Demographic Characteristics of Population With Affinity for Wetland Settlements in Ghana.

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Abstract

Wetlands all over Africa are being unsustainably reclaimed due mostly to high rate of population growth, urbanization and rising poverty. Despite having numerous ecosystem services that are of great benefit to humanity, wetlands are among the most threatened ecosystems due to destructive anthropogenic activities. However in order to sustainably use and manage wetlands in Africa, more data must be made available for policy formulation and decision-making. Africa lacks sufficient, basic and accurate data on population demographics that have affinity to wetland settlement. Research is needed to provide this scientific basis in Africa. This study investigates the demographic characteristics of the population with affinity to wetland settlements in Ghana to also contribute in filling in the gap identified by the National Environmental Action Plan of Ghana. The questionnaire survey approach was used with a sample size of 318 residents along two rivers in Kumasi. The demographic information that characterizes wetland settlers as revealed by this study include, low incomes, high rate of unemployment and poverty and low patronization of formal education. The high percentage of those with Senior High School certificates holders at the wetlands was also alarming. The settlers were mostly young and active. However, it was also found that data on the gender, ethnicity and religion of wetland settlers must be better determined at individual localities.

1. Background

The main objective of the study was to investigate the demographic characteristics of the population that have affinity for wetland settlements in Ghana to establish some basic facts and data needed for policy formulation and decision-making. Wetlands are defined to include swamps, bogs, marshes, fens, peatlands, floodplains and coastal areas (Zedler and Kercher, 2005). They also include edge habitats of plants and animals along rivers, streams and lakes (Lomnicky et al., 2019). Their sources of water include rains, surface flow, springs and floods (Sah and Heinen, 2001). All continents have a network of temporary, perennial and permanent wetlands along their coasts, rivers, lakes, streams and in some depressions. Wetlands are mostly undeveloped areas which can easily be converted into agriculture lands and industrial development areas (Wood et al., 2013; Hachigonta et al., 2013; Rebelo et al., 2010). They make up about 5–8.5% of the world's land surface, that is about 7–10 million km^2 (Mitsch and Gosselink 2007). The extent of wetlands coverage in Africa lacks accurate data (Schuijt, 2002) however, it is estimated to be between 1% (World Conservation Monitoring Centre (WCMC), 1992) and 16% (Koohafkan, 1998). Zedler and Kercher (2005) also estimate it to be 2%, while Rebelo, et al. (2009) estimate 4.7% for sub-Saharan Africa, which corresponds to the 228 million hectares of Bergkamp et al. (2000) and Matthew and Fung (1987).

Wetlands were considered as swamps lands that bred diseases, impeded overland travel and the production of food and fiber and therefore not useful for human survival (Tebeau, 1980). They were regarded mostly as wastelands, unpleasant and unhealthy environments (Patrick Jr., 1994), and obstacles to development and therefore must be destroyed to make available the land for beneficial purposes such as agricultural, urban and industrial uses (Tebeau, 1980; Patrick Jr., 1994). However, since the last century, society's view about wetlands have changed considerably, especially with better and in-depth knowledge about their values. There is more interest in their protection, management and preservation (Dahl and Allord, 1982). They are considered as highly fertile plain landscape topography (Foziah, 2009) which have played important roles in the history of human development. The fertile plains of the rivers Nile, Euphrates, Tigris and Indus propelled the economic bases that produced the high cultures of the Egyptians, Sumerians and the Harappas about 5000 to 4000 years ago (Hammerton, 1972; Boule, 1994), and according to the Ramsar Convention (2018), wetlands provide critical support to seven (7) of the seventeen (17) main Sustainable Development Goals defined by the United Nations. Wetlands exhibit a wide range of functional attributes that benefits humanity, including water purification and storage, shoreline protection, processing of nutrients, assurance of food security and support of biodiversity for animals and plants (Ramsar Convention, 2018; Millennium Ecosystem Assessment, 2005). They contain 10–20% of the global terrestrial carbon (Mitsch and Gosselink, 2007), retain sediments and toxicants (Kent, 2000) and serve as ecological balance systems (Root et al., 2003). Wetlands also provide construction materials, serve as basis for rich cultural tradition (van Dam et al., 2011) and other economic activities (Wood et al., 2013; Hachigonta et al., 2013; Rebelo et al., 2010). Other functions include the provision of fuelwood, medicinal resources, genetic resources, transport systems, energy, climate stabilization, and storage and recycling of organic waste (De Groot, 1992; Roggeri, 1995).

