Innovative Technologies:** Local donors should invest in appropriate and affordable water technologies, such as solar-powered water pumps, mobile data management systems, and remote monitoring technologies, to improve the efficiency of rural water supply systems.
- **Long-Term Financing:** Donors should ensure that financing mechanisms are designed with sustainability in mind. This includes developing funding models that support the long-term operation and maintenance of water systems, rather than just focusing on short-term infrastructure development.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to all those who contributed to the success of this research.

First and foremost, I would like to extend my heartfelt thanks to Eng. Frankson Kyando, and Melchizedeck Mgeni, my fellow researchers, whose invaluable insights, support, and expertise were crucial in shaping the direction and depth of this study. Their collaboration, constructive feedback, and unwavering commitment were instrumental in the completion of this research.

I am also grateful to all the participants who took the time to provide their perspectives through interviews and questionnaires. Their openness and willingness to share their experiences enriched the study and provided essential insights into the challenges and opportunities faced by local donors in scaling rural water supply solutions.

I would like to acknowledge the support of the Tanzanian Ministry of Water, RUWASA, and other key stakeholders who provided relevant data and documentation that helped frame the research within the context of Tanzania's water supply sector. Their cooperation was indispensable for the success of the study.

Finally, I extend my appreciation to my family and friends for their continuous encouragement and support throughout the research process. Their patience and understanding were a source of strength during the challenging phases of the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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