

AN ASSESSMENT STUDY OF THE CHALLENGES OF URBAN WATER SUPPLY IN CASE OF GALKAYO TOWN, PUNTLAND, SOMALIA.

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Abstract: *Assessing the challenges of urban water supply is a decisive issue as water supply sector is one amongst the highly challenging sectors in urbanization. Due to ignorance and lack of resources that have resulted from the civil war that Somalia is currently facing, the mutual exclusive relation with economic development and human livelihood makes these challenges more complex. The focus of this study is to ascertain the challenges of the water supply system in the Galkayo town. The study used systematic sampling technique to obtain information from 167Noshousehold respondents and non-probability sampling techniques for key informant selection. To acquire the required information both secondary an primary date were collected through Questionnaire, and Interview. The data collected were analyzed and processed both qualitatively by wider description, and quantitatively by using SPSS and Ms-Excel. The study revealed that there exist an inadequacy of water supply both in terms of quality and quantity, and the major constraints being financial and technological incapability, lack of coordination and promotion of active community participation, policy and regulation issues gaps, etc. The key findings of the study highlight the urgent need to take-up necessary developmental measures, to enhance the living standards of the people in Puntland, Somalia.*

Keywords: *Urban water supply, Consumption system, Challenges,*

1.0 Introduction

In the Mar del Plata Water Conference 1977, it was convened that all people whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs. Former UN Secretary General Kofi Annan stated that, all resources that nourish life owe their existence to water, from the tiniest algae to the giant mammals along with everything they live on, feed on, and make possible their breeding are the creations of water. As stated by the UNESCO 2006 declaration, Water supply is indispensable in both rural and urban areas. Therefore, the accessibility to adequate clean water, to produce food for both rural and urban population, is just one aspect of the role played by water in meeting basic needs and contributing to development. These statements make us realize the greatness and importance of water.

In the United Nations Millennium Declaration 2015 and the world summit on sustainable development, the international goals set were to reduce the proportion of people without adequate access to water and basic sanitation by one-half. In the struggle for economic and social development, the challenges being faced by many countries of the world are undoubtedly related to water. While access to sufficient and clean drinking water may be taken for granted in the developed nations, but seems to be more severe in the developing countries. More than 5 million people perish every year from water-related diseases, and more than 1 billion people suffer without access to water for their basic needs. Due to the rapid population growth and uninhibited residential development witnessed in most developing countries, the global urban environment is seriously being degraded in terms of service delivery. Water supply is the public utilities that have been worst hit by this scenario. Compared with any region of the world, the problem of water supply is deep rooted and multi-dimensional in Africa. In the year 2000, World Health Organization estimated that Africa contains 28% of the world's population without access to improve water supplies. Even though Africa is stated that it is currently urbanizing rapidly and by 2020 it is expected that over 50% of the population in Africa will reside in urban areas, more than 30% of the residents in urban areas currently lack access to adequate water services and facilities.

The attention of the present study is drawn towards Somalia, which is facing similar types of problems as any other African nations. The Somali urban water supply sector has suffered severe deterioration due to ignorance and lack of resources that have resulted from the civil war the country is currently facing. Donor support and interventions almost proved fruitless and unsuccessful. Numerous water supply system assessments and interventions implemented by United Nation (UN) agencies and International Nongovernmental Organizations (NGOs) in the region, which have yet to attain the millennium development goals (MDG) target of reducing by half the proportion of people without sustainable access to safe drinking water by 2015. One of the most important assessments, the water and sanitation sub-cluster recently conducted by the Joint Needs Assessment (JNA) through the UN and The World Bank, provides a through situation analysis and Somali priorities for international support.

The availability of water sources throughout the world is becoming depleted due the rate at which population is increasing. The situation is more alarming in the developing countries. There is an urgent need for planned action to manage water resources effectively for sustainable development. In this present limited study, the study area was chosen as the Galkayo town, which is not different from such realities. In Galkayo, which is a historical town and currently one among the big cities of Somalia, the problem of sustainable water supply has become a common feature since the last two decades.