Since 4000BC, during the Neolithic times, wetlands have been sites for subsistence settlements (Kooijmas, 1987). Early human beings settled close to water bodies and their wetlands to benefit from their fresh water, natural water treatment, food, fibre and

construction materials. In fact, many of the world's urban cities are built along rivers and their wetlands (Kingsford et al., 2016) and many local communities in almost all parts of the world depend on the wetlands for their many functional services (Morrison et al., 2013; van Dam et. al., 2011; Ozesmi and Bauer, 2002). However, increasing population has resulted in extensive wetland reclamation for agriculture and urban construction and expansion activities (Wang and Ma, 2016). Other human activities that negatively affect wetlands include airborne particulate fallouts (Lomnicky et al., 2019), construction of flood control systems including levees, dams and wells (Fretwell et al., 1996), and water management and land drainage projects (Dahl et al., 1991). Wetland functions can be overwhelmed in areas of heavy human activities (Mitsch and Gosselink, 2000) and since these activities have always exploited the productivity of wetlands, their overexploitation has become an increasing problem (Stone, 2003). Wetlands are under increasing threat (Mafabi, 2000; Owino and Ryan, 2007) and despite their importance, globally they are shrinking at a rate faster than other ecosystems, especially in developing countries (Nicholls, 2004) mainly due to human activities (Johnson, 1994; Millennium Ecosystem Assessment, 2005: Jacob, et al 2014). Researchers have different estimates for the extent of global wetland depletion. Nicholls (2004) estimates it as 50% since 1900, whereas Hu et al. (2017) put the global loss at 33% since 2009. Kingsford (2016) asserts that about 70% of the world's wetlands is already destroyed or impaired and based on existing data in several regions, Davidson (2014) also asserts that not only is 87% of the world's wetlands degraded since 1700 but also these degradations occurred mostly in the 20th and early 21st centuries.

Since wetlands are among the world's most important productive ecosystems (Zedler and Kercher, 2005; Wang and Ma, 2016) and the human benefits that accrue from maintaining them greatly outweighs converting them to other land uses such as agriculture (Maclean, et al., 2011; Schuyt, 2005), they must be protected or be used sustainably (Sabic et al., 2013) at worse. Considering the current rate of wetland depletion, especially in Africa (Quevauviller, 2009), there is the need to provide sound policies, structures and guidelines to aid its protection, management, conservation and sustainable use. Many African countries are signing the Ramsar Convention, which also indicates a growing interest and commitment to sustainable wetland management (Schuijt, 2002). However, the future of wetlands in Africa lies in the hands of sound policies (Kabii, 1996). Many tropical countries still require national wetland policies and structures to enforce their protection and sustainable management (Junk, 2002). For efficient protection of wetlands, there must be provision of data to bridge science and policy (Cools et al., 2013). There is insufficient data for policy-decision makers in wetland management (Martinez-Harms et al., 2015; Foster et al., 2015). Laws, statutes and policies for the determination, delineation, regulation, restoration, acquisition, incentives and disincentives and permits to use wetlands must be backed by scientific data (Kent, 2000). The need for data and information to support wetland management is multi-scalar: global, regional, national, local to guide policy formulation and decision making (Finlayson and Spiers, 1999). The Millennium Ecosystem Assessment also underscores the importance of the availability of a comprehensive information base for the understanding of the status and trends, values and major drivers of change of wetlands (Finlayson, et al., 2005; Wetlands International, 2005). Though the challenges with regard to the provision of data and information for understanding wetlands prevail on all continents (Cools et al., 2013), the scarcity is worse in much of the developing world where encroachment and degradation proceed at an unprecedented rate (Quevauviller, 2009). This paper contributes to the provision of data for policy-decision making to facilitate sustainable wetland management in Ghana (Anderson, 1998) by investigating the demographic characteristics of the population with the affinity for wetland settlement in the country.

1.1 Characteristics of Population with Affinity for Wetland Settlement

A major reason given by Schuijt (2002) for the reclamation and use of wetlands in developing countries is the rising poverty, since many who settle on wetlands are from poor areas (Sabic et al., 2013). Infield (1988), Newmark et al. (1993) and McGregor (1995) are also of the view that poorer people are more dependent on natural products such as wetlands. For Badola (1997), it is part of the tradition and culture of people of lower socio-economic strata to use natural resources such as wetlands. In other words, mostly, the economically marginalized depend on wetland resources for their livelihood (Ozesmi, 1999) since they are mostly unskilled or unqualified workers (Sabic, 2013). The poorer status of those who have affinity for wetland settlement is reflected in the higher unemployment rates (Foziah, 2009; Ozesmi, 1999; Tyler, 2011) and low paid jobs (Tyler, 2011; Pattison et. al., 2011) prevalent at these settlements. These jobs are mostly in the primary sector including fishing, grazing, reed harvesting (Ozesmi and Bauer, 2002), agriculture and labor-class works (Foziah, 2009) and temporary service-based employment (Tyler, 2011). Wetland settlers are mostly part of the local population who depend on the nearby wetland for food and other services (Morrison et al., 2013; Ozesmi and Bauer, 2002), and who usually have lower educational background since literate population has lower dependency on wetland resources (Foziah, 2009). Those who reside at wetlands are mostly young and active (Tyler, 2011).

