

RAINWATER HARVESTING AS STRATEGIC PLANNING MANAGEMENT TOWARDS A PREVENTIVE CARE OF COVID-19 PANDEMIC IN SECONDARY SCHOOLS IN TANZANIA

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ABSTRACT

Strategic planning management is at the heart of work towards achieving organizational goals. This study explored the rainwater harvesting as a strategic planning management for Preventive Care of Covid-19 Pandemic in Secondary Schools in Tanzania. It was a qualitative study employing a cross-sectional research design. The study was carried out in Dodoma region involving 66 schools out of 124 public secondary schools. The units of inquiry were heads of secondary schools and units of analysis were schools. Data were collected through semi-structured interviews, semi-structured questionnaires and documentary analysis. The study found that most of the schools had strategic plans but without a specific goal for water harvesting. Despite the fact that the heads of schools acknowledged the importance of water during the fight against Covid-19, they were unable to change or advise the districts to adapt and respond to the problem through the rainwater harvesting in their institutions. The findings further indicate that lack of financial resources; commitment and ability to improvise the available technologies were the main challenges that were facing the schools. It is concluded in this study that for schools and their teachers to fight against COVID-19 effectively and efficiently, rainwater harvesting adaptive leadership skills are imperative.

Keywords: Strategic Planning Management, Covid-19 Pandemic, Rainwater Harvesting, Education, Tanzania.

INTRODUCTION AND BACKGROUND

Globally, water resource scarcity is harsh and associated with diverse health consequences to human beings especially in developing countries and rural communities (World Health Organisation (WHO), 2019). The challenge is also anticipated to increase and become even more critical in the future due to the depletion of the available water resources arising from the increase in the global population that does not match with the increase in water resources production (World Bank, 2020). According to the United States' Bureau of Economic Growth, Agriculture, and Trade, it is anticipated that more than 2.8 billion people will be living in either water-scarce or water-stressed regions of the world by 2025 while more than one (1) billion people lack access to improved water supply services and more than two (2) billion people lack access to improved sanitation. Sub-Saharan African countries have very low water and basic sanitation coverage despite the good sanitation and safe drinking water being fundamental for wellbeing and part of the basic human rights (United Nations International Children's Emergency Fund (UNICEF), 2015).

Moreover, challenges of access to clean and safe water for drinking, sanitation and health in Tanzania have hit both urban and rural areas, individual households and public institutions.

For instance, in 2018, schools in urban areas were more likely to have access to improved source of drinking water (84.2%) compared to those in rural areas (63.8%). About two out of ten schools in rural areas were using unimproved source of water and about 16 per cent had no water source (URT & UNICEF, 2020). On the contrary, in urban settings, only 8.2 per cent of schools were using unimproved source of water, whereas, about 8 per cent did not have any source of drinking water for pupils/students (Ibid). The status of rainwater with roof catchment in public secondary schools in Tanzania was only more than 8 per cent, where in urban schools it was only about more than 9 per cent and about more than 3 per cent in rural schools (URT & UNICEF, 2020). Statistics show that the water supply situation is worse in rural schools compared to those in urban areas in Tanzania. Similarly, according to URT and UNICEF (2020), rainwater harvesting in rural schools is very low (3.4%) regardless of the number of pupils/students enrolled in each year. Despite the fact that Dodoma region is Tanzania's capital city, students in public secondary schools face challenges to access clean and safe water for drinking and washing (URT, 2020). Also, in 2018 the region scored 20.9 per cent of schools observed to have water and soap at their hand washing facilities by region in Tanzania (URT, 2020). Again, URT and UNICEF's study (2020) in Tanzania revealed that in Dodoma region, secondary schools had access to clean water from basic sources by only about 42 per cent of the availability of water and soaps for hand washing for only about 21 per cent with only about 9 per cent of basic hygiene services.

