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COMMUNITY PARTICIPATION IMPACTING CLEAN WATER PROJECTS' SUSTAINABILITY IN RWANDA: A CASE STUDY ON RUHANGO SECTOR OF RUHANGO DISTRICT

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Abstract: *The study focused on community participation in clean water project sustainability. It was guided by three objectives; assess how Ruhango sector communities participate in the initial stages of clean water projects. To investigate the effect of the Ruhango Sector community participation in clean water project design and implementation and to investigate the obstacles to the participation of Ruhango sector communities in clean water projects. Policy makers and implementers are to benefit from this research as it will provide them with the insight to make clean water development projects strategies more effective to Ruhango Sector communities as well as other communities. Furthermore, organizations involved in the water development sector will gain deeper understanding as to how to maneuver through the hindrances to community participation. This research finding will be useful to students and scholars doing research in this field as it will be available for reference both online. The research has also put the Geographical location on record as far as ground realities on sustainability of wash projects are concerned in relation to hearsay. A pretest of the research instruments was administered to ten respondents chosen randomly, 90% of these were of the affirmed that clean water projects sustainability could be achieved through community participation at initial and implementation stages. 96% of the respondents agreed that they feel great ownership of the projects when they participate and that this has improved their social networks. 95% acknowledged that the greatest challenge to participation is lack of technical knowledge about water and complicated technology used in water systems This study employed descriptive survey. The study population constituted of the household heads, other sector water informants and other water project implementers. The respondents were reached through household survey and purposive identification of the subject matter or key informants across relevant local institutions. The study used a combination of both probability and non-probability sampling techniques. This study collected quantitative data using a questionnaire from 100 respondents and 20 other key players in the water sector were interviewed. The data was analyzed using descriptive statistics generated from statistical tools (SPSS V.17.0 and Excel). The researchers have recommended the following; the level of community' participation in the project planning and implementation should be increased to enhance the sustainability of the water projects in the sector. The project Implementers should seek to adopt modern community friendly technology through increased community training on sustainability. The government should institute stringent measures to ensure that community participation is achieved in order to orient them to the whole project cycle processes other than community being at the receiving end and just users. The water projects should be managed by highly competent personnel to increase its efficiency and sustainability. Finally, the researchers recommend that Community based water project implementers should continue to engage with other key stakeholders in the water sector for concerted effort to support government efforts on community mobilization and sensitisation on the critical role they play as partners for clean water projects sustainability in their communities.*

Key Words: Community Participation, Clean Water Projects, Sustainability, Rwanda

Research Area: *Technology and Business Studies*

Paper Type: Research Paper

1. BACKGROUND OF STUDY

In efforts to meet Millennium development goals, most Sub-Saharan countries come up with many clean water projects, Donnelly (2000) emphasizes, projects are sustained "…when those who live with the result of a project are stillenjoying the benefits as they perceive them…". Great reason to be concerned with program sustainability is that new programs may encounter diminished community support and trust in communities with a history of programs that were abruptly or inappropriately terminated (Goodman and Stickler, 1987/88). Project sustainabilityis defined as the capacity of a project to continue to deliver its intended benefits over a long period of time (The World Bank's definition in Bamberger and Cheema, 1990). One of the reasons many clean water projects are not sustainable is because they don't take into account the needs and views of some relevant stakeholders. Furthermore, communities are not given the proper training for the proper amount of time nor skill or motivation to fix the water system whenever required especially when broken (Parry Jones et al. 2001:19).

Jalan&Ravallion (2003) also noted that social networks were a crucial determinant of who benefited from the workfare program. When communities are given a voice they start to own the project from the start, they see themselves as part of it and carry a measure of the responsibility in sustaining it. The communities then turn their focus from more than just the capacity of the NGOs, government ministries, and other stakeholders, to their capacities as well (for example their skills and knowledge, natural resources).

Since the 1970s, non-economists have seen community participation as one of the solutions to problems relating to sustainability of development projects. Participation at its broadest is seen as an involvement in the decision-making processes. Participation can include attending meetings, actively participating in the decision-making process(Jalan&Ravillion, 2003). The Rwandan government in this light emphasizes in its Economic development for Poverty Reduction Strategies (EDPRS), 2000 that "… a high priority of the Economic development and Poverty reduction strategy is to ensure sustainable and integrated water resources management and development through community participation". Achieving community participation is challenging; for one, it is difficult to achieve full participation as it is time-consuming and conflicts can easily arise. Therefore, NGOs recognize that different levels of stakeholders should have different levels of participation at various points in the project's life cycle. The diverse levels of participation include coercion, informing, consultation, partnership (co-operation), and control (collective action or co learning). Achieving partnerships with primary stakeholders is difficult as primary stakeholders may see it as too time-consuming and requiring much money as compared to perceived benefits, they may not have the proper knowledge and skill for effective participation in the decision-making processes, and sometimes they may challenge the right of other stakeholders to participate (ex: trying to exclude women), EDPRS 2010.

2. STATEMENT OF THE PROBLEM

The Rwandan Government of National Unity (RGNU) has heavily invested in human resource development as an Impetus for community participation in clean water projects sustainability among other development elements and goals as contained in the Vision 2020 launched in 2000 and 2002. Whereby, Community participation was declared as one of the critical elements of vision 2020 seen as a precondition for among other areas clean water project sustainability; (EDPRS 1) 2010. However, no study has been specifically conducted locally to establish the impact of community participation in clean water projects sustainability in Ruhango Sector, Ruhango District in the Southern Province of Rwanda. This

study therefore seeks to assess the actual Impact of community participation in clean water project sustainability and the challenges thereof.

3. GENERAL OBJECTIVE OF THE STUDY

The general objective of this research is to assess how the Ruhango Sector community participation impacts on the sustainability of water projects.

