

Implications of Water Development Projects on Community Welfare; The Case of Elounden I Mbankomo Sub Division, Mefou and Akono Division

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Abstract

Global trends like desertification, urban growth, and economic restructuring are making water increasingly scarce and water access increasingly inequitable in cities around the world. While much is being done to extend water provision systems to most communities, the roots of water scarcity are complex and difficult to resolve. Today, as communities face water scarcity challenges, research is needed to help mitigate its impact on the environment and human welfare. The aim of this research is to establish the implication of water development projects on community welfare in the Elounden I community through determining the different waters sources, knowing the causes of water supply problems in the Elounden I community and examining the various health related hazards caused by water crisis in this community. The research performed participant-observation, direct observations, and survey interviews in an impoverished, water-scarce neighborhood in Elounden I community. The study contains a thorough discussion of the definition and operationalization of the “community water scarcity” concept, including water provision, water sources, and the environmental impact. The data indicate that water scarcity greatly affect the health situation of the population of this community. When people are first hit by severe water scarcity, the health concerns become more intense.

Keywords: *Water, Development Projects, Community Welfare1 General.*

Introduction

Background to the Study

Water is a basic need, an essential resource for survival to secure good health and therefore all access to safe drinking water is right to all. People need water for various domestic purposes like drinking, cooking, sanitation, and irrigation. Besides domestic use, people also need water for other diversified livelihood activities including livestock, gardening, cropping, food processing, aquaculture and fisheries (Soussan 2003; Kopper et al. 2006). In rural and peri- urban areas of developing countries. People around the world face the problem of water scarcity. Scarcity of water forced the people to use unsafe water for drinking and other domestic purposes (WHO, 2009). About 1.7 billion people in developing countries have no access to safe drinking water (Health UNICEF, 2013).

As a result, about 50% of population in the developing countries suffered from water- borne diseases such as diarrhea, cholera, ascaris, hookworm (Murcoot, S., 2001). About 10 million

people die each year due to intervention of some 500 million new cases of waterborne diseases (Snyder, J. D., Merson. M. H., 1982). When people do not have access to safe water supply and sanitation, there will be higher risk in their health condition. Diarrheal infection alone is responsible for 1.8 million deaths a year worldwide, of which 90% are children under age of five (WSSCC, 2010). Like water, sanitation is also a basic way to ensure healthy life. Parallel to water, sanitation is a serious health risk and affront to human dignity. Sustainability of water supply system depends on social acceptability, social viability and technical and environmental sustainability.

While the world’s population tripled in the 20th century, the use of renewable water resources has grown six-fold. Within the next fifty years, the world’s population will increase by another 40 to 50 percent. This population growth coupled with industrialization and urbanization will result in an increasing demand for water and will have serious consequences on the environment. (World Water Council, 2014). In spite of the

importance and apparent abundance of water, most of sub-Saharan Africa faces a serious water scarcity problem (Obed Fung, 2013).

Africa faces huge challenges with multiple issues that adversely affect public health. One major challenge is the ability for both rural and urban Africans to access clean water supply.

The situation of access to clean water and sanitation in rural Africa is even more dismal than the previous statistics imply. The WHO (2006) stated that, in 2004, only 16% of people in sub-Saharan Africa had access to drinking water through a household connection (an indoor tap or a tap in the yard). Not only is there poor access to readily accessible drinking water, even when water is available in these small towns, there are risks of contamination due to several factors. When wells are built and water sanitation facilities are developed, they are improperly maintained due to limited financial resources. Water quality testing is not performed as often as is necessary, and lack of education among the people utilizing the water source leads them to believe that as long as they are getting water from a well, it is safe. Once a source of water has been provided, quantity of water is often given more attention than quality of water (Awuah et al. 2009).

There are limited sources of water available to provide clean drinking water to the entire population of Africa. Surface water sources are often highly polluted, and infrastructure to pipe water from fresh, clean sources to arid areas is too costly of an endeavor. Groundwater is the best resource to tap to provide clean water to the majority of areas in Africa, especially rural Africa, and groundwater has the benefit of being naturally protected from bacterial contamination and is a reliable source during droughts. However, the high costs associated with drilling for water, and the technical challenges in finding sources that are large enough to serve the population in need, present challenges that limit tapping the resource. Groundwater is not a safe resource, either, when it comes to providing clean water. There may be contamination of the water with heavy metals, and bacteria may be introduced by leaking septic systems or contaminated wells. For these reasons, it is important that groundwater be monitored frequently, which is costly and requires technical abilities that may not be present in rural areas (Awuah, et al., 2009).

