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Analysis of Gender Disparity on Household Water Collection in Yenagoa Metropolis, Nigeria

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Abstract

In developing countries, household water collection, especially in the rural area is generally seen as a traditionally assigned role for the female gender. However, the situation is not very clear in the urban area. Hence, this study was aimed at the analysis of gender disparity on household water collection in Yenagoa metropolis. The data were obtained from a structured questionnaire, which was administered by hand, directly to the 400 sampled household heads in the metropolis, using the classified and systematic sampling techniques. The collected data were analyzed using descriptive (percentages) and inferential (t-test) statistics. The analyses established that both male and female genders are involved in water collection in the metropolis. However, the major task of water collection in the metropolis is undertaken by the male gender as indicated by the various households. Specifically, in 274 and 101 households, the male and female genders were indicated as the main water collectors, respectively. The t-test analysis of the first hypothesis (t = 5.381; p-value = .000 at 0.05 alpha level), shows that there is a significant difference in household water collection characteristics between male and female water collectors. Similarly, the t-test of the second hypothesis (t = 7.961; p-value = .000 at 0.05 alpha level), shows that there is a significant difference on the impact of water collection between male and female water collectors. To eliminate gender disparity and the burden associated with water collection, every household should be provided with safely managed water (SMW) services.

Keywords: Gender disparity; household water collector; rural; urban; water collection
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1. Introduction

Water is life, as every living organism including humans depend on it for survival, maintenance of good health, socioeconomic development and ecological sustenance (Ohwo & Abotutu, 2014; Roche *et al* 2017; Chowdhury *et al* 2018; Prüss-Ustün *et al* 2019; Ohwo & Omidiji, 2021;). Hence, to maintain a healthy living, every human requires adequate quantity and quality of water supply for daily use. Households require water for daily activities such as drinking, bathing, cooking and washing. Unfortunately, households' access to sufficient and safe drinking water supply is a huge challenge in most parts of the world, especially in low resource regions such as sub-Saharan Africa (SSA). This situation partly accounts for the inclusion of water targets in the Sustainable Development Goals (SDGs). Specifically, SDG 6, target 6.1 focus on ensuring that everyone globally, irrespective of their status have equitable access to affordable and safe drinking water by 2030. This implies that everyone should enjoy "safely managed drinking water services (drinking water from an improved source that is accessible on premises, available when needed and free from faecal and priority chemical contamination)" (WHO, 2017).

Although much progress has been made towards achieving the SDG target for water from 2015 till date, however, many households globally still lacked access to "safely managed water services"-the ultimate aim of target 6.1. For example, from 2015-2022 (seven years into the SDG), access of the global population to safely managed water (SMW) services increased by 4% (69-73%). In spite of this increase, about 2.2 billion people globally still lacked access to SMW services, while about 1.8 billion people still use water supply sources located outside the premises (UNICEF & WHO, 2023). Based on current rate of progress on SMW provision, the Joint Monitoring Programme (JMP) report for 2023 projected that the world would miss the SDG water target as "no SDG region is on track to achieve universal access by 2030 and the overall rate of progress will need to increase sixfold to meet the SDG global target" (UNICEF & WHO, 2023). This conclusion by the JMP, 2023 report, clearly indicates that a significant number of households globally are still bearing the huge burden of water collection to

meet the daily need of their respective households.

In SSA for example, about 66% of the population usually collect their daily water needs from sources outside their premises (Graham *et al,* 2016), which are usually transported using different modes and over considerable distances. It should be noted that the burden of water collection varies among regions, countries and between urban and rural areas. For example, the JMP reports have consistently noted that generally, urban areas have better access to SMW services than rural areas of the same country (UNICEF & WHO, 2023), which suggests that rural households bear greater burden of water collection compared to their urban folks. In a study of 24 SSA countries on water collection show that the proportion of households without water on premises was higher in the rural area than the urban area. For instance, in 13 (54.17%) of the studied 24 countries, the proportion of households without water on premises in the rural area was over 90%; while in the urban area the proportion was less than 50% for eight countries and between 50 to 75% in another 14 (58.33%) countries. Specifically, in three of the countries studied-Ethiopia, Lesotho and Zimbabwe, the proportion of households without water on premises in the rural/urban area were 99%/50%, 95%/37% and 86%/23%, respectively (Graham *et al,* 2016). In the same study, it was revealed that the time spent in water collection by households also vary between rural and urban area. For example, in 13 of the countries studied, 20-50% of the rural households spent more than 30 minutes for water collection, while in the urban area, the range was 3-39%, which were recorded in Madagascar and Mauritania, respectively (Graham *et al,* 2016). These statistics show that a significant proportion of the population of households in SSA bears the daily burden of water collection to meet their domestic and other needs.