1.2 Wetlands in Ghana

Wetlands constitute about 10% of the Ghana's total land surface, comprising marine/coastal, inland, and man-made systems (Ministry of Lands and Forestry 1999). Until recently, wetlands were considered as "waste lands" and breeding grounds for mosquitoes in Ghana. As such, they were dredged to facilitate water drainage, reclaimed for socio-economic activities and used as dumping grounds for wastes. However, the Ministry of Lands and Forestry Ghana (MLFG) in June 1999 launched the National Land Policy which precluded practices such as physical draining of wetland water, the draining of water courses of wetlands and unapproved human settlements and anthropogenic activities on wetlands (Republic of Ghana, 1999). Moreover, since 1971, when the Convention on Wetlands of International Importance (Ramsar Convention, 1971) came into force, more interests have been shown in Ghana about wetlands. In the early 199Os, the National Environmental Action Plan (NEAP) of Ghana was launched by the then Environmental Protection Council (EPC). The program, which was sponsored by the World Bank and the United Nations Environment Program was to concentrate on areas of environmental concern to the government and people of Ghana (Government of Ghana (GoG), 1994). NEAP covered all aspects of natural resource use in Ghana, including wetland ecosystems. The third of the NEAP's seven research objectives focused on the assessment of the socio-economic conditions of wetland settlements including demographic characteristics (Anderson, 1998). However, much of the research activities in wetlands concerning Ghana has concentrated on mapping of wetlands (such as in Nyarko, 2007; Gumma et al., 2009; Nsor and Obodai, 2014; Adade et al., 2017; Ekuma et al., 2020), health condition and environmental impact of wetlands (Ryan et al., 2000; Attuquayefio and Gbogbo, 2001; Opoku, 2013; Kumi et al., 2015) and wetland management (Armah, 1993; Asomani-Boateng, 2019). Few researches included some demographic characteristics (such as in Opoku, 2013 and Kumi et al., 2015). Thus this study focused mainly on investigating the demographic characteristics of the population that have affinity for wetland settlement, not only to contribute in filling the gap identified by the NEAP (Anderson 1998) but more importantly to provide data to facilitate policy-decision making about wetlands in Ghana.

2. Materials And Methods

2.1 Study Area

Kumasi was chosen for the research, not only because of its many rivers and streams in its urban and forest environment, but importantly, most of the research on wetlands in Ghana concentrate on the coastal wetlands including Armah (1993), Ryan and Ntiamo-Baidu (2000), Attuquayefio (2001), Adade et al. (2017) and Ekuma et al. (2020). The few wetland researches conducted in the hinterland of Ghana are also concentrated in the northern part of Ghana and do not focus on demographic characteristics, including Nyarko (2007) on mapping the White Volta, Nsor and Obodai et al. (2014) on seasonal variation of bird diversity and Gumma et al. (2009) on rice cultivation. Kumasi, the study area, is both the capital of the Ashanti Region, one of the 16 Regions in Ghana (Figure 1), and the second largest city in Ghana after Accra, the country's capital and largest city.

Kumasi is considered the commercial and transportation hub of the country. Its land area is about 214.3km^2 and has a population of 1,730,249 with 826,479 males and 903,770 females (Ghana Statistical Service, 2014). The city continues to urbanize at a rate of 5.47%, encompassing about 90 suburbs or neighborhoods, many of which were absorbed through urbanization (Nimura and Eisen, 2010). It is located within latitudes 6.35^{0}N and 6.40^{0}N and longitudes 1.30^{o}W and 1.35^{o}W and lies about 300 meters above sea level. It is situated in the forest zone of Ghana and has a tropical wet and dry type of climate with high temperatures for most of the year. The average temperature is 26^0 C, the average humidity is 85% and total annual precipitation is about 1,684.7mm (World Weather, 2019). As confirmed by GSS (2014), the city is enriched with a number of major wetlands, including rivers and streams. The notable rivers are the Wiwi, Subin, Aboabo, Owabi, Sisai, Oda, Nsuben, Suntre, Kwadaso, Asuoyeboa as shown in Figure. 2.