3.1 Specific Objectives

a) To assess how Ruhango sector communities participate in the initial stages of water projects planning.
b) To investigate the effect of the Ruhango Sector community participation in water project implementation.
c) To investigate the obstacles to the participation of Ruhango sector communities in water projects.

4. SIGNIFICANCE OF THE STUDY

Policy makers and implementers will benefit from the present research for it will provide them with the insight to make clean water development projects strategies more effective to Ruhango district communities as well as other communities. Furthermore, organizations involved in the water development sector will gain deeper understanding as to how to maneuver through the hindrances of community participation. They will adopt strategies whose foundation is based on the idea that the community is a partner, not just a benefiter. When projects are sustained, it will enable organizations to put aside more money that would have gone to repairs caused by negligence or low maintenance, for other projects or the furthering of current water development projects. Those bringing water development projects will engage them effectively; Ruhango district communities will play an active role in the sustainability of the project. Instead of leaving all the decision-making and responsibility of maintenance to the organisations bringing the projects, they will take up their responsibility.

The findings of the present study may be useful to students and scholars doing research in this field as it will be available for reference both online and libraries. The research will also put the Geographical location on record as far as ground realities on sustainability of wash projects are concerned in relation to hearsay.

5. THEORETICAL LITERATURE

This section presents relevant theories that this study will be based on. This study is built upon certain theories that have much links with sustainability in organizations. The most outstanding ones that have found much application in sustainability include Community Participation Theory and Sustainability Theory. For community based projects to achieve sustainability, resources are important. These resources will come in the form of human resource, therefore, the need for participation by all the stakeholders in the project for sustainability, other resources of land and finances notwithstanding.

5.1 Community Participation

The term participation is hard to define or as Netshiswinzhe (2000) says 'has become an almost meaningless buzzword over the last decade or so'. Authors do agree that the depth/extent of participation influences the sustainability of a water supply service. Like Evans and Appleton (2005) argue: 'The shift from participation as users of a new service to

the participation of the beneficiaries as owners, partners, and managers is thought to be an important contributory factor to the sustainability of a project '. White (1981) considers that the 'depth of participation' is the extent to which all members of the community are involved in all aspects of a project. To get a better idea from the extent of participation Arnstein introduced the ladder of participation in 1969, which describes the manner in which the community gets to participate in a project. The highest form of participation is the one in which the community feels in control in all stages of the project (Arnstein, 1969).

Netshiswinzhe (2000) argues that almost everybody agrees about the need for participatory development instead of a top-down approach, but still the reality remains that most development work is external driven or top-down. The kind of participation that works is the one in which 'all role-players actually believe that people, regardless of age, sex, educational background, socioeconomic status and history, can actually solve their own problems' (Netshiswinzhe, 2000). In summary implementing a project in a truly participatory way implies that the community members feel in control during all project phases and that the beneficiaries become owners, partners and managers (Joanne, 2005).

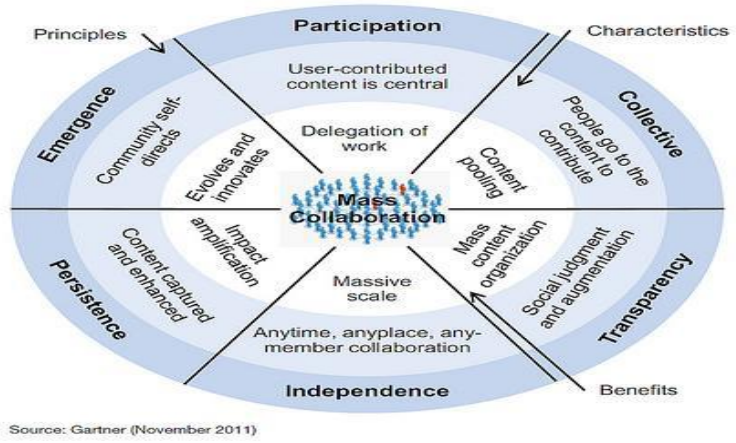

Figure 2.1: Six core principles of community participation according to Gartner (Source Gartner 2011)

According to Gartner, there are six principles for community participation in project implementation if sustainability has to be realized. Applying the six core design principles creates a better social media environment for meaningful collaboration and social community participation (Gartner, 2011). Community participation is the driving force behind successful mass collaboration. Leaders should focus on giving information that seeds discussion and provide social incentives (social status, ramification techniques etc.) that allow for wider community participation.

Collective: the unifying cause of community participation People will swarm if the purpose within the community is compelling enough to each individual personally and the timing is right. It is fairly easy to get people to join a community and visit to contribute ideas around a unifying cause. This is their purpose, their reason for community participation

Transparency: from community participation to community validation Successful social media outlets allow users to view other people's participation. Creating an environment with transparency gives the community the ability to grow, to improve, and to self-correct. Leaders can use tools within a transparent environment to encourage greater

participation. Allowing comment and voting are other ways to provide feedback and participation.

Independence: The freedoms of community participation gating mechanisms impede mass collaboration. Independence allows for anyone to participate anytime without relying on anyone else. **Persistence** and the need to observe how much persistence it is desired within the community as well as the quantity of contribution worth capturing.

Emergence and self-direction; Mass collaboration allows for behaviors to emerge gradually as users interact. In traditional systems, behaviors can be regulated and designed, but not so with mass collaboration in social media. Self-directing communities are more participatory interactive, more idealistic, and greater productivity is easily achieved. Gartner (2011).

5.2 PROJECT SUSTAINABILITY

According to Saugeen (2003), Sustainability "has become one of the most overused and abused word in the development vocabulary". In the most obvious sense, the term "sustainable" refers to something which can be kept going. But, it also refers to resource use and lifestyles which do not damage resources or society ''. Sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future"(United Nations, 1987)."Sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs." (Merriam Webster, 2010).

