



Urban Environmental Health Management Challenges and Prospects in Ghana: A Case Study of the Accra Metropolis

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KEYWORDS Accra. Environmental Health. Hygiene. Management. Policies. Population. Sanitation. Urban Centres. Waste

ABSTRACT Ensuring congenial environmental health conditions in congested urban centres can significantly facilitate sustainable development of Sub-Saharan African (SSA) countries like Ghana. Most urban centres in Ghana are experiencing rapid growth and increasing rural-urban migration due to ineffective policies and governance. Environmental health in most urban areas, especially Accra metropolis, has deteriorated over the years. This paper examines the principal environmental health policies in Ghana during the past decades. Administration of questionnaires, face-to-face interviews and focus group discussions (FGD) were used to collect information from relevant target groups ranging from policy-makers to media houses in four selected areas in the metropolis. SPSS version 20 was used to analyse the principal environmental health challenges for discussion. Ensuring quality environmental health in the metropolis requires an integrated approach and close collaboration by all stakeholders. Proper planning, coordination and evaluation of urban environmental health conditions should be systematically analysed and appropriate corrective measures implemented.

INTRODUCTION

Ensuring congenial environmental health conditions, especially in congested urban centres in Sub-Saharan African (SSA) countries like Ghana can significantly facilitate achievement of the Sustainable Development Goals (SDGs), especially Goal 6 which focuses on the provision of clean water and improved sanitation condition (UN 2015). Environmental health comprises those aspects of human health including quality of life that are determined by physical, biological, social, and psychosocial factors in the environment (WHO 1992). According to UN DESA (2018),

“Today, 55% of the world’s population lives in urban areas, a proportion that is expected to increase to 68% by 2050. Projections show that urbanization, the gradual shift in residence of the human population from rural to urban areas, combined with the overall growth of the world’s population could add another 2.5 billion people to urban areas by 2050, with close to 90% of this increase taking place in Asia and Africa.”

Sub-Saharan Africa (SSA) is the fastest urbanizing region in the world. Urban areas in the region have 472 million people and this will double over the next 25 years. Ghana has experienced

a very rapid rate of urban growth since the middle of the twentieth century (Ardayfio-Schandorf et al. 2012). With over 70 percent of the population being rural at independence, the country is now over 50 percent urbanized. Urbanization in Ghana is particularly concentrated in Accra, Kumasi and Takoradi Metropolitan Areas and Tema Municipal Area. This paper focuses on urban environmental health challenges in the Accra Metropolis because of the size of its population as well as its economic, political and cultural importance. The rapid urbanization of the metropolis in the face of inadequate infrastructure and basic social services such as provision of housing, drinking water, proper sanitation and drainage, and health care access is the root cause of the poor environmental health conditions. Listorti and Doumari (2001) describe the urban environmental health problem as follows:

“There is an explosion in lawlessness and uncontrolled growth in urban areas. In the last decade and a half virtually no new service roads have been built to the sprawling shelters in urban fringes, and existing roads are in disrepair. Sewage drains are broken and choked, refuse collection and street cleaning are unable to cope with mounting refuse and filth, and there is a lack of service personnel. Many uncontrolled

private dumps exist, creating high risks of rodent infestation and disease outbreak.”

Environmental health challenges are exacerbated by the impacts of climate change such as drought, floods and pollution and the associated increase in environmental and human health impacts. In other words, urban development and urban environmental challenges, are significantly affecting the quality of life of urban populations. The consequences of these developments are increasingly drawing the attention of policy-makers and development actors (United Nations 2011). About one quarter of the global disease burden and one third of this figure in developing countries could be reduced by effectively implementing appropriate environmental health policies, interventions and management strategies. Good environmental health plays a pivotal role in creating and fostering urban environments that are safe for work, refreshing recreation and high quality of life. In 2002, 23 percent (2.4 million) of all deaths in Africa were attributed to environmental risk factors (Prüss-Ustun and Corvalan 2006). In the same year, 1.03 million deaths were linked to lack of access to safe drinking water and adequate sanitation and hygiene conditions, with an additional 550,000 deaths being attributed to poor water resource management and unsafe water environments. According to the World Health Organisation (WHO 2012), sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces. Inadequate sanitation is a major cause of disease world-wide and improving sanitation is known to have a significant beneficial impact on health both in households and across communities. The word ‘sanitation’ also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal. The USA National Institute of Environmental Health Science (NIEHS 2011) defines environmental health as *research, education, training and research directed at health problems that are related to environmental exposures and transcend national boundaries, with a goal of improving health for all people by reducing environmental exposures that lead to avoidable diseases, disabilities and deaths.*

