



Leveraging Crowdfunding to Finance Rural Water and Sanitation Projects: Opportunities, Challenges, and Pathways to Sustainable Development

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Abstract: Access to safe water and sanitation remains a significant challenge in rural Zimbabwe, impacting public health, livelihoods, and socio-economic development. Traditional funding sources, including government budgets and donor aid, are constrained by limited fiscal capacity and declining external support. Crowdfunding, a technology-driven financing mechanism that mobilises small contributions from diverse donors, presents a viable alternative to address these gaps. This study systematically reviews literature using the PRISMA framework to explore the potential of crowdfunding in financing rural water and sanitation (WASH) projects. Findings indicate that donation-based, reward-based, and impact-investment crowdfunding models are most applicable to the Zimbabwean context. Key enablers include widespread mobile money adoption, diaspora engagement, community-led governance, and effective use of social media for storytelling and transparency. Challenges such as low digital literacy, connectivity issues, trust deficits, and regulatory ambiguities are also highlighted. The study underscores that integrating crowdfunding with community participation and local governance enhances ownership, accountability, and sustainability of WASH initiatives. Policy recommendations include establishing legal frameworks for crowdfunding, investing in rural digital infrastructure, and building community capacity. Harnessing crowdfunding effectively can supplement traditional financing, accelerate progress toward Sustainable Development Goal 6, and ensure equitable access to safe water and sanitation in Zimbabwe's rural communities.

Keywords: Alternative Finance; Sustainability; Digital Financing; PRISMA; WASH

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1. Introduction

Access to safe drinking water and adequate sanitation is widely recognised as a fundamental human right and a cornerstone of sustainable development (United Nations, 2015). However, in many low- and middle-income countries (LMICs), particularly across sub-Saharan Africa, this right remains unrealised for millions of rural inhabitants (Kouamou et al., 2023). Zimbabwe is no exception. Despite decades of policy efforts, including the adoption of the Integrated Water Resources Management (IWRM) framework and alignment with Sustainable Development Goal (SDG) 6 (clean water and sanitation), the country continues to face significant deficits in rural water supply and sanitation services (World Bank, 2021; UNICEF, 2022; Mundonde & Makoni, 2024). These deficits compromise public health (SDG 3), exacerbate poverty, undermine education (SDG 4), and constrain economic opportunities, creating a vicious cycle of underdevelopment in rural areas. Mundonde and Makoni (2023a) argue that SDG 6 is an instrumental multiplier goal with the capacity to decide Zimbabwe's development pathway, as water and sanitation are at the centre of socio-economic development. Practitioners and academics have linked SDG 6 to SDG 3 (health), SDG 4 (education), and SDG 11 (sustainable cities) (Mugagga & Nabaasa, 2016; Shah, 2016, cited by Mundonde & Makoni, 2023a).

According to the Zimbabwe National Statistics Agency [ZIMSTAT] (2022), nearly 30% of the rural population still lacks access to improved drinking water sources, while more than 60% do not have access to basic sanitation facilities. Rural women and children bear the burden of these deficits, spending hours each day fetching water from unsafe sources, which increases exposure to waterborne diseases such as cholera, typhoid, and dysentery (Mabiza et al., 2020). Inadequate water and sanitation infrastructure impede agricultural productivity, limit industrial diversification, and deepen gender inequalities (UNDP, 2021). Addressing these challenges requires innovative financing approaches, as traditional funding sources have proven insufficient (Mundonde & Makoni, 2023b).

Zimbabwe's fiscal constraints are acute. The government faces limited budgetary capacity, with competing priorities such as debt servicing, education, healthcare, and infrastructure crowding out investments in rural water and sanitation (IMF, 2022).

Donor funding has declined due to global economic volatility, shifting priorities, and political concerns (Chikozho, 2020; Mundonde & Makoni, 2023b). These dynamics have left a financing vacuum, creating urgent demand for alternative and complementary mechanisms that can mobilise resources efficiently and sustainably. Against this backdrop, crowdfunding emerges as a promising, technology-driven solution to bridge financing gaps in rural water and sanitation.

Crowdfunding, defined as the practice of raising small amounts of money from a large number of people through digital platforms, has gained global prominence as a tool for financing social, entrepreneurial, and community projects (Belleflamme, Omrani & Peitz, 2015; Shneor & Munim, 2019). The model leverages digital connectivity, social media storytelling, and trust networks to mobilise resources from diverse contributors, including local citizens, diaspora communities, philanthropic organisations, and impact investors. Global crowdfunding platforms such as GoFundMe, Kickstarter, Indiegogo, and Kiva have demonstrated the ability to finance projects that would otherwise remain underfunded or excluded from traditional financing systems (World Bank, 2013; Short et al., 2017; Shneor & Munim, 2019). The rise of mobile money platforms such as M-Pesa in Kenya and EcoCash in Zimbabwe has expanded digital financial inclusion, thereby creating fertile ground for innovative financing mechanisms (GSMA, 2022).

