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Governance Dynamics And Sustainability Of The Rural Deep Underground Water Sources: Lessons From Central Sub Region, Of Uganda In Sub- Saharan Africa

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Abstract*: Over the years governance and sustainability of Uganda's rural deep underground water sources in the central sub-region of Uganda. It aimed to analyze the influence of governance structures and water users' management committees' rules on these sources. The research used a mixed methodology, collecting both qualitative and quantitative data from 1458 people across 36 rural communities in Uganda. The study employed stratified, purposive, simple random, and convenience sampling approaches. The study used a case design grounded on governance system theories and it also used a positivism philosophy that posted into ontology and epistemological stance. The study drew a sampled 1458 people as unit of inquiry from targeted population of 36 study site across rural community in the entire central region of Uganda. The study used stratified, purposive, simple random and convenience sampling approaches. The results indicate that there is a positive and significant contribution of governance structures towards sustainability of rural deep underground water sources in study are and the entire emerging economies in Sub-Saharan Africa. Whereas correlation results of the study indicated high levels of equity, efficiency and overall sounding strategies for sustainability. The study highlights challenges in implementing national rural safe water policies, highlighting a knowledge gap among local leaders and inadequate follow-up of governance structures. It recommends institutionalized governance strategies, community engagement, and the use of new public management paradigms, mobile technology, and structural equation models to enhance water source sustainability in Uganda and Sub-Saharan Africa.*

Keywords: **Sustainability, structures, Central Sub-Region, Equation, Model**

Introduction

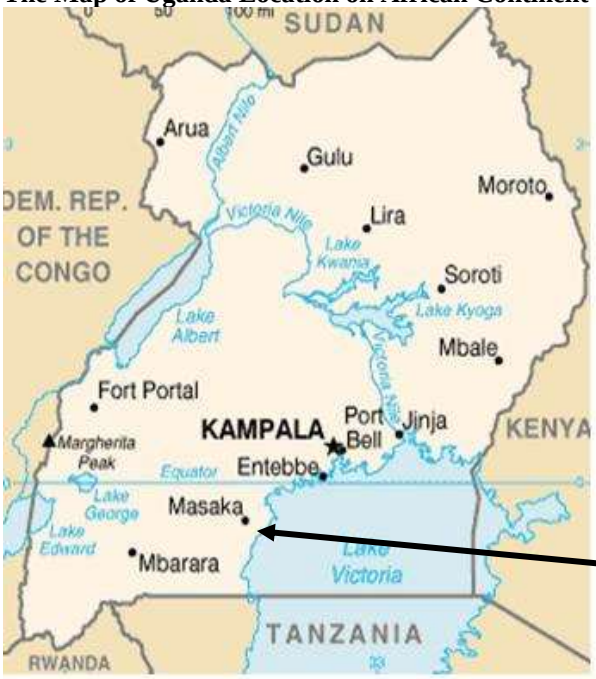
There is global quest to answers the increasing relative risk and growing concern safe water scarcity and sustainability of underground water sources. The experience safe water scarcity is severe in many of the emerging economies globally, with about 1.2 billion people, who do not have access to safe water. It is estimated that, more than 1 billion people who do not have access to safe drinking water and domestic use live in Africa and yet water is insurance to life (Tripp, 2015:132). This chapter traces the roots effective Governance Systems and Sustainability of Rural Deep Underground Water Sources concept is crucial and calls for sense of citizen based participation in the management system.

The study area was in the Sub-Saharan Africa because most of the countries in this locality are faced with challenges in governance system and sustainability of their underground water sources. That made Sub-Saharan Region suitable for the study and Uganda being one of countries in Africa that experience scarcity of safe water. It was notable most of the countries in Sub-Saharan Region encounter Governance constraints and management of their available resources. This mainly observable emerging country of Africa south of Sahara and Uganda is no exception. The Countries in eastern region of experience Semi-Arid corridor of sub-Saharan Africa, which shares boarders with Kenya in the east, Tanzania and Rwanda in the south, Democratic republic of Congo in the west and Southern Sudan in the northern side.