Many studies from different geographical regions have found out that the burden of water collection is gender bias, as women and girls are saddled with the daily responsibility of providing water for their respective households (Graham *et al*, 2016; Cassivi *et al*, 2018; Dickin & Caretta, 2022; UNICEF & WHO, 2023). One of the major reasons why household water collection is gender bias is because females have been culturally and traditionally assigned the role of domestic housekeeping, which include water collection. This gender role has created disparity between male and female in the task of water collection for the household. Although the task of water collection generally rests on the shoulders of females in both rural and urban households, however, the proportion of rural female households involved in water collection is far higher than their urban counterparts (Geere & Cortobius, 2017). The probable reason for this is because traditional and culturally assigned gender roles seem to be more adhered to in the rural area than the urban area due to changes in gender-based roles over time (UNICEF, 2017).

It should be noted at this juncture that in some countries and locations the burden of household water collection is undertaken by the male gender, especially in urban areas. For example, Geere and Cortobius (2017) reported that in a survey in Iraq, Ukraine, Montenegro and Jamaica, more households identified a man as the major water collector in both the urban and rural areas; while in places like Afghanistan, Indonesia West Papua and Pakistan Punjab, more male and female are responsible for household water collection in the urban and rural area, respectively. This suggests that gender disparity in household water collection is gradually being reduced and eliminated in the urban area of some countries. However, the same cannot be said of the rural area where the traditionally assigned gender roles still hold sway.

Although water collection is a basic necessity for the survival and maintenance of households, however, the burden of the collection exerts serious stress on the major water collector, especially women and children in low resource rural setting (Geere & Cortobius, 2017). The act of water collection has been confirmed to have some negative impacts on the health, socioeconomic and psychological wellbeing of the water collector. For example, a study in South Africa reported that children who engage in water collection usually report negative educational outcomes, as they often face fatigue, which affect their concentration in class, prompting them to often leave school early (Hemson, 2007). Similar findings were also reported in a study carried out in rural Ethiopia, where the girls indicated that water collection for their household limit their ability to participate in school activities and succeed (Abebaw *et al*, 2010). Another impact of water collection reported by 33% of girls and boys in a survey in Ghana, was lateness to school due to the time they spend in the morning fetching water before going to school (Porter *et al.* 2012).

Apart from educational impact of water collection, the health implication is also very serious on the water collector. For example, a study in South Africa noted that children involved in water collection experience severe pains and fatigue, which may be dependent on the distance they traverse to their water sources (Geere *et al.,* 2010). In the same vein, Asaba *et al.,* (2013) in their study in rural Uganda, reported that "over 40% of all the age groups and gender involved in household water collection complain of chest pain or headache." Also, the weight of water exerts heavy physical burden on the collector, which could lead to injuries in the neck, back or

other joints (Geere *et al*., 2018; Sorenson *et al.*, 2011). Water carrying has also been associated with "musculoskeletal disorders, such as spinal pain or other joint problems" (Sultana, 2009). The impact and burden of water carriage seem to be more on the female gender because about 90% of them transport water by foot from their respective water sources to their homes, while the male folks (about 60%) bear lesser burden from water carriage as they often use wheelbarrows, motorcycles and bicycles (Asaba *et al.,* 2013). Due to the mode of water transportation commonly used by female water collectors, they are exposed to the risk of sexual assault, especially if they have to travel long distances from their homes (Sommer *et al,* 2015). In addition, women do experience psychosocial stress (anxiety & worry) associated with inability to find safe water source or the long wait in queues to fetch water for their respective households (Sultana, 2011). These challenges could adversely affect household water security and threaten the attainment of SDG target 6.1.

Studies have also established a relationship between incidence of diarrhea and water collection. The shorter the distance and time spent fetching water from a major water source, the higher the level of reduction in the incidence of diarrhea and increase in "bodyweight score in children under five" (Wang & Hunter, 2010). Similarly, another study in Kenya asserts that "water collection time greater than 30 minutes was associated with an increased risk of moderate-to-severe diarrhea among children" (Nygren *et al*., 2016).