Subin and Wiwi rivers were purposively selected for this study due to the fact that they are among the most important wetland sites of ecological, landscape and social interest, (Abdul-Razak, 2012), and also very much depended on by several communities (Obiri-Danso et al., 2005; GSS, 2014; Forkuor, 2010; Owusu-Ansah et al., 2016). The Subin river flows from the north of Kumasi towards the south through the city centre or the Central Business District (CBD) and merges with the Oda river at Asago (Dickson and Benneh 1980). The suburbs or neighborhoods through which the river Subin flows are Bantama, Kejetia, Fante New Town, Asafo, Asokwa and Kaase (Obiri-Danso et al., 2005) with an estimated total population of 2,130 (GSS, 2014). The Wiwi river also flows from the north of Kumasi and joins Sisai river (Dickson and Benneh 1980). It passes through the neighborhoods of Kentinkrono, Wiwiso,

Amangoase, Kwame Nkrumah University of Science and Technology (KNUST) campus, Ahinsan, Atonsu and Gyinaase with an estimated total population of 1,720 (GSS, 2014).

2.2 Data Collection Technique and Analysis

The mixed method approach was used, namely the qualitative and quantitative approaches. The qualitative method comprised the literature reviewed which served as the theoretical foundation to the study. Through the literature, some of the demographic variables including gender, age, education, occupation, marital status, ethnicity/tribe and length of stay were adopted from Opoku (2013) and Kumi et al. (2015) to help design the questionnaire. Other demographic variables used were religion, income and type of households. The quantitative approach comprised questionnaire survey. The respondents were randomly selected from the residents living along the Wiwi and the Subin rivers. The distribution of questionnaire was done within the 300 meters (330 yards) on both sides of the rivers established as green-belts during the colonial era and therefore prohibited from habitation (Curtin, 1992; Quagraine, 2011). With study area total population estimates of 1,720 and 2,130 along the Wiwi and Subin rivers respectively, sample sizes of 10% (Asamoah-Gyimah and Duodu, 2007) were used for the collection of data. Out of the 172 questionnaires for Wiwi and 213 for Subin distributed, 138 and 180 respectively were rightly completed, returned and used for the study. The questionnaire data was analysed using a quantitative method with the aid of the Statistical Package of Social Science (SPSS). The data was first compared to the current demographic distribution data of the Ashanti region (AR) and Ghana as a whole (GSS, 2012) and data sourced from literature for possible similarities and differences that would be important for policy-decision making.

3. Results And Discussions

3.1 Gender Distribution

Table 1 shows a dominance of female presence in the data for Ghana, Ashanti region (AR), Wiwi and Subin rivers. However, its intensities are revealed along the wetlands of Wiwi (55.8%) and Subin (58.9%), as compared to the 51.1% and the 51.6% of Ghana and the AR respectively. The male distribution is the reverse of the females'. While this result confirms Pattison et al. (2011), it also differs from Tyler (2011), Opoku (2013) and Kumi et al. (2015) where male dominance is revealed. The result suggests that for policy-decision making, gender data may not be generalized but may be sourced at the individual localities.

3.2 Age Distribution

Whereas the age groups 20s and 30s have higher scores in both the AR (36.0% and 25.2%) and Ghana (34.7% and 24.6%) respectively, the age group with the highest scores along the rivers was the age group 40s: Wiwi (39.9%) and Subin (61.6%). Nevertheless, the concentration of the younger and active ages of 20s, 30s ,40s was similar along the rivers (Wiwi and Subin) and also in AR and Ghana. This finding agrees with Kumi et al. (2015) where the same age groups (20s, 30s, 40s) scored higher among the respondents and Tyler (2011) where mostly young people (18-64 years) constituted 62% of the population. For policy purposes, it must be noted that, though wetlands attract young and active population, it is the more matured ones (40s) that are more prevalent.

3.3 Educational Background

Table 3 shows higher percentages of Senior High School (SHS) certificate holders along the rivers (Wiwi 39.86% and Subin 21.0%) and those with no formal education (Wiwi, 31.9% and Subin 52.8%). This finding confirms Opoku (2013) where those with 'no formal education' were the highest, followed by SHS/ Secondary Certificate holders. That wetlands are populated with illiterate population is attested by Foziah (2009), but the situation becomes alarming when the data for Wiwi (31.9%) and Subin (52.8%) is compared to those of AR (2.2%) and Ghana (2.9%). For policy-decision making, it is important to note that, wetlands are mostly populated with those without formal education, and this phenomenon poses problems since illiterates may consider wetlands to be wastelands that must be converted into other 'profitable' uses such as subsistent farming or into whatever one likes (Tebeau, 1980; Patrick Jr., 1994). In Kumi et al. (2015), those with SHS/Secondary School certificate holders had the highest concentration along wetlands, like the high percentage revealed at the Subin river. The proliferation of SHS Certificate holders can also pose problems. Unable to continue their formal education, SHS Certificate holders would have to be looking for jobs which currently in Ghana are difficult to find. As a consequence, they may feel comfortable to settle on the cheap or free lands along wetlands to engage in subsistent jobs that destroy wetland resources. This finding is crucial for policy-decision making since this phenomenon may introduce new

