

Community Participation and Water Projects Sustainability in Rwamwanja Settlement, Kamwenge District, Uganda

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Article Detail:	Abstract
<p>Received: 18 May 2022; Received in revised form: 12 Jun 2022; Accepted: 20 Jun 2022; Available online: 30 Jun 2022</p> <p>Keywords— Community participation, water projects sustainability, mixed methods sequential explanatory design, Refugee settlement.</p>	<p><i>Community participation is believed to be central to ensuring project sustainability in the development realm. Project developers, implementers, development partners, government officials and communities need to be aware of the role a community plays in making projects in their environments work better from both the theoretical and practical perspectives. The purpose of the study was to investigate the influence of community participation on water projects sustainability in Rwamwanja Refugee Settlement Camp, Kamwenge District, Uganda. Using a mixed methods sequential explanatory method, the study revealed that the level of community participation in water projects in the studied settlement was low. In addition, water projects sustainability was also low. It was noted that community participation has a weak but positive significant influence on water projects sustainability. Initiating action was the main aspect of community participation that influenced water projects sustainability significantly. Non community participation aspects such as inadequate external funding, use of poor quality materials and corruption affected water projects sustainability. It was recommended that governments, development partners and firms contracted to develop water projects should have a clear water project development protocol that stipulates the steps, structures and processes that build and sustain effective community participation.</i></p>

1. Introduction

A reliable, affordable and easily accessible water source is essential for any community including refugee settlements. However, lack of water project sustainability has become one of the greatest challenges facing the global community currently with rural communities being the worst hit (van der Helm *et al*, 2017. Several authors Cronin *et al* (2008); WHO (2012) UNHCR (2019) have reported that in recent years, water issues in refugee settlements have become a worrying situation among the top challenges facing refugees globally, and more than one billion people, most of whom live in refugee settlements, do not have access to safe drinking water. According to Okoth-Oboth (2019), globally 65 percent of the 25 million refugees do not have access

to functional drinking water supplies within their home while only 35% of water supply systems in refugee homes are functional. Refugees are at the risk of being left behind in the reforms aimed at ensuring access to safe water by all. Community participation has been reported (World Bank, 2016) as being one of the important conditions essential for the implementation of projects and largely contributes to the sustainability of water sources by resolving problems related to willingness and ability to pay user fee and take good care of the water points, hence ensuring the sustainability of water. However, despite all the efforts to ensure sustainable water supply systems it is proving difficult in many parts of the world.

According to Boinet (2020), Africa has about 135 million people who do not have access to safe drinking water. UNHCR (2017) suggests that the average safe water coverage is estimated at 62% while in refugee settlements it is at 47%. The community participation in water projects includes, contribution of labor and materials and or collection of user fee and participation in project planning, design, construction and management systems. This has been reported (Ananga, 2017) to create a sense of ownership to the community which may result into the sustainability of the water projects. Arslan *et al.* (2014) and UNHCR (2019) reported that the challenge facing the water projects in refugee settlements is limited community participation to increase the maintenance of the water services and estimated that 70% of camps and settlement water projects in Africa are not functional at any given time. Community provision of resources is an accepted practice in the East African Region for small –scale development projects, such as collection of user fees, labor and materials. This helps in developing a sense of community ownership of the projects, hence local responsibility for accessibility, reliability and maintenance of water projects (Bassi *et al.*, 2018). It has been further reported (Ching'oro, 2017) that community participation in decision making accomplishes several collaborative management goals. These include increase in community capacity and social capital, while complying with legislation that requires the community to be informed on issues and decisions that affect water source functionality. This in turn increases support in decision planning and implementation which contributes to successful sustainability of the water systems. According to Nyarko *et al.* (2013), involving those affected by a given challenge increases their cooperative ability to find solutions, and provides opportunities to initiate actions, facilitating community members' ability to develop trust and confidence in their project and leadership. This also helps in building community goodwill and active participation in sustaining their development projects (Abdullahi & Ahmed, 2014). A survey conducted in Dadaab Refugee Camp, Kenya by Kim Bode (2016) shows that many refugees are suffering from gaps caused by lack of water projects sustainability, and only 55% of the water projects remain functional at any given time after successful implementation. This is affected to a large extent by low community participation in terms of decision making, provision of resources, lack of initiating actions which results into poor sanitation and water borne diseases (Otieno & Mumo, 2017).