1.1 Study area: Puntland officially known the Puntland State of Somalia is a region in northeastern Somalia centered on Garowe in the Nugal province, and was declared the territory as an autonomous state in 1998. Puntland is bordered by the Gulf of Aden in the north, the

Indian Ocean in the southeast, the central Galmudug region in the south, the disputed region of Somaliland State to its west and Ethiopia in the southwest. Galkayo lies in southern part of Puntland and the central of Somalia. The Galkayo has a significant importance in the history of Somalia, the town was made the center of the official Galkayo District, and has grown considerably in recent times and serves as a commercial hub. It connects various regional parts, such as Puntland and other part of region, south/central part of the Somalia, and Somali regional state of Ethiopia. The town of Galkayo is divided into two areas, which are separated by a distinct boundary, with the southern district governed by the Galmudug State Government and northern districts governed by Puntland State Government, in the northern part of the town.

Galkayo is the capital of the Mudug region in central Somalia, although control of parts of the town is disputed by Puntland and Galmudug. It is located about 700 km north of Mogadishu, along the main road that connects northern and southern Somalia. The area can be classified as semi-arid, with an average annual rainfall of 150- 200 mm. The town is approximately 285 meters above sea level, with an average temperature of 30°C-32°C during the day and 28°C-30°C at night. The town was founded in this location, largely because of the availability of shallow groundwater, which is the main source of water supply for the majority of the town population; the town encompasses five administrative units (villages) namely: Garsoor, Israac, Horumar, Wdajir, and Tuulos. The surrounding livelihood zones of the town are all pastoral, with sheep, goats, and camels being the primary livestock. The town is an important regional hub for commerce between southern and central Somalia, Somali region of Ethiopia and the port of Bossaso. Given the location of Galkayo and the importance of the city as a trade center, the town is one of the most developed in the region

The scope of the research is limited in space and theme. Spatially, the research is conducted to assess the challenges of urban water supply in three villages namely: Garsoor, Israac, and Horumar in the town. The scope of the study in terms of subject/theme/ is limited to assess the challenges of urban domestic water supply only (it doesn't include industries and consumptions by other sectors) in terms of the equitability of water distribution in all parts of the town, its adequacy, quality and accessibility (distance travelled to fetch water, time consumed and affordability) to all resident.



Fig1: Map showing the Study area Source: Wikipedia (2016).

1.2 General objectives: The objectives of the study is to explore the overall challenges that are influencing the urban water supply in Galkayo town, so as to provide information that would help to give a clear understanding on the challenges. The specific objectives of the study include;

- To identify the water sources of water supply in the Galkayo town.
- To evaluate the current urban water supply, demand and accessibility status in the Galkayo town.
- To identify the major challenges of urban water supply in the Galkayo town
- To investigating the role of private sectors in the provision of urban water supply in the Galkayo town.

2.0 Literature Review

According to WHO (2004) the basic indicators of water accessibility, included optimal access (water supply through taps continuously), intermediate access (water supplied through multiple taps continuously within less than 100m distance travel and within 5 minutes), basic access (between 100m and 1000m distance and 5-30 minutes time) and no access (more than 1000m distance travel and more than 30 minutes time). This reflected the extent to which accessibility challenges time, distance and affordability. In this study the research works carried out by earlier researchers were extensively studied, to identify the key areas to be addressed in attaining the major objectives of the study.

George M. Onyango et al (2010) studied on the water services accessibility in Kisumu municipality of Kenya. The low levels of investment in water infrastructure, the low income obtained and the time involved in collection of water were related to reduce access to water services. Kimey Victor (2008) studied the performance of urban water supply utilities in Korogwe and Muheza towns, Tanzania. The quality of the service and unaccountability for water had been cited as some of the major factors which reflected the performance of many water utilities. The study recommended that by adopting appropriate water demand management strategies such as metering and billing would improve the quality of services and thereby render effective customer relations.

Betelhem Sisay Tezera, (2011), carried out studies on the accessibility of potable water supply and sanitation in rural areas, Sodo, Ethiopia. The study concluded that the impacts of the poor accessibility to potable water and sanitation showed a significant effect on the economic, social and environmental conditions in the study area. Mushir (2012) carried out studies on water supply and consumption relating to home functions, in Nekemate Town, Ethiopia. The study indicated that water supplied by municipal system was only 61% and the average daily household water usage of the town was 15.26Liter/Capita/Day. This spatial and temporal difference at household level was three times lower that IWRA (International Water Resource Association). Further, it was found that the economic backwardness and topographical

features of the land determined the supply of water for consumption in the study area. The study revealed that amount of income; working conditions and education were indicators and influenced the water consumption in the town.