In Zimbabwe, the convergence of mobile money penetration, a highly engaged diaspora community, and the urgent need for rural development financing suggests that somebody could harness crowdfunding to support water and sanitation projects (Maune, Nyakwawa & Magara, 2022). For example, the Zimbabwean diaspora, estimated at more than three million people globally, has remitted billions of dollars annually, primarily towards household consumption and education (Reserve Bank of Zimbabwe, 2022). Redirecting even a fraction of these remittances into structured crowdfunding campaigns could provide substantial capital for rural infrastructure. Similarly, the growing use of social media platforms such as WhatsApp, Facebook, and Twitter in Zimbabwe offers new channels for mobilising awareness, trust, and collective action around community-driven water and sanitation initiatives (Muchena & Dube, 2021).

Despite its potential, crowdfunding for rural water and sanitation in Zimbabwe faces significant barriers. These include low digital literacy in rural areas, limited internet connectivity, trust deficits in financial systems, weak regulatory frameworks, and a lack of experience in managing large-scale community-based crowdfunding

initiatives (Munene, 2019). Furthermore, cultural factors, power dynamics within communities, and the risk of elite capture of resources undermine equitable distribution and sustainability (Cleaver & Whaley, 2018). Therefore, a critical examination of both the opportunities and challenges of crowdfunding in Zimbabwe's rural development landscape is necessary to identify feasible pathways toward sustainable financing solutions.

This article explores the potential of leveraging crowdfunding to finance rural water and sanitation projects in Zimbabwe. It addresses three central objectives:

- *RO1*. To assess the opportunities presented by crowdfunding in Zimbabwe, including digital finance, diaspora engagement, and community-led approaches.
- *RO2*. To analyse the challenges and constraints that limit the effectiveness of crowdfunding for rural water and sanitation.
- *RO3*. To propose pathways and policy recommendations to create an enabling environment for crowdfunding, thereby contributing to sustainable development.

The article adopts a systematic literature review methodology guided by the PRISMA framework; synthesising global, regional, and country-specific evidence to evaluate how crowdfunding models such as donation-based, reward-based, and impact investment can be adapted to Zimbabwe's rural realities. This research contributes to the growing discourse on innovative financing for sustainable development in LMICs by integrating insights from academic literature, development reports, and case studies.

The significance of this study lies in its potential to inform policymakers, practitioners, researchers, financiers, and community leaders about the viability of crowdfunding as a complementary financing mechanism. By highlighting both opportunities and pitfalls, the article seeks to position crowdfunding not as a panacea but as part of a broader financing ecosystem that includes government budgets, donor contributions, and private-sector participation. If properly structured and supported by enabling policies, crowdfunding could accelerate Zimbabwe's progress toward SDG 6 and its Vision 2030 objectives of achieving inclusive, sustainable development.

The remainder of the article follows: Section 2 reviews relevant literature on Crowdfunding for Water, Sanitation, and Rural Development. Section 3 outlines the research methodology. Section 4 presents the findings, while Section 5 discusses the results. Finally, Section 6 concludes the article, highlighting key implications and contributions.

2. Literature Review

Crowdfunding has emerged as a major disruptive innovation in the financial landscape, offering an alternative to traditional financing channels such as banks, venture capitalists, and donor agencies (Shneor & Munim, 2019). Defined as the practice of raising small sums of money from a large group of people through online platforms, crowdfunding has become a multibillion-dollar global industry (Belleflamme, Lambert & Schwienbacher, 2014; Zhang et al., 2016; Shneor & Munim, 2019). According to Massolution (2015), the global crowdfunding market was valued at over USD34 billion by 2015 and has since continued to grow, particularly in social impact and development-oriented projects.

Crowdfunding platforms such as Kickstarter, Indiegogo, and GoFundMe have popularised the concept, while others like Kiva and GlobalGiving have focused on social impact and poverty alleviation (Lehner, 2013). Scholars argue that crowdfunding democratises finance by lowering entry barriers for individuals and communities excluded from formal financing systems (Belleflamme, Omrani & Peitz, 2015). Furthermore, crowdfunding provides more than just financial capital; thus, it also enables community engagement, awareness-building, and social accountability (Mollick, 2014).

Global development agencies have recognised crowdfunding's potential for financing SDGs. The World Bank (2013) highlighted crowdfunding as a "game-changer" for development, particularly in financing small-scale projects and engaging diaspora communities. Moreover, the United Nations Development Programme (UNDP) has piloted crowdfunding platforms in countries such as Bosnia and Herzegovina, Ecuador, and Nepal to mobilise resources for community development (UNDP, 2016). These global trends suggest that crowdfunding could be adapted for rural water and sanitation projects in Zimbabwe, but context-specific challenges must be addressed.

The application of crowdfunding to water and sanitation projects remains underexplored compared to sectors such as health, education, and entrepreneurship. Nevertheless, existing literature provides examples of its potential. For instance, Kiva, a micro-lending platform, has successfully financed water access projects in Kenya and Uganda (Kiva, 2021). GlobalGiving has hosted campaigns for clean water and sanitation initiatives across Africa and Asia, demonstrating the willingness of donors to support such causes when compelling narratives are presented (Burtch, Ghose & Wattal, 2015).

Water and sanitation projects often appeal to donors because they deliver visible, tangible, and immediate benefits. Research shows that projects with clear community impact, such as drilling boreholes, installing hand pumps, or building toilets, are more successful in crowdfunding campaigns (Ahlers et al., 2015). Furthermore, storytelling and transparency play crucial roles in attracting donor trust and sustaining long-term contributions (Cumming et al., 2019).