Here are some African statistics to assert the above which 6km is the average distance African women must walk in order to collect water. Also, 20 liters of water is the average weight that African women carry on their heads (elena96, 2017).

Over the last decade, the water crises in Eloundem I community has worsened as rapid urbanization into Cameroons capital Yaoundé, and other towns such as Douala and Buea have rendered the existing infrastructure extremely inadequate. According to a report by Anthony B. Ndah and XiongzhiXue, for a country endowed with freshwater sources, only an estimated 40% of Cameroon's population has access to portable water. Majority of those without portable water turn to wells, rivers and lakes for drinking water whose quality, for the most part, is usually compromised by their proximity to biological and industrial waste. Though UNICEF and the World Health Organization (WHO) recently celebrated the attainment of the 2015 Millennium Development Goal (MDG) target of having the proportion of people with access to safe drinking water, Cameroon unfortunately did not meet these goals.

Statement of the Problem

Some communities in Yaoundé and Cameroon in general stay without water for about a month; or could have a non-consistent water flow; water flows only a few hours, usually at night.

Taps have run dry in most parts of the city. Those who cannot go to regularly supplied places like military barracks have turned to wells, streams and springs. Others are forced to drive far out of town to fetch clean water (Eugene Nforngwa, 2014). Consequently, local authorities have failed to provide neighborhoods with adequate utilities, services, and infrastructure.

Water like everywhere in the world, is becoming both a scarce and a crucial resource; particularly because both people and industries need water and electricity for survival. Eloundem I community is not an exception, as many households do not receive a regular supply of water. The problem is escalating at an alarming rate as the number of households in the Community increases rapidly. These developments therefore, call for an investigation of the impact of water shortage on the health situation of members of the households in the community.

Objective of the Study

Main objective

The main objective of this work is to establish the implication of water development projects on community welfare in the Elounden I community.

Specific objectives

- To determine the different waters sources
- To know the causes of water supply problems in the Elounden I community.
- To examine the various health related hazards caused by water crisis in this community

Research Questions

Main research question:

- What is the intensity of water crisis on the health situation in the Elounden I community?

Specific research questions

- What are the different water sources in the Elounden I Community?
- What are the causes of water supply problems in Elounden I community?
- What is the various health related hazards caused by water crisis in this community?