The study was carried in Central Sub-Region of Uganda as a case of the developing countries in sub Saharan Africa. The study examined the governance systems and sustainability of rural deep underground water sources. It analysed the applicability of rural water sector policy and widely held beliefs based on community participation model supported by local governance systems and decentralized service delivery. The study was guided the objectives and arched on governance theories while observing their applicability in Uganda, particularly in Central Region. This area was purposively selected due to its characteristics and uniqueness in terms geographical, political and social-economic settings. Besides that area is located in semi-Arid corridor stripe with enormous rural deep underground water sources which are meant to provide safe water to the communities. However despite having many deep underground water sources constructed sustainability is not emanate and remains a challenge in rural communities. This area has attracted funders and financial support from Arish Government Aid, UNECIEF and World Bank through the central government, they all high consecrated on construction and ensuring access of rural deep underground safe water sources to communities due to topography of the area(Rogers, Jalal, & Boyd, 2012:357).

The area is prodominantly occupied by Buganda as inhabitants, however mixed up with some other ethinic groups of bantu speaking people which include Banyankole, Banyarwanda and Bakiga. These people practice sustance farming and keep cattle along the corridor stripe for the economic earnings. (Emdon et al. 2013) most of the people in rural community commonly use Luganda and english as a medium of communication and the mojority of the inhabitant depend on substance farming for their livehood. Despite Uganda being in the Equatorial region it experiences tropical type of climate and it has high temperature. The area has a plenty of flesh water, protected wells and deep underground water sources. The quest under study is about governance system and sustainability of the variable water sources in the central region of Uganda. The study was conducted in the central region of Uganda and selected purposive due the uniqueness in nature and it being in the part where we have quite a number Irish Aid funded water projects, UNICEF and the Central Government of Uganda.

The Map of Uganda Location on African Continent



Sources:(http://goafrica.about.com/library/bl.mapfacts.uganda.htmand
http://www.worldatlas.com/webimage/countrys/africa/ug.htm)

Despite the remarkable coverage of underground water sources in Uganda and presence national policy safe water, since in 1990s there is inappropriate management system of the water facilities and service delivery of safe water to the rural communities. Uganda Central Sub-Region is endowed with plenty of different Underground water sources including deep wells, sorrow wells and springs. The Local government and non-government Organizations have deeply invested in the provision of safe water to this community and one wonders the trends and the prevailing situation of water scarcity in the study area. As a case in Uganda and Sub-Saharan Africa as whole there are many rural communities with deep underground water sources evidenced as the main sources of safe water supply(Burns and Worsley 2016).

Lockwood and Smits Stef (2011:353) affirms that, community based engagement in governance practices promote capacity and efficiency in operation systems and maintenance water sources. The approach include regular protective servicing, maintenance and carrying out major rehabilitation of the non-functional water supply sources, regardless of whether government or non-governmental agencies did provide the water facility (Hacker 2013). The concept of good governance and sustainability is widely recognized these days in various sectors; it is questionable how adaptable and how most of the beneficiaries corporate solutions regarding sustainability of the underground water sources are in Central Sub-Region. It is very likely that most of what passes challenges for deep underground water facilities in the study area are rural water sector policy issues, governance systems, structures and sustainability legal framework which fails to do precisely the one thing it purports to do in regard to deep underground safe water sources.

LITERATURE REVIEW

The related literature of relevant authors and domain experts in fields Governance system and sustainability strategies of rural underground Water Sources were reviewed. This literature entailed current legal policy documents and institutional framework for rural safe water supper as sub-sector so as to shade light on the prevailing environment in the attempt to enhance the governance systems and positively contribute to sustainability of water sources in Uganda.

This study was modeled around institutional Systems Theory and Governance theory as advanced by Kuhn (1974) and cited by Wilson woodland who stated that system theories need to control the operation as well as failure in one system of governance that may lead to failure in others. This theory view the community as a social system consisting of individuals who cooperate within a formal framework, drawing resources, people and finances to produce quality service delivery (Lewis and Kanji 2009). Good governance of Deed Underground Water Source would ensure efficient and effective functionality of the water facilities and continuity of resources for maximum outputs.