Kahariri Morris Maina (2014) investigated the challenges of water supply and sanitation in Huruma Estate, Nairobi, Kenya. The study highlighted that the increased urban population had a direct impact on water supply and sanitation in Huruma Estate. It recommended the use of water storage devices such as water tanks as a short term strategy and an extension of water pipes distribution lines to be in direct proportion with population growth. It was also recommended that, the community led total sanitation mechanisms would help to correct the situation. Agbubata et al (2015) conducted studies about the population increase and water supply in Nigerian Cities, in Jos, Plateau State, Nigeria. This study aimed to establish the relationship between population increase and water supply that existed in the city of Jos. The study finally concluded that the underlying fact that, water was an independent commodity on which the population seriously depended for survival; and implementing effective conservation measures would greatly minimize the impact of population increase on water supply.

3.0 Methodology and Data sources

It was proved in earlier researches that descriptive survey research design approach is economical in obtaining information from larger population, time efficient and inferences could be easily drawn, hence this approach is used in the study. The investigation study involves the usage of data collection instruments like questionnaires, interviews, field observations and focus group discussions. The focus would be to collect, extract, and process and analyze the information obtained from the Town households, Water Supply Service Office Heads and Experts/Employees. The reason for qualitative approach is important to generate reliable data through interviewing the water supply service officials, and quantitative approach to generate data in quantitative through questionnaire to the service users (households).

The data was gathered from residents relating to the socio-demographic data, frequency of water availability in their respective areas of residence and household's water consumption patterns etc., comprised the primary data. The valuable information obtained from reports, journals, books, district development plans from government agencies such as Puntland State Agency for Water, Energy and Natural Resources (PSAWEN) constituted the secondary data sources. During the field investigation certain observations were noticed and it was felt to use them as a vital information for further studies and are discussed in the upcoming sections. The size of the sample of the study was determined by scientific methods using Kothari's (2004) sampling design technique and 167Nos households were selected from three districts, viz., Garsoor, Israac and Horumar respectively by using random sampling technique. Purposive sampling was used for obtaining information from 3Nos of officials and experts from Galkayo Water Supply Company offices and Galkayo Municipality.

4.0 Data Analysis

The effectiveness of any research study lies in the reliability and validity of the data gathered, for this a pilot study was conducted to construct reliable and valid questionnaires. Few questionnaires were given to experts and the suggestions made were incorporated in the final questionnaire. The final set of questions framed for the questionnaire was effective in addressing the research questions and objectives. Somali is the working language of the study area, so the Questionnaires, Interview guides were translated into the Somali language. This helped the respondents for easy understanding of the questions and give reliable details in proper manner.

The questionnaire was well prepared to represent the context of urban water supply situations. In the current study a total 167Nos questionnaires were administered to the household respondents of the town. Out of the 167Nos questionnaires distributed, 166Nos were returned by data collectors in a proper way; which contributed to 99.4 % response rate. On the other side the interview study, 3 respondents composing Galkayo water supply company officer, and Municipal expert, and similarly to Galkayo Water Supply Company Technical were interviewed and three types of questions were posed to them in the study. In the study, the researcher used quantitative and qualitative approaches of data analysis. The data were collected by survey, closed-ended and opened-ended questionnaire, semi- structured interview, focus group discussion and field observations. The analysis of the sample respondents of survey questionnaires and other quantitative data were analyzed by the Statistical Package for Social Studies (SPSS.20) and Microsoft Excels 2007. In the study the dependent variable and independent variables were water supply, consumption system and challenges in Galkayo town respectively.

5.0 Results

5.1 Demographic details: The study was conducted in three administrative units Garsoor, Israac and Horumar, comprising of 166Nos of household respondents, in which the male and female respondents were 61Nos (36.74%) and 105Nos (63.26%) respectively. The majority of the respondents were female, and they are the first to witness and suffer the problem associated with water supply. Age of the respondents is one of the most important characteristics in understanding their views about the particular problems; it indicates the maturity levels of individuals towards social problems. Hence the lower age limit of respondents was taken as 20years, and it was found that distribution of respondents was 20-30years and 31-40years are 45.18% & 27.71%. It is to be noted that the majority of the respondents (72.89%) were between 20-40years; this indicated that the responses obtained were very much informative and they are shouldering the responsibility of the households. It was identified that, education levels were not so impressive and most of them were illiterates to basic education. The family size of most of the respondents varied between 4 to 9Nos and the occupation details of the households indicated that, they were obtaining meagre incomes and leading tough life.