demographic distribution along wetlands with the rapidly increasing numbers of the SHS certificate holders coming from the recently introduced free SHS education in Ghana.

3.4 Occupation

As shown in Table 4, the most prevalent occupation along the two wetlands was self-employment (Wiwi, 39.9% and Subin, 38.0%) in various small and medium scale endeavours (Opoku 2013). This finding is in consonance with, but at higher percentages for both the AR (73.3%) and Ghana (75.4%). However, along the wetlands, unemployment not only came second but had high rates of 23.91% along Wiwi and 47.0% along Subin rivers compared to AR (4.5%) and Ghana (3.6%). Other studies have also identified the economically marginalized as those who mostly depend on wetland resources including Ozesmi (1999), Foziah (2009) and Pattison et al. (2011). The concentration of the unemployed along the rivers (wetlands) may be due to the presence of free or cheap land and building materials that can be used to raise cheap shelters to live in as one searches for a job in the city.

3.5 Marital Status

Though the married had higher percentages at Wiwi (79.71%) and at Subin (70.5%) as shown in Table 5, the finding reflects the general demographic characteristics of both AR (51.9%) and Ghana (55.1%). It also agrees with Kumi et al (2015) where the married were in the majority and the divorced and widows were in the minority. Neither wetland registered the divorced nor the separated among the respondents.

3.6 Ethnicity

All the three (3) major ethnic groups in Ghana namely, the Akan (53.1%), Dagomba (Mole-Dagbani) (18.6%) and the Ewe (15.6%) were found along the two wetlands (Table 6) as also found in Kumi et al (2015). However, the Akans had the highest representation among the respondents along Wiwi (75.0%) and Subin (88.3%) rivers. This finding is understandable since the two rivers are located among the Ashanti's who form a greater part of the Akan tribe. The finding is supported by literature (Foziah, 2009; Ozesmi and Bauer, 2002; Van Dam et al, 2011; Morrison et al., 2013) that mostly, it is the people from the local community that settle along the wetlands. It will be important to let policy-decision making reflect the ethnicity or the tribe of a particular locality since data on wetlands also need to be multi-scalar (Finlayson and Spiers, 1999).

3.7 Religion

The two most practiced religions in Ghana, Christianity (75.2%) and Islam (18.6%) were the only ones practiced at Wiwi (76.1% and 23.9%) and Subin (88.3% and 11.7%) respectively as shown in Table 7. This finding differs from the study by Kumi et al, (2015) conducted in Accra, Ghana, where African Traditional Religion (ATR) came second with 32% after Christianity (60%). For policy-decision making, the distribution of religious practices along wetlands, like ethnicity, may be local community biased.

3.8 Households

The prevailing modes of household type for the respondents were the tenancy and family house types, and the percentages were Wiwi (44.2% and 39.8%) and Subin (76.7% and 20.6%) respectively, as shown in Table 8. This differs from both the AR and Ghana where the leading modes were the tenancy (38.3% and 31.3%) and the house ownership (35.1% and 47.5%) respectively. This finding suggests that the respondents were not in positions to own houses, so they were mostly renting, though some also stayed in family houses. This phenomenon may also be due to the transient nature of wetland settlers.

3.9 Length of Stay

Most of the respondents have been staying along the wetlands for less than five years: 71.2% at Wiwi and 76.7% at Subin. This is followed by those who have stayed 11-20 years and 5-10 years as shown in Table 9. The findings together with the prevailing household modes are important for policy-decision making since they suggest that most wetland settlers stay for a relatively short time (5 or less years) and move elsewhere to find jobs and better living. Only those who have been staying there for more than 20 years seem to be permanent.