Since the expected attainment of the global water target by 2030 means the elimination of all forms of disparity in access to safe and affordable water located on premises, it is imperative to obtain baseline information on the current state of water services in all parts of the globe to assist in the monitoring of progress and the development of action plans to improve water services. Many studies have reported that the female gender is more saddled with the responsibility of water collection for the household, while few others have reported the male gender. However, there is dearth of information on the current state of water services in most communities in Nigeria and Bayelsa State in particular. Hence, this study was aimed at the analysis of gender disparity on household water collection in Yenagoa metropolis.

2. Method of Study

2.1. Study Area

The study was carried out in Yenagoa metropolis the capital of Bayelsa State in the South-South geopolitical zone of Nigeria. As shown in Figure 1, Yenagoa is geographically located within "latitudes 4° 55' and 5° 02' north and longitudes 6° 15' and 6° 25' east" (Ohwo, 2019). Yenagoa is a flood plain area, with average height of less than 15m above sea level (Ohwo, 2014). It is drained principally by the Ekole and Epie Creeks. The area experiences the tropical monsoon climate, with two major seasons-dry and wet. The wet season last for about seven months (April to October) with high volume of precipitation and an annual range of 2500 to 3500mm. The monthly average temperature ranges from 28 to 30^{o}c. The population of Yenagoa has been increasing steadily since it became the Bayelsa State capital in 1996. The projected population for 2019 was 350,000 people (Ohwo, 2019). Despite being a state capital, infrastructural provision in Yenagoa lags behind population growth, which has led to serious pressure on available infrastructure (Ohwo & Abotutu, 2014). For example, the state water agency is moribund forcing the residents to make private arrangements to obtain their daily household water needs from other sources, which quality and reliability may not be guaranteed. For this reason, many households rely on water sources located off premises, necessitating water carriage from the source to the home, which constitutes additional burden on households, especially the major water collectors. In spite of the current water supply situation in Yenagoa, no study has been carried out to the best of the researchers' knowledge to understand the basic household water collection characteristics in the metropolis. This study was therefore designed to fill this gap in knowledge.