According to a Joint Monitoring Programme by WHO and UNICEF (2008), in 16 of the 54 African countries, less than 25 percent of the popula-

tion has access to improved sanitation facilities. Rapid population growth is a major constraint in the provision of adequate sanitation. In urban areas, where coverage is better, the expansion of slum areas poses a challenge. Most African countries like Ghana generally lack the technologies needed for improving water and sanitation provision. The quality of air and drinking water in many urban areas is poor and very unreliable. It is important to note that the diversity and complexity of urban environmental challenges make it more difficult for metropolis like that of Accra to effectively manage these problems. The environmental health situation in Ghana has worsened since the colonial era (UNDP 2007). To enable Ghana to achieve the Sustainable Development Goals (SDGs), it is vital to effectively implement the existing environmental health policies and strategies. The United Nations 2030 Agenda for Sustainable Development and the Sustainable Development Goals, especially SDG 6, stresses the need to (UN 2015):

“...improve sanitation and access to drinking water; there needs to be increased investment in management of freshwater ecosystems and sanitation facilities on a local level in several developing countries within Sub-Saharan Africa, Central Asia, Southern Asia, Eastern Asia and South-Eastern Asia” (UN 2015).

Study Location and the Problem under Investigation

The location of this investigation on urban environmental health management challenges is the Accra Metropolitan area in the Greater Accra Region in Ghana (see Fig. 1). The population of Ghana is about 24.4 million (Ghana Statistical Service 2012). In terms of area, Greater Accra is the smallest of Ghana’s 10 administrative regions. It is however the second most populated region, with 2.9 million inhabitants and accounts for 15.4 percent of the country’s total population (Fried 2012). Accra is the capital city of Ghana and the engine of national economic growth. Although Ghana has an environmental health policy which specifies strategies for promoting quality environmental health, the rapid growth of the Accra metropolis is causing serious environmental health challenges (MLGRD 2010). Ghana’s most

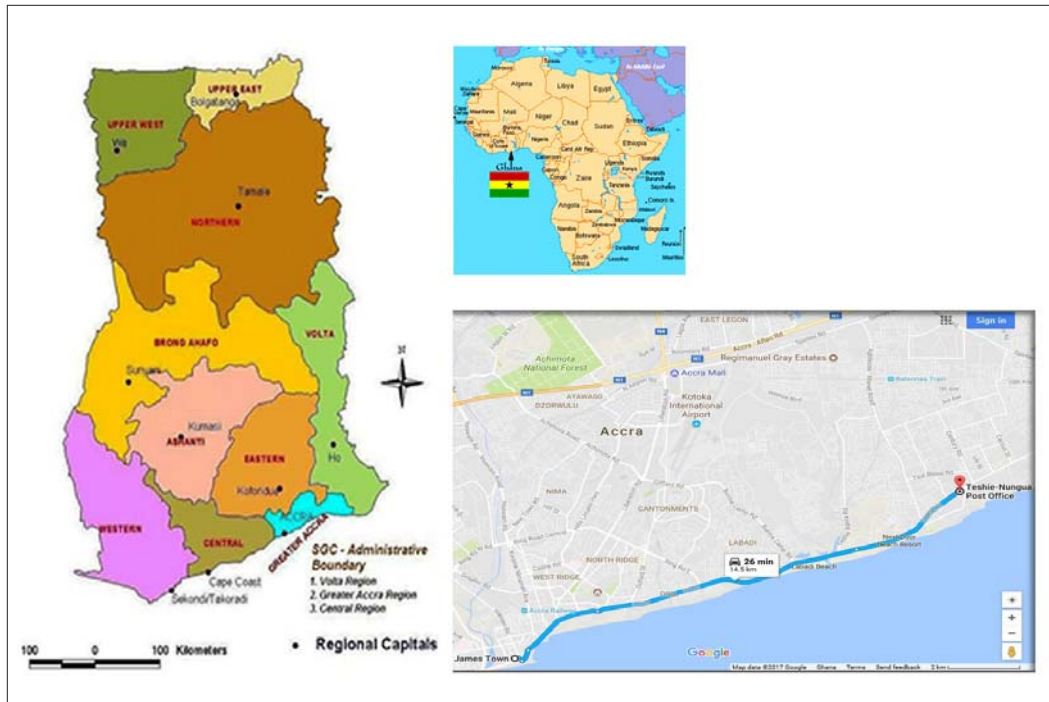


Fig.1. Map Africa indicating the Greater Accra Region in Ghana and the Study Locations (James Town; Teshie Nungua, Airport Residential Area and East Legon)
 Source: Adapted from Google, 2017