Ingle (2005) indicated that sustainability encompasses conventional approaches while adding a longer-term perspective. This longer-term perspective invites other, less traditional considerations for project identification and selection. Further, Ingle (2005) highlighted that, for a project to achieve sustainability, it needs to be implemented through a strategic approach. The strategic approach incorporates four main elements, future Orientation: assuming things will change, and planning to maximize benefits which can be derived during and from that change; external emphasis: recognizing the diversity of the project environment and the many dimensions which impact on project outcomes, including technology, politics, society, and economics; environmental fit: planning for a continual fit between the project (both benefits and delivery institution) and its environment, including mission, objectives, strategies, structures, and resources; and process Orientation: planning and management priorities evolve in an iterative cycle of conscious and deliberate learning from experience as the reality changes. In the last three decades, literature in the water supply sector has shown that sustainability of rural water supply structures has become positively associated with small-scale initiatives, which maintain public participation (Davis &Liyer, 2002).

Getting the users' Participation in the planning, implementation, operation, protection and maintenance of water supply systems meaningfully is the key to sustainability. Community members' contributions might take the form of money, labor, material, equipment, or participation in project-related decision-making and meetings (Davis &Liyer, 2002). The United State Agency for International Development, over the past three decades, has shown that water and sanitation activities are most effective and sustainable when they adopt a participatory approach that acts in response to genuine demand, builds capacity for operation and maintenance and sharing of costs, involve community members directly in all key decisions, develop a sense of communal ownership of the project, and uses appropriate

technology that can be maintained at the village level. Also important are educational and participatory efforts to change behavioral practices (USAID, 2009).

Relevant policies and project management plans take into account sustainability criteria as appropriate to each area while tendering and contracting processes are explicit about the project requirements related to environmental and social performance. Furthermore, project instructions support commitments to various practices such as resource efficiency, waste management, procurement, and stakeholder relationships among others. Appropriate training was provided at all levels to ensure understanding of the project commitments to sustainability (Kerry, 2005).

5.3 COMMUNITY PARTICIPATION AT THE START OF PROJECT PLANNING

Community participation is a cornerstone of community based projects. Well-developed community based projects will bring people together and allow them to share ideas and concepts and then arrive at a consensus on what is best for them (Watkins, Leigh, and Kaufman, 2008). Community participation is an opportunity to get "grassroots" participation in the communities' program. Effective community participation can: Provide a way for community members to share information, encourage a more democratic process, provide dialogue between the community and decision makers, generates creative alternatives and solutions, help reach consensus on solving issues and problems in the community (Kizlik, 2010). Members of the community should be seen as equal partners in the dialogue that takes place during execution of the projects. Community members need to understand the details of a project to evaluate its importance, costs, and benefits (Donna and Greg, 2001). Hence, failure to adequately inform and involve them can cause significant delays as a result of their reluctance or outright opposition to the project. To make progress, a high level of patience and willingness to listen with an open mind are important to all stakeholders and participants in the process (Kizlik, 2010).

The community participation process should begin early and often. Early participation at the community will enable participants to feel they are a part of the process, develop a spirit of cooperation among participants and encourage the flow of accurate and unbiased information (Gilbert, 1998). Gordon (2004) suggested the following steps for setting up a community participatory program: Solicit individuals, especially those directly impacted by the project. Pay particular attention to the identification of groups that do not traditionally participate in the revitalization process, such as minority and low-income communities; establish educational programs or a repository to access data (such as a public library), or both, so that groups or individuals can obtain timely, accurate information that enables them to have a meaningful influence in decision making. According to Roger, Rojas and Mayer (1993) it is important that communication is factually correct, consistent, and relevant to communities with a high percentage of minorities. Project managers should provide timely and frequent announcements of public meetings through local media and/or flyers and identify the source where interested community members can get more information; develop sponsoring and co-planning relationships with community groups, ensuring them shared roles in developing agendas, setting of goals, and providing leadership and outreach; plan meetings that are accessible and accommodating. Community leaders assist in the communication of information by suggesting appropriate means of informing the community, talking to their respective constituents, announcing meetings, ensuring that participation efforts reflect cultural diversity and communication differences among the ethnic groups, developing notices that are concise, understandable, and available to the communities involved, mapping

the capabilities and assets of individuals, citizen associations, and local institutions, and building relationships and alliances to respond to the project challenges. Rojas & Mayer (1993).

Communities need a continuous process of engagement, as they are outside the system and need information, knowledge and time to ensure they can engage effectively. Community participation in project planning can assist with developing good relationships at local level with communities, and helping to identify community needs in advance. This can provide greater certainty and time in the determination process and implementation of projects (Gilbert, 1998). An informed choice-of-technology and level of service decision should be made by the community, consolidating their role as the primary partner in a project. This local choice can then be supported by the implementing agency by creating the needed supporting infrastructure (pump repair training, and well maintenance) for the community-chosen type of technology. This type of substantial participation between the two involved partners has a higher potential of leading to a more sustainable clean water project (Narayan, 1995).

Recent studies have shown that sustainability of projects improves when communities are allowed to take a central role during all stages of the project, including design and planning (Mangin, 2001 & Williams, 2008). For instance, failure of the water projects in recent years can be attributed to the project's failure to involve the communities in the design, planning and management phases. By offering options it is more likely that the chosen type of project technology will show benefits in terms of the community values, not just quality improvements that the donor agencies typically stress, but also convenience, time savings, improved access (Kendie, 1992). This type of approach requires a high degree of institutional flexibility on behalf of the implementing and donor agencies in order that they remain capable of responding adeptly to the diverse needs of their client villages. As long as choice-of-technology decisions are predetermined and influenced in such a way by the implementing agency, the community demands cannot be adequately met (Narayan, 1995).