Scope of the Study

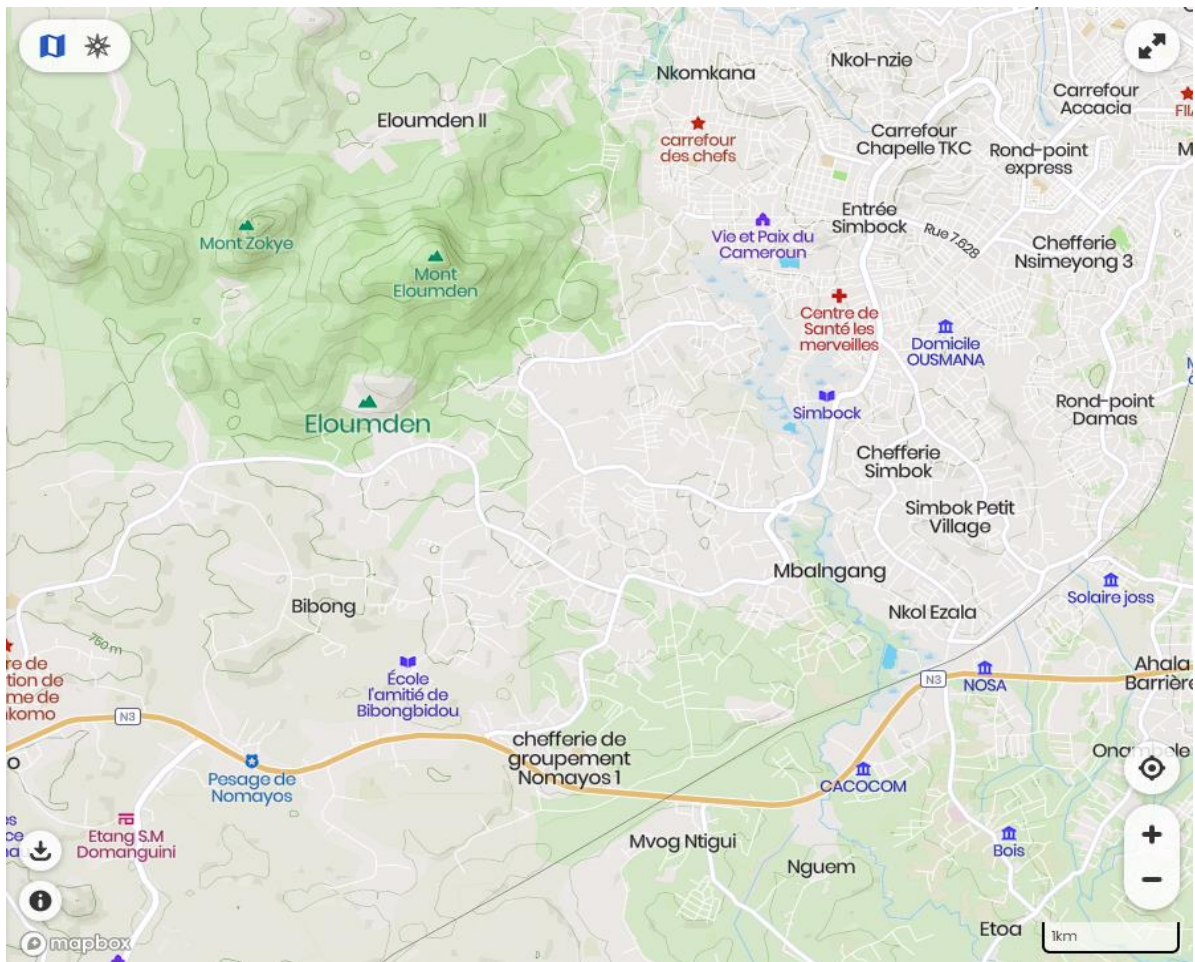
The present study assesses potable water resources and their suitability for drinking with the challenges faced in water supply

management. This study was carried out between, August and October 2020. The study was centered in North East of Mbankomo sub Division specifically at Eloundem I which is composed mostly of new residential units. Population Sampling and data collection, was done following a convenience sampling system. This research is based on qualitative and quantitative data collection in Eloundem I. Eloundem I is not an isolated case, but represents a broader national problem of water crisis. This research therefore only focuses on Eloundem I, located in North East of Mbankomo sub Division. Only water scarcity and the health situation of the community is taken into account and does not include aspects of community life.

Research Localization

Located in the Mefou Akono Division, Mbankomo sub division, Eloundem I am a village half nested in the city of Yaoundé, this because of urbanization, it is the border village of the Mfoundi Division and that of Mefou Akono through the sixth Subdivisions of Yaoundé. It is an industrial village that deals with quarries the produce construction materials for civil engineering like the Arab contractor Egyptian firm which is the leader. They hire young people in this locality and are responsible for several road works. We also have the Chinese wood processing companies (kanap wood), mineral water treatment companies (valclair) and many others. This thus facilitates the reduction of the unemployment rate as well as the development of infrastructural Development.

Map of Eloumdem I Community



Source: Author adapted from Mapcarta (2020)

Literature Review and Theoretical Framework

Water scarcity is as a result of an imbalance between the supply of and demand for water sources in a geographical area. A limited or inadequate water supply is one of the toughest issues facing the world's poorest countries, but the populations of these countries are not the only ones to endure the burden of water scarcity. As Levy and Sidel correctly pointed out, distribution in water-strained settings is the source of numerous conflicts globally.

To begin, water crisis or water scarcity as stated by Jaeger, W. K, et al. (2013: Pp1), may appear to be a simple concept, but it can be difficult to apply to complex natural-human systems. While aggregate scarcity indices are straightforward to compute, they do not adequately represent the spatial and temporal variations in water scarcity that arise from complex systems interactions. The uncertain effects of future climate change on water scarcity

add to the need for clarity on the concept of water scarcity. Starting with a simple but robust definition, the marginal value of a unit of water they highlight, they highlight key aspects of water scarcity and illustrate its many biophysical and socioeconomic determinants. They make four central observations. Firstly, water scarcity varies greatly across location, time, and a multitude of uses that are valued either directly or indirectly by society. Secondly, water scarcity is fundamentally a normative, anthropocentric concept and, thus, can and should be distinguished from the related, purely descriptive notion of water deficit. Thirdly, the ability to understand and anticipate changes in water scarcity requires distinguishing between the factors that affect the value or benefits of water from those affecting the costs of transforming water in space, time and form. Finally, the robust and rigorous definition of water scarcity will facilitate better communication and understanding for policymakers and scientists.