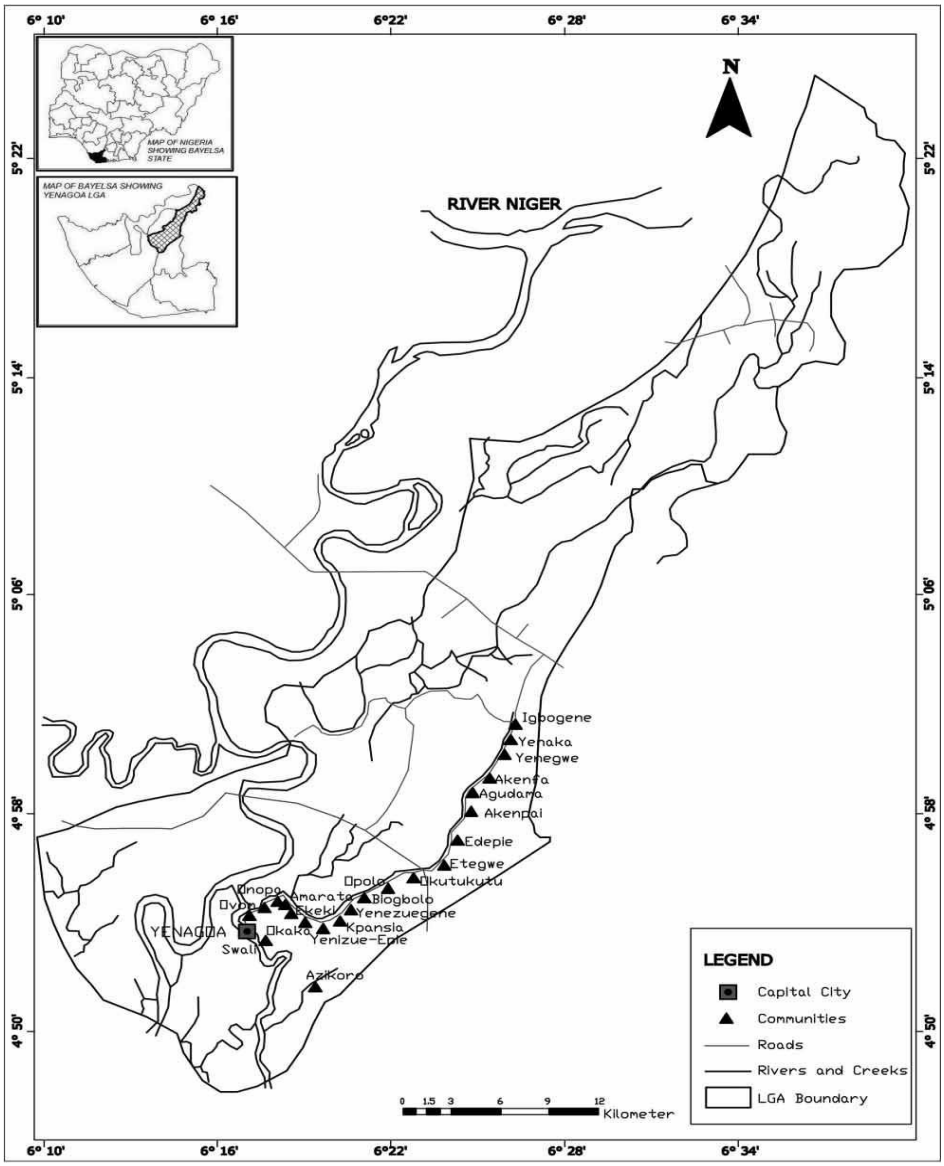

Figure 1: The Study Area in Yenagoa Local Government Area

Source: Ohwo (2019).

2.2. Method of data collection

A cross-sectional research design was adopted to collect the needed data for the study with the aid of a structured questionnaire, which was administered by hand to sampled household heads in the metropolis. The population for the study consists of all the household heads in the metropolis, which was estimated to be 75,000 (Ohwo, 2019). In order to select a representative sample for the study, the Krejcie and Morgan (1970) table was used and a sample size of 382 was obtained. However, this number was rounded up to 400 to provide for possible loss of questionnaire. To ensure that every household was given opportunity to be selected for the study, the metropolis was classified into 20 neighbourhoods based on the communities that make up the metropolis. Since the population size of each of the neighbourhoods was not readily available, 20 copies of the questionnaire were administered in each neighbourhood using the systematic sampling technique at every ten houses intervals in five randomly selected streets in each neighbourhood.

The questionnaire was administered by hand, directly to the household head (male or female) that was available as at the time of visit. After administering the questionnaire, the household head was given sometime to fill it and

was immediately collected back after filling to avoid the loss of questionnaire. The questionnaire was divided into three sections (A, B & C). Section A, focuses on the demographic characteristics of the household head; section B, deals with the household water collection characteristics and Section C, centered on the impact of water collection on the major collector in the metropolis. Responses to the question items in each section of the questionnaire were collected and constituted the data for the study.

2.3. Method of data analysis

The obtained data were analyzed using both descriptive (percentage) and inferential (t-test) statistics. The descriptive statistics was used to present and describe the demographic characteristics of the household heads, household water collection characteristics and the impact of water collection on the major collector. On the other hand, the t-test was used to test the two hypotheses which states: "There is no significant difference in household water collection characteristics between male and female water collectors in Yenagoa metropolis" and "There is no significant difference on the impact of water collection between male and female water collectors in households in Yenagoa metropolis". The t-test was conducted using the Statistical Package for Social Sciences (SPSS), version 15, at 0.05 significance level.

3. Results and Discussion

3.1. Demographic characteristics of household head

A total of 400 copies of the structure questionnaire were administered to the sampled household heads in the metropolis to elicit the needed data for the study. However, 375 (93.75%) were retrieved and used for the analysis. The demographic characteristics of the household heads, which gave an indication of the diversity and representation of the population are presented in Table 1. From the data in the table, it was found that 52.5% and 47.5% were male and female, respectively. This suggests that the views of both genders were adequately captured. The age distribution revealed that 65.4% of the respondents were 40 years and below, while about 34.7% were above 40 years. This shows that majority of the household heads are within the productive age bracket. Since less than 3% of the respondents were above 65 years, it shows that the population of Yenagoa is youthful. Same conclusion was reached in an earlier study in Yenagoa, where 4.8% of the sampled population were above 65 years (Ohwo & Omidiji, 2021). The educational status of the respondents shows that 89.6% had either secondary or tertiary education, while only 10.4% either had primary or no formal education. This indicates that majority of the respondents were educated enough to understand and respond adequately to the questions raised in the questionnaire.