Achieving sufficient access to water and improved sanitation especially during the COVID-19 for all people in the world is the current global development agenda. Goal number six of the Sustainable Global Development Goals Agenda of 2015 that has to be achieved by 2030, intends to ensure availability and sustainable management of water and sanitation for all people (UNDP, 2015). Water is known to be an important life ingredient and a catalyst for community development and is needed by both individual and public institutions for supporting quality life and improving the accomplishment of the daily activities (UNICEF, 2015). Access to clean and safe water is crucial for improved sanitation and hygiene, which are important for human health and well-being and for safeguarding people against COVID-19 (WHO, 2019). In contrast, inadequate supply, access to clean and safe water or any condition of insufficient supply of water may lead to diverse socio-economic setbacks and distress to humankind as individuals, communities and at national level. While much has been done in relation to COVID-19 and what measures have to be undertaken to control its spread, see for example (WHO, 2020); previous literature concentrated on preventive measures without linking them with the availability of clean and safe water for the developing countries including Tanzania. Given this scenario, this study intended to investigate the ability of public schools to implement strategic planning management for rainwater harvesting in Tanzania during the era of Covid-19 pandemic. The research question was: How can the secondary schools use rainwater harvesting as a strategic planning management for preventive measures against COVID-19 pandemic in Tanzania? This study did not investigate the rainwater harvesting in private primary and secondary schools, although clean and safe water is equally required in those institutions.

What is Strategic Planning Management?

Strategic planning management (SPM) is defined as the process of determining the future of overall goal or objective of a business aimed to bridge the gap between where it is, and where it wants to go (Adeleke, 2001). As defined by Bryson (1988), strategic planning is a disciplined

effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does, and why it does it, with a focus on the future. On the other hand, according to Schendel & Hofer (2009), strategic planning management is understood as part of the contemporary managerial tool kits that deal with the inevitable uncertainties in the management environment as well as useful for stimulating organizational performance. Similarly, strategic planning management can be viewed as an essential tool for evaluation and review of organizational performance to ensure effective and efficient accomplishment of the organizational long-term objectives. Generally, in this paper, strategic planning management is understood as a managerial tool that guides the schools in achieving the organizational goals and objectives. The bottom line is that strategic planning management is geared towards ensuring the institutional sustainability frameworks and adaptability of the services for the goal achievement and survival in the time of pandemic similar to COVID-19.

Water harvesting is a technique of water management that aims at contributing significantly to ensure the sustainability of water availability to various individuals, communities and nations. Water harvesting could be explained as all actions to accumulate obtainable water resources, provisionally storing leftover water for consumption when needed, especially in drought seasons or when no continuing water resources exist. Thus, in order to ensure water supply sustainability for their populations, schools and other institutions have to seek reliable means of harvesting water rather than solely depending on the government water supplies, which, on average, are not sufficient. Rainwater is widely considered as one of the largest sources of domestic, aquatic and surface life water supply throughout the world (World Bank, 2011). Some common harvesting technologies and methods include floodwater and runoff harvesting, rooftop rainwater harvesting, terraces, earth dams and surface water wells collections. Although rainwater harvesting has been formerly a popular technology for sustaining agricultural activities (Han, 2019), it is currently receiving a lot of credit as a potential alternative and as a management strategy for sustainable water supply due to increased freshwater crisis (Marwa et al., 2018). It is therefore important that educational institutions in Dodoma employ various rainwater harvesting techniques, particularly rooftop harvesting since schools have a large number of iron sheets used to roof the buildings that would support maximum collection of rain water.

Effects of Water Scarcity to the Livelihood

Inadequate and lack of clean and safe water supply has numerous health and social consequences especially during the COVID-19 pandemic. WHO (2019) links water scarcity with the continued deterioration of health conditions and the outbreak of diseases. For instance, nearly 90 per cent of diarrhoea is attributed to unsafe drinking water, inadequate sanitation, and poor hygiene (United States' Bureau of Economic Growth, Agriculture, and Trade, 2009). Current studies on the Covid-19 pandemic have emphasized the need for regular hand washing as a preventive care against transmission and protection against the pandemic. Researches on preventive care against the deadly Covid-19 pandemic have directed individuals, institutions and the general public to use clean water to wash their hands regularly (World Bank Group, 2017). Thus, school institutions with diverse users such as pupils/students from different backgrounds and health conditions; have to be safeguarded by the availability and reliable clean and safe water. However, most of the public secondary schools depend on tap water from government supply systems, which is both costly and sometimes unpredictable (URT & UNICEF, 2020).