Chévarro Jimena (2015) explains the history of the human right to water and examines its main content and the obligations that derive from this right. To her, the main purpose of the recognition of the human right to water is to guarantee everyone access to sufficient, safe and affordable drinking water to satisfy personal and domestic uses. She discusses on whether the human right to water is recognized as a derivative right or as an independent right at three levels: universal, regional and domestic.

Chellaney Brahma (2013) sketches a bleak picture of water scarcity in Africa, Asia, and the Middle East, regions also struggling with unstable governments and rapidly growing populations. What he calls “water stressed conditions” are also appearing in developed countries, such as Spain, Australia, and South Korea. Even the deep-water aquifers that support modern agriculture in North America are dwindling. But will the social and environmental stresses of water shortage lead to conflict and armed violence? On that question, Chellaney is speculative. To him, conflicts over water have already embroiled states along the Tigris Euphrates basin, in the Middle East, and the war in Darfur has been partly caused because of water shortages. He makes it clear that such conflicts will become more common as water begins to be “used as a weapon”.

Marq de Villiers (2015) agrees that water problems persist but argues that they are more localized than global, and that local issues such as water shortages, pollution, ownership, and distribution are all “more tractable, easier to solve, not harder” than worldwide ones. In five sections, he addresses water issues with equal parts caution and confidence. He writes that the state of groundwater, for example, is “dire” but hardly catastrophic, depending on the region. The same goes for the world’s rivers, which are in big trouble, but not so far gone that they cannot be saved.

Marq de Villiers (2003) describes the ecological damage incurred by the use and abuse of water sources. Through pollution, diversion, and degradation, industrialization of the world has taken a heavy toll on water quality. To him, “Humans consume water, discard it, poison it, waste it, and restlessly change the hydrological cycles, indifferent to the consequences: too many people, too little water, water in the wrong places and in the wrong amount. The human population

is burgeoning, but water demand is increasing twice as fast”.

The Cameroon WASH Institutional Framework

Water governance has been described as the range of political, social, economic and administrative systems that are in place to develop and manage water resources and the delivery of water services at different levels of the society (Pittman, 2008). Hence, improving governance in the water sector is not only about government systems and services delivery. Rather, it encompasses a much broader range of factors including engaging civil society, non-state agents and their relationship to government.

According to the Water Partnership Program (WPP) of the African Development Bank (ADB), sustainable services in water governance are not achieved without the involvement of other stakeholders and particularly water users in the development of policies and laws for sector development (WPP-ADB, 2008). The overall purpose of a sector policy is to serve as the means for establishing and maintaining the enabling environment necessary for sector development (Mogranahan et al, 2006).

In terms of legislation, the water sector in Cameroon is governed by decree n° 98/005 of 14 April 1998. Masanga, (2014) however argues that, the 1998 national water law is limited as it was not elaborated within the framework of integrated water resource management. This law, according to this scholar, failed to address some of the key principles of sustainable water resource management like the management of water in hydrological basins, effective stakeholder participation and economic value of water.

Nonetheless, in Cameroon, the WASH sector has undergone a series of reforms aimed at improving water governance and promoting effective service delivery. Among the reforms undertaken by government to redress this situation was the privatisation of the then National Water Corporation (SNEC) that was launched in 1999 and concluded in 2008. It was expected that privatization was going to play an increasingly important role in the provision, rehabilitation and maintenance of infrastructure.

The WASH sector is divided in two sub-sectors. Notably, the urban sub-sector (urban areas) and the rural sub-sector (for rural areas).

Most of the reforms carried out in this sector fall under the water sector; mostly in the urban water supply sub-sector. In the main time, there exists no institutional structure particularly responsible of the sanitation sub-sector (CSO, 2015).