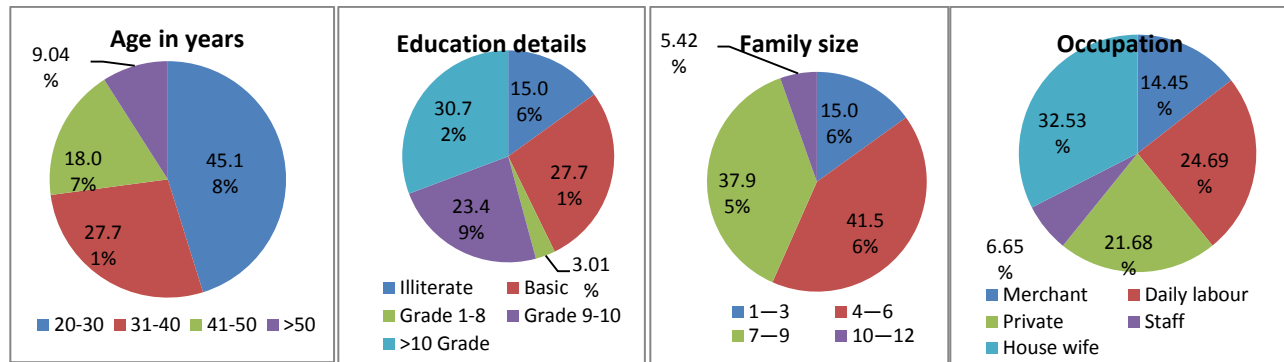


Fig 2 : Figure showing the demographic details of respondents

5.2 Water Sources and Distribution System in the Town: In the questionnaire, the information regarding the availability of water sources, alternative sources, distance of source and other important details were extensively studied. The factors responsible for the causes and effects of water interruptions and their frequencies were also addressed. It was found that about 100Nos (60.2%) of the household respondents had access to potable water but not regular, while the rest 66Nos (39.8%) do not have access; this indicated that potable water supply at Galkayo town is in poor condition. As the study also revealed that, 80Nos (48.2 %) of the sampled households have piped connection of water within their house from Galkayo Water Supply Company, while the remaining 86Nos (51.8 %) have no piped connection within their house. Water is distributed through pipes which may be located in a home or at a focal point where it can be accessed through buying. The majority of them did not have piped connection in their house, and the remaining collected water at different times of supply.

Regarding the interruptions of water supply through pipeline connections, out of the total respondents about 37Nos (46.25%), 27Nos (33.725%) and 16Nos (20%) reported that they obtained regularly, once in 2-3days and once in 4-5days respectively. It was found that more than half of the town residents stated that interruptions in water supply were common and the reasons were attributed to scarcity of water at the source (56%), electrical power fluctuations (9.6%), technical problems (12.7%) and reasons unknown (21.7%) respectively. The frequency of interruption of supply were studied, it was found that it was a common situation to have supply once in 2-3 days and at times it could even extend beyond week days. The residents of Galkayo town were forced to have an alternative source of water supply due to the scarcity of source of water supply experienced in the town, about 133Nos (80.1%) and 21Nos (12.7%) depended on private yard pipeline connection and bore wells as their source of water. It was identified that the water obtained from private connections was not fit for drinking, as it was composed with many objectionable minerals and salts.

5.3 Average consumption and supply: The average consumptions of the households was investigated, and it was found that the daily requirements were between 100-150 Liters, 151-200 Liters and more than 200 Liters for about 18Nos (10.8%), 88Nos (53%) and 60Nos (36%) of the respondents respectively. Among the respondents, about 13Nos (7.8%) have answered that the consumption of water in proportion with daily demand, while the rest about 153Nos (92.2%) reacted that water supply was not proportional to the demand, this indicated that the majority of the respondents used additional water obtained from other sources. It is to be noted that the supply was not in proportion with the requirements and they were forced to obtain the additional requirements from alternate sources.

It was found that about 55Nos (36.0%) used borehole water, 60Nos (39.2%) buy water from the water retailer who carry water in to wheelbarrow and the rest 38Nos (24.8%) used spring purified water from small firms. Based on the financial capabilities, labor requirements, distance of travel etc., various alternate sources were opted to satisfy their daily demand. The expenditure incurred towards meeting the cost for water, signified that about 45Nos (27.1%) and 85Nos (51.2%) of the respondents paid \$1 and \$1.3 per 1m³ respectively. It was reported that the water costs were high, the pricing structure is not pro-poor and poor predictably paid high prices for water per unit volume than those with household connection. Amongst the negative consequences of this most vulnerable situation was that, most of them preferred to minimize the usage. This in turn leads to the psychological and mental health impacts on the consumers.