critical and immediate environmental problems include widespread pollution, inadequate supply of quality drinking water, poor sanitation facilities, drainage, urban industrial waste management and negative climate change impacts. According to the Ghana News Agency (2012a), poor sanitation costs Ghana GHC 420 million (equivalent to US\$290 million) each year. This sum is the equivalent of US\$12 per person in Ghana per year or 1.6 percent of the GDP. As part of the strategies to keep the city clean, the Accra Metropolitan Assembly (AMA) has introduced a “polluter pays principle” (PPP) for solid waste collection, automation of revenue collection, construction of modern toilets and storm drains to reduce perennial flooding and decongestion of the city. However, in spite of these initiatives, the gross indiscipline by the population of the metropolis continues to choke the city and intensify the spread of environmental health related diseases.

Sanitation, environmental health and human health are closely inter-linked. The impacts of

environmental degradation on human health are critical issues of sustainable development. Rapid urbanisation, climate change, globalisation, air pollution, poverty and inequity are key concerns for environmental health practitioners. Climate change has become a major challenge to environmental health due to its effects on access to quality of water supply and food insecurity in many SSA countries. It is also causing a reduction in arable land and re-emergence of infectious diseases such as dengue fever and malaria. Globalisation is also adding to the rapid transmission of infectious diseases such as influenza and other diseases like severe acute respiratory syndrome (SARS) and avian flu (CDC 2011). Figure 2 illustrates the key components of the conceptual framework that guided the research and preparation of this paper:

- ◆ The inputs in the urban environmental health system such as urban environmental health policies and programmes.

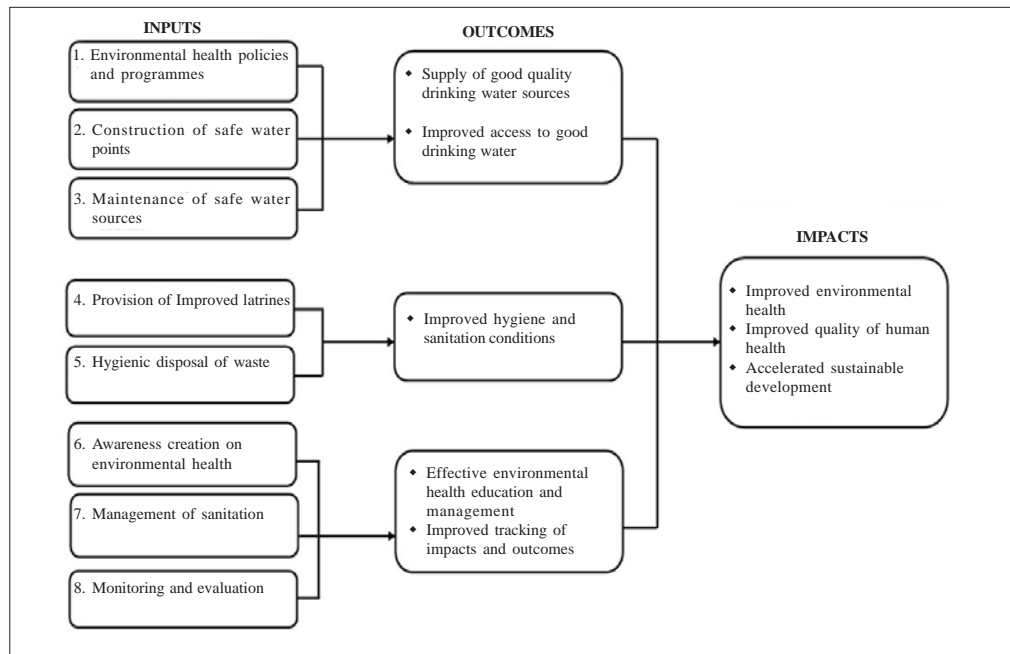


Fig. 2. Conceptual framework for improving environmental health in the Accra Metropolis

Source: Author's own, 2016

- ◆ The outcomes of the system which include supply of good quality drinking water.
- ◆ The impacts of the inputs and outputs such as improved environmental health, improved quality of human health and accelerated sustainable development.
- ◆ Monitoring and evaluating the impact.