Whereas Sustainable Development Goal (SDG) 6 requires that by 2030, there should be universal and equitable access to safe and affordable drinking water for all, this seems elusive more especially in the refugee camps in Uganda. According to Water Barometer (2020), and Water. Org (2020), by close of 2020, Uganda targets 90 percent of her population to have access to adequate clean and safe water. However, only 51 percent (22 million people) of the population reportedly has access to adequate clean and safe water. In Rwamwanja Settlement, UNHCR (2019) indicates that current access to clean water per person is 17.5 liters per day against the WHO recommended minimum of 50 to 100 liters to ensure that most basic needs are met and few health concerns arise. Studies suggest that sustainable availability of water depends, among others, on responsible consumption and proper management of water projects and participation of communities is crucial in ensuring water supply sustainability (Muhwezi, 2018; UNHCR, 2019). Although community participation is one of the recommended principles of project development in UNHCR supported programmes (UNHCR, 1992), it is not empirically ascertained whether this is the practice in developing and implementing water projects in Rwamwanja Settlement.

2. Rationale

In Rwamwanja Refugee Settlement, despite efforts by the Lutheran World Federation (LWF) the UN High Commission for Refugees (UNHCR) and government of Uganda through establishing water points in the camp and creating water committees, access to clean and sufficient water continues to be very low (UNHCR, 2019). Moreover, Maonga (2017) claims that only 58% of the water projects in Rwamwanja remain functional after being implemented and 22% of the water sources get broken down within a period of only 3 months while 20% of the water projects are not functioning at any given time (Kumudu *et al.*, 2016).

Several studies have been undertaken about sustainability of water projects in Uganda. Nyende (2007) examined the sustainability of granitised aquifer systems of the Kyoga catchment area and focused on ground water quality and sustainability. From a different perspective, Mugisha and Borisova (2010) using linear programming model analyzed the affordability of basic water project implemented by Uganda's National Water and Sewerage Corporation (NW&SC) system to ascertain financial sustainability and pro-poor water services. While Foster (2013)

using logistic regression analysis focused on identifying operational, technical, institutional and environmental predictors of functionality of water systems. In contrast, Mugumya (2013) in a single case and mixed methods design examined the key governance dynamics in Uganda's safe water supply service delivery systems and unravelled contextual issues that undermine effectiveness of the current dominant community-based management model of water supply and sustainability. Meanwhile, Nayebare *et al.* (2014) aimed at identifying and prioritizing possible actions on how sustainable high quality water in Uganda's water supply systems could be achieved. However, the cited studies are dated and do not, specifically, in context, content and methodology answer the researchers' quest to understand the contribution of community participation in sustainability of water supply projects. Our point of departure is the need to examine whether community participation in water supply projects influences the level of sustainability of water supply points as alluded to in the literature (see Maonga, 2017) in Rwamwanja Refugees Settlement camp. Examining the challenge from the refugees stand point offers a rare opportunity to appreciate whether what works in the general communities could be replicated in the refugee communities with equal success. In order to do so, this study answered one main question; 'what is the influence of community participation on water project sustainability in Rwamwanja Settlement Camp?' Two sub-questions were attempted to answer the above question namely what is the level of community participation in water projects? And what is the status of water project sustainability? The findings and recommendations of this study are expected to contribute to updating the current body of knowledge about community participation and sustainability of water projects. Moreover, water policy makers, community leaders, project designers and implementers could pick helpful insights on how to effectively design and implement water supply projects.

3. Theoretical and Conceptual Reflections

The essence of theoretical reflections in a study like this is to examine the interrelated concepts, definitions, and propositions that explain or predict events or situations by specifying relations among variables with the purpose of understanding the problem (Fox & Bayat, 2009; Green, 2014). Meanwhile, the substance of conceptual reflections (Chinn & Kramer, 1999) is to provide ideas, thoughts