In the rural development literature, crowdfunding is increasingly seen as a tool for financing infrastructure that governments and donors struggle to fund. Studies in India and Latin America show that community-led crowdfunding initiatives can mobilise diaspora and local contributions to fund projects such as schools, clinics, and clean water systems (Banerjee, 2017). The applicability of these lessons to Zimbabwe requires careful consideration of socio-economic conditions, digital penetration, and community governance structures.

Crowdfunding in Africa is still in its early stages, but it is growing rapidly due to mobile money penetration and increasing internet connectivity. A GSMA (2022) report revealed that sub-Saharan Africa has the world's highest mobile money adoption, with over 548 million registered accounts. This creates a strong foundation for digital financial innovations, including crowdfunding.

Several African countries provide instructive case studies. In Kenya, crowdfunding platforms such as M-Changa have been used to finance community projects ranging from education to healthcare (Ordanini et al., 2011). In Nigeria, platforms like Donate-ng have also engaged the diaspora community to finance rural development initiatives (Aderemi, 2020). South Africa's Thundafund platform has supported social enterprises, while platforms like StartSomeGood have targeted community development (Agrawal, Catalini & Goldfarb, 2015).

African diaspora communities play a critical role in crowdfunding. For example, remittances to sub-Saharan Africa totalled USD53 billion in 2022, with Nigeria, Ghana, and Kenya among the top recipients (World Bank, 2022). Diaspora-targeted crowdfunding campaigns leveraged on strong emotional ties, trust networks, and the desire to contribute to community well-being (Munyoka & Musiyiwa, 2018). Zimbabwe's large diaspora population thus presents a significant opportunity for crowdfunding rural water and sanitation initiatives. However, African experiences also highlight barriers, including weak regulatory frameworks, fraud risks, low digital literacy, and infrastructural constraints such as poor internet coverage in rural areas (Mollick & Nanda, 2016). These issues must be addressed if crowdfunding is to succeed in Zimbabwe.

Zimbabwe's water and sanitation crisis is well-documented. Successive droughts, economic instability, and infrastructure neglect have undermined rural service delivery (Mabiza et al., 2020). Cholera and typhoid outbreaks have been recurrent, with the 2008 cholera epidemic killing over 4,000 people and infecting nearly 100,000 (Chigonda, 2019). While urban areas face challenges, rural communities remain the most vulnerable, with many relying on unprotected wells, rivers, and streams for water (UNICEF, 2022).

Financing these needs has proven difficult. Government expenditure on water and sanitation has fallen short, accounting for less than 1% of GDP annually (World Bank, 2021). Donor contributions, once a key source of support, have declined due to political instability and competing global crises such as the COVID-19 pandemic and the war in Ukraine (IMF, 2022). As a result of this decline, rural communities now rely on non-governmental organisations (NGOs), faith-based organisations, or informal local fundraising to address water and sanitation needs (Munyoka, 2020).

Digital finance penetration now creates new opportunities. EcoCash, Zimbabwe's leading mobile money service, has over 6 million active users, representing a significant population share (GSMA, 2022). Social media usage has also expanded, with WhatsApp being the most widely used platform for communication and information-sharing (Muchena & Dube, 2021). These tools can be harnessed to facilitate crowdfunding campaigns, expand outreach, and improve transparency.

Literature identifies four main types of crowdfunding: donation-based, reward-based, lending-based, and equity-based (Belleflamme et al., 2015; Ziegler et al., 2018; Shneor & Munim, 2019). Donation-based and reward-based models are most applicable for rural water and sanitation in Zimbabwe, with potential integration of

impact investment. Donation-based crowdfunding involves donors giving money without expecting financial returns. This model aligns well with water and sanitation projects, as it leverages altruism and social impact motivations (Cumming et al., 2019). Reward-based crowdfunding offers non-financial rewards, such as recognition, cultural products, or symbolic tokens (Shneor & Munim, 2019). In Zimbabwe, communities may offer acknowledgements or cultural artefacts to diaspora contributors. Lending-based crowdfunding (peer-to-peer lending) and equity-based crowdfunding are less applicable for rural infrastructure due to a lack of financial returns. However, hybrid models such as impact investment can be explored with development finance institutions.

The adaptability of these models depends on regulatory frameworks, community engagement, and digital literacy. The PRISMA-guided literature review shows successful campaigns often combine donation-based crowdfunding with storytelling, transparent reporting, and community co-management (Banerjee, 2017; Lehner, 2013).

Table 1 below shows the barriers and enablers of crowdfunding finance for rural water and sanitation that were identified in the literature (Burtch et al., 2015; Cleaver & Whaley, 2018; Munyoka & Musiyiwa, 2018; Munene, 2019; Chikozho, 2021; World Bank, 2021; GSMA, 2022; Reserve Bank of Zimbabwe, 2022).

Table 1. Enablers and Barriers of Crowdfunding for rural water and sanitation projects

<i>Enablers</i>	<i>Barriers</i>
Mobile money penetration (Several platforms facilitate digital payments).	Low digital literacy (Limits rural participation).
Diaspora engagement (Strong emotional and social ties).	Trust deficits (Concerns about misuse of funds).
Community ownership (Local management increases accountability).	Weak regulation (Lack of crowdfunding-specific laws).
Social media storytelling (Narratives build trust and donor confidence).	Infrastructure gaps (Poor connectivity in rural areas).