The Deep Underground Water Sources therefore needed a functional system to manage water facility well and enhance sustainability. The study further adopted the Stakeholder Theory. This was to compliment the system theory in order to provide firm ground and rigor to community members as stakeholders in governance system of rural community underground water facilities.

Governance structure systems and Sustainability of water sources

Governance system is conceptualized in many ways. (Banks 2015) conceive governance as laws, regulations, discursive debates, negotiation, mediation, conflict resolution, elections, public consultations, protests, and other decision-making processes in the maintenance and sustainability of groundwater sources.(Sabatier and Weible 2014) views governance as a complex set of institutions and actors that are drawn to help government create the conditions for ordered policies rule and regulatory approaches for collective action by which individuals in the community to make decision and share power.

At the local level, governance is about decision-making regarding asset portfolios of individuals and households. The Sharing roles and responsibilities of individuals in regard to provision of safe water is defined at households and community level. (Young and Esau 2015) billions of dollars have been invested in the provision of rural water supply systems in developing countries over the past three decades. Although progress is being made and rates of coverage are increasing, users often find that, once installed, water supply systems are poorly maintained and eventually break down, leaving them with an unreliable and disrupted water supply.

The local government Institutional Framework for safe water service delivery

The local government and rural water supply sub-sector in Uganda operates within the clearly stipulated structures to support safe water service delivery (Lockwood and Smits 2011).The framework states water should be done and is to spearhead the program and further indicate the source of funding of a particular activity. Hamric et al. (2014) affirms and demonstrates that safe water service delivery and the actors within local government structures levels have been categorized under macro, meso and micro levels.

Functional Water (User) Management Committees

According to the (Hannigan, Richards, and Richards 2017)water user committees are charged with the following roles; Promotion and improvement of sanitation and hygienic behaviors, Mobilizing the community for sanitation and hygiene improvement, Maintaining an up to date record of Water Users. Stal and Cretoiu (2016)affirms that monitoring services are some of the major strategies that post into sustainability of the water points e.g. repairing of cracks on the water source, engaging a mason in case of need of repairs and remunerate of the mason, purchasing any materials needed for repairs and proposing, enacting and enforcing bye-laws to govern the use of the water source(Kimani, Nyagero, & Ikamari, 2012:165).

METHODOLOGY

The study adopted a mixed methods approach together with a singular case cross sectional research design for the purpose of clarity and simplifying the unity of analysis. The choice of methods was informed by the belief of narrow views of world characterized by positivist's paradigm orientation and approaches of the researcher's inquiry. The study used a case design grounded on governance system theories and it also used a positivism philosophy that posted into ontology and epistemological stance that enabled clear and ultimate understating of the knowledge claims of the study variables. The positivists believe that using more than one methods in research study is very helpful in undertakings of social science research it avoids the weakness of single method and biasness of researcher's experience. These methods have particular strengths with respect to the subject matter analysis from the unit of inquiry and they provide a clear broad overviews and wide picture to the variables under study (Cash, Stanković, & Štorga, 2016:152). The

positivists also contends that, the combination of methods avoids basis and enhances the validity of empirical materials, researcher can overcome the weakness of intrinsic and problems that come from the single method.

A Case research design was used and it provided clear understanding the nature of the variables under study and the overall tends and direction to be undertaken by the study. Simuforosa & Wiseman,(2015:46) defines a research design as the overall plan or strategy for conducting research and it has a number strength to provide rigor for appropriate execution of the study.
(Ritchie et al. 2013)contends that a case study design is suitable in a way of simplifying scope for study as central sub-region of Uganda and selected 36 sites as unity of analysis accurate gathering data from the manageable area of study and sampled 1458 from the targeted population. This approach was adopted because it enabled engaging a cross section of the targeted population that provided accurate and in-depth understanding of the variables under study.

Data analysis of the study

The quantitative data was analysed using SPSS and SMARTPLS computer software and processing analysis. These software computer Analytical program, which was used to generate Descriptive Statistics on the study variables, the SMARPLS was used in generating the study model explaining in the influence of different aspects of study on sustainability of underground water sources (Jr et al. 2013). The method was adopted due to its ability of merging different components of the study variables into one, hence making it the most powerful tool in this study(Walz and Deterding 2015).