Some Efforts Made So Far in Tanzania in Rainwater Harvesting and the Associated Challenges

The Tanzania National Water Policy (TNWP) of 2002 directed all actors to harvest rainwater by using available rainwater harvesting technologies to ensure the availability of clean and safe water in rural areas (URT, 2020). The TNWP (2002) emphasized all water stakeholders including public institutions to promote rainwater harvesting through the creation of awareness and training of various stakeholders. However, studies such as that of Innocent & Levi (2017) have revealed that for better implementation of policies and other government directives, institutions must adopt the policy directives in their institutional strategic planning. According to these studies strategic planning management is vital in the effective achievement of organizational objectives and goals including the rainwater harvesting. Indeed, these strategies are more likely to safeguard students against COVID-19 pandemic. However, devising a stable and consistent strategy and implementing it for secured functioning of the entire organization is viewed as a challenging and difficult task for any management team (Hrebiniak, 2006; Innocent & Levi, 2017). Studies like that of Bovaird (2009) and Thompson, Strickland and Gamble (2007) found that poor strategic planning management resulted into vague results in most organizations' operations. Proper strategic planning management may foster and accommodate any risks and challenges in the attainment of organizational goals and in this case, rainwater harvesting strategies may safeguard students in schools against COVID-19. Despite having the strategic planning management for the provision of clean and safe water, rainwater harvesting in the region has not been well achieved. For example, out of 160 planned projects for rain water harvesting in Chemba, one of the districts in Dodoma region, only 25 (15.6%) projects have been successful and are functioning (URT, 2017). According to URT, out of 262 water supply sources in Mpwapwa district, only 43 (16.4%) are rainwater harvesting projects while in Bahi district, out of 136 water schemes, only 20 (14.7%) are rain water sources. These data clearly indicate that the achievement of rainwater harvesting plan/goal has been less attained in Dodoma region. Nevertheless, the available data on the districts' strategic plans do not specifically set the strategies for supporting public school rainwater projects regardless of the increased number of the population in these institutions.

Indeed, in Tanzania, the importance of water and rainwater harvesting are guided by various policies and regulations. For instance, the National Water Policy of 1991 with its amendments of 2002 describes water as a basic natural resource for socio-economic development. The policy describes water as a fundamental resource for various socio-economic development activities such as industrial production, irrigated agriculture, livestock keeping, mineral processing, hydropower production, navigation and recreation and tourism. Moreover, the Tanzania Water Policy of 2002 insists on the supply of clean, safe and potable water within a 400 meters walking distance and with acceptable water quality. The policy has put much emphasis on community participation, private sector participation, and integrating water supply with sanitation and hygiene education. Thus, the policy recognizes the importance of adequate water supply for improved hygienic conditions, including prevention of water borne diseases. All public institutions within an administrative council fall under the administrative authority of the District/Municipal or City Executive Director of a particular council. In Dodoma region, the available data indicate that each district and municipal has its strategic plans of which, water service supply is among the main objectives.

Literally, Covid-19 has reinforced the importance of access to safe and reliable water of which various stakeholders should seek to re-prioritize the water sector after decades of under-investment and lack of political prioritization of water (World Bank Group, 2017). Similarly, the 2014 - 2016 Ebola outbreak in West Africa increased the demand for safe water for prevention and treatment, and also increased development partners' attention to water, sanitation and hygiene (WASH) at the household and healthcare levels both during and after the outbreak (Cooper, 2020). Cooper (2020) further proposes that, immediate water, sanitation and hygiene (WASH) responses to the Covid-19 pandemic will help to save lives. Furthermore, data on the incidence of water-borne, water-related and water-washed diseases in Mpwapwa District indicate that these are prevalent where people use contaminated water or have little water for daily use and account for over half of the diseases affecting the population. These facts support the proposition that school institutions that host large population of people (teachers, students and other staff members) in Tanzania and particularly in Dodoma region, could suitably invest in harvesting rainwater to tackle the increasing demand for water supply during the on-going Covid-19 pandemic; short of which the situation may threaten the provision of education in the country.