5.4 Effects of community Participation on Project Sustainability

Recent studies have shown that sustainability of projects improves when communities are allowed to take a central role during all stages of the project, including design and planning Community participation involves capabilities and willingness of communities to take charge, influence and determine the nature of project during its life cycle to ensure long lasting impacts. (Mangin, 2001 and Williams, 2008). The critical Reasons for Community Participation are described in detail below; Chamala (1995) identified efficiency benefits from participation, stating that 'involving stakeholders and empowering community participants in programs at all levels, from local to national, provide a more effective path for solving sustainable resource management issues'. Participation enhances project effectiveness through community ownership of development efforts and aids decision-making (Kelly &Vlaenderen, 1995; Kolavalli& Kerr 2002).

Price and Mylius, (1991)also identified local ownership of a project or program as a key to generating motivation for ecologically sustainable activities. The authors also identify the role of community participation in disseminating information amongst a community, particularly local knowledge, which leads to better facilitation of action (Price and Mylius, 1991; Stieglitz, 2002). Kelly (2001), identified that participation results in learning, and learning is often a prerequisite for changing behavior and practices. Your opinion is important: Community participation is a vital part of many projects and the benefits of it are

well documented, such as better outcomes for all stakeholders, community ownership and lower project costs. Public participation brings more information to the decision, including scientific or technical knowledge about the context where decisions are implemented. Community benefit / ownership: When the community participates in a project, they have ownership of it and the decision making process, which is a critical key to a successful project outcome, it seems people will participate on community boards or groups in order to have direct influence and impact over decisions in their community. These reasons appear to link to their sense of quality of life and what is important to them in the community (Joanne and Vasant, 2005).

5.5 Obstacles to Community Participation in Project Sustainability

According to Schubeler, different constraints for participatory strategies impede the success of the possibility of effective community participation between the different elements of development programs in developing countries; the legal constraints, regulations and technical standards, planning methods, project management procedures, or absence of a workable model. Regulations and technical standards which local governments apply to development often delay participation. Theconservative master plans for development embody a conceptual approach, which is in many ways a top-down process that focuses on the desiredfuture state of development (Schubeler, 2011)

Afsar (1999) in her study shows that poor people's participation in local development activities is very limited; community participation in the decision-making process has been very minimal. Because of the over-class bias and widespread corruption there has been severe neglect of the poor and the disadvantaged in the decision-making process. Khan (2009) identifies bureaucratic domination in the local councils, lack of knowledge, and lack of expertise in technical matters are the root causes for non-participation. Local elites form connivance with local administration for their own interests and bypass the needs of the mass. So the scanty participation that exists is limited only to the rich and participation of the rural poor is minimal.

Hossain (1978) examines that people's participation in planning and implementation of development projects has been very limited. "Poor rural community people are hardly included in planning and decision making. Committees are mostly dominated by people with strong socio-economic or political background. In addition, project committees have largely been used as mechanisms of patronage distribution''. Development projects have been a means for the local representatives to build a future for themselves. He further identifies that prevailing socio-economic and political contexts act as important deterrents to grassroots' participation in the development process (Siddiquee, 1995)

Asaduzzaman (2008) found that people's participation in development projects is still an 'elusive golden deer' that the nation sought persistently but could not find during the last three decades or more. His study however, emphasized that clientelism which is a direct product of the undemocratic political culture of many developing countries, is a major threat to people's participation in local development programs /projects. In addition, the study also Identifies political reluctance and bureaucrat resistance as major challenges to people's participation in development intervention. In fact, there is lack of empirical evidence on the extent and status of community people's participation in development projects and identification of the major factors for non-participation and its possible solutions.Kaler, J. (1999),highlights eleven constraints, including the paternalistic posture of authorities, prescriptive role of the state, embellishment of successes, selective participation, inattention

to negative results, hard-issue bias, intra/inter-group conflicts, gate-keeping by leaders, excessive pressures for immediate results, lack of interest, population size, and belief systems, are some of the hindrances to community participation in clean water project sustainability sighted.

6. MPIRICAL LITERATURE

6.1 Community Participation at Initial Stages of Clean Water Supply Projects

The harmony of water supply programs' components is crucial to the sustainability of a project. According to Betman& Miriam (2007), clean water-supply programs consist of three essential components: technology, people and institutions. This article highlights the differences in maintaining and operating water-supply systems in rural villages and rural market centers in Nepal. The analysis considers disparities between users' willingness to pay based on data collected through surveys of 205 households and representatives of 12 water-user committees. Due to varying geographical locations and socioeconomic conditions among rural villages and rural market centers, core operation and maintenance problems for drinking water sustainability are immensely different. Weak institutional capacity is the prime obstacle in the provision of drinking water in the rural villages while technicalities such as insufficient water quality and inconvenient water-point locations are the major issues in the rural market centers. Moreover, levels of user satisfaction influence the operation and maintenance of both types of systems. This study considers user-satisfaction parameters and the overall influence of satisfaction on users' 'willingness to pay' (Betman& Miriam, 2007). In other words, when communities place value on clean water projects and understand the importance of clean water, then they are more willing to bear the cost in exchange for the returns.

6.2 Community Participation and Sustainability of Water Supply Projects

According to Ahmad(2011), Punjab is one of the most populous provinces of the country, as 90 million out of total 185 million populations of Pakistan lives in this province. More than 70% population lives in rural areas. 89% of the rural population has access to water supply, while piped network coverage is nearly about 48% in rural areas. Since 1996, the PHED Department is following the policy of community participation in various stages including post construction O&M of the scheme. This Department has constructed and handed over 4000 schemes to community groups – called Community Based Organizations (CBOs) for O&M. Out of 4000 schemes, over 85% are pumping piped water supply schemes, while remaining are gravity schemes, but all have house connections. Although PHED exists in remaining three provinces of the country, but there the Department takes full charge of O&M, leading to poor services being a typical public sector organization (Ahmad, 2011).