Source: Author

The literature suggests that crowdfunding is not a panacea but a potential tool when integrated into the broader finance ecosystem. The Zimbabwean case offers a unique testing ground where mobile finance, diaspora engagement, and urgent water and sanitation needs intersect.

3. Research Methodology

This study employed a systematic literature review (SLR) design to explore the potential of crowdfunding as a financing mechanism for rural water and sanitation (WASH) projects in Zimbabwe. A systematic review was selected due to its ability to synthesise evidence across multiple sources rigorously, identify recurring themes, and provide a comprehensive understanding of global and local trends (Kitchenham, 2004; Moher et al., 2009; Khan & Hussain, 2025; Jayasignhe, Retscher & Retscher, 2025). The review focused on empirical studies, policy reports, and grey literature that examined crowdfunding, digital finance, and rural WASH development in sub-Saharan Africa and Zimbabwe.

The researcher adopted the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to ensure transparency, reproducibility, and methodological rigour (Moher et al., 2009; Mahmood, 2017; Khan & Hussain, 2025; Raman, Iyer & Nedungadi, 2025). The PRISMA approach involves systematic identification, screening, eligibility assessment, and inclusion of relevant studies, thereby reducing bias and enhancing the reliability of synthesised findings (Muka et al., 2020; Roppelt et al., 2024).

3.1. Data Sources

The literature review used multiple sources to capture a broad and representative evidence base. Peer-reviewed journals were accessed through Scopus, Web of Science, and Google Scholar, covering studies published between 2009 and 2025. Grey literature, including reports from the World Bank, UNICEF, UNDP, African Development Bank (AfDB), Reserve Bank of Zimbabwe, and government publications, was also included to ensure contextual relevance. African Journals Online (AJOL) provided region-specific literature, particularly studies on mobile money adoption, rural development, and community-led water projects.

Key search terms included combinations of:

“Crowdfunding”

“Water and Sanitation” / “WASH”

“Rural Development”

“Digital Finance”

“Zimbabwe”

“Diaspora” / “Remittances”

“Sustainable Development Goals” / “SDG 6”

Boolean operators (“AND”, “OR”) and truncation symbols (\) were applied to expand the search and capture variations of relevant terms.

3.2. Inclusion and Exclusion Criteria

The study applied inclusion and exclusion criteria to ensure relevance and quality of the reviewed literature. An inclusion criterion was developed by following the methodology of Durach et al. (2017), which is shown in Table 2 (Stern, Jordan & McArthur, 2014; Zareef, 2021; Khan & Hussain, 2025). The searches were limited to English-language, peer-reviewed journal articles (Denyer & Tranfield, 2009), conference papers, and institutional reports published between 2009 and 2025. Exclusion criteria comprised non-peer-reviewed works, editorials, book reviews, and any grey literature inaccessible through institutional repositories or major academic databases (Stern, Jordan & McArthur, 2014; Khan & Hussain, 2025).

Table 2. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Peer-reviewed articles	Non-peer review studies
Papers published during 2009–2025	Papers published before 2009 or after 2025
English-language	Non-English-language
Accessible articles only	Non-accessible/restricted articles
Journal articles and conference papers	Books, theses, chapters and unpublished studies

Source: Author

3.3. Screening and Selection Process

The initial search yielded 412 records. After removing duplicates ($n = 133$), 279 titles and abstracts were screened against the inclusion criteria. The screening focused on relevance to crowdfunding, digital finance, WASH, rural development, or Zimbabwe. Of these, 95 full-text articles were then assessed for eligibility. Of these, 58 studies met all criteria and were included in the final synthesis. The researcher used the PRISMA flow diagram to document the selection process, ensuring

transparency and replicability (Moher et al., 2009) with each article independently reviewed. A PRISMA flow diagram in Figure 1 was developed to visually and transparently illustrate this selection process.