and devolution of abstract system of thought by which one can scientifically investigate, interpret and understand specific strands of social reality. The researchers peeped into the theoretical and conceptual reflections of community participation and sustainability of water projects to be able to relate the study to existing body of knowledge. In the context of this study, a community is a group of people living in the same place, linked by social ties, shared common perspectives and may have similar or diverse characteristics (Bhatnagar, 1992). Several explanations have been put forward by scholars and practitioners to give meaning to the concepts of community participation and sustainability. On the one hand, Mushtaq (2004), defines community participation as a process by which people from all sectors of the community influence or control decisions that affect their lives. From another angle, Putnam (2000), looks at community participation as peoples' engagement in community activities that promotes quality of life'. Community participation could be initiated by the authorities or the people themselves whose welfare is at stake. On the other hand, Sebastian, Eduard and Cristian (2018) suggest that sustainability refers to "whether or not something continues to work over time" as intended. While Musaana (2018) claims that sustainability is the ability of the project to continue providing those benefits for as long as necessary. Further, a sustainable project should produce resources that can be used in its ongoing operation, making the project worth the time and effort to continue. Therefore, project sustainability requires compliance with current standards besides providing a viable means of allowing the project to generate benefits on an ongoing basis. In a nutshell, sustainability is related to ensuring that an undertaking such as a project continues to generate the desired benefits to the community overtime while community participation is the involvement of the people in form of the community taking decisions and actions that influence their welfare. Community participation in relation to project sustainability may be construed as a state where the target beneficiaries are able to take responsibility for ensuring that those in the current and future generation are able to benefit from the project by maintaining the inputs, processes, outputs and outcomes of the project (Christiana, 2009; ILO, 2012; Gitonga, 2015).

Several studies suggest that there are numerous theories related to community participation and project sustainability, including community asset based model of development, systems theory,

sustainability theory, and community participation theory, among others (Guy, 1983; McKnight & Kretzman, 1993; White, 1996; WCED, 1987; Midgley, 2003; Kerzner, 2006). The four aforementioned theories seem most relevant to investigating, interpreting and understanding the influence of community participation on sustainability of water projects. The Asset-based Community Development Model (ABCD) or Asset-based community development (ABCD), or asset-based community-driven development postulates that communities should be developed based on their internal strengths and assets rather than their deficits and problems (Kretzman et al., 2005; Syarifuddin & Amir, 2017). The central argument of the model is that every community and its environment has resource potential and capacity to manage its own affairs without depending on the external support. However, project development may either focus on the positive side (assets) or negative side (deficits) of the model. The positive side looks at the assets and capacity within for the development and sustainable implementation of development activities. In so doing, capacity of the community should be identified, assets mapped into human resources, organization and association, physical and natural resources and economic and cultural resources (Haines, 2009; Cunningham, Mathie & Peters, 2012). Basing on the resources within, the project would be designed and implemented employing community structures to address social needs and empower groups of people to take challenges affecting their welfare (Mendes, 2008). This model provides opportunities for community capacity building to implement the projects effectively. Positive relationships with the community are built making members active partners in the project management process. However, in instances where community deficit side of the model is adopted, capacity development of the community is passive, with limited participation and inability of the community on its own to maintain the projects overtime without external influence (Adhiambo Shikuku, 2012; Gitonga, 2015). From the foregoing, the reasoning behind the treatment of the community in the project process matters. Building on their strengths and assets creates trust and invites the community to participate in various ways including involvement in decision making, initiating relevant actions, provision of resources, and maintenance of the project (Haq, Hassan, Ahmad, 2014; Olajuyigbe, 2016; Culbertson, Oliker, Baruch & Blum, 2016; UNHCR, 2017). These

community participation practices enhance the chances of project sustainability.

System theory has gained recognition as a general descriptive set of ideas, thoughts and abstract aspects that are applicable to issues related to community participation and sustainability of projects (Midgley, 2003; Kerzner, 2006; Gitonga, 2015). Systems theory as related to project sustainability implies that for sustainability to occur, consideration must be given to the interplay between the different elements of the project in its complex form. The theory prescribes a multidisciplinary approach to investigating and understanding a phenomenon. The theory notes that projects as living entities are subject to influence from a number of factors both internal and external (Kerzner, 2006), including community structures, community participation, and human capital to manage the project, among others. Designing, implementing and operating projects involves systematic logical processes where various project elements interact (Midgley, 2003; Gitonga, 2015). System, theory notes that projects, individuals, groups, organisations and institutions do not exist in a vacuum but in a context of interactive components forming complex sets of interrelationships (Kerzner, 2006). Related to study of community participation and sustainability of water projects, systems theory contributes to the analytical framework that depicts the relationship between community capacity, participation, structures, resources and ability of the project to continue generating the planned benefits to the community overtime (Gitonga, 2015). Community participation in project processes by way of taking part in decision making, sharing resources, project maintenance, among others, promotes sustainability of the project. Understanding how the various elements of the project context interact to deliver project results is critical in designing and implementing water projects. Systems theory provides an array of terms and concepts that enhance project developers' appreciation of how some elements of project design and implementation such as community participation and sustainability may be identified, analysed and optimised to ensure that the project meets its desired objectives.