The qualitative analysis was analysed using content data analysis. This helped to direct subsequent data collected from unity of inquiry that was useful for the research (Bell, 2010). The analysis of qualitative data was carried out immediately after data collection. Qualitative data analysis entailed organizing of data into thematic constituent parts in order to obtain answers to question. Analysis of qualitative data was done by translating the narratives into a set of themes paying attention to actual voices as used by interviewees and other key informants (Feig and Stokes 2011). Each interview findings was a transcribed verbatim, with thematic content data analysis which was used to guide the analysis procedure of the interview with the help of theoretical flexibility and piratical sound methodology (Creswell 2013). Thematic content of qualitative data analysis focused on identifiable themes and patterns of the variables under study (Goodwin and Goodwin 2016).

RESULTS AND DISCUSSION

The first objective of the study was to examine the influence of governance structure on sustainability of rural deep underground water sources. The respondents were asked to explain the influence of governance structures on the sustainability of rural deep underground water sources in central region of Uganda. The study findings indicated governance structures and local water user management structure had positive significant influence on sustainability strategies.

Table 1Governance structures and sustainability of deep underground water sources

Variable	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree	Total
our sub-county authority always involves us in governance structure of deep underground water sources	190 (15.2%)	318 (25.4%)	273(21.8%)	322(25.8%)	147 (11.8%)	1250 (100%)
our sub-county authority invites us to participate in planning meetings for underground water source in our area	182 (14.6%)	322(25.8%)	333(26.6%)	316(25.3%)	97(7.8%)	1250(100%)
all beneficiaries are aware of the rules and regulations regarding the management of our water sources	81(6.5%)	298(23.8%)	367(29.4%)	400(32.0%)	104(8.3%)	1250(100%)
we consistently facilitate the maintenance of our	81(6.5%)	250(20%)	300(24%)	430(34.4%)	189(15.1%)	1250(100%)

deep underground water sources						
we are updated on status and functionality of our water sources	103(8.2%)	252(20.2%)	272(21.8%)	409(32.7%)	214(17.1%)	1250(100%)

(*Source, Primary data, 2019)*

The study findings on governance structure considered in the study, as detailed in table 4.5.1 above revealed that most of the respondents were agreements and hand some were disagreements.

Based on the respondents responses (37.6%) indicated were in total agreement that sub-county governance structure contributes to sustainability of deep underground water sources. While (21.8%) respondents slightly agreed and (40.6%) respondents disagreed with the assertion that sub-county authority greatly influence the sustainability of the existing water sources. This means the authority involvements contribute to a given extent but their commitment does not significantly impact on the sustainability of the rural deep underground water sources.

The sub-county authority always invites the community members to participate in the planning meetings (33.1%) respondents' agreed. while 26.6% slightly agreed and 40.4% respondents disagreed respectively. This implies the sub-county authority really involve local water users' community in the planning meetings which affects the good governance practices and sustainability of the existing deep underground water sources in community.

The study findings in table 1, in regarding deep underground water users being aware of the rules and regulations governing the maintenance and sustainability of their deep underground water sources(34.4%) respondents were in agreement, (29.9%) slightly agreed and (30.3%) respondents were not aware of the rules and regulations regarding the effectives management and sustainability of their water sources. This implies the knowledge gaps of the rules and regulations negative affect the governance practices and control the water users hence jeopardizing the effectiveness of the existing sustainability strategies of the underground water sources in the community.

The findings further indicate that (49.5%) respondents were in total agreement and 24% slightly agreed that consistence of community members' contributions and facilitation for maintenance enhances functionality and sustainability of their existing water sources. Only (26.8 %) respondents disagreed with the assertion that consistence of community members' contributions and facilitation for maintenance enhances functionality and sustainability deep underground water sources. This means the majority of the respondents were aware of effective community participation and consistence financial contribution facilitates maintenance and sustainability of their water sources.

