SOURCES OF WATER IN GITHURAI WARD, KIAMBU COUNTY, KENYA

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Abstract

Water is a basic human right as it is fundamental to life. However it has become very scarce and has very limited sources. Access to and use of safe drinking water makes an immense contribution to health, productivity and social development. This paper examines the sources of water in Githurai Ward, Kiambu County, Kenya. Water sources and their accessibility are measured by the percentage of the population having access to using improved drinking water sources. Water being a basic resource has become very scarce and has limited sources. The primary objective of this study was to determine the sources of water in Githurai ward. Simple random sampling was used to select the households and water vendors while purposive sampling was used to select the water officers and the chiefs who were sources of information. Questionnaires were used as instruments for collecting data from the households and water vendors, while interview schedules were administered to the water officers and chiefs. There were several sources of water in Githurai ward. It was found that, 5.6% households obtained water from boreholes, 0.8% from shallow wells while 2.2% depended on rain water harvesting. 91.4% of the households have piped water system which is either communally or personally owned; however running water is rarely present in the taps. In conclusion, it was noted that the sources of water were boreholes, shallow wells, rain water harvesting and piped water. The piped water was unreliable as result of vandalism of water pipes, high population that has increased due to rural-urban migration in the past years and poor maintenance of the pipes. The researcher

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135

recommends that the members of the community should drill more boreholes, wells and conserve the already available water by minimizing any leakages in the system. Strict measures such as heavy penalties and fines should be taken against those involved in pipes vandalism. 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.

Key words: Water sources, Accessibility, Distance, Reliability, Adaptations.

1.0 Introduction

Africa's water resources are scattered throughout the continent. While some areas receive more than enough water, others experience constant drought. Water supply in Kenya is characterized by low levels of access, particularly in urban areas as well as poor service quality in the form of intermittent water supply. The demand is far beyond the supply (Chartres & Varma, 2010). Sources of water are either surface water, ground water or from precipitation. Precipitation include: rain, snow, hail and sleet that are precipitated upon the surface of the earth and are considered as the original source of water. Three aspects are considered in describing water resources such as the quantity, the quality and the reliability of available water (Birongi & Nhi, 2005).

Surface water accumulates mainly as a result of direct runoff from precipitation (rain or snow. Precipitation that does not enter the ground through infiltration or is not returned to the atmosphere by evaporation, flows over the ground surface and is classified as direct runoff. Direct runoff is water that drains from saturated or impermeable surfaces, into stream channels, and then into natural or artificial storage sites (or into the ocean in coastal areas). The amount of available surface water depends largely upon rainfall. When rainfall is limited, the supply of surface water will vary considerably between wet and dry years. Surface water supplies may be further divided into river, lake, and reservoir supplies. Dams construction mainly for artificial storage (Antao, 2007 & Bouwer, 2002)

Ground water is due to accumulation of water that drains downward through the soil and finally collects at a certain level on the earth. The ground water is obtained through digging of wells, boreholes and when it flows continuously it becomes a spring.

Improved drinking water sources should, but does not always provide safe drinking water. Household water supply includes piped connection, public standpipe, borehole, protected dug wells; protected spring and collected Rainwater (Ngigi & Macharia, 2006).

Unimproved drinking water sources include unprotected dug well, unprotected spring, Surface water (river, dam, lake, pond, stream, canal, irrigation channel) vendor-drawn water (cart with small tank/drum, tanker truck) and tanker truck water (Ngigi & Macharia, 2006). Only 9 out of 55 water service providers in Kenya provide continuous water supply. Seasonal and regional water scarcity increases the difficulty to improve water supply. The average number of service hours that Kenyan water utilities provide is 14 hours. One in any seven Water Service Providers (WSPs) water supply is continuous. In Nairobi water is provided on average for 16 hours a day and in Mombasa for 6 hours. Instances of water scarcity (defined as more than five days without or with insufficient water supply) still occur in Kenya. In 2006 in Kisumu over 40% of households (both poor and non poor) connected to water mains reported low water supply (Nyangeri & Ombongi, 2007).

In urban areas, including Nairobi, Mombasa, Kisumu, Nakuru,Thika among others, only about 40 % of the habitants have direct access to piped water. The rest obtain water from kiosks, vendors, illegal connections or from wells. Only about 40% of those with access to piped water receive water 24 hours per day. On average, most of the major towns mentioned receive water 6 hours per day, a level which is unacceptable by the Water Sector Regulatory Board (Nyangeri and Ombongi, 2007)

Rationing of the municipal water and low rainfall levels are indicators of water scarcity in most areas. Due to the increased water scarcity in Githurai ward which is an urban and peri-urban area, the aim of the study was to find out the other possible sources of water in the area.

2. 0 Data collection materials and methods

2.1 Area of study

Githurai ward is located 12 km from Nairobi town and 5km from Ruiru town. It is located at the co-ordinates 1º, 12' 31" S 36º, 55'14"E. It is made up of two sub wards; Kiuu and Mwihoko and has a population of 58,185 people (Kenya Population and Housing Census, 2009)

2.2 Sampling and sampling procedure

The sample size was determined by the Fisher's sample size determination equation at a confidence interval of 95% and an error margin of 5% of the target population (58, 185) (Fisher et. al., 2008). There were 252 households, 120 water vendors, 2 chiefs and 10 water officers summing up to 384 respondents (Joyce et. al., 2010).

2.3 Data collection instruments

Questionnaires; were used to collect quantitative data and were randomly administered to randomly selected households that served as a representative of the Githurai community so as to ensure correct responses and maximum return rates.