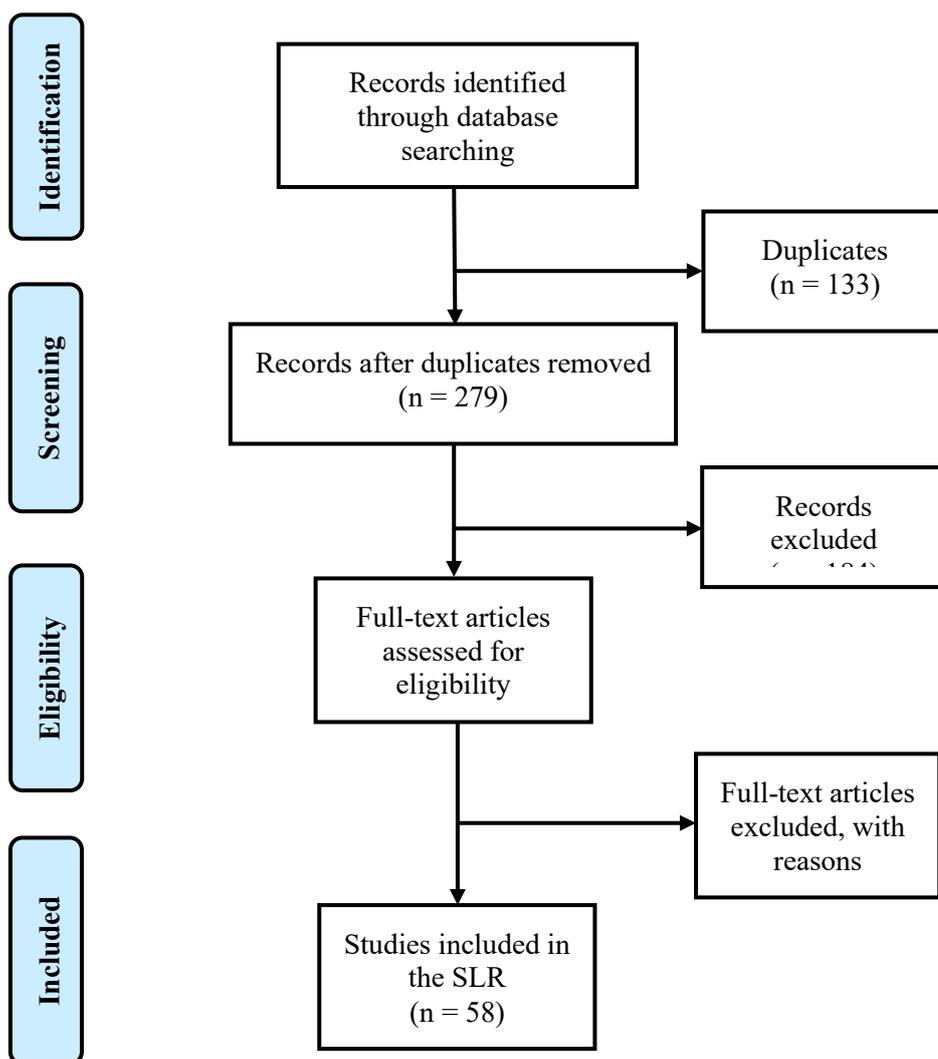


Figure 1. The PRISMA flowchart illustrates the various phases of the literature search carried out in this study

3.4. Data Extraction and Synthesis

Data from the selected studies were extracted using a structured coding template. Table 3 shows the key variables identified and their description.

Table 3. Identified key Variables

<i>Variable</i>	<i>Description</i>
Crowdfunding models	Donation-based, reward-based, equity, lending/impact investment.
Project type	Water, sanitation, rural development, and community infrastructure.
Geographical context	Zimbabwe, sub-Saharan Africa, global case studies.
Digital infrastructure	Mobile money, internet access, and social media use.
Enablers and barriers	Community engagement, trust, regulatory framework, and donor behaviour.
Sustainability and governance mechanisms	O&M, oversight committees, and transparency features.

Source: Author

Thematic synthesis was then conducted to identify patterns, recurring lessons, and gaps. Findings were grouped into three primary categories: opportunities, challenges, and pathways to sustainable implementation.

3.5. Limitations

While the systematic literature review provided robust insights, several limitations were noted:

- *Reliance on grey literature for Zimbabwe-specific data:* Many Zimbabwean cases were unpublished or reported in NGO reports, which may limit generalizability.
- *Publication bias:* Studies reporting successful crowdfunding interventions were more likely to be published than those with adverse outcomes.
- *Rapidly evolving technology context:* Digital finance adoption and mobile money use are changing rapidly; some older studies may underrepresent current capabilities.
- *Lack of empirical pilot studies in Zimbabwe:* There is limited evidence on crowdfunding campaigns for rural WASH in Zimbabwe, necessitating inference from regional and global experiences.

Despite these limitations, the methodology ensures a systematic, transparent, and replicable literature assessment, providing a strong foundation for the findings and discussion sections.

4. Findings

4.1. Crowdfunding Models for Rural WASH in Zimbabwe

The systematic review revealed that three crowdfunding models are most relevant for financing rural water and sanitation (WASH) initiatives in Zimbabwe: donation-based, reward-based, and impact-investment-based crowdfunding.

Donation-based crowdfunding is the most straightforward approach, where contributors provide funds without expecting financial returns. This model aligns well with rural WASH projects because donors are motivated by social impact and humanitarian outcomes (Gerber & Hui, 2013). Examples from Kenya's M-Changa platform and India's civic crowdfunding initiatives demonstrate that donation-based crowdfunding models can mobilise funds for boreholes, sanitation blocks, and community toilets (Brown & Kinyua, 2019; Sinha, 2018).

Reward-based crowdfunding offers non-monetary incentives, such as recognition, certificates, or symbolic gifts. This model can enhance community engagement by providing tangible acknowledgement to contributors. For instance, naming rights for wells or plaques recognising donors have been used in India and South Africa, creating social prestige and encouraging repeated contributions (Mollick, 2014). In Zimbabwe, similar culturally related reward mechanisms could leverage local traditions of reciprocity and honour.

Impact-investment-based crowdfunding combines social goals with modest financial returns. While less common in rural infrastructure, pilot initiatives in South Africa and Kenya have shown that small returns linked to project performance can enhance donor confidence and ensure accountability (Mitra & Gilbert, 2018). In Zimbabwe, such models could be piloted with diaspora investors seeking social impact alongside low-risk returns, possibly through partnerships with microfinance institutions or development banks.

The literature emphasises that hybrid approaches, integrating donation and reward elements with accountability measures, are most effective in rural WASH contexts (Lehner, 2013).