The results of findings indicate that (49.8%) respondents were in agreement and (21.8 %) were slightly in agreed that they were always updated on operations and functionality of their deep underground water sources. While (28.4%) respondents were in disagreement this notion of being informed on the operations and functionality of their water sources. The implies the majority of the water users were involved, informed and updated with whatever happened on their water sources which is a good gesture of governance practices and promotes community confidence among their leaders.

Based from secondary data analysis from documentary reviewed, it was observed that fundamental governance structure, coupled with excellent National water rural sector public policy greatly reinforce sustainability paradigm and strategies employed in management of public resources. The document reviewed included guidelines and currents reports on governance dynamics and innovative strategies for sustainability of water sources. The Ministry of Water and Environment programs, District Local Government and Local community Water Users' Management Committees always design a program and framework to be followed for effective service delivery as far as provision of safe water is concerned. However, it was notable in the study that there were several other underlying factors that influence implementation system and proper follow-up of the predetermined plans.

> ''Some of the observed factor is delayed release and allocation of funds to implement the plans and schedules as designed and knowledge gap of the service providers in some rural communities,,

There need to ensure that leaders lobby for funds to facilitate their programs and framework in order to offer quality services to community. It is also necessary to empower the service providers with needed knowledge and skills for effective service delivery in the rural water sector. The study results indicated that most people contend that governance has the capacity to provide the necessary services but, politicians have governance dynamics.

The study findings further indicated from the secondary that there many factors affecting governance structures and active participatory of local community members in the governance system and sustainability of underground water sources. These were dynamics of political influence, economic status of the water users, level of education of the citizen, inadequate confidence among the local leaders and insufficient information regarding national safe water rural sector policy.

The knowledge gap had a negative bearing on people's support and significantly jeopardizes willingness of individual to positively participate in the governance system and engagement into sustainability activities their underground water sources. The results from in-depth interview with keep informant, even if community member are willing to contribute on the governance and

sustainability of their water sources,

> ……. inadequate education levels, knowledge gap and insufficient awareness of the policy rights and privileges influenced their attitude and perceptions about safe water service providers. By so doing they affect governance structures and effectiveness of water users committee that have seemingly remained ignored or unknown to rural sector and programme actors.(Community Development Officer)

The findings of study observed that in Uganda have appropriate rural safe water sector policies and guidelines but realized the challenge and problem was with local government leaders' interpretation and implementation framework strategies which significantly affect the governance of rural deep underground safe water supply sub-sector.

The Water User's Management Committees

The study examined the contribution of water user management committee towards the functionality and sustainability of deep underground water sources and the results are presented in table below. While in the study, a number of aspects performed by the water users' management committee members were considered to rank the functionality of water management committees. This was deeded important because the water users' management committee plays a vital role in the governance system, operations, maintenance and sustainability of the deep underground water sources.

Table 4.5.3.1The functionality of Water User Management Committee

Variable	Strongly disagree	Disagree	Slightly agree	Agree	Strongly agree	Total
our water user committee organizes regular meetings to inform and deliberate on issues of sustainability of our water source	207(16.6%)	337(27%)	227(18.2%)	346(27.7%)	133(10.6%)	1250(100%)
our water user committee maintain and keep records for our water source	165(13.2%)	317(25.4%)	305(24.4%)	337(27%)	126(10.1%)	1250(100%)
our water user committee has a system to access the records on the maintenance and sustainability of the water source	134(10.7%)	334(26.8%)	334(26.8%)	325(26%)	120(9.6%)	1247(100%)
our water user committee motivates the technical team regularly	117(9.4%)	297(23.8%)	339(27.1%)	370(29.6%)	127(10.2%)	1250(100%)
our water user committee enforces bye laws regarding the water source use	137(11%)	256(20.5%)	350(28%)	364(29.1%)	143(11.4%)	1250(100%)
am satisfied with the job performed by water user committee	94(7.5%)	279(22.3%)	335(26.8%)	386(30.9%)	156(12.5%)	1250(100%)
The water management authorities officially launch completed water sources and handover to our users committee and	117(9.4%)	333(26.6)	229(18.3%)	408(32.6%)	163(13%)	1250(100%)

the community at large						

(*Source, Primary data, 2019)*

The findings from that table above indicate local community members are involved in the decision making process regarding development of deep water project being implemented in this village, (49.1%), local community members are best placed to make decisions related to the water sources (45.4%), decisions related to the water sources are made by water management committees (44.5%), and community leaders do involve us to decide on issues related to initiating action for sustainability of the water sources (42.4) were the aspects agreed on by the respondents that prove the functionality of water management committees.