Theoretical Review

This study used adaptive leadership theory, developed by Heifetz in 1994, to assess the leadership practices among the heads of secondary schools in combating Covid-19 pandemic through preventive care strategies of using water. Historically, the work by Heifetz (1994) paved the way for the development of a new form of leadership that promoted the adaptive capacities of people, other than addressing problems within their leadership realism and environment. Specifically, the main focus was put on the leaders' role to mobilise followers to solve difficult problems and continue to grow together as a team (Heifetz et al., 2009). The adaptive leadership style focuses on behaviours of leaders in organizations. As observed by Northouse (2016) the main distinction of this theory with other leadership theories is its emphasis on behaviours of adaptive leaders. Earlier studies (Heifetz, 1994; Heifetz et al., 2009; Heifetz & Linsky, 2002) have identified three components of adaptive leadership style. These components are (a) the situational challenge, (b) the leaders' behaviours, and (c) adaptive work (innovation). Adaptive leaders act as principal guides of helping co-workers and other organizational members overcome challenges and any other organizational changes that create stresses. Similarly, Boylan & Turner (2017) uphold that a comprehensive definition of adaptive leadership is a multifaceted concept that combines both individual adaptability and organization adaptability. Individual adaptability is a mind-set and a cognitive ability applied by a leader in a given context. As observed by Boylan & Turner, organizational adaptability is a derivative of organizational change.

Moreover, organizational adaptability can be a planned or unplanned change; however, to foster planned organizational change, a planned method or framework is required to modify the functioning of an organization. According to Heifetz et al. (2009), adaptive leadership requires improvisation and experimentation. As earlier observed by Tillson et al. (2005), adaptability leadership is proactive in nature. Boylan & Turner (2017) argued that adaptive leaders are innovative, use creative approaches in anticipation of, or response to, environmental changes appropriate to solve problems. The adaptive theory of leadership was used as the basis for

evaluating the ability of heads of school to tackle the contemporary challenge of Covid-19 pandemic by adapting the use of strategic plans to harvest rain water for storing water for hand-washing.

STUDY METHODOLOGY

Research Approach and Design

This study employed a cross-section survey with mixed research approach. A mixed research method approach involves the use of both qualitative and quantitative approach in the single study. Researchers commented that mixed research method serve important aspect of triangulation and complementarity of information.

The Study Area

This study was carried out in Dodoma region, in Central Tanzania, because despite hosting the capital city of Tanzania, the region experiences a semi-arid climate where rainfall is unpredictable and is non-torrential, with a long dry season. In this region, public schools have all the potential for rainwater harvesting and health awareness programmes. For instance, the region is the hub of government activities, vocational education authorities, many higher education institutions and a referral hospital (the Benjamin Mkapa Hospital).

Population, Sampling and sample size

The study population involved all public secondary schools in Dodoma region. According to BEST (2020) Dodoma region had 124 Public secondary schools. The units of analysis were selected 66 public secondary schools whereas the units of inquiry was 66 head of public secondary schools in Dodoma region. This study employed the purposive and simple random sampling techniques. Purposive sampling was used to select public secondary schools and the heads of public secondary schools from seven districts in Dodoma region. Since the study sample was only public secondary schools in Dodoma region, the researcher employed simple random sampling to get 66 secondary schools. Simple random sampling means that all population units have an equal chance of being involved in the sample. Simple random techniques can be used to sample participants/respondents with similar characteristics. A sample size of at least 50 per cent of the population is appropriate for analysis and reporting purposes. Therefore, the sample of 66 secondary schools (53.2%) was satisfactory to get the required data. Similarly, the larger the sample, the more accurate are the results.

Data Collection Methods

Data were collected through semi- structured questionnaires, semi –structured interviews and documentary analysis.

Semi-Structured Questionnaires

Semi-structured questionnaires are said to be relevant when one wants to collect huge quantitative and qualitative data within a short time. The use of semi-structured questionnaires enables a mix of qualitative and quantitative information to be gathered. Therefore, it was

possible to collect quantitative and qualitative data from heads of school in 66 public secondary schools by using likert and open-ended questionnaires. The expectation was that the heads of school had many other school administration tasks and therefore could not be precise and accurate while responding to closed – opened questionnaires. In the same questionnaire, respondents were asked about their leadership experiences in rainwater harvesting.

Semi-Structured Interview

The study also employed semi-structured interviews to capture the perceptions of the head of schools on the government efforts and benefits of rainwater harvesting in their schools. The aim was to understand the extent to which each public institution had been prepared to harvest rainwater during this era of Covid-19 pandemic. Similarly, interview focused on understanding their experience and adaptability to endure the challenge of water scarcity in their institutions located in semi-arid areas of Dodoma.