State of Urban Environmental Health in the Accra Metropolis

A comprehensive literature review provided a number of useful insights on the state of environmental health conditions in the Accra metropolis. Poor access to improved water and sanitation is attributed to a number of reasons including weak sector policies, inadequate political will, weak local government capacity and inadequate financing (Larbi 2006).

a) Ineffective Policy Framework

One of the most critical challenges of urban environmental health management in Ghana and the Accra metropolis is an ineffective policy

framework for many years. This situation is ascribed to the following reasons:

- ◆ An unclear national goal or vision on environmental health as an essential social service and a major determinant of the standard of living.
- ◆ The absence of a formally constituted environmental health sub-sector in national development planning.
- ◆ The non-existence of a comprehensive policy assigning responsibilities for environmental health to relevant ministries and agencies, resulting in overlaps, gaps and poor co-ordination in the management of programmes and services.
- ◆ Weak technical capacity of the sector ministry and related ministries and agencies to orient and support the Metropolitan, Municipal and District Assemblies (MMDAs) in the provision of environmental sanitation.
- ◆ Weak and/or outdated and poorly enforced environmental health legislation.
- ◆ Inadequate allocation of resources for providing environmental health services, both nationally and at the local authority level.

b) Rapid Urbanisation

According to Kanton et al. (2010), the rapid growth and expansion of urban centres in Ghana dates back to colonial development policies. Since the 1950s, Ghana's urban population has rapidly been increasing. Between 1950 and 2000, it grew almost threefold, from 15.4 percent to 43.5 percent (Ghana Statistical Service 2012) mainly because of rural-urban migration and high birth rates. According to the 2016 African Economic Outlook (UNECA 2016), more than half of Ghana's population now lives in urban areas compared with 30 percent at independence. The urbanisation rate, with its attendant problems is projected to reach 72 percent by 2035.

The rapid growth of slums is a principal cause of the increasing poor environmental health conditions in the Accra metropolis. According to Osabutey (2011), there are more than 25 slums in Accra alone and one third of Accra's residents are believed to live in slums. According to GNA (2012a), the total number of people living in slums in Ghana was estimated at 4.1 million in 2001 and 5.5 million in 2008. These slums are characterised by the lack of one or more of the following: security of tenure; structural quality and durability of dwellings; access to safe water; sufficient living area; and/or access to sanitation facilities (UN-Habitat 2003). The overwhelming numbers of urban dwellers are causing cities to deviate from development plans and move away from agreed sub-urbanisation objectives. Ties of ethnicity and tribalism further propel individuals and families to stay in slum areas when their social or economic status would predict a different choice of housing. Jankowska (2009) indicates that a geodemographic classification of slums in Accra reveal that a variety of people live in slums, including lawyers, doctors, and government workers.

c) Increasing Air Pollution

Increasing air pollution is a serious environmental health challenge in the Accra metropolis. The major sources of air pollution are road dust, emissions from vehicles, industrial processes and open burning. Air pollution in the metropolis is associated with acute respiratory infections which are normally on the increase during the dry season (November to March). It is estimated that

close to 7,000 deaths occurred in Ghana in 2013 because of outdoor air pollution, with the economic cost of premature deaths estimated at \$5 billion (EPA 2017). Vehicular emissions are a significant cause of the increasing air pollution levels in the metropolis. The situation is worsened by the use of fuel with high sulphur content of 3,000 parts per million imported into the country. Residents, particularly traders, hawkers, children and people who spend long hours in traffic or live along main roads in the city are exposed to high risk of respiratory and cardiovascular diseases. Whiles the WHO limit for particulate matter (with a size less than 10 microns) is 50 microgrammes per cubic metre and that of the EPA pegged at 70 microgrammes per cubic metre, the city was recording averagely between 100 and 200 microgrammes, almost four times the acceptable level (EPA 2017). Among the top 20 diseases in Ghana, respiratory ailment is second to malaria. Acute respiratory infections rank second among the five top diseases in Ghana. This is a serious public health challenge that should be fixed through a multifaceted approach such as reduction of emissions from heavy-duty diesel vehicles and engines, the introduction of soot-free buses, use of compressed natural gas, electricity and biodiesel.