From the interview with a key informant from doctorate of water development office who also services as the civil engineer said.

> ''*We are working hard to ensure people sensitized and trained in safe water management and they access safe water in the rural community. The challenge is people's perception and attitude to attend meetings and use of the acquired knowledge in their livelihood''*

The district local governments leaders together water officer make all the possible measures to ensure the local community water users' management committee are empowered in order to effectively serve as community mobilizers. When water users' management committee is well informed of the water sector policies and they are knowledge of their mandates the effective lead the community and ensure quality service delivery.

The district engineer further observed that effectively sensitization of the community enhance networking and coordinate community development officer who in return mobilize the rural community to support their existing water sources.

> *The social mobilization is the work of local leaders and water user's management without good community networks, the Engineers can't do…. to ensure quality service delivery to rural community.*

The key informant in the study also noted that, there are low rate of constructing new boreholes in the community and besides the existing ones some of them are not functional. It was observed that the main issue was around governance and sustainability strategies in some communities.

The Political intervention is seen to be viable approach and imperative more so during the election season. In order to do anything successfully in the community these days one need to have political will and support the operation systems and sustainability strategies.

> *The political pressure of budget management at district level it seem to favour politicians and they can easy show need in their areas of constituents. It appears that allowing politicians to be involved in the governance structures of water sources is a blessing and it is believed that water user's management committee needs a political support to effectively control their deep underground water sources (KII Chairperson LC III)*

Collaborative working creates an enabling environment for good governance practices and sustainability of water sources in their locality. The existing current environment in rural community of central region of Uganda where the study was conducted clearly indicate that community based governance system facilitates the maintenance and functionality of rural water sources.

Photograph 1: Local Government Leaders training water users' management committee and sensitizing them of their roles and responsibilities

Photograph (a): Regular meeting water user Photograph (b): Members drawing water

(Source, Author's photograph, 2019)

As earlier indicated in the literature areas where they active local government leadership like how they are reflected in photograph (a): The act of training community water user management committee members to effectively sensitize the people on their roles and rights, the functionality and dynamics of governance and sustainability of water sources are high. The operation and functionality deep water sources were fairly good as reflected in photograph d: where the children and community members were accessing water.

> *The effective operational system and functionality of water source was due having sensitized and trained water users' management committee members who encourage maintenance and proper use the existing water sources.(*Water user manager).

The study results suggest that there is need to have active leaders and motivated, well trained and informed community leaders on National safe water sector policy issues. However, it was further observed that district local government and district water development involvement was critical for the mobilization of the general public to engage service providers on the quality of service delivery.

On the other hand, there was a gradual decline noted in the way the local leaders are perceived by the local members' community in the study area as people who were not visionary focused to enhance decision making for having improved safe water services in the rural communities. This was compounded by the fact that community members share on the contribution of low attitude and there are also not quite enthusiastic to attend sensitization village meetings called upon by neither water user management committees nor local government leaders. That information asymmetry indicated a huge knowledge gap of rural community on the policy issues and sounding strategies to undertake so as sustain the existing water sources in their communities.

However based on the low degree of significance knowledge levels, willingness and community involvement side of the governance structures it resulted into having low or no sounding strategies of sustainability in some areas for rural deep underground water sources. This implied that the active leadership and the existence of water users' management committee played significant role in operation and maintenance of water sources. That is a clear indictor that there were significant relationships between functionality of water user's management committees and sustainability of deep underground water sources.

The study results from the regression analysis of the study indicated and equation model show those prospects of effectiveness of water users management committees, there is a positive significant benefit of the rural community from the existence of deep underground water sources for their functionality (P values 0.00591). Beside, that the Uganda's safe water sector policy clearly spells out the responsibilities of each service providers and actors does not explicitly state how chairpersons of should be elected neither the water users' management committees members, nor are there deliberate and regular members in the community.