Document review

Documentary reviews were carried out by making analysis of the existing literature on rainwater harvesting efforts and organizational strategic plans within districts in the Dodoma region. In specific schools, rainwater harvesting plans and strategies were analysed to reflect the district's efforts in water supply and availability. Moreover, it was important to sort out all the materials with similar arguments on adaptive leadership qualities and behaviours when dealing with contingent situations like the Covid-19 pandemic. Furthermore, documents were also useful for this study as they provided contextual data, and it was possible to survey the data from different districts, countries and leadership traditions on how strategic planning management can be useful in adapting changes during its implementation stage.

Data Analysis and Ethical Consideration

Data analysis was carried out by transcribing the data first and coding the information from the heads of school. It was important to identify similarities and to assemble them together using tables. During data presentation, data from open-ended questionnaires were coded using the tables and were analysed first and then supported using written statements as extracted from the open-ended questionnaires based on their relevance to the issue at hand. The study maintained anonymity by not using any personal identifiers or names to ensure that participants were free to give their frank views and opinions. Open-ended questionnaires were labelled using numbers. The study commenced after the researcher was granted permits by the relevant district authorities after the approval of the Dodoma Regional Administrative Secretary (RAS–Dodoma).

Sampling and Sample Size

This study employed the purposive and simple random sampling techniques. Purposive sampling was used to select the heads of secondary schools from the seven districts in Dodoma region. Simple random sampling and convenient sampling were used to sample the total of 66 head of public secondary schools from both urban and rural areas.

Data Collection Methods

Data were collected through Likert and Open - Ended questionnaires, semi –structured interviews and documentary analysis.

Open–Ended Questionnaires

Questionnaires are said to be relevant when one wants to collect huge data within a short time. It was possible to collect quantitative and descriptive data from heads of school in 66 public secondary schools by using open-ended questionnaires. The expectation was that the heads of school had many other school administration tasks and therefore could not be precise and accurate while responding to closed–opened questionnaires. In the same questionnaire, respondents were asked about their leadership experiences in rainwater harvesting.

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FINDINGS AND DISCUSSION

Strategic Planning Management on Rainwater Harvesting in Secondary Schools

It was the aim of this study to investigate if the heads of schools' had strategic planning management for rainwater harvesting in their schools. The findings indicated that 52 (79%) of the investigated public secondary schools had school strategic plans. However, of those with strategic plans, most of the schools' strategic plans 44 (67%) did not involve rainwater harvesting objectives despite the fact that following the outbreak of COVID-19, adequate water supply became essential, although the schools remained with the traditional thinking of depending on unreliable sources of water (Table 1).

Table 1 PERCEPTIONS OF HEADS OF SCHOOL ON THE USE OF STRATEGIC PLAN IN RAINWATER HARVESTING IN SECONDARY SCHOOLS				
Statements	Responses			
	Agree	Percentages (%)	Disagree	Percentages (%)
Do you have a valid School Strategic Plan?	52	79	14	21
Within your School Strategic Plan, do you have any goal/target for rainwater harvesting?	22	33.3	44	67
Did you review your school strategic plan in order to establish new goal(s) to accommodate the National Strategies for Preventive Care of COVID19?	6	9	60	91

Source: Field Data (2020)

The data also indicated that most of the schools (91%) had not yet incorporated new goals for the preventive care of COVID-19. This kind of reluctance may be perceived as a lack of flexibility and innovation among the heads of schools to adapt the changes that occur within their planned goals. During the interview with a head of school, she said:

"As head of school management team, I believe rainwater harvesting will end the crisis of water in institutions that have many students and therefore support the fighting against Covid-19. However, it was an oversight for not involving rainwater harvest plans in our annual strategic plans. I think, next time, we shall consider this objective to be among the main goals and activities (Head of School number 24)."

This finding concurs with Boylan & Turner (2017) and Tillson et al. (2005) who found that adaptability leadership is proactive and innovative. Similarly, heads of schools were expected to deliver adaptive leadership to respond to environmental changes and take all necessary sufficient measures to fight against the spread of the COVID-19 pandemic in their schools. On the other hand, these findings concur with those of UNDP (2020) which revealed that the nations were not taking proactive steps against the spread of the disease and its resultant socio-economic impacts.