The concept of sustainability is founded on the theory of environmental limitation (Gitonga, 2015). The sustainability theory stipulates that environmental resources are finite and should be optimised to meet the needs of the present and future generations (WCED, 1987). In relation to project management, sustainability denotes the project's ability to maintain

and sustain the planned outcomes by their own resources (International Labour Organisation, 2012). In the context of this study, the concept of sustainability construed to mean where a project remains functional, accessible to the beneficiaries and reliable in delivering project benefits (Inter-American Development Bank, 2016). In line with ILO (2012), a water project that remains functional, accessible to users and reliable in delivering project benefits is in position to meet the needs of the present and future generations. As noted by Gitonga (2015), in order for the project designers, implementers and other stakeholders to have sustainable projects, knowledge of what a sustainable project is and what is likely to influence it is critical. In conceptualising and actualising project sustainability, local actions of communities play a central role. Knowledge of contextual competence of the community to undertake right actions related to the success of projects is one of the issues underpinned by sustainability theory. Sustainability theorists inform us that in order to develop and implement successful projects, it is necessary to identify community needs and priorities, determine their preferences, and gauge the role the community is likely to play in the success of the project (Gitonga, 2015). Moreover, lasting project benefits emanate from local involvement. This study borrows from sustainable development theorists' postulation that elements such as community participation influence project sustainability outcomes. Arising from the aforementioned, community participation and sustainability of water projects in terms of functionality, accessibility and reliability were selected as explanatory and response variables respectively for this study.

So close to the conceptualisation of this study is the community participation theory. As noted by the Danish Refugee Council (DRC), participation is crucial in any humanitarian or development intervention, both from a value-based and an effectiveness-based perspective (DRC, 2018). According to Guy (1983), community participation theory postulates that people can and should play a key role in development and implementation of development projects in their localities. Community participation provides a clear understanding of the local conditions which eventually results into project success. It helps circumvent bureaucratic organizations and closes the gap between the beneficiaries and project designers and implementers. In support of Guy (1983), Paul (1987) provides a hierarchy of levels of intensity in project

participation. Paul (1987) differentiates community participation into four levels from the simplest to the most complex. These include: (i) information sharing where project designers and implementers just share information with the community without members taking any action besides providing information. This although at the lowest point of community participation, facilitates understanding of the contextual aspects that could influence the success of the project. (ii) Consultation where the community is both informed and consulted on salient issues regarding the design and implementation of the project. At this level, the community is invited to share local knowledge and their experience about the project. (iii) Decision making where the community is informed, consulted and allowed an opportunity to make choices on what solutions will serve the community best. This level permits the community to include their needs and priorities and select options that suit their needs during the project design and implementation process. (iv) Initiating action is the highest level of participation where besides making choices, the community has the latitude to introduce actions aimed at serving their interests better. To optimise community participation, more especially, among the disadvantage groups such as refugees, empowerment or capacity strengthening is necessary. According to Paul (1987), the first two present ways to exercise project influence while the latter two offer ways to exercise control. For more effective community participation, both influence on and control of projects processes is essential. In a nutshell, community participation underpins the centrality of beneficiary involvement in the design, development and implementation of projects and as postulated, influences their success and sustainability.

The conceptualization of this study was informed by the aforementioned theoretical claims and empirical literature on the influence of community participation on sustainability of water projects. Several studies undertaken on aspects related to community participation and sustainability of water projects were reviewed, including Ofuoku (2011), Mukunga (2012), IRC (2012), Kamau (2015), Waitbaka, Kisovi and Obando, (2016), Wanyera (2016), and Otieno and Mumo (2017) to ascertain how the explanatory and response variables have been constructed. Using thematic analysis, the researchers discerned three key dimensions that may be applied to measure community participation namely, community provision of resources, participation in decision making, and initiating

actions. Meanwhile, continuous functionality of the water supply system, accessibility to water points and reliability of water service overtime applied to measuring sustainability of water projects. Moreover, the studies revealed that community participation

and sustainability of water projects were researchable variables with established causal relationship. From the conceptual reflections, the conceptual model below was devised for the study.