According to Therkildsen(1988), in order to see the relationship, if any, between community participation and sustainability of rural water supply programs in District Faisalabad, Punjab, Pakistan. After data collection, editing, coding and data entry was done in the computer for data analysis. SPSS (Version 19) was used for data analysis. It was found that out of 100 respondents, 90% were paying monthly water supply bill. It was also found that 51% of the respondents were contributing to great extent" that community participation played a vital role in sustainability of the water supply program. It was found that 54% of the respondents had the sense of ownership of water supply program „to some extent" and 45% of the respondents had the sense of ownership to great extent. Through inferential analysis

(Chi-Square Test), it was found that there is an association between community participation in O&M of the program and sense of ownership in the community. The findings of the present study clearly warrant the need for increased rural clean water supply programs and active engagement of community participation for sustainability, (Haq1, Hassan2&Ahmad, 2014)

6.3 Critical Review and Research Gap Identification

In their vision 2020, The Rwandan Government of National Unity has heavily invested in human resource development which it believes will be catalyst to community participation in clean water project sustainability. Community participation was thus declared a critical element in the achievement of clean water project sustainability as enshrined in the EDPRS 1 AND 2. In the last three decades, literature in the water supply sector has shown that sustainability of rural water supply structures has become positively associated with small-scale initiatives, which maintain public participation (Davis and Liyer, 2002). Involving the users in the planning, implementation, operation, protection and maintenance of water supply systems meaningfully is the key to sustainability. Community members' contributions might take the form of money, labor, material, equipment, or participation in project-related decision-making and meetings (Davis and Liyer, 2002 (Thematic Group, 2005). As noted elsewhere in this study, it is estimated that 35% of improved rural water supplies in sub-Saharan Africa are non-operational and this scenario is no exception in Rwanda. In East Africa, Netwas International (2009) notes that provision of water and sanitation services through projects is one thing and maintaining the services is quite another.

Brager1 Specht2, and Torczyner3 (2001) defined participation as a means to educate citizens and to increase their competence. It is a vehicle for influencing decisions that affect the lives of citizens and an avenue for ensuring success of a project. However, it can also be a method to co-opt dissent, a mechanism for ensuring the receptivity, sensitivity, and even accountability of social services to the consumers. Armitage (2003) indicated that citizen participation as a process by which citizens act in response to public concerns, voice their opinions about decisions that affect them, and take responsibility for changes to their community, their support, he pointed out is key for the sustainability of a community project. Manga & Wendy (Chappel, 2005) suggest that stakeholders support may also be a response to the traditional sense of powerlessness felt by the general public when it comes to influencing government decisions.

According to Oakley and Marsden (2007), stakeholders' support brings together individuals, families, or communities who assume responsibility for their own welfare and develop a capacity to contribute to their own and the community's development. In the context of development, community participation refers to an active process whereby beneficiaries influence the direction and execution of development projects rather than merely receive a share of project benefits. The current study seeks to establish the relationship of community participation and sustainability of community based clean water projects in Ruhango District. The identified indicators in the literature review of community participation are community participation in decision making, at initial stages of project inception, Participation in implementation and its effects on sustainability. The review has also indicated some of the methodologies that have been used to carry out assessment of sustainability studies, and their pros and cons. The literature reviewed also shows there is a knowledge gap of studies done locally to investigate the post project implementation assessment of sustainability of community clean water projects managed, indicating that there

is a local knowledge gap on water projects' sustainability issues in Ruhango Sector,Ruhango District, Rwanda; thus prompting the researcher to embark on this most needed assessment research project.

7. THEORETICAL FRAMEWORK

The study was constructed based on two theories, Community Participation and sustainability theories respectively:

7.1 Community Participation Theory

The most important process in any development project is the encouragement of the active Participation of the local community. Without community participation it is not possible to determine what are the problems, constraints, and local desires for a given community. According to Harvey and Reed (2007) participation of project beneficiaries' is of great essence in that it enhances the sense of ownership among members. This is important in ensuring that water projects are operated and maintained after the implementation phase. Cohen and Up Hoff's theory regarding people's participation is chosen for this study. Community participation theory assumes that the higher the community participation in a decision, the less the likelihood of interferences of external organizations on that decision. In this theory focus is given on the participation of beneficiaries and not that of personnel from the implementing agencies in development projects. Community participation is attained through collaborative or joint involvement of project beneficiaries and the implementing agencies. (Khawaja, 2004) According to Holcombe (1995), acknowledgement of the importance of participation grew out of the recognition that the worlds' poor have actually suffered as a result of development, and that everyone needs to be involved in development decisions, implementation and benefits. As participatory approaches advanced, they highlighted the weaknesses inherent in traditional, top-down approaches that focused on single disciplines and reductionist paradigms (Johnson and Walker 2000). Agrawal and Gibson (1999) identified the limitation of the state in top-down resource conservation practices and emphasis popular participation as the remedy of these shortcomings. Mompati&Prinsen (2000) made a similar observation of the uniqueness of an individual as an entity who is capable of making unique contributions to decision-making. This represents a move towards people centered development at a normative level which is a source of inspiration for contemporary community participation in clean water project sustainability among other areas of sustainable development (Chambers, 1993).

7.2 Sustainability Theory

The social dimensions of managing water projects may involve things like village-level coordination, compromise, financial management and decision-making. Sustainability theory gained wider use after the World Commission on Environment and Development published a report titled "Our common future" (Brundtland, 1987) which defined sustainability as "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs". According to IFAD strategic framework 2007 -2010 (IFAD, 2007) sustainability amounts to: Ensuring that institutions supported through projects maintain and continue the benefits after the end of projects. The term sustainability integrates social, environmental and economic responsibilities (Ekardt, 2016).