Supply and Use of Water in Secondary Schools in the Dodoma Region

Data from Table 2 above reveal that the sources for water supply in most public secondary schools in Dodoma region were not reliable. It was reported that only 22.7 per cent of the public secondary schools were satisfied with the reliability of water sources compared to 77.3 per cent of the schools which were dissatisfied (Table 2). Moreover, the findings show that water

supply in most public secondary schools was not enough to sustain the day requirements or less than a week's requirements (71.2% & 68.2%) respectively. The supply in these institutions was not sufficient to cover the requirements. The results, as presented in Table 2 lead to a conclusion that water supply was scarce, available water, did not satisfy the schools' requirements and schools had reliable water only during rain seasons (89.4% & 71.2%) respectively. Similarly, during the interview, one head of school (School 36) said that:

“Despite the fact that our school is connected to tape water, the reliability of water supply is not guaranteed. Sometimes, available water does not suffice the daily requirements for the whole school community. Students do suffer as some do not attend classes due to long hours of fetching water.”

These findings may be interpreted to indicate that public schools do not have enough water for the basic requirements of a respective school community. This situation may raise curiosity on how the school community has been managing to implement national and general health directives on protective measures against Covid-19 through regular hand washing practices as scientifically recommended (WHO, 2019; Cooper, 2020).

Table 2 WATER SUPPLY AND SCHOOL WATER REQUIREMENTS				
Perception on access to water	Institutions	Responses (%)	Institution	Response (%)
	Satisfied		Not Satisfied	
Satisfaction with the reliability of current water sources	15	22.7	51	77.3
Water supply satisfies only daily requirements	19	28.8	47	71.2
Water supply satisfies our requirements for few days (3-5days)	21	31.8	45	68.2
Water supply satisfies our requirements only during rain seasons	7	10.8	59	89.4
Water supply does not satisfy the requirements	19	28.8	47	71.2

Source: Field Data (2020).

The study findings confirm the critical challenge of unreliable supply and access to water in rural areas in Tanzania. This is supported by the African Development Bank Group (ADB, 2010) which asserted that almost one out of every two rural Tanzanians does not have access to improved water supply and sanitation. Likewise, in Kongwa district, the water supply level is 52 per cent of the entire population, which means that the service level is still low (Kongwa District Council, 2016). Similarly, the average water supply service in 2017 was only 32 per cent in rural areas and about 70 per cent in Mpwapwa town (URT, 2017). With this scenario of water scarcity countrywide, secondary schools in Dodoma need to re-think investing in locally workable means of producing water supply resources to protect their large populations against COVID-19.

Perceptions of Heads of School on Rainwater Harvesting in Central Tanzania

Respondents were asked to state whether or not rainwater harvesting was beneficial to their institutions. On this, 97 per cent of the respondents said that rainwater harvesting was beneficial to their institutions. When asked to list down ways in which rainwater harvesting was or would be beneficial to their institutions, the following responses were given (Table 3).

Table 3				
PERCEIVED BENEFITS OF RAINWATER HARVESTING IN PUBLIC INSTITUTIONS IN DODOMA				
Statement	Responses			
	Agree	Percent (%)	Disagree	Percent (%)
Rainwater harvesting ensures the availability of water throughout the year	56	84.8	10	15.2
Rainwater harvesting reduces the cost of running the institution	51	77.2	14	21.2
Rainwater harvesting improves hygiene and sanitation as measures to control diseases	60	90.9	6	9
Rainwater harvesting enables establishment of vegetable gardens	63	95.5	3	4.5
Rainwater harvesting saves time for collecting water	54	81.8	12	18.2
Rainwater harvesting provides clean water for drinking water	64	94	2	3

Source: Field Data (2020)

Rainwater harvesting is perceived to be important for public institutions in various ways. Apart from the use of rain water for domestic uses (washing, cleaning etc.), respondents reported that rainwater would make their schools establish vegetable gardens and that rainwater would be used for watering trees around the institutions thus conserving the environment. Rainwater harvesting can be used to guarantee the availability of water throughout the year thus reducing institutional running costs.