3.10 Incomes

The findings from Table 10 show that 83.7% and 91.8% of the respondents at Wiwi and Subin respectively earned Gh¢500.00 ($87.00) or below. This income falls below the average monthly wage of Gh¢974 ($171) in Ghana (GSS, 2019) though it is still about the minimum monthly wage figure of Gh¢319.00 ($55.50) (WageIndicator Foundation, 2020) in the country. The findings suggest that only a few (16.3% at Wiwi and 8.9% of Subin) are not poor and have income above average, per the Ghanaian standard. These findings which confirm Infield (1988), Newmark et al. (1993), McGregor (1995), Badola (1997), Ozesmi (1999) and Tyler (2011) that, mostly it is the poor who settle along wetlands to take advantage of their natural resources, are important for policy-decision making

Conclusion

During the colonial period in Ghana, the area that stretched from the edge of wetlands (rivers and streams) to 300 meters inland were established as green-belts in Kumasi and human settlements were prohibited in those areas. Currently, settlements are evolving along edges of many rivers and streams in Ghana, including the Wiwi and Subin rivers in Kumasi without regard to the green-belts prohibitions, or the damage settlements cause to wetlands. The findings of this study call for the review of existing policies and or enactment of new ones to help protect and manage wetlands sustainably in Ghana. The demographic characteristics of wetland settlers revealed in this study neither favour sustainable management and utilization of wetlands nor socio-economic development, since settlers are mostly poor, without formal education and employment, though mostly young and active. Consequently, the wetlands would be destroyed by the rapidity of the depletion of their natural resources. Though the low incomes and poverty prevalent along wetlands make most wetland settlers transient, another pressing issue that must be confronted is the accumulating presence of the SHS certificate holders who were also found to be young, active, jobless and poor.

Declarations

- Funding: Not applicable
- Conflict of interest: The authors declare that there is no actual or potential conflict of interest in terms of financial, personal or other relationships with other people or organizations that could inappropriately influence or be perceived to influence this work. The cost of undertaking this research was borne by the authors and as such has no potential of adversely influencing the article's content.
- Availability of data: Not applicable
- Code availability: Not applicable
- Ethics Approval: The ethics of the study protocol was approved by the Architecture Department Review Board, Kwame Nkrumah University of Science and Technology and No human, animal, plant or soil subjects were used for this study. The study involved questionnaire-based survey of residents at wetland sites. Participants provided their verbal informed consent for the survey questions.
- Consent to Participate: All participants included in the questionnaire survey gave verbal informed consent to participate in this research.
- Consent for publication: All participants included in the questionnaire survey gave verbal informed consent to publish the data contained in this article.
- Availability of data and materials: All data produced from this study are provided in the manuscript.
- Authors contribution:
    - **Victor Kwesi Quagraine:** Conceptualisation, Methodology and Editing of Original Manuscript; Literature review and Investigation; Writing – Original Draft Preparation; Writing – Original Draft Preparation and Reviewing and Editing of the Revised Manuscript
    - **Joy Ofori-Konadu**: Conceptualisation; Writing – Original Draft Preparation and Reviewing and Editing of the Revised Manuscript.
    - **Michael Osei Asibey**: Literature review and Investigation; Methodology; Writing – Original Draft Preparation.

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Tables

Table 1: Gender Distribution

Gender	Frequency (Wiwi)	Frequency (Subin)	Frequency (Ashanti Region)	Frequency (Ghana)	Percentage (Wiwi)	Percentage (Subin)	Percentage (Ashanti Region)	Percentage (Ghana)
Male	61	74	2,316,052	12,024,845	44.2%	41.1%	48.4%	48.9%
Female	77	106	2,464,328	12,545,229	55.8%	58.9%	51.6%	51.1%

Table 2: Age Distribution

Age	Frequency (Wiwi)	Frequency (Subin)	Frequency (Ashanti Region)	Frequency (Ghana)	Percentage (Wiwi)	Percentage (Subin)	Percentage (Ashanti Region)	Percentage (Ghana)
20s	33	17	886,687	4,373,602	23.9%	9.3%	36.0%	34.7%
30s	28	32	619,861	3,100,212	20.3%	17.6%	25.2%	24.6%
40s	55	111	411054	2,124,448	40.0%	61.6%	16.7%	16.9%
50s	11	21	257,366	1,356,793	7.9%	11.5%	10.5%	10.8%
60s and above	11	-	286,691	1,643,381	7.9%	-	11.6%	13.0%

Table 3: Educational Background

Highest Education	Frequency (Wiwi)	Frequency (Subin)	Frequency (Ashanti Region)	Frequency (Ghana)	Percentage (Wiwi)	Percentage (Subin)	Percentage (Ashanti Region)	Percentage (Ghana)
Primary	22	37	1,094,173	5,615,573	15.9%	20.6%	39.1%	44.2%
JHS/Middle School	11	5	933,518	4,048,059	8.0%	2.8%	33.4%	31.8%
SHS	55	37	512,133	1,756,714	39.9%	21.0%	18.3%	13.8%
Tertiary	6	5	194,097	927,017	4.3%	2.8%	7.0%	7.3%
No formal Education	44	95	61,047	369,365	31.9%	52.8%	2.2%	2.9%