Increasingly, local people are being required to pay into a community fund for every liter of water they use. These roles into the economic development aspect where by a village

committee is set up, a bank account opened, and a custodian appointed to collect fees. The committee is effectively charged with running water project to ensure sustainable supply to the people in the locality (Ekardt, 2016).

Figure 2.2: Dimensions of Sustainable development (Source: Ekardt 2016)

Several dimensions of project sustainability have been considered depending on the nature of the sector or project. Each of these dimensions has the capacity to influence project sustainability in one or way or another. The Sustainability Planning and Monitoring guide on Methodology for Participatory Assessment (MPA) for Community-Driven Development Programs (2000) described the following five dimensions applicable for assessment of water projects sustainability. Technical sustainability refers to the reliable and correct functioning of the technology and, for water supplies, the delivery of enough water of an acceptable quality. Equity aspects relate to the technology meeting the demands of all user groups. Requirements for technical sustainability include: a technically good design, which is adhered to in construction and operation, financial resources meet at least the costs of operation, maintenance, and common repairs. Equity elements relate to who pays for all this and how fairly payments are shared between and within households. Institutional sustainability.Social sustainability. Users will only sustain services that satisfy their expectations Water supplies and sanitation facilities themselves threaten the environment through the unsafe disposal of wastewater and human and solid waste. It also incorporates fair sharing of responsibility among users for the protection of their environment and water resources.

M. Adel Khan (2000)

8. CONCEPTUAL FRAMEWORK

Independent Variable Dependent Variable

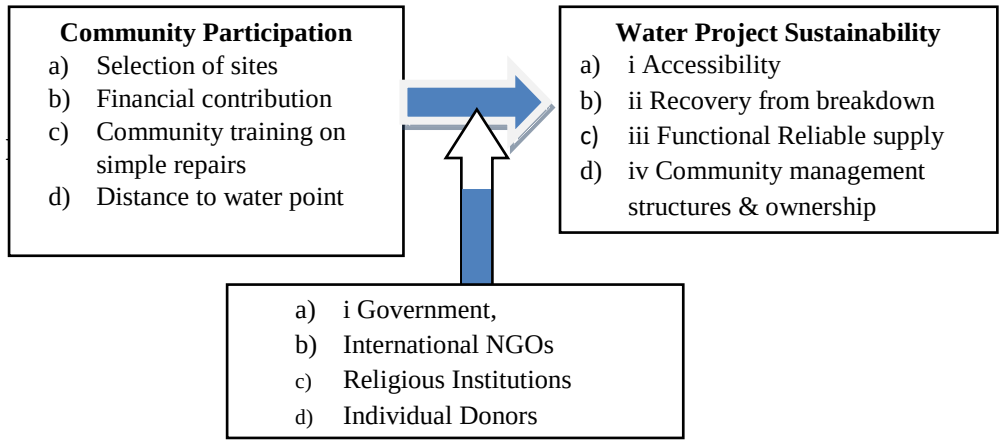

Figure 2.3: Conceptual framework (Sourcethe Researcher)

The conceptual framework above is a diagrammatic representation of the relationship between the variables. Community participation, training on the kind of technology used in extraction of water and distance between the user and the water point are the independent variables for this study. They influence the dependent variable which is; Sustainability of water projects. This relationship is affected by the Government policy which is a moderating variable and will not be measured in this study. The intervening variables which can affect the relationship between the dependent and independent variable are; weather conditions and the attitudes of community members. Community ownership of water projects is negatively influenced by the use of inappropriate technologies, unavailability of spare parts, lack of local maintenance and operational capacity, lack of local community education and participation, ineffective community demand, lack of co-ordination of sector agencies and water facilities being sited far away from the beneficiary households. From the conceptual framework, community participation, community training and distance between the user and the water point are the independent variables for this study. They influence the dependent variable which is; Sustainability of clean water projects. If community water projects are to succeed, technical, social, economic and environmental aspects must be well coordinated. Without the interest and support of the target beneficiaries using the system, no project will succeed.

The study adopted the community participation theory which is considered appropriate for this study because community participation in decision making, implementation, operation and maintenance of development projects influences community ownership which in turn enhances Sustainability of development projects. From the literature reviewed such a study hasn't been conducted in Ruhango Sector. This study will thus contribute towards the bridging of the knowledge gap.

When the right levels of participation are employed, the project is likely to be more sustainable. When the communities are engaged to participate, the outcomes are a combination of efforts and inputs from both government, NGOs, religious leaders and individual donors working together with communities for sustainable development, thus achieving one of the MDGs of providing communities with sustainable clean water.

9. RESEARCH METHODOLOGY

9.1 Research Design

Descriptive research design as the case study attempted to describe present conditions (how community participation was impacting clean water projects' sustainability in Ruhangosector in Ruhango district Southern Province of Rwanda) which is our case study. It primarily attempted to answer the questions such as who, how, what, which, when and how? The relationship between two variables; and the intervening variable will also be highlighted. Community participation and clean water project sustainability will be investigated. [Cooper & Schindler 2011] The fact that it provides data that is statistically inferable, allowing the researcher to measure the significance of the results and their correlation. In addition, the descriptive research design is both quantitative and qualitative and can be carried out by observation, case study, and survey; Ruhango district is a very large area to cover and it would be time consuming to study specific communities in depth. Hence, the case study would be appropriate for this research.

9.2 Target Population

The study population **constituted** the inhabitants of Ruhango sector in Ruhango District and the water key informants found in the same locality. This formed a cross section

of people involved in the development of clean water projects, use, management, as well as those with expert information on clean water community based projects. The respondents were reached through household survey and purposive identification of the subject matter or key informants across relevant local institutions. From the census data of the Fourth Census 2012 of Rwanda, Ruhango sector has a population of 65,700 who are targeted in the study Source (Rwanda 4th Population and Housing Census, 2012 (NISR). Further, the study focused on 20 different experts working and implementing water projects in the sector.