The rural water supply sub-sector is placed under the direct supervision of the Ministry of Water Resources and Energy (MINEE), through its Directorate of water supply and hydrology (DHH). Without any specific guidelines or national policy in respect with sanitation, the activities of the DHH focus mainly on the construction of water supply facilities and organisation of the supply of drinking water in rural areas (CSO, 2015).

As reported in the Growth and Employment Strategic Paper (GESP), within the framework of the urban water supply policy letter of 2007, the government of Cameroon had adopted the public-private partnership policy in the urban areas.

The implementation of this policy is the responsibility of the state-owned company; Cameroon Water Utilities Corporation (CAMWATER), with supervision from the Sub-Directorate of urban water supply and sanitation (DEAU). Camwater was created in December 2008, to replace the defunct Société National des Eaux du Cameroun (SNEC). The efforts of Camwater were to be complemented by la 'Camerounaise des Eaux' (CDE), a Moroccan private operating company through the signing of a lease agreement with Camwater in April 2008. CDE was charged with the responsibilities of producing, distributing, maintenance of infrastructure and marketing of safe drinking water up till April 30, 2018 when this contract comes to an end (GESP).

In spite of the putting in place of the required building blocks for the institutional framework, in the WASH sector, water experts hold the fact that, there exist no formal national water policy for the integration, application and enforcement of water legislation (Masanga, 2014). As a result, Cameroon is still unable to ensure regular, adequate and sustainable water and sanitation provision to a greater proportion of its citizens. The 2015 Cameroon country status overview (CSO) published by AMCOW reported that, Cameroon still lack an operational programmatic approach that would not only enhance the conduct of proper needs assessment, but also would enable the establishment of plans based on

priority criteria; thus, leading to a harmonization plan on the use of finances (CSO, 2015). The Cameroon WASH institutional framework consequently suffers from a certain number of road blocks among which;

- Large number of sector players leading to fragmentation, over lapping of responsibilities and poor coordination of operations.
- The transfer of power in favour of councils has not been accompanied by adequate allocation of financial resources to enable them effectively assume the duties entrusted them.
- Limited coordination between the different ministries involved in the sector and the other asset holding company like Camwater.
- The problem of ownership of facilities and responsibilities for their maintenance and renewal still yet to be resolved as the decentralization process in Cameroon is on a slow pace, with the roles of the councils in the sector that remain largely theoretical. As such, the demand responsive approach pruned in the national water supply and sanitation (WSS) policy for rural areas remains limited.
- The private sector is not particularly active in the rural areas and only a few numbers of NGOs are actually involved in the construction of tertiary services.
- The National Water Committee (CNE) created by decree to coordinate the water subsector activities is not yet operational.
- Corruption and embezzlement of funds (CSO, 2015).

Theoretical framework

The Theory of Change

Change in theory is based on an approach that depends on the underlying problem, the context and assumptions. However, Taplin et al think that, at its very heart, a theory of change spells out initiative or program logic. According to these scholars, a theory of change defines long-term goals and then maps backward to identify changes that need to occur earlier, known as preconditions. The identified changes are then mapped graphically in causal pathways of outcomes, showing each outcome in logical relationship to all the others. While interventions, which are the activities and outputs of any sort, are mapped to the outcomes pathway to show

what stakeholders think it will take to effect the change, and when (Taplin et al, 2013).

The essence of any project is to take a people from a less desirable condition A to a more desirable one B. That is, bring about a positive change in the lives of the beneficiaries. Simply put, the idea behind every development intervention is that, by undertaking an action X, it will lead to the achievement of progress Y. Based on the premise that every development intervention is expected to positively impact the livelihood of communities, an underlying theory of change will clearly articulate the logic between the intended activity (the 'if' part), and the expected change it will generate (the 'then' part) (Care, 2012).

Just like a logical framework describes the hierarchical logic between activities, and their expected outcomes, a grounded theory of change offers a clearer picture of results intended to emanate from an action. In this perspective (Colby et al, 2013) holds that, a well-articulated theory of change provides a working model against which testable hypotheses and assumptions regarding how the planned activities will best contribute to achieving the desired results.

The water and sanitation sector and more especially the rural WASH sector is a complex adaptive system consisting of multiple actors and relationships, all of which need to work together effectively for success to be achieved. In this light, Shouten stresses that, at the heart of a given approach to change, is a vision of how the rural water sector needs to function if sustainable water and sanitation services are to be provided, and a set of guiding messages intended to inspire stakeholders to start creating change in their own context (Shouten et al, 2013).