Functionally of water users management committees

In order to determine the functionality of water user's management committee and its influence on the deep underground water sources number issues were considered. Among other the study examined whether water users were satisfied with services rendered by the committee, checked whether there were clearly set bylaws. The effectiveness of the water users' management committee was determined by looking at the functionality of the water sources. It was also observed in the way how the community members' contribution to the maintenance and sustainability. a number of questions were asked and detail are presented here below.

Photography 2: Hand pumps technician and Community members participating in the focus group discussion in one of the villages.

Photograph (c) Technician Discussing **Photograph (d). Monitoring Functionality**

(Source, Author's photograph, 2019)

The above undertaking of community members discussion with the hand pump technical person and monitoring the functionality of the existing water sources as reflected in photograph 2 is a clear indicator that, there is need to have effective sensitization and training of the community members and their active involvement leadership structures enhance decision making for water users management committees.

The active community participation and monitoring of the functionality of the existing water sources by leadership coupled with willingness of the motivated hand pump caretakers and technicians yielded positive and significant results in the study. The effective community participation and assessment of functionality required for maintenance and repairs for the existing water sources. When community is explained of their roles and responsibility in case they are asked to contribute they can ably give positive response. However, the challenge was observed some communities where they had no active water user management committee as well as local government leadership in the villages.

The hand pump technician said

> …….it usually had and difficulty to explain rural community members with low education levels to understand the values they of financial contribution to facilitate repairs and maintenance of water facilities. It is not easy carried out proper servicing and maintenance of water sources without money with the support of members.

It was observed that monthly contribution fee from the water users can solve the problem of moving house to house mobilizing and collection the required funds for repair of the water source in case of breakdown and end up without getting the required funds. That approach is inappropriate and it delays the repairs hence the waters users suffer in case of borehole breakdown. Some are never repaired due to lack of funds and yet they are having minor chain and hand pump challenges.

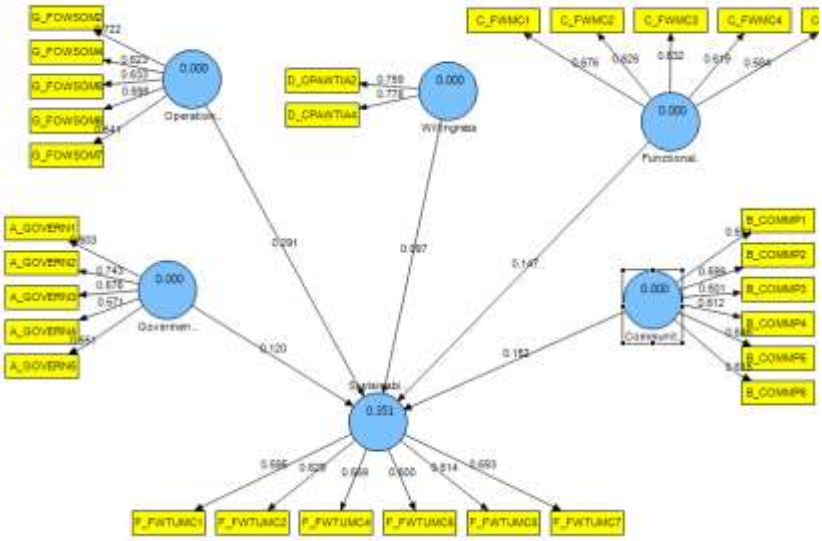
That was a clear indicator that some people may fail to contribute due to their economic status, this does not mean they are not willing to contribute nor participate in governance and sustainability of their water sources.

> *We are sometime in dilemma our policy says community contribution, but it does not spell out how much should each household pay for repairs and maintenances of their water source. It is also observed the failure of transparency and accountability affect local member's willingness to financially contribute as mandate…(Senior DWD officer)*

The study also observed that there is political dependence and thinking the government has to provide. However, it should be observed that politicians and government support does not necessarily mean and rule out, local leaders mobilization of funds or stop seeking for community support to facilitate the maintenance and well-being of their underground water sources.