Respondents' marital status show that majority (48%) were single, which was followed closing by married respondents (43.2%), while separated and widowed respondents accounted for 8.8%. Responses to monthly income show that 90.9% of the respondents earned N250,000 ($166.67) and below, while only 9.9% earned above N250,000. This clearly suggests that majority of the respondents are either low-income or middle-income earners, hence, the cost of water collection may constitute addition economic burden to majority of the households, especially to the 42.9% respondents that earned below N50,000 ($33.33) monthly and those that live in houses without water connection on premises. This situation may push some households to seek for free water sources, including surface water that are unsafe for domestic use. This tendency could negatively affect household health and the drive towards the attainment of the global water target, since a large proportion of the population have poor or no access to safe water on premises. The household size of 1-3 persons had the highest (37.3%) responses, while above 9 persons had the lowest (4%) responses. Since the average household size in the metropolis is about 5 persons, it implies that the quantity of water needed to meet daily basic household needs may be high, based on the recommended minimum water requirement of 50 litres per capita per day (l/c/d) (Gleick, 1996). Meeting the recommended minimum household water needs, especially from sources outside the premises may exert serious physical stress on the major household water collector, which may result to other health challenges.

Table 1: Demographic characteristics of household head

S/N	Variable	Classification	Response (%)
1	Sex of household head	Male	197 (52.5%)
		Female	178 (47.5%)
2	Age	Below 25 years	82 (21.9)
		25 – 40 years	163 (43.5)
		41 – 65 years	120 ((32)
		Above 65 years	10 (2.7)
3	Education status	Tertiary Secondary No formal/primary	209 (55.7) 127 (33.9) 39 (10.4)
4	Marital status	Single	180 (48)
		Married	162 (43.2)
		Separated	19 (5.1)
		Widowed	14(3.7)
5	Income per month	Below N50,000	161 (42.9)
		N51,000 – N150,000	141 (37.6)
		N151,000 – N250,000	39 (10.4)
		N251,000 – N350,000	24 (6.4)
		Above N350,000	10 (2.7)
6	Household size	1-3	140 (37.3)
		4-6	130 (34.7)
		7-9	90 (24)
		Above 9	15 (4)

Source: Author's fieldwork, 2024

3.2. Household water collection characteristics

Responses to six major household water collection characteristics were used to analyze disparity between male and female water collectors, as presented in Table 2. The data show that out of the 375 sampled households, 274 (73.07%) indicated male as the major water collector, while 101 (26.93%) indicated female. This finding contradicts the generally held believe that females are majorly saddled with household water collection (Sorenson *et al,* 2011; Garcetti & Kevany, 2013; Graham *et al.,* 2016; Cassivi *et al.,* 2018; UNICEF & WHO, 2023) due to the traditional gender assigned roles of domestic chores (Asaba et al., 2013). However, the finding agrees with some other studies, especially those conducted in urban areas, that reported male as major household water collector (Hawkins & Seager, 2010; Gonda, 2016; Geere & Cortobius, 2017; Harris *et al.,* 2017). The probable reason for this finding may be due to the changing roles assigned to female gender in the urban area. This submission is substantiated by Dickin and Caretta (2022), that female dominated household water collection were usually reported in studies carried out "in patriarchal, rural and agricultural communities". Since Yenagoa is a state capital, it is expected that the traditionally assigned gender roles would have changed overtime.

The age distribution of the household major water collector for the male and female revealed that majority of the male,154 (56.20%) and female, 53 (52.48%) water collectors were within the age bracket of 18-25 years, which contradicts the findings of a study in rural Uganda where both male and female children between the ages of 5-15 years were more saddled with the responsibility of water collection than youths and adults (Asaba *et al.*, 2013). Similarly, a study in Malawi, reported that water fetching was mainly carried out by children (girls & boys) within the ages of 9 and 18 years (Robson *et al.,* 2013). In this study, the lowest proportion of water

collectors for male, 10 (3.65%) and female, 0 (0%) were both recorded for above 45 years. Overall, the major household water collectors for both genders were 35 years and below, which coincide with the active age group that migrates most often to cities in search of better socioeconomic opportunities. This perhaps explains why majority of the water collectors who may still be single but independent, indulge in household water collection, especially for the male gender. The proportion of female water collectors dropped drastically to 4.95% between the age bracket of 36-45 years, from 28.71% that was recorded for 26-35 years. The drop may be attributable to the fact that between ages 36-45 years, most of the households may have had grown up children who have taken over the task of water collection for the household. This view is supported by Asaba *et al* (2013) that "women with children and youth in the household are less involved in water collection, as the task is usually left for the children to carryout, except in few occasions when the children are at school or not at home".