d) Poor Hygiene and Sanitation Conditions

Inadequate access to improved sanitation conditions such as water and toilets is another urban environmental health challenge in the Accra metropolis and most other cities in Ghana. About 50 percent of the population of Ghana resides in urban areas of which only 18 percent have access to improved sanitation conditions (WHO/UNICEF 2010). Although accessibility to improved drinking water sources looks encouraging, only 30 percent have access to piped water which in most cases is supplied intermittently. The rest depends on other improved sources such as standpipes, protected dug wells, protected springs and rainwater harvesting. According to Ghana News Agency (2012b), US\$1.5 million is lost each year due to productivity losses whilst US\$54 million is spent each year for treating diarrhoea and its consequences for other diseases like respiratory infections and malaria. Approxi-

mately 13,900 Ghanaian adults and 5,100 children under five years die each year from diarrhoea. Nearly 90 percent of these figures are directly attributed to sanitation and water related problems. Ghana News Agency (2012c) also revealed that 4.63 million Ghanaians have no latrines at all and defecate in the open whilst 16.34 million use unsanitary or shared latrines. Consequently, large quantities of faecal waste are discharged into the environment without any treatment. This is likely to have major impacts on the infectious disease burden and quality of life (Hutton et al. 2007).

UN (2015) regards the provision of water and sanitation services in poor urban areas as a critical challenge for the realisation of the Sustainable Development Goals (SDGs), especially Goals 1 (No Poverty); 2 (Zero Hunger); 3 (Good Health and Well-being); and 6 (Clean Water and Sanitation). Poor sanitation resulting from unmanaged domestic wastewater, solid waste and overcrowding are contributory factors to pollution and poor environmental health conditions in the Accra metropolis. These in turn impact negatively on economic development and public health. Accra generates about 1,500 tons of solid waste per day of which only about 55 percent is collected and disposed (EPA 2002). Domestic wastewater is mostly discharged directly into drainage systems that empty into water bodies such as rivers, lagoons and streams (see Fig.3). By 2000, about 80 percent of sewage treatment facilities in Accra were not functioning, thus placing a lot of pressure on the receiving water bodies in the city. The extent of pollution, especially in the Odaw River in Accra, is very intense and is causing the loss of aquatic organisms. It is also estimated that the Chemu Lagoon in Tema receives over 2 million m³ of discharges per day from industries in the catchment area (NIEHS 2011).



Fig. 3. Damping of human excreta in the sea in Accra
Source: Author's own, 2015

e) High Incidence of Environmental Related Diseases

Communicable diseases such as cholera, diarrhoea and malaria are serious environmental challenges in the Accra metropolis and Ghana in general due largely to poor environmental sanitation, ignorance and poverty. Since the emergence of cholera in the country in 1970, the disease has become endemic with seasonal outbreaks that coincide with the onset of the rainy season. According to AMA (2006), the figures for 1999 were 1,671 cases and 42 deaths. Among the 10 leading diseases treated at the Out-Patient Department (OPD), malaria ranked highest with an average incidence of 53 percent. AMA (2006) suggested that the next two most frequently diagnosed diseases after cholera were upper respiratory infections and diarrhoea disease at 11 percent and 6 percent respectively. Malaria is central in any consideration of health status improvements, nationally and in AMA particularly. A total of 68 persons died of cholera within the Accra metropolis between 2006 and 2011; 40 people died from the disease in 2011; and 17 people died in 2012 (The Chronicle 2012). As of 13 April 2012, 826 cases have been reported from 12 public health facilities with 17 deaths. The city is too congested and dirty. Heaps of human excreta and other debris continue to engulf the city and serve as havens for germs. Maamobi, Nima, Kotobabi, Pig Farm, Accra New Town, Kanda, Chorkor, Korle-Gonno, Sukura, Sabon Zongo, Darkuma, Mataheko and Laterbiokorshie are cholera epidemic areas in the city with serious waste management challenges. They are suffering from bad or no drains, toilet facilities and refuse dumps. Consequently, most of the inhabitants are obliged to defecate and throw away refuse anywhere they can find (see Fig.4). Clearly, the situation is very



Fig. 4. A gutter in Accra choked with plastic waste
Source: Author's own source, 2016

alarming and therefore calls for concerted efforts by all to tackle it effectively. According to UN (2008), access to a toilet alone can reduce child diarrhoea deaths by 30 percent and hand washing by more than 40 percent.