5.4: Challenges of water supply: About 163Nos (98.2%) have declared that there exists a lot of water supply challenges in the town, and the factors such as technical, financial, and facilitation problems were the major factors that contributed to this hard situation. Bart Van der and Chris Vinckier (2009) carried out studies to identify the causes of water supply problems in urbanised regions in developing countries. The study indicated that three interrelated factors viz., high rate of population growth, lack of investments in water supply infrastructure, and the upper limit imposed by the availability of water sources caused the problems of water supply in the developing countries. These were given importance and the various conditions favouring these challenges and the difficulties faced to overcome this situation were studied. From the information obtained it was found that about 124Nos (74.7%) claimed that applying for a new water supply connection was not entertained by the concerned officials, while the rest 42Nos (25.3%) voted that they were encouraged in this regard. The various hurdles that are enhancing the present situation regarding the type of challenge, the factors influencing the challenges and the causes inhibiting these challenges are shown in the figure below.

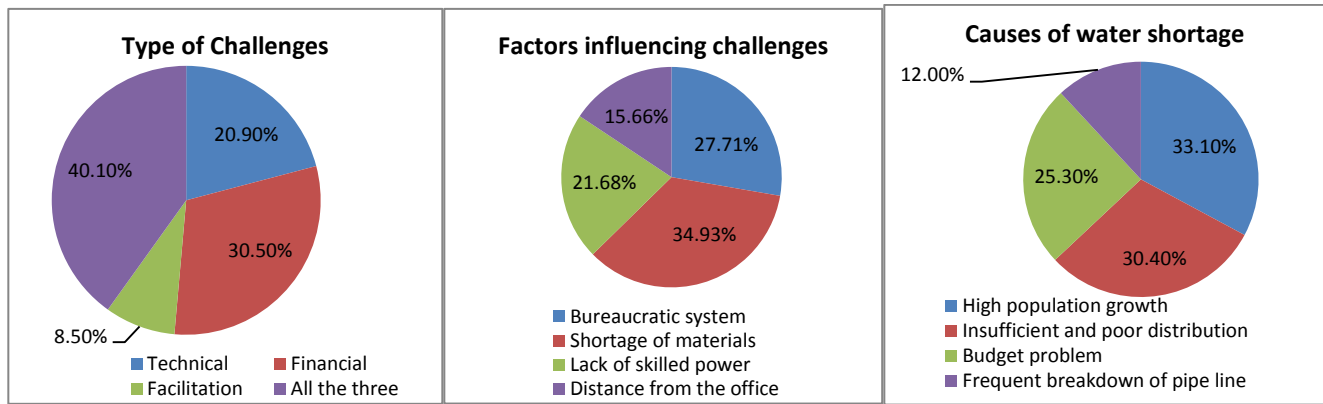


Fig 3 : Figure showing the various challenges and the causes

5.5: Role of Responsible bodies: Certain questions were posed to identify the underlying causes for the existence and regarding the duties delivered by the responsible bodies. For this the respondents were asked to respondents to the reasons for not having piped connection so far and which authority must play an active role in this regard. The reasons stated by the households for not having pipe connection to their houses were, the distance of the water line from their homes and there was no public water supply connection at all. About 21Nos (13%) of other respondents mentioned availability of public connection depended on financial capabilities, so the households doesn't have the financial capacity to meet the cost of public water connection, whereas the majority 73Nos (44.5%) household respondents gave different answer, by stating the inefficiency of municipality and the company do not get any support to manage this problem, these collided challenges lead the town to have a poor grade public water supply system.

According to the study, the percentage wise responses about which authority to play a the major role in this regard, the responses were 20.1%, 33.3%, 24.8% and 21.8% for Government, Private sector, Non-governmental organization and Public-Private partnership respectively. It was identified that the private sector played an important role in the provision of water service in the town, and filled the void created by the lack of public leadership in providing water supply services. Entrepreneurs throughout the country have built berkads, drilled private boreholes, provided services throughout the main cities including Galkayo, and to some extent improved Water supply system operation.

When asked to state about the reasons to why the town water supply service company is not able to overcome the supply challenges, it was responded the various reasons to be attributed comprised due to recent recognitions, less attention rendered by the executive bodies, inefficiency of the company and lack of enforcements. Majority had responded to the inefficiency on the company, and the possible undermining problems were lack of skilled manpower, financial abilities and lack of coverage.