Data on the location of major source of water supply show that a large number of the sampled households obtain their water from sources located off premises. This suggests that a considerable number of the households transport water regularly for their daily use. The data revealed that 139 (50.73%) of male water collectors obtain their water from sources located off premises; while for female, it was 29 (28.71%). Overall, 168 (44.8%) of the sampled households had their major water source located off premises, which is however less than the 66% estimated for SSA (Graham *et al.,* 2016). Since 72 (71.29%) of female water collectors use sources located on premises, it may be inferred that as distance to major source of water location increases, more women shy away from water collection and the male gender tend to assume more responsibility.

Responses to time spent fetching water from major source for a return trip including queuing show that 244 (89.05%) of the male water collectors spent 30 minutes and below, with the majority 149 (54.38%) spending less than 15 minutes, while 95 (34.67%) spent between 15-30 minutes. On the other hand, 86 (85.15%) of the female water collectors spent 30 minutes and below, with the majority (69.31%) spending less than 15 minutes, which may be attributed to the fact that (71.29%) of the female water collectors use sources that are located on premises. If the water sources used by the respective households are "improved", it means that majority of the households have access to at least basic water services, using the SDG monitoring indicators for drinking water (UNICEF & WHO, 2023). It should also be noted however, that 8.76% and 2.19% of the male water collectors spent between 31-60 minutes and above 60 minutes, respectively. As for the female water collectors, 14.85% spent between 31-60 minutes, while none of them spent above one hour. In a study of 24 SSA countries, it was reported that in 13 of them, 20-50% of the rural households indicated spending above 30 minutes to fetch water, while in the urban area, it ranged from 3-39% in urban Madagascar and urban Mauritania, respectively (Graham *et al.,* 2016). The disparity in the time spent fetching water between male and female in this study was far better than what was recorded in "Malawi, where women and girls spent 52 minutes per day collecting water, while men and boys spent three minutes" (UNICEF & WHO, 2023).

The major mode of water transportation from the source by the water collectors were by foot and wheelbarrow. For example, 64.60% and 52.48% of the male and female water collectors used foot, respectively; while 33.58% (male) and 42.57% (female) used wheelbarrow. These major modes of water transportation were also reported in a study in South Africa (Geere *et al.,* 2010). In another study in rural Uganda, about 90% of female water collectors transport their water by foot, while about 60% of their male counterparts use either wheelbarrows, motor bikes or bicycles (Asaba *et al.,* 2013). The probable reason for the use of wheelbarrow in this study was to reduce the weight burden of head carriage of water from a distance and also increase the quantity of water that could be collected for a single trip. In addition to the two major means of water transportation, 4.95% of the female water collectors used vehicle as opposed to their male counterparts that does not. Instead, only 1.82% of the male collectors used motor bike. These modes of water transportation are additional cost to households that used them, considering the fact that majority of the households in Yenagoa are classified as low- and middle-income earners (see Table 1). This additional cost on water may negatively impact affected households' disposable income to meet other equally important basic necessities.

The average quantity of water fetched for a return trip by the major water collectors vary, due mainly to the mode of water transportation adopted by the respective water collectors. The data showed that majority of the male, 92 (33.58%) and female, 45 (44.55%) water collectors fetched between 20-30 litres per trip. Overall, 60.95% of the male and 79.2% of the female water collectors fetched 30 litres and below for a trip. This means that water collectors may most likely embark on more than a trip a day to meet the household water needs. It should also be stated that 39.05% and 20.79% of male and female water collectors, respectively fetched more than 30 litres on a trip. Some of the reasons that determine the quantity of water fetched for a trip include, means of transportation, distance to water source, age of the collector, weight of water, among other considerations. Since the mode of transportation from the major water source was by foot, explains why majority of the water

collectors (male & female) could only carry 30 litres and below for a trip. Similar figures were also reported in a study in Limpopo Province, South Africa, where the women could only carry 20-25 litres of plastic containers because they use head loading method to transport their water and could only carry a container per trip (Geere *et al.,* 2010).