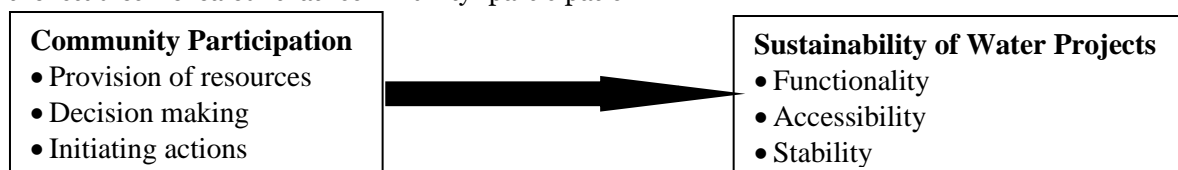


Fig.1. Conceptual Model

The interplay in Figure 1 assumes that when the community provides project resources, takes part in decision making, and initiates actions related to the project influences the ability of the project to provide benefits to the community over a period of time by remaining functional, accessible and reliable. This conceptual framework provides the analytical framework for investigating the influence of community participation on sustainability of water projects in Rwamwanja Settlement.

4. Methods and Materials

This study employed mixed methods sequential explanatory design utilizing both qualitative and quantitative research approaches (Creswell, 2011). The data were collected in two phases with phase one collecting quantitative data while phase two collected qualitative data. The study was carried out in Rwamwanja Settlement, a refugee camp located in Nkoma Sub-county in Kamwenge District of South-western Uganda. Currently, Rwamwanja hosts 72,666 refugees most of whom are from the Democratic Republic of Congo (DRC) and Burundi (UNHCR, 2020). This settlement was a candidate of this study due to low levels of per capita water consumption, a reported high level of non-functional water points and low water project sustainability in spite of the existence of efforts to provide water points and establish community based structures to manage the water points. The study involved 353 primary

respondents and 15 key informants. The sample of 353 respondents was proportionately drawn from 4 centers that make up the settlement camp. Stratified and random sampling approaches were used to select the respondents. Purposive and convenient sampling procedures were applied to select the key informants. The researchers administered survey questionnaire to collect quantitative data and key informant interview guide for the qualitative data. Quantitative data were collected and analyzed first. The quantitative data were analyzed using SPSS version 2.0 utilizing descriptive and inferential statistics to describe the status of the phenomenon and answer the main research question that sought to ascertain the influence of community participation on sustainability of water projects respectively. The salient predictors in the quantitative findings informed the design of the key informant interview guide that was used to probe further and dig out the explanations of the observed quantitative results. Qualitative data were used to provide a deeper explanation of the observed behavior of the explanatory and response variables from the lived experiences of the community (Kothari, 2004).

5. Findings and Discussion

Respondent's Profile

Respondents were profiled along three characteristics namely sex, age and period in the settlement. The respondent's profile is as provided in Table 1.

Table 1: Respondent's Profile

		Variable Frequency (N-353)	Percent
Sex	Male	187	53.0
	Female	166	47.0
Age	Below 25 years	63	17.8
	26 – 32 years	136	39.1
	33 – 43 years	103	29.2

Period in the Settlement	Less than 2 years	71	20.1
	2 – 4 years	113	32.0
	5 – 6 years	98	27.8
	Above 6 years	71	20.1

Source: Field data

Respondent's Sex

The results in Table 1 show that slightly more than half (53%) of the respondents who participated in the study were male. As most household heads are male, this is consistent with the norms of society.

Respondent's Age

Most (78.3%) of the respondents were between 26 and 43 years old which is generally a youth-full population.

Period of staying in the settlement

Results further show that, only 20.1% of the respondents had stayed in the settlement for less than 2 years and the majority 79.9% had stayed for a

period exceeding two years. This could be due to fewer arrivals of refugees in recent.

Level of Community Participation in Water Projects

The findings reflected in Table 2 indicated that community participation in water projects in Rwamwanja Settlement is low as depicted by the results regarding the different aspects deemed to be associated with community participation.