9.3 Sampling Design

This study collected data from community households residing within Ruhango sector. A mix of both probability and non-probability sampling methods were combined to achieve maximum reliable responses for triangulation of themes. A sample from the households be picked because a household was taken in this study as an appropriate unit providing reliable information regarding the objectives of the study. Van Dalen (1979) lists three factors that he considers to determine the size of an adequate sample as (l) the nature of the population, (2) the type of investigation, and (3) the degree of precision desired.

9.3.1 Representative Sample Size

Slovene's Formula was applied in selecting the representative sample size of the present study. According to the 2012 census of Rwanda, the population of Ruhango sector was 65,700. Applying this to the above formula the minimum sample size obtained was 100 house hold heads to be interviewed. To increase response rate for more accurate data 20 other key stakeholders including Religious leaders, other implementers and district water teams will also be randomly sampled and interviewed.

9.4.1 Methods of Data Collection

Questionnaires and Interviews were used in collecting relevant data in relation to the objectives of the study within the area of study. Questionnaires were administered to 100 household heads across the cells as clustered; Whereas Interviews were done on key water informants as sampled to meet the need for the research.

The questionnaires were administered to targeted sample groups by research assistants who were distributed within the geographical area of study. The target categories were reached out to in 8 cells within the sector in question. Specific experts and technical targets in both water sector and government players acting as intervening variables were also targeted.

9.5 Data Analysis Procedure

The researchers edited completed questionnaires to ensure their completeness and consistency. Data clean-up followed; this process involved editing, coding, and tabulation in order to detect any anomalies in the responses and assign specific numerical values to the responses for further analysis. The descriptive statistical tools (SPSS V.17.0 Data analysis procedure was used, that included the process of packaging collected information and putting it in order and writing it in a way that the findings could easily and effectively be communicated. Editing, coding and tabulation was carried out as part of the inferential and descriptive statistics through correction of detected errors and omissions.Both qualitative and quantitative means including use of tables, among others were an important step in preparation of data for computer processing with statistical software in readiness for presentation.

10. FINDINGS

The study established that the majority (54.4%) of the community members never participated in the initiation/start of the water projects. thus level of stakeholders' participation in the water projects was low which affected the sustainability of water project. The household participated in the initiation/start of the water projects when they were consulted through a meeting, contribution of building materials and as leaders of the committees. This implies that community participation was critical in the implementation of the water projects in the sector. The involvement of the all the stakeholders determined the efficiency and sustainability of the water projects.

The stakeholders' participation positively enhanced the sustainability of community based water projects to a great extent. Therefore, the community' participation enhanced the Efficiency of the water project to a great extent consequently improving the sustainability of the project. The main benefit associated with community' participation in the project was continuity of the project (67%), timely maintenance/repairs (56%), harmony/conflict management (46%), strong ownership of the projects (44%), better service delivery and expansion of the project. The stakeholders were not adequately involved in the project. Therefore, the lack of sufficient stakeholders' participation in the project implementation contributed to the project failure.

The study also revealed that; stakeholders' support ensured that participants are actively involved in project planning and implementation or through formal or informal training and consciousness- raising activities stakeholders' participation has enabled them to clearly understand their involvement of the target communities is crucial for the sustainability of rural water supply systems stakeholders influence and share control over water development initiatives, and the decisions (e.g. for expansion, operation and maintenance) and resources which affect them by the Stakeholders' support, the community ensures the success of a project through collective efforts to increase and exercise control over project building a partnership with the communities lead towards improving the people's problem solving capacities stakeholder are better placed to lobby for government and donor support for the community project community support has increased project efficiency stakeholders' contribution influences the direction and execution of water development projects rather than merely receive a share of project benefits stakeholders support ensure that community project are managed effectively, minimizing wastes and thereby ensuring their sustainability more so financial sustainability stakeholders' support brings together individuals, families, or communities who assume responsibility for their own welfare (ownership) stakeholders' involvement in the project implementation has enhanced continuity in the operation of the water project respectively.

The study found that the water project has positively transformed health, water and sanitation practices in the region the water project has facilitated participation of local communities in development initiatives in the region the project has encouraged residents to take ownerships of their own community resources the project has improved security in the region by reducing conflicts over natural sources of water the water project has encouraged residents to conserve available water resources and other natural resources the community has gained substantial knowledge and technical skills from the water project the water project unites people from different cultures/tribes/clans in the region the water project builds community identity and pride , through the water project the cultural norms are upheld in the community around , the

water project promotes social networks amongst residents in the region the water project has enhanced partnerships between the local community and the government or non-governmental organizations and that people from different cultures/tribes/clans in the region benefit from the water project respectively.

The study showed that those who managed the water project responded adequately to concerns whenever raised. The people appointed to manage the water project were effective. The study however found out that there is insufficient technical expertise to manage the project by community if proper training is given, there is sufficient human resource for sustainability of the project the community is satisfied with the overall management of the water project (risk management is satisfactory management of projects has increased the alignment of development projects with host communities priorities project managers have adequate and experience (task familiarity) in management there are clear and achievable estimates in the project schedule and budget community based projects are complex and require multifaceted management skills the leadership skills of the managers is satisfactory and that advise about technical architecture was made available for the project respectively.

The study revealed that in the majority of the households there was no meters installed to monitor consumption of water. Therefore, the level of adoption of technology in the management of water project was very low impairing the sustainability of water projects.

The challenges affecting constant supply of the water to the households form the water points expensive parts/fuel (56%), breakdown of generator pumps (45%), breakage of pipes (44%), vandalism (31%) and blockages of pipes (23%) respectively. The water project suffered major setback due to breakdown as the local artisan's who were relied on lacked adequate skills to maintain the water project. The sustainability of the water projects in the sector was highly affected by lack of modern technology required in the running of the project as the local community was not fully equipped with adequate skills.