The average number of trips undertaken per day for water collection also varied between male and female collectors. For example, 51.82% (male) and 45.54% (female) water collectors undertook 1-3 return trips per day, while another group of 28.83% (male) and 44.54% (female) collectors covered 4-6 trips per day. In addition, 7-9 trips were undertaken by 7.66% (male) and 9.90% (female) water collectors per day. Although no female water collector undertook more than 9 trips, however, 11.68% of their male counterparts undertook above nine trips per day. The average number of trips undertaken per day for household water collection suggests that much man-hour is wasted, which could have been channeled to other productive activities for the benefit of the water collector in particular and the entire household in general. The t-test analysis of the first hypothesis (t = 5.381; p-value = .000 at 0.05 alpha level), shows that there is a significant difference in household water collection characteristics between male and female water collectors.

Table 2: Household water collection characteristics between male and female water collectors

S/N	Variable	Classification	Male (%) n=274	Female (%) n=101
1	Age of major water collector	Less than 18 years	62 (22.63)	14 (13.86)
		18-25 years	154 (56.20)	53 (52.48)
		26-35 years	24 (8.76)	29 (28.71)
		36-45 years	24 (8.76)	5 (4.95)
		Above 45 years	10 (3.65)	0 (0)
2	Location of major source of water supply	On premises	135 (49.27)	72 (71.29)
		Off premises	139 (50.73)	29 (28.71)
3	Time spent fetching water from major source for a return trip including queuing.	Less than 15 minutes	149 (54.38)	70 (69.31)
		15-30 minutes	95 (34.67)	16 (15.84)
		31-60 minutes	24 (8.76)	15 (14.85)
		Above 60 minutes	6 (2.19)	0 (0)
4	Mode of water transportation from the major source	By foot	177 (64.60)	53 (52.48)
		Wheelbarrow	92 (33.58)	43 (42.57)
		Bicycle	0 (0)	0 (0)
		Motor bike	5 (1.82)	0 (0)
		Vehicle	0 (0)	5 (4.95)
5	Average quantity of water fetched for a return trip at a time by the major water collector	Less than 20 litres	75 (27.37)	35 (34.65)
		20-30 litres	92 (33.58)	45 (44.55)
		31-50 litres	86 (31.39)	11 (10.89)
		Above 50 litres	21 (7.66)	10 (9.90)
6	Average number of trips undertaken per day	1-3 trips	142 (51.82)	46 (45.54)
		4-6 trips	79 (28.83)	45 (44.55)
		7-9 trips	21 (7.66)	10 (9.90)
		Above 9 trips	32 (11.68)	0 (0)

Source: Author's fieldwork, 2024

3.3. Impact of Water Collection on the Major Collector

Household water collection is a strenuous activity, which could have different kinds of impact on the water collector. Responses to the impact of water collection on both male and female water collectors are presented in Table 3. The data in the table suggest that some of the water collectors experienced some negative impacts, which vary between male and female water collectors. For example, out of the 274 male water collectors, 31.39% indicated that they have had dispute either with fellow water collectors at the source of water collection or with others on the way to or from the water source; while 44.55% of female water collectors confirm same. Disputes and arguments are major occurrence at public or private water collection points, especially when there are long queues or the water pressure is very low. In an attempt to save time spent on queue, some water collectors tend to jump the queue, which may result to resistance by other water collectors, resulting to serious altercations. In some cases, female water collectors are sexually harassed on their way to or from the source of water collection, especially late in the evening or very early in the morning. Similar view was also expressed by Sommer *et al* (2015) that the "risk of sexual violence, as well as the stress associated with that risk, may also be increased when women and girls must travel long distances away from home to collect water".

The stress and burden of water collection on the collector has given rise occasionally to dispute between water collector and other members of the household when the collector feels water is being wasted. The data suggest that households with male water collectors experienced more dispute than their female counterparts, as 48.91% of male collectors indicated having household dispute when they feel that water was being wasted, while 29.70% female collectors experienced dispute. The probable reason for this reported response pattern could be attributed to the fact that the female gender is more saddled with domestic chores involving water usage. Since the water collector is female and probably involved in domestic water usage, there is less tension in the home compared to households where the water collector is male. If the disputes are not well resolved it could lead to serious disaffection and lack of harmony in the home.

Water collection activities involve time, especially when the distance from the water source is long and the mode of water transportation is by foot. This explains why 38.05% and 39.60% of male and female water collectors, respectively reported that the time they spent fetching water caused school/work lateness or absenteeism. In some households', children and youth have to fetch water in the morning before going to school or work. In some cases, due to long queues, low water pressure or other reasons, cause undue delay at the water source, making the water collector too late for other important assignments or activities, such as going to school or work. For instance, a study noted that in Ghana 33% of boys and girls reported lateness to school due to the activities of water collection (Porter *et al*., 2012). Another study reported that sometimes mothers pulled out older children from school to fetch water or watch over the younger ones when the mothers go to fetch water themselves (Koolwal & van de Walle, 2013). This act could affect the children concentration in school and miss vital lectures, thereby limiting their potentials to succeed in their studies.