Table 4: Occupation

Occupation	Frequency (Wiwi)	Frequency (Subin)	Frequency (Ashanti Region)	Frequency (Ghana)	Percentage (Wiwi)	Percentage (Subin)	Percentage (Ashanti Region)	Percentage (Ghana)
Public/Civil servant	11	17	129,783	655,884	8.0%	9.0%	7.3%	7.3%
Entrepreneur/ Self employed	55	69	1,298,921	6,791,570	39.9%	38.0%	73.3%	75.4%
Students	17	11	261,145	1,226,077	12.3%	6.0%	14.7%	13.6%
Unemployed	33	85	80,160	320,852	23.9%	47.0%	4.5%	3.6%
Others	22	-	2,775	17,666	15.9%	-	0.2%	0.1%

Table 5: Marital Status

Marital Status	Frequency (Wiwi)	Frequency (Subin)	Frequency (Ashanti Region)	Frequency (Ghana)	Percentage (Wiwi)	Percentage (Subin)	Percentage (Ashanti Region)	Percentage (Ghana)
Married	110	127	1,271,348	7,061,627	79.7%	70.5%	51.9%	55.1%
Single	28	48	852,003	4,039,724	20.3%	26.7%	34.8%	31.5%
Divorced	-	-	124,406	573,235	-	-	5.1%	4.5%
Separated	-	-	56,709	314,487	-	-	2.3%	2.5%
Other (Widow)		5	145,525	822,593		2.8%	5.9%	6.4%

Table 6: Ethnicity

Ethnicity	Frequency (Wiwi)	Frequency (Subin)	Frequency (Ashanti Region)	Frequency (Ghana)	Percentage (Wiwi)	Percentage (Subin)	Percentage (Ashanti Region)	Percentage (Ghana)
Akan	104	159	3,449,358	11,321,568	75.0%	88.3%	79.3%	53.1%
Ga	-	-	54,968	1,766,287	-	-	1.3%	8.3%
Ewe	6	5	175,456	3,327,072	4.3%	2.8%	4.0%	15.6%
Hausa	-	-			-	-		
Mamprusi (Grusi)	17	5	94,509	594,248	12.1%	-	2.2%	2.8%
Dagomba (Mole-Dagbani)	6	11	525,742	3,963,017	4.3%	6.1%	12.0%	18.6%
Other	5	48	50,014	342,197	4.3%	2.8%	1.2%	1.6%

Table 7: Ethnicity

Religion	Frequency (Wiwi)	Frequency (Subin)	Frequency (Ashanti Region)	Frequency (Ghana)	Percentage (Wiwi)	Percentage (Subin)	Percentage (Ashanti Region)	Percentage (Ghana)
Christianity	105	159	3,719,793	17,546,837	76.1%	88.3%	82.3%	75.2%
Islam	33	21	728,741	4,345,723	23.9%	11.7%	16.1%	18.6%
Traditionalist	-	-	34,685	1,270,272	-	-	0.8%	5.4%
Other	-	-	37,172	193,914	-	-	0.8%	0.8%

Table 8: Household

Type of Household	Frequency (Wiwi)	Frequency (Subin)	Frequency (Ashanti Region)	Frequency (Ghana)	Percentage (Wiwi)	Percentage (Subin)	Percentage (Ashanti Region)	Percentage (Ghana)
Tenant	61	138	428,376	1,699,250	44.2%	76.7%	38.3%	31.3%
Owner	22	5	392,626	2,579,493	16.0%	2.7%	35.1%	47.5%
Family house	55	37	295,663	1,138,097	39.8%	20.6%	26.4%	21.0%
Other	-	-	1288	9,806	-	-	0.1%	0.2%

Table 9: Length of Stay

Years of Stay	**Frequency (Wiwi)**	**Frequency (Subin)**	**Frequency (Ashanti Region)**	**Frequency (Ghana)**	**Percentage (Wiwi)**	**Percentage (Subin)**	**Percentage (Ashanti Region)**	**Percentage (Ghana)**
Below 5 years	99	138	-	-	71.2%	76.7%	-	-
5-10 years	6	16	-	-	4.3%	8.9%	-	-
11-20 years	6	5	-	-	4.3%	2.7%	-	-
Above 20 years	28	21	-	-	20.2%	11.7%	-	-

Table 10: Income Distribution

Income group	**Frequency (Wiwi)**	**Frequency (Subin)**	**Frequency (Ashanti Region)**	**Frequency (Ghana)**	**Percentage (Wiwi)**	**Percentage (Subin)**	**Percentage (Ashanti Region)**	**Percentage (Ghana)**
Below Gh¢ 500	116	164	-	-	83.7%	91.8%	-	-
501-1000	17	16	-	-	12.0%	8.9%	-	-
1101-2000	6	-	-	-	4.3%	-	-	-
Above 2001	-	-	-	-	-	-	-	-

Figures

Figure 1

Map of Ghana with its sixteen (16) regions (Source: Adapted from Ghana Permanent Mission to United Nations, 2021).