Change is all about people; there is therefore a need to adequately identify the actors to work with in any community development intervention. Moreover, projects that spring up from contextual realities based on community analysis and assessment, and proper identification of relevant stakeholders (inputs) are more likely to bring about the expected change. Nonetheless, most WASH supply projects focus on the 'hardware' that is, the physical infrastructure, ignoring the knowledge and behaviours aspects that constitute the 'software', and upon which the achievement of project goal, to create the expected change

depends to a greater extend. Consequently, project end up building water and sanitation infrastructure instead of providing water (Moriarty et al, 2013).

Methodology

Population

Eloundem I have an **estimated** total population of **18,000** people. The unit of analysis was the individual households and water providers while the unit of observation which was the target population comprised of the respondents from the sample survey. Simple random sampling and purposive sampling was used to obtain a sample from a sampling frame of all the households in the study area.

Sample and Sampling Procedure

The sample size given that the target population was 18,000 at a confidence interval of 95% and the error margin of 5%, the sample population was 100 respondents (Fisher *et al.*, 2008). As earlier noted, the water sector was selected due to the basic role the resource plays in our lives. The unit of analysis was individual households while the unit of observation was the respondents from the sample survey. Simple random sampling was used to obtain a sample from a sampling frame of all the households in the study area. The researcher selects who to be included in the study based on their ability to provide necessary data but most importantly for those who are willing and available. The rationale for choosing this approach was that the researcher was seeking knowledge about; water crisis in the Eloundem I community which the respondents would provide by virtue of their experience.

Data Collection Methods and Instruments

In this study, both primary and secondary data were collected. Primary data provided the researcher with first-hand information on the subject matter, and this could be attained through observations, interviews as well as questionnaires. On the other hand, the secondary data collection was gotten from existing information from other similar works and related articles.

Questionnaires

The questionnaires administered to the respondents were divided into five sections. The first section was a letter to the respondent with the

personal information of the researcher (school, dissertation theme). We had to move from home to home asking the questions ourselves while ticking and filling where necessary. Section 2 was the demographic profile of the respondent, which collected personal information about the respondent such as the gender, level of education (others specify), and number of years living in Elounden I community. Section 3 was to get the opinions of respondents on water crisis in their community. Section 4 sought to get their opinion on the water governance system in Elounden I community. Part 5 tried to know about alternative water sources found in their community.

Interviews

Here, some water supply actors were interviewed based on their accessibility and availability. Face to face interview was conducted, and main interviews were conducted with Senior Technical Staffs of the Sub-Department of Drinking Water Supply in Urban and Rural Areas in relation to the water crisis. Also, an interview was carried out with Still there was an interview with the Chief/Quarter Head of Elounden I community as regards water issues plaguing their community. Answers to the questions were given and the researcher wrote them down as they responded.

Observation

Observation method was used to determine the impacts of water shortage in Elounden I community. The researcher observed the activities related to water for a period of three months to assess the impacts posed by water shortage in Elounden I community and find out possible solutions to the problems. The observations were recorded in a note book and photographs on activities revolving around the water sites taken during field trips.

Analytical Approach

The data collected were subjected to inferential statistical analysis which included discussing general characteristics from a sample population. The qualitative method was also used to interpret data from the interviews and social surveys; both made in the Elounden I community, and to water actors. The data analysis was based on the study objectives and research questions. After all data was collected, the researcher identified incomplete or inaccurate responses,

which were corrected to clarify the quality of the responses. The responses from the questionnaires, interview schedules and observation schedules were coded into statistical package for social sciences (SPSS) version 20 for analysis. Qualitative data was analyzed using content analysis based on analysis of meanings and implications emanating from respondents' information and documented data. It was summarized into meaningful statements, which were used to supplement the quantitative data to enrich the interpretation of the findings.

Validation of the Results

Our work is acceptable in the sense that after the qualitative and quantitative analysis being carried out, truths and facts about the water problem in Elounden I community is brought to light. At the end of the study, results acquired could be replicated and compared to other communities facing similar experiences of water crisis.