The time spent collecting water instead of engaging in other equally important activities has also been reported as another source of concern to the water collectors. The responses revealed that 45.26% of the male water collectors and 39.60% of the female collectors complained of this fact. Most of the water collectors that were mostly affected were those that spent above 30 minutes for a return trip and had to undertake several trips a day collecting and transporting water by foot. Time lost could affect collectors' recreation and leisure and other economic activities. This view was also shared by Dickin and Caretta (2022), that the time-consuming task of water collection forces the female gender to shorten other equally important activities. In the same vein, Jaren *et al* (2022) assert that the task of water collection affects women's participation in other household and income-generating ventures, which negatively impact their productivity.

Water collection is a stressful activity, which may impact negatively on the health of the collector. From the responses, it is evident that more female gender reported negative health outcomes associated with water collection. This is so because the weight of water and transporting it through considerable distance on foot exert so much physical pressure and stress on the female gender, when compared to their male counterparts. Hence, 44.55% of the female water collectors reported health issues as opposed to 29.56% for the male gender. These statistics suggest that the female gender bears the major health burden associated with water collection in Yenagoa. Some of the commonly associated heath impacts of water collection on the collector are pains (neck, back, headache & chest). Other impacts may include, increase prevalence of diarrhea and other waterborne diseases. For example, Graham *et al* (2016) after a cross-sectoral data analysis, concluded that reducing water collection time by 15 minutes could led to a 41% reduction in diarrhea risk for children below the age of five.

Another study asserts after the review of several studies that there is a relationship between water carriage and

the impact on the carriers' health. The study therefore concluded that "there is moderate quantitative and strong qualitative evidence that water carriage is associated with pain, fatigue, perinatal health problems and violence against vulnerable people" (Geere *et al.,* 2018). Other identified impacts of water carriage on the health of the collector, especially the female gender include long-term injuries to the neck, back and musculoskeletal disorder (Geere *et al.*, 2018; Sorenson et al., 2011). This implies that much positive health outcomes may be reported by water collectors by just significantly reducing the time spent in water collection or locating water sources on premises. The t-test analysis values on the impact of water collection between male and female water collectors were, t = 7.961; p-value =.000 at 0.05 alpha level. This implies that there is significant difference on the impact of water collection between male and female water collectors in households in Yenagoa metropolis.

Table 3: Impact of Water Collection on the Major Collector

S/N	Impact	Classification	Male (%) n=274	Female (%) n=101
1	Has the major water collector experienced any dispute with other water collectors or others at the source of water collection or on the way to and from the source?	Yes No	86 (31.39) 188 (68.61)	45 (44.55) 56 (55.45)
2	Has there been any reported case of dispute between water collector and other members of the household when the collector feels water is being wasted?	Yes No	134 (48.91) 140 (51.09)	30 (29.70) 71 (70.30)
3	Has the time spent fetching water caused school/work lateness or absenteeism for water collector?	Yes No	107 (39.05) 167 (60.95)	40 (39.60) 61 (60.40)
4	Has the major water collector at any time complained of the time spent fetching water instead of engaging in other productive ventures?	Yes No	124 (45.26) 150 (54.74)	40 (39.60) 61 (60.40)
5	Does the weight of fetched water from the source impact on collector's health?	Yes No	81 (29.56) 193 (70.44)	45 (44.55) 56 (55.45)

Source: Author's fieldwork (2024)

4. Conclusion

The findings from the study have established that many households major source of water supply were located off premises, which encourages water collection by both male and female genders in Yenagoa metropolis. However, most households indicated that the male gender was the major water collector, which departs from the generally held view that household water collection was majorly undertaken by the female gender due to traditionally assigned roles of household chores. The findings also show that there is a significant difference on household water collection characteristics between male and female water collectors. Similarly, there is a significant difference on the impact of water collection between male and female water collectors in households in Yenagoa metropolis. Major impacts associated with household water collection include health, disputes (both at home and water sources), loss of time for other productive works and poor education outcomes of children involved in water collection. To reduce the associated impacts of water collection and disparity between male and female water collectors, all households should have access to SMW services.

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