4.2. Enabling Contextual Factors

Several key enablers for crowdfunding in Zimbabwe emerged from the literature.

Mobile Money and Digital Finance: Mobile money platforms, such as EcoCash, OneMoney, and TeleCash, are critical enablers. With over 13 million active subscribers and penetration into rural areas, mobile money reduces transaction costs, facilitates micro-donations, and allows seamless transfers from diaspora contributors (Reserve Bank of Zimbabwe, 2023; GSMA, 2022). Case studies from Kenya's M-Changa platform demonstrate that mobile money integration increases participation rates and campaign success (Brown & Kinyua, 2019).

Diaspora Engagement: Zimbabwe has a substantial diaspora population estimated at three million, contributing USD1.5 to USD2 billion annually in remittances (United Nations Zimbabwe, 2022). Diaspora members maintain strong social and emotional ties to their communities and have historically funded infrastructure projects informally. Crowdfunding platforms can formalise these flows, increase transparency, and expand scale (Mandizvidza, 2021).

Community-Led Governance: Community participation is a critical success factor. Local water committees, faith-based organisations, and traditional leadership structures provide oversight, ensure equitable resource allocation, and manage maintenance. Studies highlight that community involvement enhances accountability and ownership, reducing the risk of project failure (Whaley & Cleaver, 2017; Carter et al., 2019).

Storytelling and social media: Effective communication through social media storytelling and digital updates fosters trust and sustains donor engagement. Platforms like WhatsApp, Facebook, and Twitter are widely used in Zimbabwe, allowing project organisers to share videos, photos, and progress reports (Muchena & Dube, 2021). Global evidence shows that transparent, engaging content increases donor confidence and recurring contributions (Burtch, Ghose & Wattal, 2015).

4.3. Challenges and Constraints

Despite its potential, several constraints threaten the effectiveness of crowdfunding for rural WASH in Zimbabwe.

Low Digital Literacy and Connectivity: Rural populations often have limited familiarity with online platforms and may lack internet-enabled devices. While

mobile money adoption is high, full digital literacy remains a barrier to accessing crowdfunding portals (Munene, 2019). Poor connectivity in remote areas further limits participation.

Trust Deficits: Economic instability and past banking crises have eroded trust in financial systems (Moyo, 2021). Potential contributors, both local and diaspora, may be reluctant to donate without robust transparency mechanisms. Studies suggest that escrow accounts, third-party verification, and milestone-based fund release can mitigate these concerns (Lehner, 2013; Ryu, Hwang & Park, 2018).

Regulatory Ambiguity: Zimbabwe lacks explicit legal and regulatory frameworks for crowdfunding. This gap poses risks related to consumer protection, fraud, and financial oversight. Comparative studies in Kenya and South Africa show that regulated crowdfunding environments significantly enhance donor confidence (Agrawal, Catalini & Goldfarb, 2015).

Sustainability and Operations & Maintenance (O&M): Rural water projects often fail post-implementation due to inadequate O&M planning. Literature indicates that even well-funded boreholes and sanitation blocks can become non-functional within 1–3 years without dedicated maintenance funds, trained caretakers, and local oversight (Whaley & Cleaver, 2017; McNay, Sridharan & George, 2019). Crowdfunding campaigns must therefore incorporate O&M budgeting to ensure long-term functionality.

Donor Fatigue: Repeated campaigns may lead to donor fatigue due to weak communication and reporting. Maintaining transparency, demonstrating impact, and providing regular updates are essential to sustaining contributions over time (Ryu et al., 2018).

4.4. Governance and Trust-Building Mechanisms

The literature emphasises governance as a cornerstone of successful crowdfunding finance. Recommended mechanisms include *milestone-based fund release*, when funds are disbursed incrementally upon completion of verified project stages, such as site assessment, construction, and water quality testing (Smith, Watson & Chipangura, 2016). *Community oversight:* Local water committees or NGO partners monitor project progress, ensuring equitable resource allocation and timely maintenance (Carter et al., 2019). *Transparency dashboards:* Live updates of financials, milestones, and beneficiary impact create donor confidence (Mollick,

2014). *Third-party verification*: Independent technical assessments ensure that installed infrastructure meets standards and functions sustainably (Banerjee, 2017). Integrating these governance measures with Zimbabwe's local institutions and leadership structures can mitigate risks and enhance credibility.

4.5. Strategic Pathways for Zimbabwe

Based on the literature, successful crowdfunding for rural WASH in Zimbabwe requires:

- *Mobile-first platforms*: Unstructured Supplementary Service Data (USSD) and mobile money integration to ensure access for rural populations with low digital literacy.
- *Diaspora-targeted campaigns*: Leveraging emotional and social ties to maximise contributions.
- *Community participation*: Engaging local committees in planning, implementation, and oversight.
- *O&M allocation*: Ring-fencing a portion of funds for maintenance and spare parts.
- *Transparent communication*: Frequent updates, social media engagement, and donor recognition.
- *Hybrid funding models*: Combining donation-based, reward-based, and impact investment elements to diversify revenue streams.

These strategies align with global lessons while adapting to Zimbabwe's socio-economic and infrastructural realities, offering a practical framework for implementing crowdfunding in rural water and sanitation projects.