Validity is defined as the accuracy and meaningfulness of inferences, which are based on the research results (Mugenda & Mugenda, 1999). Validity, according to Borg and Gall (1989) is the degree to which a test measures what it purports to measure. All assessments of validity are subjective opinions based on the judgment of the researcher (Wiersma, 1995). Again, according to Borg and Gall (1989) content validity of an instrument is improved through expert judgment. As such, the researcher sought assistance of the supervisors, who, as experts in, research, helped improve content validity of the instrument.

Presentation of Results and Discussion

In any scientific research, the data collected from the field requires being treated using appropriate statistical methods which are recognized in the domain of social sciences so as to confirm research questions and explain findings related to the study. In our work, we used the descriptive and inferential statistical analysis so as to understand our research.

Sources of Water

In the study, the first objective was to assess the sources of water in Elounden I community. The first research question sought to achieve the objective by finding out the sources of water at Elounden I community. The following water

sources were identified in Eloundem I community Main sources of water for the households were; piped water from boreholes,

shallow wells and running stream water. The water sources information is represented in the figure below.

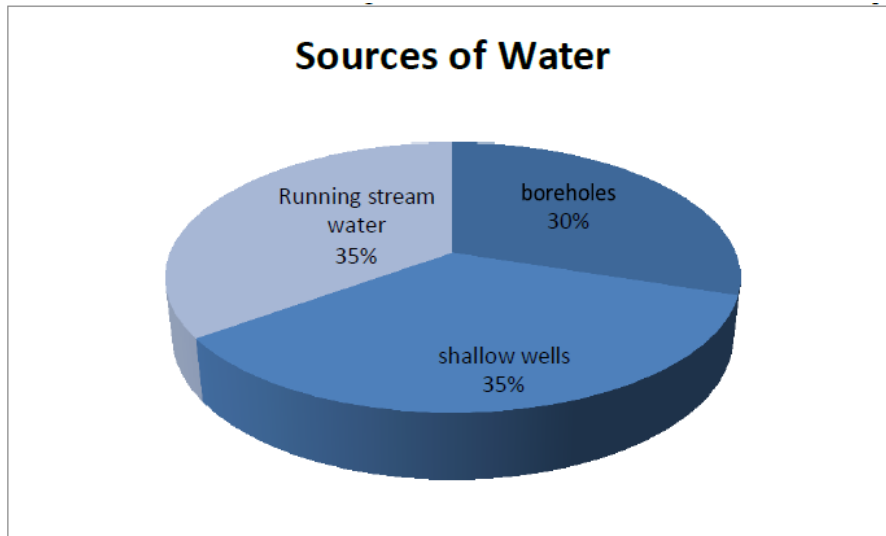


Figure 4.1. Sources of Water in Eloundem I community

Figure 4.1 above illustrates the proportions of the respondents who use the different sources of water in the research area. From the figure 4.1 above, 35% get their daily water from running streams around the community, 35% obtain the water from shallow wells, 30% from boreholes. The respondents depending on the piped boreholes for water supply spend some amounts of money as charges for the water. Most of them pay for water per 20 litter containers, 70% have the charges included in the rent and spend 1500FCFA per month on water. Based on their varied income, this resulted to use of much money on water since they spent extra cost when the water is not available in the taps by buying from water vendors and water kiosks. The income

of most respondents was very little. Employed (33.6%) lowest income was 30,000FCFA per month and the highest income was above 300,000FCFA per month. For the business persons (59.4), the lowest income was 50,000FCFA per month and the highest income 500,000FCFA per month which varied according to the market trends and the health of the economy. The other 7% of the respondents were unemployed and paying the monthly water charges as well as buying water was very expensive for them. The respondents agreed that acquiring water was expensive for them and was evident from the charges paid for the water.

The figure below shows an improvised water collection point.



Plate 4.1. Plate indicating an improvised water collection point (Photograph; 17/ 09/ 2020)

Causes of Water Supply Shortage

The second objective of the study was to identify the causes of water supply shortage in Eloundem I community. The second research question sought to find out the causes of water supply in Eloundem I community. The possible main cause of water supply problems is the unexploited water resources of this area.

From research there exist areas with spring water with production volume of about 20 liters per second. Meaning within one minute five families can collect water if this source is been developed but unfortunately nothing is been done to exploit such a lofty resource.

Health and Socio-Economic Effects of Water Crisis at Eloundem I

The third objective of the study was to evaluate Health and Socio-Economic impact of Water Crisis at Eloundem I. The third research question sought to find out the Health and Socio-Economic Effects of Water Crisis at Eloundem I.