6.0 Discussions and Recommendations

According to the assessment study conducted an assessment report study on urban water supply in Somalia by the UNICEF in 2006, it was identified that the delivery of water supply services in most parts of the country were dramatically weakened due to formerly organized and operated agencies. The study added the extensive use of surface water sources to overcome this situation, but the capacity of these systems in most urban areas is overstretched due to a growing urban population and increasing demand from rural populations, especially in the long dry season and during drought events. Amy J. Pickering and Jennifer Davi (2004) stated that the availability of freshwater and distance involved in fetching water seriously affected the health in Sub-Saharan Africa. The survey indicated that for most of the respondent's the water sources are not in the compound or nearby reaches and considerable amounts of time is being spent in fetching water to their homes. K. Farah & I. Yonis (2015) carried on assessment of challenges of sustaining urban water supply for rapidly growing post war city in Hargeisa city, Somalia. The study indicated that the mass of the residents in the town are currently relying on water trucking from unprotected and poorly maintained water sources around the town for daily water use and the poorest families spend almost 5 times more than others who have access to main water due to the high price of the trucked water.

The study was aimed to assess the challenges of urban water supply in Galkayo town and investigate the adequate management and other stakeholder participations, to ensure that every member of the society has adequate access to water supply service. It was found that the water demand exceeded the capacities of the water supply and low piped-water networks in the study area. It was found that the poor households were suffering due to high prices paid for water, especially during the dry season where water has to be trucked from different distances in the town. The study concluded that provision of the water supply in the town was not enough for urban dwellers due to overexploitation of private sectors, inadequate finance, inadequate skill power, lack of budgets problem, weak coordination among the offices, lack of strong involvement of among bodies, rapid population growth and failure to motivate the community are the major challenges in the study area.

The interview findings of the Galkayo Water Supply Company officers, GWSC and municipal authorities, showed that the major challenges faced by the urban water system in the town, were due to limited coverage, lack of developing new water supply facilities, poor management practices in maintenance of water supply, decrease in the quality of water supply services, difficulties in setting tariffs to recover costs in managing operations and maintenance of water supply system in town.

7.0 Conclusions

On comparing the average daily consumptions and the international or national standard benchmark for water utilization different domestic purposes, it was found that the supplies were very low and do not match with the standards. These situations affected the

economic and social development of the residents. The frequent water interruptions, low pressure, insufficiencies in terms of quality and quantity are the common features identified present in the town water supply system. The unequal distributions and unfair tariff among the residents/ consumers of the town, was a common cause for dissatisfaction towards the town water supply. The study concluded that there is a need for adequate government and other stakeholder involvement in the goal of ensuring that every member of the society has adequate access to water service. The study concluded that the improvement of water supply services in Town is an important target for the public involvement and developmental activities. To have a constant and sufficient water supply, the barriers such as technical, financial, and facilitation must be identified and removed and should adopt an integrated approach to ensuring the sustainability of water supply services, based on demand-driven service provision.

Based on the present study survey findings the following practical suggestions and recommendations were forwarded to improve the water supply system in Galkayo town by effectively addressing the challenges.

- The income levels of the town residents were meager, a major portion of their income was spent towards purchasing water to meet the daily domestic demands and health related issues. A feasible slab system must be encouraged, so that the user will have to pay based on the water consumption and income levels.
- Lack of active involvement of the responsible authorities, NGOs and the public was the undermining weakness for not identifying the necessary steps to overcome these barriers.
- Ensuring effective coordination and collaboration with various stakeholders in the water supply sector as stipulated by the government legislations and policies.
- Empowering and legalizing of comprehensive reforms, policies, acts and strategic plans in the water sector.
- The Puntland State Agency for Water Energy and Natural resource (PSWEN) should increase its capacity with the support of various partners such as, public-private-partnerships (PPP) WASH models, regulation, governance, etc.
- Independent regulatory agencies must be set up to enable the PSWEN and other Ministries to coordinate the efforts and ensure adequate funding to promote the sustainable usage and conservation of water resources.

It was identified that the residents were restricting their water usage to cope with the income levels, which critically shows the miserable conditions of the common man. Ethically, access to water, food and shelter are basic rights of the people. Hence necessary measures must be ensured to improve the water supply facilities in various developing countries. Various research studies must be carried out in this areas and sustainable approaches must be brought in improving the living conditions.

8.0 Acknowledgements

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