METHODOLOGY

The conceptual framework that guided the preparation of this paper is the human ecological approach (HEA). The Ecological Society of America (ESA 1997) regards ecology as the study of the relationships between living organisms, including humans, and their physical environment. HEA seeks to understand the vital connections between plants and animals and the world around them. HEA enables the investigation of the inter-relationships between humans, the environment and health (Raffestin and Lawrence 1990). The use of this approach is particularly relevant because human activities tend to produce serious impacts on the physical environment and which inevitably affect the quality of life support systems and the health of human beings. In other words, environmental health and human health are closely intertwined. A second vital element of HEA is the complexity of human and environment inter-actions and inter-relations which can only best be studied and understood through the use of multi-disciplinary methods that draw relevant knowledge from various disciplines such as anthropology, biology, economics, geography, management, medicine and sociology. In fact, the logic of HEA is that no one single discipline is capable of providing the required methods, information and knowledge to permit holistic analysis and understanding of the complex human-environment relationships. This is particularly so because environmental health issues have globally evolved over time to encompass a more holistic approach (WHO 1992). Therefore, since urban environmental health management is a central issue of human and environment inter-relationships, it is more appropriate to use multidisciplinary and participatory action research methods to analyse them.

Four areas in the Accra metropolis were investigated. The first was James Town which is one of the oldest districts in the metropolis. It emerged as a community around the 17th century (Wikipedia 2013) and remains a fishing community inhabited primarily by the indigenous Ga. Jamestown is a vibrant, smelly, crowded and

noisy community in the centre of Accra city. Low corrugated-iron roofs stand over painted shops, shacks and houses. Teshie and Nungua are adjacent twin old communities in the Accra metropolis. They are close to the coast and stretch from the Kpeshie Lagoon to Teshie-Nungua Estates and from East to West on the Teshie Road and have grown to become one of the biggest urban areas in Ghana. Teshie-Nungua is more than 300 years old and very rich in cultural diversity. It is renowned for its unique coffin making trade. It is one of the most preferred choices for people living in Accra, due to its serenity, easy connection to the central business district and its wide range of available home choices. Most of the indigenes are fisher folks and the local people mainly live in family homes for generations. The neighbourhood has all the basic amenities including water, electricity and good road infrastructure. The second study location was the Airport Residential Area which is one of the finest places to live in Accra. It is quiet, clean and very secure. Prominent Ghanaians and many foreign nationals reside in this community. Many top hotels and schools, serviced apartments and good public infrastructure are located in this area. East Legon is the third area of the Accra Metropolis that was investigated. It is noted for its modern low-rise apartment blocks and detached houses. A significant number of expatriates live in this community. Prominent offices, hotels, restaurants, bars, shopping malls and international schools like the American International School of Accra and Ecole Française Jacques Prevert (French School) are located in East Legon. Traffic is heavy in the mornings and evenings (Accra Expat 2014).

Information from both secondary and primary sources was collected and analysed in this paper. A comprehensive desk research on environmental health policies and management in Ghana was conducted. The findings of the literature review informed the design of research instruments for collecting relevant primary data and information from the four selected study locations for analysis (see Fig. 1). A participatory research approach, including use of structured interviews, direct observation during field visits and focus group discussions (FGD), permitted the collection of data and information from relevant target groups included policy-makers, environmental health officers, traders, transport union workers, researchers, students, NGOs, and media houses in the study locations. The selection of

the study locations was informed by the need for a comparative analysis of environmental health challenges in poor urban areas and well planned and properly managed parts of the metropolis. Airport Residential Area and East Legon are first class residential areas whiles Teshie-Nungua and Jamestown are respectively third and fourth class residential areas.

Random and purposive sampling methods were used to select 260 respondents from the four study locations for interview. To ensure an acceptable representation of the population of the study locations, the first house on the principal streets in each community was identified and used as the starting point for selecting the interviewees. Household heads or their representatives were aided by trained research assistants to complete structured questionnaires designed for collecting the required information. Questionnaires were also administered to randomly selected traders, market women and transport union workers whiles purposive sampling method was used to select policy-makers, environmental health officers, researchers, students, NGOs, media, houses and informed experts to collect information from informed experts. The third aspect of the field data

Table 1: Socio-demographic characteristics of respondents

<i>Socio-demographic characteristics</i>	<i>Frequency (n)</i>	<i>Percentage (%)</i>
<i>Sex</i>		
Female	131	50.4
Male	129	49.6
Total	260	100.0
<i>Age</i>		
18-25	48	18.5
26-35	86	33.1
36-45	55	21.2
46-55	57	21.9
>56	14	5.4
Total	260	100.0
<i>Marital Status</i>		
Married	131	50.4
Single	88	33.8
Divorced	34	13.1
Widowed	7	2.7
Total	260	100.0
<i>Education</i>		
No education	42	16.2
Non-formal education	15	5.8
Primary education	50	19.2
Secondary education	83	31.9
Tertiary education	70	26.9
Total	260	100.0

Source: Field Data 2016

collection involved a FGD comprising 35 post-graduate students of the Department of Public Administration and Health Services Management of University of Ghana Business School. The participatory research approach allowed active involvement of the respondents in the data collection process and a deeper understanding of the environmental health challenges in the metropolis. Appropriate management strategies and other interventions were proposed for redressing the identified challenges.