The research investigated the water related diseases in Eloundem I. The diseases identified were diarrhea, Typhoid, Malaria and Dysentery and their effect on the households were categorized in terms of employed, business persons and the unemployed. The results obtained were represented in the table below.

Table 4.4. Water borne diseases related to water in Eloundem I.

Occupation	No disease		Diarrhea		Typhoid		Malaria		Dysentery	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Employed	25	53	2	6	10	24	5	10	3	7
Business Persons	15	50	5	18	3	10	5	18	2	4
Unemployed	10	40	5	20	1	4	8	32	1	4

Source: Field survey 2020

Table 4.4 above indicates that, 53% of the employed respondents said that there were no cases of water borne related diseases, 6% of the employed said there were cases of diarrhea, 24% had typhoid, 10% suffered from Malaria, 7% for dysentery and there were no cases of cholera in this area. According to the business persons, 50% of them said there were no cases of diseases, 18% said they had experienced diarrhoea, 10% suffered from typhoid, 18% from malaria and 4% said there were cases of dysentery. Unemployed respondents had almost similar responses with 40% saying there were no cases of water related diseases, 40% said there were cases of diarrhoea 4% suffered from typhoid, 32% from malaria and

4% also confirmed that there were cases of dysentery. Due to reduced quantities of drinking water, some respondents said that they were forced to take chances, buy and consume water which they were not sure of the sources and at times is not fit for consumption leading to the mentioned water borne diseases (diarrhoea and cholera). This has impacted negatively on the health of some members of the population resulting to low output in terms of labour. They may not perform their duties as expected hence reduced output in production which negatively affects the economy and development of Eloundem I.



Plate 4.3. Plate indicating water source which doubles as a breathing ground for mosquitoes (Photograph; 17/ 09/ 2020)



Plate 4.3. Plate showing accessibility to water collection point (Photograph; 17/ 09/ 2020)

From the analysis, 96% of the respondents said there was poor sanitation and low standards of cleanliness while 4% said that there was no effect of water supply shortage on the sanitation of their residential areas. These results are with line with those of water shortage by Kimani *et al.*, (2007) that water has a major effect on the sanitation of an area especially in the urban areas.

Recommendations and Conclusion

Recommendations

Based on the analysis of the study, the researcher wishes to make the following recommendations;

Water actors should involve the community to aid in water maintenance, development programmes and water provision projects. Members of the community should come up with other ideas to supplement the current water sources and make communal contribution to support that e.g. drilling more boreholes, wells and implementing any water conservation techniques that may be beneficial.

The government should organize more capacity building programmes for both water actors and the households (members of the community) to equip them with adequate skills and abilities to handle any issues that are related to water.

The households should embrace maximum use of roof water harvesting in most buildings so as to collect a lot of water during the rainy seasons.

The study mainly evaluated the water crisis on health situation in the EloumdenI community. The researcher recommends further research on:

- The impacts of water crisis on health situation on other areas in the country other than evaluate the water crisis on health situation in the EloumdenI community.
- The strategies being employed by the government to develop water facilities in EloumdenI community and other parts of the country.
- A case study of an area that has well exploited water resources to use as a model in the case of Eloumden I.

Conclusion

The study established that the respondents had adaptive measures to ensure that water is available despite the problems in water supply. This is possible mainly by expiating the available springs along the slopes of mount Eloumden. Others depend on borehole water and shallow well which supplement the water supplied from other sources. This ensures that the daily activities that require water are not severely affected and the health situation of this area is ameliorated.

The first objective was to assess the main sources of water. From the findings it was noted that the sources of water were three mainly, of which most of them were unhealthy. With 75% of them using water from sources judged uncertain and unhealthy. This showed that there was a major problem of water.

The second objective was to investigate the causes of water supply crisis. The study established main cause of water supply problems is the unexploited water resources of this area.

The third objective was to investigate the health and socio-economic impacts of water crisis. The study established that a lot of money was spent community members that contracted disease from unhealthy water sources. This has affected the health of the individuals and a lot of finances used on the treatment would have been used for development. There were also conflicts related to water. This has socially affected the members of the community. In the study, females are the most affected members of the community in water collection activities since they are involved in home chores. This negatively affects them since they have few chances for decision making and involvement in other development activities.

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