Observation; the researcher observed the main sources of water in the area, their location (accessibility), reliability and their efficiency.

Interview schedules; they were conducted on individual owners of water kiosks, water vendors and water officers. The aim of the selection was to create a wide view of the subject.

3.0 Results and discussion

3.1 Sources of water in Githurai ward

The main objective of the study was to assess the sources of water in Githurai ward. Findings indicate there were several sources of water in the study area.

It was noted that 5.6% households obtain water from the boreholes, 0.8% from shallow well while 2.2% depend on rain water harvesting. 91.4% of the households have piped water system which is either communally or personally owned; however running water is rarely available in the taps. There are specific hours per week when the water is provided by the supplier (Nairobi municipal council) which happens to be low. 46.5% have it for only 24 hours per week, 8.3% have it for 21 hours per week, 8.9% have it for 12 hours per week, and 5.1% have it for 20hours per week, the rest of the households' have less than 10 hours per week water availability. On average, the area receives water 6 hours per day, a level which is unacceptable by the Water

Sector Regulatory Board (Joyce et.al, 2010). The analysis shows that the households in Githurai ward depend on municipal council for water supply but the water availability on the taps is very limited. Some go even 5 days without water running from the taps. The households have water available in the taps on Tuesdays (7am- 5pm; 10 hours), Thursday (7am-1pm; 6 hours) and Sunday (7am-5pm; 10 hours). This implies that they must put adaptive measures into place to ensure they have water for consumption available (Nyangeri and Ombongi, 2007).

3.2 Distance to the water source

It was noted that the distance travelled to the water source varied among the respondents. 52.2% fetch water 10metres away; 20.7% walk for 100metres to obtain water, 10.8% cover 300metres to fetch water, 2.7% and 3.2% water points are 200 metres and 2000 metres away respectively. The rest of the households' (10.4%) cover varied distances to water points but less than 2000metres. The households being some distance away from the water collection points means that some time is spent to collect water which could have been used to carry out other activities if the water sources were all near the households (Water Aid, 2006b).

Relationship between the gender and the distance travelled to the water sources.
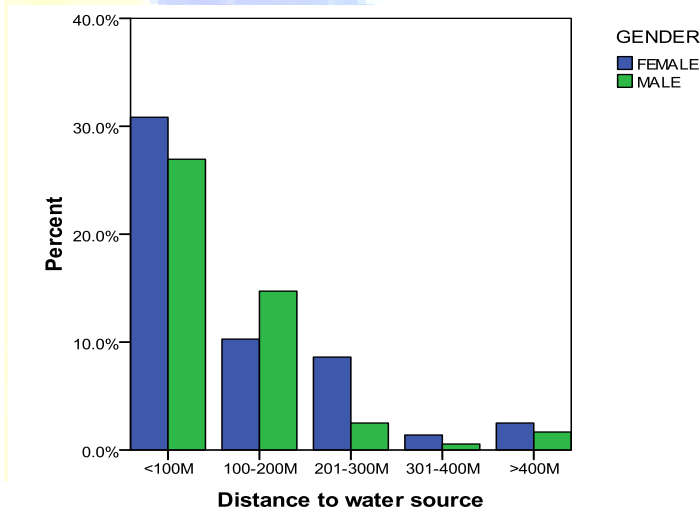
From the findings as indicated in the figure above, there was a significant association between the distance travelled to water source and the gender, with 53.6% of female response on distance being higher than for males (46.4%). Chi-square test showed a significant relationship since, X^2 = 15.978, P=0.003 at 4 degrees of freedom. The female response was higher compared to the male since the females are the most involved gender in water collection.

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139

3.3 Cost of water

The households depending on the municipal council for water supply spend considerable amounts of money as charges for the water of which they pay monthly. 66.1% have the charges included in the rent.14.8% spend 500 shillings /month on water, 3.2% pay 700 shillings/month, 3.2% spend 300 shillings/month, 3.0% spend 150 shillings/month and the other 9.7% spend varied amounts. Based on their varied income, this resulted to use of much money on water since they spent extra cost when the water was not available in the taps by buying from water vendors and water kiosks. There were varied prices for 20litres of water based on the vendor or water kiosk 66.6% of the respondents spend 10shillings per 20litres of water, 28% spend 20shillings per 20litres of water, 2.4% spend 30shillings per 20litres of water and 0.3% spends 5shillings per 20litres of water. This implies that most of the households spent much money on water depending on the members in a household. The income of the household was varied; employed (33.6%) lowest income was 1000 per month and the highest income was 6,200 per month. For the business persons (59.4%) , the lowest income was 2,200 per month and the highest income 10,500 per month which varied according to the market trends and the economy. The other 7% of the households were unemployed and paying the monthly water charges as well as buying water which was very expensive for them. The households agreed that acquiring water was expensive for them and was evident from the charges paid for the water.

4.0 Conclusion

The primary objective was to assess the main sources of water in Githurai ward due to the evident water scarcity indicated by high rationing of water and many water selling points and vendors. From the findings it was noted that the sources of water were boreholes, shallow wells, rain water harvesting and piped water. The piped water was unreliable as result of vandalism of water pipes, high population that has increased overwhelmingly due to rural-urban migration in the past years and poor maintenance of the pipes. 82% of the households rated the water sources as inadequate and very unreliable in the supply patterns. This showed that there was a major deficit of water and its supply levels. There was a significant association between the source of water and the income of the household in the area.

5.0 Recommendations

i. The members of the community should drill more boreholes, wells and conserve the already available water by minimizing leakages at the taps and pipes in the system.

ii. Strict measures such as heavy penalties and fines should be taken against those involved in pipes vandalism.

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

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