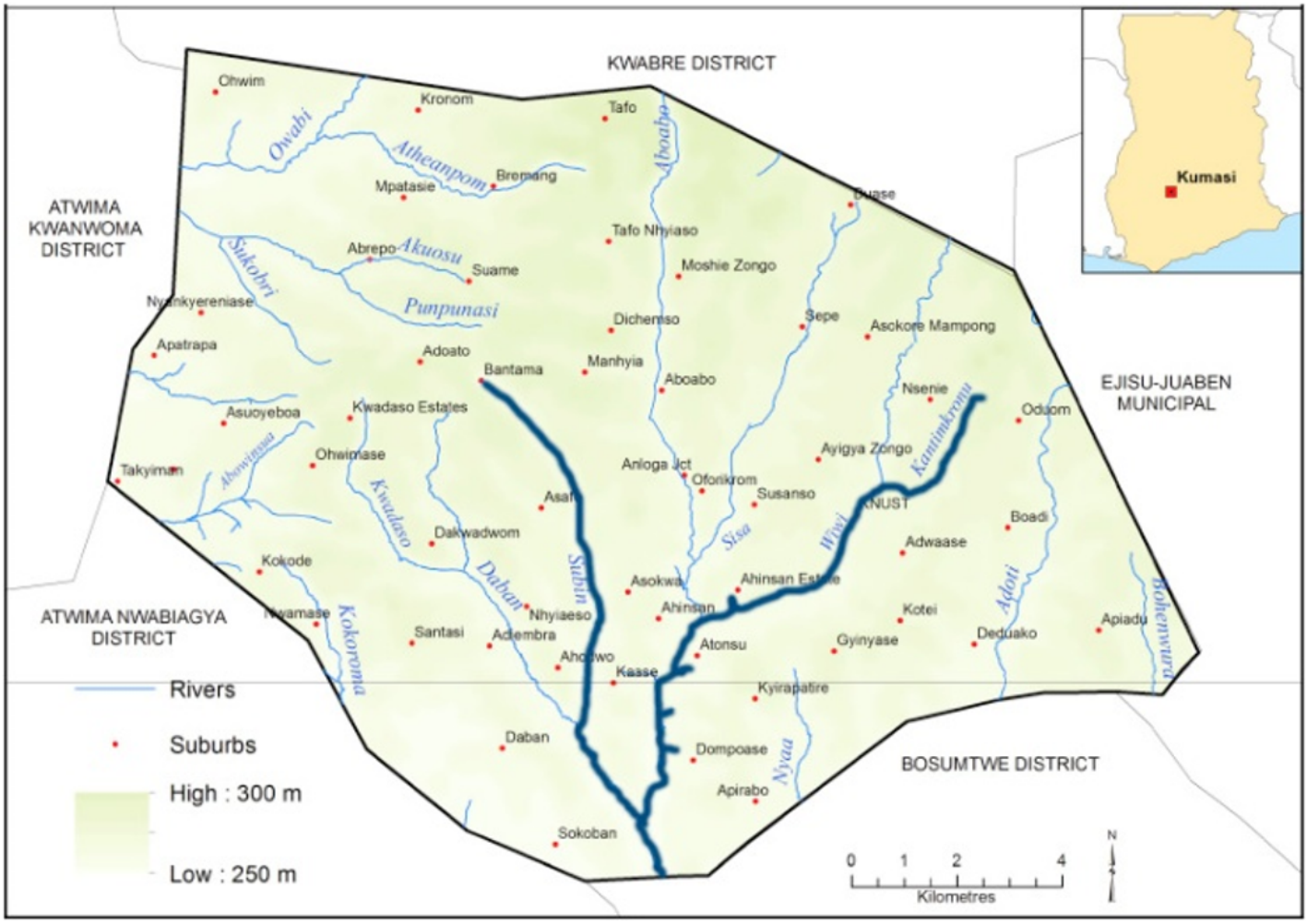

Figure 2

Rivers and streams (wetlands) in Kumasi (Source: Ghana Hydrological Department, 2006).