RESULTS

The key results emanating from the data analysis revealed that 50.4 percent of the respondents were females and most (33.1%) were within the age group 18-25 (Table 1). A little more than half

Table 2: Awareness of environmental health conditions in the metropolis

	<i>Frequency (n)</i>	<i>Percentage (%)</i>
<i>Have Environmental Conditions Worsened in the Metropolis? Yes</i>		
No	12	4.6
No change	32	12.3
Don't know	4	1.5
Total	260	100
<i>Means of Waste Disposal</i>		
Waste is collected by contracted people	185	71.2
Waste is personally disposed at dumping sites	68	26.2
Waste is buried in pits	7	2.7
Total	260	100
<i>Level of Satisfaction with Current Environmental Conditions</i>		
Not satisfied	142	54.6
Very unsatisfied	79	30.4
Satisfied	38	14.6
Very satisfied	1	0.4
Total	260	100
<i>Willingness to Participate in Activities That Promote Environmental Health</i>		
Form groups to clean up polluted neighbourhoods	67	25.8
Keep waste in bins	58	22.3
Health educate people on cleanliness	47	18.0
Pay taxes regularly	34	13.1
Waite on the government	30	11.5
Complain to relevant authorities	24	9.2
Total	260	100

Source: Field Data 2016

(50.4%) were married. Only 16.2 percent and 5.8 percent respectively had no education and non-formal education while 19.2 percent completed primary school. The majority attained secondary school education (31.9%) followed by 26.9 percent with tertiary education.

Awareness of Environmental Health Issues in the Metropolis

The study sought to identify the level of awareness of the respondents on environmental health issues, including their thinking on the trends of environmental health conditions in the Accra Metropolis over the past 10 years. As Table 2 indicates, 81.5 percent of the respondents confirmed that environmental health conditions in the metropolis have worsened, 12.3 percent indicated there was no change and 1.5 percent had no opinion.

With regard to methods of waste disposal, the majority (71.2%) disposed waste through contracted waste collectors; 26.2 percent personally disposed waste at dumping sites; and (20.7 %) buried their waste in pits. The majority of the respondents (54.6 %) were not satisfied with the current environmental health conditions in the metropolis. About 26 percent indicated their willingness to form groups to clean up polluted neighbourhoods; 22.3 percent agreed to keep waste in bins and help to educate people on best hygiene and sanitation practices in order to promote good environmental health conditions in the metropolis.

Principal Environmental Challenges in the Accra Metropolis

High prevalence of environmental related diseases such as cholera, diarrhoea, malaria and typhoid was identified by 60 percent of the respondents as the main urban environmental health problem in the Accra metropolis. Water, air and noise pollution and perennial floods were other urban environmental health problems cited by the rest of the respondents (Table 3).

Principal Causes of Poor Environmental Health Conditions in the Metropolis

The worsening environmental health situation in the Accra metropolis was attributed to other factors. As is shown in Table 4, inappropriate

Table 3: Principal environmental challenges in the Accra metropolis

<i>Environmental problems</i>	<i>Frequency (n)</i>	<i>Percentage (%)</i>
Occurrence of diseases (malaria, cholera, typhoid)	260	60.0
Pollution in several areas (water, air and noise)	149	34.5
Frequent floods	23	5.3
Total	432	100

*1multiple response

²Multiple response refers to questions that allow respondents to select more than one response for a particular question. Therefore, total frequency exceeds the sample size for the study.

Source: Field Data 2016

Table 4: Causes of environmental health challenges in Accra Metropolis

	<i>Frequency (n)</i>	<i>Percentage (%)</i>
<i>Causes</i>		
Inappropriate environmental health policies	153	27.5
Lack of commitment by AMA to ensure appropriate sanitation practices	125	22.5
Increased population growth rate	94	16.9
Ineffective public education on health and sanitation	76	13.7
Inadequate waste bins and dumping sites	67	12.1
Inadequate toilet facilities	41	7.4
Total	556	100
<i>Entities Responsible for the Poor Environmental Health Conditions</i>		
Individuals	177	34.6
National government	128	25.0
Metropolitan Assembly	96	18.8
Traders	48	9.4
Environmental Protection Agency (EPA)	31	6.1
Drivers	31	6.1
Total	511	100

*multiple response¹

Source: Field Data 2016

government policies, lack of commitment by AMA to enforce appropriate sanitation practices (22.5%) and increased population growth rate (16.9%) are the main causes of the worsening environmental health conditions in the metropolis. Ineffective public education on environmental health and

sanitation, inadequate provision of waste bins, dumping sites and toilet facilities were identified to be the other major causes of the worsening environmental health situation in the metropolis.