5. Discussion of Findings

The findings of this study underscore the significant potential of crowdfunding as an alternative financing mechanism for rural water and sanitation (WASH) projects in Zimbabwe. The global, African, and Zimbabwean literature discussion highlights three key areas: opportunities, challenges, and strategic pathways for sustainable development.

5.1. Crowdfunding Opportunities in Zimbabwe

Mobilising Alternative Finance: Crowdfunding represents a paradigm shift in development financing by democratising access to capital. Unlike traditional government budgets or donor aid, which are often limited, delayed, or politically constrained, crowdfunding mobilises small contributions from a broad base of individuals and institutions (Belleflamme, Omrani & Peitz, 2015). For Zimbabwe, where government expenditure on WASH remains below recommended levels (<1% of GDP) and donor funding is declining due to global crises, crowdfunding can fill critical financing gaps (World Bank, 2021; IMF, 2022).

Leveraging Diaspora Remittances: Zimbabwe's diaspora, estimated at over three million individuals, contributes billions annually through remittances (Reserve Bank of Zimbabwe, 2022). Crowdfunding platforms provide a structured and transparent channel for diaspora members to support community water projects. Studies show that diaspora-targeted crowdfunding increases contribution size and frequency due to emotional attachment and social accountability (Munyoka & Musiyiwa, 2018). Furthermore, integrating diaspora engagement with social media storytelling can significantly enhance campaign visibility and trust.

Enhancing Community Ownership and Participation: Community involvement is a critical success factor in rural WASH projects. Governance literature emphasises that projects managed collaboratively with local stakeholders tend to have higher sustainability and effectiveness (Cleaver & Whaley, 2018). Crowdfunding campaigns that engage community leaders, water committees, and beneficiaries in planning and oversight improve accountability and foster local ownership. By linking financial contributions to participatory decision-making, crowdfunding can strengthen local governance structures and ensure equitable distribution of resources.

Technology-Driven Efficiency: The proliferation of mobile money services, such as EcoCash, and the widespread use of social media platforms create a conducive environment for digital crowdfunding. Mobile integration allows small, secure, and rapid contributions, while social media facilitates storytelling, progress updates, and donor recognition (GSMA, 2022; Muchena & Dube, 2021). These technological enablers reduce transaction costs, enhance transparency, and broaden the donor base, making crowdfunding more feasible than in previous decades.

5.2. Challenges and Constraints

Despite these opportunities, the study highlights several constraints that require mitigation.

Digital Literacy and Connectivity: Low levels of digital literacy in rural communities remain a significant barrier. While mobile money adoption is high, many potential contributors may struggle navigating crowdfunding platforms or accessing internet-based updates (Munene, 2019). Poor network coverage in remote areas further exacerbates these challenges. To address this, campaigns may need to adopt USSD-based solutions, offline registration options, and community intermediaries to facilitate participation.

Trust and Transparency Issues: Economic instability, past financial crises, and weak governance structures contribute to low trust in financial systems (Moyo, 2021). Donors may be hesitant to contribute without robust transparency mechanisms. Evidence from other African contexts indicates that escrow accounts, milestone-based disbursements, and independent verification effectively build confidence (Lehner, 2013; Ryu, Hwang & Park, 2018). In Zimbabwe, these mechanisms could be integrated with local water committees and NGOs to provide multi-layered oversight.

Regulatory Gaps: Zimbabwe currently lacks specific legislation governing crowdfunding activities. This regulatory vacuum raises concerns related to fraud, consumer protection, and financial accountability (Chikozho, 2020). Comparative analysis shows that regulated crowdfunding environments, such as Kenya and South Africa, enhance donor confidence and long-term sustainability (Agrawal, Catalini & Goldfarb, 2015). Policymakers in Zimbabwe must therefore develop legal frameworks that define operational standards, reporting requirements, and dispute resolution mechanisms.

Sustainability and O&M: Crowdfunding campaigns often focus on project construction or initial implementation, neglecting long-term operations and maintenance (O&M). Literature indicates that boreholes, wells, and sanitation facilities frequently fail within 1–3 years without dedicated maintenance funding (Whaley & Cleaver, 2017; McNay et al., 2019). Incorporating O&M budgeting and capacity-building for local caretakers is therefore critical for ensuring the durability of crowdfunding-financed WASH infrastructure.

Donor Fatigue and Competition: Repeated campaigns without tangible updates may lead to donor fatigue, reducing participation over time. Maintaining donor engagement through regular reporting, recognition, and storytelling is essential to sustaining long-term contributions (Burtch, Ghose & Watal, 2015). Additionally, competition with other crowdfunding initiatives may necessitate strategic prioritisation and platform coordination.

5.3. Integrating Crowdfunding into Sustainable Development

The study suggests that crowdfunding can be a transformative tool for achieving Sustainable Development Goal 6 (SDG 6) in Zimbabwe, but only when integrated into a broader financing and governance ecosystem. Key considerations include:

- *Hybrid Financing Models* – Combining donation-based, reward-based, and impact investment mechanisms allows campaigns to diversify revenue streams and appeal to a broader range of contributors (Lehner, 2013).
- *Community Engagement* – Embedding project governance within local institutions ensures accountability, equitable allocation, and long-term sustainability. Evidence from sub-Saharan Africa demonstrates that community-led management reduces infrastructure failure rates (Carter et al., 2019).
- *Technology Integration* – Leveraging mobile money, USSD, and social media platforms enhances accessibility, facilitates micro-donations, and strengthens donor communication.
- *Policy and Regulation* – Government support through clear legal frameworks, financial oversight, and incentives for community crowdfunding can increase legitimacy and reduce risks of fraud or misuse (Chikozho, 2020).
- *Capacity Building* – Training community members in project management, digital literacy, and O&M strengthens the long-term viability of crowdfunding-financed infrastructure.