Table 2: Level of Community Participation in Water Projects

Item	Mean	SD	Interpretation
Decision Making			
My ideas regarding our water sources are always valued	1.6	0.72	Very Low
Our water project is done basing on the selected priorities	1.79	0.72	Low
Decisions related to our water projects are made by us	2.08	0.09	Low
I participate in choosing the implementation methods	1.49	0.67	Very Low
Aggregate Mean	1.75	0.73	Low
Provision of Resources			
I always provide some of the construction materials when requested	1.700	0.695	Very Low
I contribute to the cost of operating the water point	1.892	0.7648	Low
I contribute water user fee regularly to our water committee.	2.006	0.7906	Low
Aggregate Mean	1.870	0.750	Low
Initiating Action			
I always participate in the construction of the water projects	1.69	0.71	Very Low
I always participate in mobilizing physical / financial resources	1.79	0.74	Low
I always participate in trench digging	1.83	0.92	Low
I always participate in cleaning our water source	2.09	0.96	Low
I regularly participate in establishing bye laws	1.89	0.82	Low
Aggregate Mean	1.86	0.83	Low
Grand Mean and SD	1.82	0.77	Low

Source: Field Data

6. Decision Marking

The findings show a low level of decision making mean (1.87). The community ranking of regard for their ideas, influence on selecting priorities, making related decisions and choice of implementation methods was low. Refugees need a voice where it matters most, their welfare (DRC, 2018). Not effectively participating in decision making makes the refugees more voiceless and more reluctant to participate in matters that affect their welfare. Contrary to the recommendations of the UNHCR (1992) and DRC (2018) that communities should fully participate in decision making, in this case, the community is not highly involved. Community participation in the settlement is at the lowest level drawing from the taxonomy of community participation (Paul, 1987). This argument is informed by the key informant interviews which revealed that water project developers just inform the community that a water project would be implemented without inviting them to fully participate in activities such as site selection, design, choice of infrastructure, appointment of water committees or other decisions related to the implementation of the project. This approach does not enable local voices to travel from the fringes of the system to the center as expected (DRC, 2018). Further, it does not help identify community capacity (Haines, 2009; Cunningham *et al.*, 2012) or build on internal strength (Kretzman *et al.*, 2005; Syrafuddin & Amir, 2017). This situation does not motivate the refugee communities to participate meaningfully in the development and implementation of the project. Further, it was revealed that there is limited effort to empower the community to take a meaningful part in the development process of the water projects in the settlement. Though water officials in the area interviewed claimed to invite the community to participate, consistent with the claims of Paul (1987), Gitonga (2015), Otieno and Munro (2017), when the community does not feel genuinely invited to participate, they will withdraw their participation and have a low regard of such a project.

Provision of Resources

Findings in Table 2 depict a low level of participation by way of not providing resources for the water projects in the settlement (mean 1.87). Respondents regard their contribution to construction materials, operating costs and user fees to be low. This finding

should not be considered in isolation of the aspect of decision making because participation in decision making clarifies the roles of the project stakeholders that, among others, include provision of resources to support the project as claimed by Gitonga (2015). The two may be considered to affect each other as noted by Paul (1987) and UNHCR (1992). When the community is not genuinely involved in decision making, they do not feel the sense of commitment to contribute their resources to the project. This seems to complement the arguments of ILO (2012), Kamau (2015), Waithaka *et al.* (2016), and Gitonga (2015) on reluctance of communities to contribute to community development projects. Key informant interviews revealed that community members consider supply of water to the settlement a responsibility of the government and development partners who introduce these projects without their much input. This claim ties in with the observed result on decision making. During the key informant interviews, one of the water service providers at the settlement indicated that the community is not willing to contribute to cost of trucked water that is delivered to supplement the water supply from the community water points because they claim they did not ask for that service.

Initiating Action

Our results (Table 2 above) reveal a low level of action initiation (mean 1.86). Specifically, respondents rank themselves low on participation in construction of water projects, mobilization of physical and financial resources, trench digging, cleaning the water sources and establishing the bye laws to manage the water source. Drawing from the postulations of Paul (1987) in his seminal work, initiating actions is the highest level in the hierarchy of community participation after decision making. Noting that decision making is deemed low, it would be theoretically contradictory (Paul, 1987) to find the community having a high regard of initiating actions related to the community. This argument complements the claims of Kerzner (2006) and Gitonga (2015) that communities that participate in decision making take the initiative to ensure that their decisions are successful. This may include mobilization of the necessary resources and getting engaged in the actual activities of the project. Key informant interviews revealed that the community is reluctant to initiate even simple actions such as