STRUCTURAL EQUATION MODEL

Full Structural Model for relationship between critical study variables and the Sustainability of deep rural underground water sources.



(Source, Primary data, 2019)

Based on the results from study, as detailed in the figures below, the constructs studied of Government structures , functionality of water committees, operation and functionality of water sources, willingness , and community participations revealed they influence the functionality of water sources all of then positively , at a rate of 35.1%.

Hence an indication that the sustainability of water sources in the areas is determined (R^2=0.351) =35.1% by the factors studies. And based on significantly, all the constructs studies, revealed to influence significantly to the sustainability of water sources (P Values <0.05), as detailed in table 10 above and figure 4.71. The structural equation model clearly indicated that there are a number of factors that are significantly influencing the sustainability of rural deep underground water sources in the study area as predicted 35.1% of the variance in (Adjusted R Square =0.504). The remaining 64.9%, this is believed to be predicted by other factors outside the study. The sum of 35.1% thesis model embedded in the new governance system and public policy paradigms that call for the involvement of multiple actors with different role sand responsibilities.

CONCLUSION AND RECOMMENDATIONS

The discussion indicted that good governance practice strongly community participation and networking or collaboration of the stakeholders. The study therefore concludes there is need for having better governance practices and advocating for institutionalization of practical model to support the rural communities' governance structures in safe water access. The study concludes the effective application of theoretical approaches the adoption of the structural equation practices are seen as means to reinforce good governance practices that can ably contribute to sustainability levels of rural deep underground water sources.

There is need for deliberate efforts to adopt mobile monitoring so as to enhance functionality and sustainability of Uganda's rural water sub-sector but the package of priorities and strategies are not adequately monitored and trusted in the public sector.

Implication for policy and practice

The country Uganda has good policy and logistic legal framework which is meant support the governance system and practices that can ably support sustainability but, the implementation of policy requires relevant political dynamics. Therefore the study concludes and suggests institutionalizing structural equation model as one of the practical approach of the underlying contracts that positively contribute to effective sustainability of deep underground water sources.

The study concludes decentralization policy of bringing services to local governments can easily be abused if the local community is not sensitized and empowered because of the knowledge gap and a weak monitoring approach. The study concludes and affirms that despite all existing challenges and demand response to quality service delivery there is need for well-designed framework to bridge the knowledge gap and ensure right actions are taken and policies are followed in the implementation activities. It also concludes that there is need to have mass sanitization and create awareness so as to bridge the knowledge gap to the local populace on best governance practices that can enable them sustain their deep underground water sources.

The study includes effective system of propagation of high and sounding level of sustainability depend on settings but this will depend more on governance related factors. The evidence in qualitative data collection indicated where they had good governance people were contributing well safe water service delivery was fairly good.

RECOMMENDATION

The study of governance systems and sustainability of rural deep underground water sources came up with the uptake of ideas generated for findings, suggestions and recommended that awareness campaigns should be undertaken to promote the key benefits of water users' management committee and entire rural communities in Uganda. The study recommends active community participation of all stakeholders' and sensitization of community members who are water users as beneficiaries in order to increase chance of access safe drinking water and sustainability of underground water sources.

The study further commends: formation of functional water users committee so as to increase chance of community mobilization for effectively have impact on the governance system and encourage community willingness to contribute in both financial and kind or physically towards governance and set realistic bylaws for rural water sources.

The study recommends that local government leaders' stakeholders and beneficiaries should take lead and champion the design strategically and right legal framework in order to appropriate management systems and sustainability of rural deep underground water users, and setting sounding strategies aligned to national safe water policy for technical support.

The study recommends use of knowledge of structural equation model and advocate for innovative application of knowledge of radical nominal theories of social cognitive and institutional systems to adequately involve the local community.

The study further recommends for conscious expansion monitoring operations and maintenance of rural deep underground water sources in the study area that alone will underpin the underlying challenges of functionality and hence promote sustainability of rural deep underground water sources.

The study lastly recommends that the good governance dynamics and best practices should be embraced at all levels of leadership structures right from ministry to the local water users management committee in order to effective address the challenges of safe water service delivery to the rural communities in study area.

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