On the other hand, the findings revealed that inadequate funds for investing in large projects for harvesting rainwater were a factor behind the shortage of water in some public secondary schools. Results show that participants from different schools which had no rainwater harvesting facilities identified insufficient financial resources as a reason for the failure to install rainwater-harvesting infrastructure in their institutions. During the interview, one head of school (school 12) said:

“The school budget does not have any slot or funds for rainwater harvesting. By the way, the government fund provided is specific to cover some costs per individual pupils. We do not have any internal sources of funds. Communities no longer support schools financially.”

It was also found that those schools that had rainwater-harvesting facilities some of them lacked the funds for services and repair of installed infrastructure and it was a big challenge to the sustainability of maintaining the technology.

These findings are in line with those of Sumra & Katabaro (2014), who found that lack of financial capacity to most of the educational institutions in Tanzania was a big challenge of institutions that were involved in the projects and it undermined the suitable environment for the quality education provision. Rainwater harvesting is reported to provide fresh water for drinking, laboratory use in schools and sterilising of medical equipment. Given these diverse benefits, studies appreciate the reliability of rainwater to be of great priority and as a sustainable alternative of water supply as well as for integrated development (Mohamed, 2018; Marwa et al., 2018). Therefore, secondary schools in Tanzania ought to invest adequately in rainwater harvesting projects across their strategic plans in order to meet the perceived benefits and uses of rainwater.

Similarly, lack of innovation skills and poor knowledge on improvisation among school authorities have been noted to hinder substantial investment in rainwater harvesting infrastructure. The study found that, most of the institutions which did not have rainwater-harvesting facilities due to the unavailability of special water harvest materials had opportunities to use normal corrugated iron sheets and local carpenters to establish the same. Despite the

intensity and fatality of COVID-19, heads of school were noted not to bother or become curious and innovative over rainwater harvesting by using the available cheap technology. This may be a consequence related to insufficient plans at district level regarding rainwater-harvesting projects as reported earlier in the documentary review data in this paper. Strategic planning management is practically a big challenge to most management teams where formulation and execution of stable and consistent strategy remain a difficult task in the entire organization (Hrebiniak, 2006). These findings do not correlate to other earlier studies by Heifetz et al. (2009) who argued that adaptive leaders have higher abilities in improvisation and experimentation. Moreover, these findings negate from the adaptive leadership theory by Heifetz 1994 on the behaviours of adaptive leaders. Similarly, the study has identified that heads of secondary schools had failed to mobilise their followers to solve difficult problems and continue to working as a team (Heifetz et al., 2009). But you did not involve the teachers? Are they not the followers?

CONCLUSION AND RECOMMENDATIONS

This study aimed at exploring the rainwater harvesting as a strategic planning management for Preventive Care of COVID-19 Pandemic in Secondary Schools in Tanzania. Based on the findings, it is concluded that heads of schools acknowledged the importance of water during the fight against COVID-19, although they were unable to change or advise the districts to adapt and respond to the problem through the rainwater harvesting in their institutions. The findings also indicate that lack of financial resources; commitment and ability to improvise the available technologies were the main challenges facing the schools. The findings further indicated that public schools' strategic planning management, was reported to be rigid and weak in adapting and addressing the critical issue for the availability of water in secondary schools. As a result, it was obvious that the struggle towards combating the COVID-19 pandemic through preventive care strategies, specifically washing hands in public secondary schools, was hardly achieved. If this situation of inflexibility and inadequate supply of water continues, the national efforts in fighting against COVID-19 and other contagious infections may become futile. Therefore, public schools require adaptive leaders who are ready to innovate and address all organizational challenges as they happen while maintaining service quality and achieving goals. They also need to promote rainwater harvesting, which is known for being a cheap affordable technology, and an environmental friendly water supply system. If the current situation continues, the provision of quality education may be jeopardised. Thus, the study recommends to the Tanzanian Government authorities, partners and stakeholders that they need to adapt the rainwater-harvesting technology as it has been said to be the best and locally affordable means to ensure availability and sustainable water supply for educational institutions. Moreover, educational institutions need to build the capacity of their managers on strategic planning management skills for better planning and execution of their goals and for organizational improvement. Nevertheless, environmental health education needs to be given its prime importance during the COVID-19 pandemic to improve hygiene and save the students and school staff members' lives. Indeed, if strategic management is well planned, it is more likely to ensure the sustainable environment for quality provision of education in the country.

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