securing the water point or ensuring that it is clean all the time. They do not care much about the status of the water points within their proximity. Due to this attitude toward the projects, some of them have been vandalized by the members of the community. The UNHCR (1992) guidelines on community participation aimed at full involvement of the refugees and building their capacity to ensure that they take charge of activities that influence their welfare to enable success of the UNHCR supported interventions. In addition, project developers should be cognizant of the fact that refugee participation in their welfare is highly contextual (DRC, 2018). It was noted during the key informant interviews that community members would be willing to take a more visible and active role in the affairs of their water projects. However, they are not much involved at the beginning through sensitization and elicitation of their views or clarification of their roles in project development and implementation. This changes the context of the project and limits community participation. Refugees need empowerment that is felt through actions (DRC, 2018). When they are not empowered through initiatives such as training, they will not ably perform some of the roles they are expected to perform to optimize their participation. Adopting a bureaucratic top-bottom approach to introduction of water projects is one major hindrance to effective community participation in the settlement. As postulated by Guy (1983), Paul (1987), Kerzner (2006), Gitonga (2015), and DRC (2018), the approach to water project development is contrary to

the best practices on ensuring optimum community participation.

Status of Water Project Sustainability in Rwamwanja Settlement

The findings in Table 3 indicated that the status of water sustainability in Rwamwanja Settlement is low characterized by low functionality, accessibility and reliability.

Functionality

The results (Table 3) show a low functionality of water projects in this Settlement (mean 1.86). This is characterized by low functioning rate of the water points, more leakages and worn out parts and low water flow. This suggests low level of sustainability as postulated by Sebastian *et al.* (2018) and Musaana (2018) that sustainable projects are those that continue to function and offer benefits to the community over time. It was revealed during the key informant interviews that some water points such as boreholes dried up during dry season due to depression of the water table while in others, inadequate maintenance left the water points without key parts such as handles to pump the water rendering them unusable. This revelation is contrary to the principles of sustainability (Christiana, 2009; ILO, 2012; Gitonga, 2015) that require inputs, processes, outputs and outcomes of the project to remain flowing overtime for the benefit of the community.

Table 3: Status of Water Project Sustainability in Rwamwanja Settlement

Item	Mean	SD	Interpretation
Functionality			
Our water sources are fitted with pumps/ function properly	1.83	0.724	Low
There are no leakages or worn out parts in our water source	1.85	1.29	Low
The water source flow is always high	1.92	1.46	Low
Aggregate Mean	1.86	1.16	Low
Accessibility			
Water is always available from the nearest water point	1.77	0.69	Low
I always have enough water for home use	2.01	2.28	Low
I spend less time while collecting water from the water source	1.77	0.68	Low
In my household, I always store water	1.96	1.81	Low
Aggregate Mean	1.79	1.36	Low
Reliability			
Our water sources provides clean water all the time	1.80	0.68	Low

I am always satisfied by the water from our water source	1.76	0.68	Low
In this village water is always available	1.88	0.29	Low
Our water source does not break down frequently	1.63	0.68	Low
Aggregate Mean	1.77	0.83	Low
Grand Mean and SD	1.807	1.117	Low

Source: Field data

Accessibility

The findings (Table 3) also show a low accessibility to water points by the community (mean 1.79). Water is less available at the nearest water points, there isn't enough water for domestic use, it is time consuming to collect water and households do not store water for their use. These findings confirm the UNHCR (2019) about the low water accessibility at 17.5 liters per person per day against the WHO minimum of 50-100 liters a day. During the key informant interviews, it was revealed that low water accessibility is compounded by high breakdown rate, poor maintenance culture, inadequate water points, and nonfunctional water points due to a number of reasons. Projects which are not accessible to the beneficiaries are not sustainable (Kamau, 2015; and Waithaka *et al.*, 2016). Since the essence of the water projects in the community is to provide accessible safe water, low level of accessibility is contrary to the best principles and practices of projects sustainability for the welfare of the beneficiaries (ILO, 2012; DRC, 2018; Musaana, 2018). This challenge seems to be compounded by the low level of functionality of the water points. It would defeat logic to argue that less functional water projects enable high accessibility to water resources. This ties in with the arguments by the systems theorists (Midgley, 2003; Kerzner, 2006; Gitonga, 2015) who advocate for consideration of the interplay of all the elements of the project in ensuring that they remain functional in their interplay for the project as system to continue providing its planned benefits.