The study established that sustainability of rural water supply system depends on factors controlled by the project like; training, technology, cost of the project and construction quality, depend upon its integration into the projects objectives adoption of technology is key in sustainability of clean water projects as it eases operations and maintenance respectively. Therefore, technology was a critical factor affecting the sustainability of the community based water project. Mbithi and Rasmussen (1999) stressed the importance of technology on sustainability of community based projects indicated that, sustainability of rural water supply system depends on factors controlled by the project like; training, technology, cost of the project and construction quality and factors that are not controlled by the project for example, communities' poverty level, access to technical assistances and spare parts.

The study established that the forms of technology used in the rural community based water projects included information communication systems, accounting systems, service delivery, fault reporting, reporting systems, payment systems respectively. Other aspects of technology influencing the projects sustainability included; pumping technology, choice of tech (Solar energy vs. Generator, borehole, dams, water pans) payment systems spare parts availability service delivery and fault reporting respectively.

The researchers observed that there were various the policies or measures either initiated or undertaken by the department to ensure proper: utilization, conservation, planning or management of the water projects. However, the policies were not fully implemented owing to lack of financial resources, lack of support by the top management, lack of community ownership of the project and lack of skilled manpower to run the water projects. The indicators of sustainability included improved access to water by the area residents, reduced cost of running the project and environmental protection and conservation. The main factors contributing to sustainability were; use of modern technology, full participation by the stakeholders, proper management of the water project by qualified personnel and integration of local community culture in the planning and implementation of the project. The sustainability of community based projects was dependent on included stakeholders' participation, cultural practices, use of best management skills and practices by the managers of the projects and adoption of modern technology in the running of the project.

11. CONCLUSION

The present researchers conclusively state that the majority of the community members never participated in the initiation/start of the water projects. Thus, level of stakeholders' participation in the water projects was low which affected the sustainability of water project. The household participated in the initiation/start of the water projects when they were consulted through a meeting, contribution of building materials and as leaders of the committees. This implies that the stakeholders' participation was critical in the implementation of the water projects in the sector. The involvement of the all the stakeholders determined the efficiency and sustainability of the water projects. The stakeholders were involved in the water project through contribution of funds/other resources, through designing and in management/running of the operation of the rural community based water projects. Thus the stakeholders brought many contributions to the running of the water projects in terms of financial supports, designing of the project and the operation of the water projects. The stakeholders' participation positively enhanced the sustainability of the water projects to a great extent. Therefore, community' participation enhanced the efficiency of the water project to a great extent consequently improving the sustainability of the project. The main benefit associated with community participation in the project was continuity of the project, timely maintenance/repairs, harmony/conflict management, and strong ownership of the projects, better service delivery and expansion of the project. In the sharing of development activities, the communities approached strategic personalities and institutions to aid in management of the project, and in lobbying for support from the government and private sector.

The study also concluded that; community participation and other stakeholders' support ensured that participants were actively involved in project planning and implementation, improved the projects ownership by the community, enhanced the sustainability of rural water supply systems through sharing control over water development initiatives, and the decisions and helped in building a partnership with the communities lead towards improving the people's problem solving capacities as well as helped in lobbying for government and donor support for the community project.

12. RECOMMENDATIONS

- The researchers are of the view that the level of community' participation in the project planning and implementation should be increased to enhance the sustainability of the water projects in the county.
- The project management should seek to adopt modern technology through increased budgetary allocations.
- The Local Government should institute stringent measures to deal with persons vandalizing the community water project. This should be coupled with improved security offered by the security agencies to mitigate the cases of vandalism.
- The water projects should be managed by highly competent personnel to increase its efficiency and sustainability.
- The Government of Rwanda should continue to insist on community capacity building in order for them to have enough knowledge that would empower them to participate more effectively in water projects sustainability, and this will only happen if communities have been legally mobilized to participate at all stages of the project cycle for hands on skills during inception implementation and management later own. Policy should make it mandatory for community members to participate in water projects in order to inspire ownership and sustainability.
- The local community is critical to sustainability since they live with the consequences of the project. Communities should have appropriate local leadership structures that are responsible for community mobilization at grassroots level for participation in water projects. The critical need for water and its relation to health, hygiene and sanitation can give great reasons for community to participate in water projects in order to improve the lives of their families.
- International organizations should continue to offer technical training to the local communities so as to empower them for participation and sustainability later after they are long gone. They should sponsor and fund workshops that could help impipe sustainability skills to communities. They should see communities' stakeholders and not at the receiving end, and that will make communities feel they are regarded and they will take responsibility for their water projects.
- Civil societies and organizations stand a better chance to engage other development partners at both regional and global proportion to jointly work together and raise more resources and network to build capacity of communities in water system management and in technical skills necessary for water sustainability and repairs.
- Religious institutions and matters of faith dram large followings. If they would influence the faithful to work with government in water projects within their communities, they would be role models to emulate. Individual donor's could invest in community capacity building and training to supplement government efforts in raising more funds for extension of water services that are sustainable.

13. SUGGESTIONS FOR FURTHER STUDIES

Since this study was on community participation in clean water project sustainability in Ruhango sector of Ruhango District the study recommends that;

Similar study should be done in other sectors in Ruhango District for comparison purposes and to allow for generalization of findings on the community participation in clean water project sustainability. Additionally, similar studies should be conducted on the role of women and other stakeholders in enhancing the sustainability of water projects in Ruhango District. The study recommends that other stakeholders in the water sector should carry out studies on how they can team up and work together with communities and local government in order to avoid overlap and repeat of strategies that do not aid in project sustainability.

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