5.4. Comparative Lessons from Africa and Beyond

Global and African experiences provide instructive lessons for Zimbabwe. Kenya's M-Changa platform demonstrates how mobile-based donation campaigns can effectively mobilise local and diaspora contributions for rural development projects (Brown & Kinyua, 2019). South Africa's Thundafund platform illustrates the role of social media storytelling and reward-based incentives in sustaining donor engagement (Agrawal et al., 2015). Meanwhile, India's civic crowdfunding initiatives highlight the importance of milestone-based funding and community oversight for accountability (Banerjee, 2017).

These comparative lessons indicate that successful crowdfunding campaigns for WASH projects in Zimbabwe must adapt models to local cultural, technological, and governance realities while integrating lessons on transparency, O&M, and community participation.

5.5. Implications for Policy and Practice

The discussion highlights several policy and practical implications.

- *For policymakers:* Establish regulatory frameworks, incentivise crowdfunding initiatives, and integrate crowdfunding into national WASH strategies.
- *For NGOs and development partners:* Collaborate with communities and local leaders to design context-specific crowdfunding campaigns, including O&M and reporting structures.
- *For technology providers:* Develop mobile-friendly, USSD-compatible crowdfunding platforms tailored for rural users with low digital literacy.
- *For diaspora organisations:* Facilitate awareness campaigns that link emotional engagement to tangible community impact.

By addressing these considerations, crowdfunding can complement traditional financing, mobilise local and diaspora resources, and enhance Zimbabwe's capacity to achieve sustainable rural water and sanitation development.

6. Conclusion

Access to safe water and adequate sanitation remains a pressing challenge in Zimbabwe's rural communities, undermining public health, livelihoods, and broader socio-economic development. Traditional financing mechanisms, including government budgets and donor aid, have proven insufficient to address the persistent gaps in rural WASH infrastructure. This study explored the potential of crowdfunding as an innovative, technology-driven financing mechanism capable of mobilising resources from local, diaspora, and global stakeholders. Drawing on a systematic literature review guided by the PRISMA framework, the study synthesised global, African, and Zimbabwean experiences to assess opportunities, challenges, and pathways for sustainable implementation.

The findings demonstrate that crowdfunding offers substantial opportunities for enhancing rural WASH financing. Donation-based and reward-based models emerge as the most applicable, while hybrid approaches incorporating impact investment may broaden revenue streams and appeal to a broader range of contributors. Mobile money penetration, diaspora engagement, community-led governance, and social media storytelling are key enablers that facilitate successful campaigns. Evidence suggests that when crowdfunding is integrated with local oversight structures, transparent reporting, and milestone-based fund disbursement, it can enhance ownership, accountability, and sustainability of rural water and sanitation initiatives.

At the same time, the study highlights significant challenges that must be addressed. Low digital literacy, limited internet connectivity in rural areas, trust deficits in financial systems, weak regulatory frameworks, and the risk of donor fatigue pose substantial barriers to successful crowdfunding campaigns. Furthermore, neglecting long-term operations and maintenance can undermine the durability of funded infrastructure, leading to repeated project failure. Comparative evidence from Africa and other LMICs indicates that these challenges can be mitigated through context-specific strategies, including capacity building, mobile-first platforms, transparent governance mechanisms, and targeted diaspora engagement.

The study underscores several policy and practical implications. Policymakers are encouraged to develop legal frameworks that regulate crowdfunding activities, provide incentives for social impact campaigns, and integrate crowdfunding into national WASH and rural development strategies. NGOs and development partners can facilitate campaign design, community engagement, and technical support, while technology providers should focus on developing mobile-friendly, accessible

platforms. Diaspora organisations and networks can leverage social and emotional ties to promote contributions and ensure sustainable engagement.

Overall, the evidence suggests that crowdfunding is not a panacea but represents a complementary and scalable financing mechanism for rural water and sanitation in Zimbabwe. Its success depends on integrating technological, social, and governance dimensions. By harnessing crowdfunding effectively, Zimbabwe can accelerate progress toward Sustainable Development Goal 6, ensuring the availability and sustainable management of water and sanitation for all, particularly in underserved rural areas. Furthermore, this approach can strengthen community participation, enhance local ownership, and promote financial inclusion through mobile money platforms.

In conclusion, crowdfunding holds significant potential to transform rural WASH financing in Zimbabwe, bridging critical resource gaps while fostering community empowerment and sustainable development. Future research should focus on empirical pilot studies to assess the practical implementation of crowdfunding in rural Zimbabwe, evaluate donor behaviour, and measure long-term impacts on water accessibility, sanitation outcomes, and community well-being. Policymakers, practitioners, and technology providers are called upon to collaborate in creating an enabling environment that maximises the potential of crowdfunding as a transformative tool for rural development.

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