Reliability

This study reveals that water sources in Rwamwanja Settlement are less reliable (mean 1.77). This is characterized by low ranking of the cleanliness of the water, dissatisfaction with the water sources, low availability of water, and frequent breakdown of the water sources. This is in line with the UNHCR (2019). Applying systems thinking to this finding (Midgley, 2003; Kerzner, 2006; Gitonga, 2015), water projects that have a low functionality and accessibility rating would be more likely to have a low reliability rating as

there is an interplay between the three elements of sustainability where low sustainability of one would cause low sustainability of the other. The key informant interviews further confirm both the empirical revelation from the quantitative results and the theoretical postulation that water projects with the aforesaid features suffer dysfunctionality problems. This as evidenced in Rwamwanja Settlement may include producing water that is not good for human health—which is hard with weird taste, the quantity of water harvested from the water points and that trucked remains below the needs of the community. Therefore, low water project sustainability in Rwamwanja may be construed as a sum of the interplay between the level of functionality, accessibility and reliability.

Influence of Community Participation on Water Project Sustainability

The study established that community participation has a significant (P-value=0.000) but weak influence ($r^2=0.055$) on water project sustainability in Rwamwanja Settlement as indicated in Table 4. This is associated with a significant but weak relationship between community participation and water project sustainability ($r=.0235$, P-value=.000). The finding supplements claims by Ofuoko (2011), Kamau (2015), Waithaka, Kisovi and Obando, (2016), Wanyera (2016), and Otieno and Mumo (2017) which concluded that a significant and positive relationship exists between the community participation and water project sustainability and promotion of community participation significantly influences the level of water project sustainability in the community. However, unlike findings by (Ofuoko, 2011; Waithaka, Kisovi & Obando, 2016; Wanyera, 2016; and Otieno & Mumo, 2017) that reveal high influence of community participation on water project sustainability, this study reveals a weak influence. As noted by DRC (2019) the influence of community participation on projects that impact on the lives of the refugees is context specific which could partly explain the low level as derived from the perceptions of the respondents. The project being in a refugee

settlement, certain factors that either limit community participation or water project sustainability independent of community participation could exist. Key informant interviews revealed that inadequate funding from the

development partners and government, use of poor quality materials, and corruption were factors beyond community participation that affected the water project sustainability in the settlement.

Table 4: Relationship between Community Participation and Water Projects Sustainability in Rwamwanja Settlement

Items	Sustainability of Water Projects
Pearson Correlation (r)	0.235***
P-value	0.000
Coeffiffience of determination (R2)	0.055
N	353

{Correlation is significant at the 0.01 level (2-tailed)}

A further analysis of the findings (Table 5) reveals that initiating action is the only significant community participation construct ($\beta=.0188$, P-value=0.001) that influences water project sustainability in the settlement. This suggests that initiating actions by the community in Rwamwanja Settlement influences up to 18 percent of the level of water project sustainability. The finding suggests that in the settlement, higher water project sustainability could be realized when the communities are allowed

to initiate actions regarding water projects. However, as argued by Paul (1987), it is imperative that to get to the highest level of participation, that is, initiating actions, the community should participate by appreciating what is being done for them through information and consultation, and taking part in decision making, then, they will be empowered enough to initiate appropriate actions. This doesn't seem to be the practice in the settlement as witnessed in the findings in Table 2 above.

Table 5: Influence of Community Participation on Water Projects Sustainability

Coefficients				
Model 1	Non Standardized Coefficients		Standardized Sig. Coefficients	
	B	Standard Error	Beta (β)	(P)
(Constant)	1.197	0.149		0.000
Decision Making	0.084	0.065	0.068	0.198
Provision of Resources	0.079	0.052	0.082	0.130
Initiating Action	0.175	0.050	0.188	0.001

Dependent variable: sustainability of water projects: R squared: 0.055; Adjusted R squared: 0.05345

7. Conclusion and Recommendation

The study revealed that community participation in water projects in Rwamwanja Settlement was low in terms of decision making, provision of materials for the projects and initiating actions related to the projects. The community does not feel genuinely invited to participate in the water projects as would be expected in an environment that promotes community participation. In addition, there was low water project sustainability with low levels of functionality, accessibility, and reliability. A

significant but weak positive relationship between community participation and water project sustainability exists. Consistent with the existing literature, community participation significantly and positively influences water project sustainability though, in this study, the influence is weak. Non community participation factors such as inadequate funding from government and development partners, use of poor quality materials and corruption were voiced by the community as aspects that affected water project sustainability in the settlement.

From the findings, the researchers recommend that government at both central and local levels, development partners and firms contracted to develop water projects should establish a water project development protocol that stipulates the steps, structures and processes that build and sustain effective community participation. This should, among others, specify who should participate, how, when and where. Issues of community empowerment to enable more constructive engagement with the other project development stakeholders should be clarified and emphasized in the protocol.

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