About 35 percent of the respondents viewed individuals to be responsible for the poor environmental health conditions in Accra. Twenty five percent and 18.8 percent respectively saw the national government and the Metropolitan Assembly as the main entities responsible for the worsening urban environmental health conditions in the metropolis.

Measures for Redressing Environmental Health Problems in the Metropolis

To address the identified urban environmental health challenges in the metropolis, the respondents recommended a number of strategies and mitigation measures (Table 5). For example, effective implementation of environmental health policies was cited by 22 percent of the respon-

dents; regular de-silting and spraying of gutters through communal labour (10.9%); massive public education (10.9%); and provision of waste collection bins by government and private sector organisations (18.1%). Other suggested mitigation measures were Construction of proper drainage systems and removal of structures on water ways; eating healthy and hot foods; and the provision of household toilets.

DISCUSSION

The results of the primary data analysis on urban environmental health management challenges in the Accra metropolis and the findings gleaned from the desk research are discussed in this section.

Effective Policy Implementation

The Government of Ghana (GoG) was identified by the respondents as the second major entity responsible for the poor environmental health conditions in the Accra metropolis. In addition, lack of commitment to ensuring appropriate sanitation practices was blamed on the government and AMA. Environmental sanitation policy in Ghana came into force in 1999 and sought to harmonize all waste related policies and to develop and maintain a clean, safe and pleasant physical environment in all human settlements and to promote the social, economic and physical wellbeing of all sections of the population (Bensah et al. 2011). The policy comprised a number of complementary activities, including the construction and maintenance of sanitary infrastructure, the provision of services, public education, community and individual action, regulation and legislation. The policy has undergone a series of revisions which took on board the changing context of national and international development priorities. The revisions sought to re-examine and deal more effectively with issues that have led to the underlying causes of poor environmental health conditions and their impact on human health. The revisions also placed emphasis on the need to ensure systematic collection of data on waste from all sectors of the economy and to support relevant research and development associated with the growing economy, rapidly increasing population and changing lifestyles.

Table 5: Measures for solving environmental health problems in Accra Metropolis

<i>Proposed solutions</i>	<i>Frequency (n)</i>	<i>Percentage (%)</i>
Effective implementation of environmental health policies	15283	20.010.9
Regular de-silting and spraying of gutters		
Massive public environmental health education	83	10.9
Government and private sector entities should provide dustbins to households and institutions	137	18.1
Construction of proper drainage systems and decongesting water ways	93	12.3
People should always eat healthy and hot food	61	8.1
It should be compulsory for all households to have toilets	60	7.9
Recycle and reuse waste	55	7.3
Waste collection contractors should always collect waste on time	32	4.2
Total	756	100

*multiple response: These are questions that allow respondents to select more than one response for a particular question. Therefore total frequency exceeds the sample size for the study.

Source: Field Data 2016

The National Environmental Sanitation Policy Coordinating Council (NESPoCC) is responsible for the implementation of the national sanitation policy, which states that all households should strictly be required to provide domestic toilet facilities (MLGRD 2010). The Ministry of Local Government and Rural Development (MLGRD) is mandated to implement effective environmental health sanitation (through Sanitary Inspectors), dissemination of sanitary information (hygiene education), pests/vector control, and law enforcement (Fried 2012). Related ministries such as the Ministry of Environment, Science and Technology (MEST); Ministry of Health; the Ministries of Works, Housing and Water Resources and Employment and Labour Relations must coordinate their policies, programmes and projects so as to ensure a significant improvement of environmental health conditions in the metropolis and Ghana in general. Clearly, effective coordination of the roles, responsibilities, programmes, projects and activities of local authorities is also primordial for delivering high quality environmental health conditions in the metropolis and Ghana in general. Secondly, it is vital that the National Development Planning Commission (NDPC) and development policy implementation agencies such as the Town and Country Planning Department, the Community Development Department and the Environmental Protection Agency (EPA) synchronise and properly coordinate the implementation of their programmes and projects and embed them in the environmental health needs of the metropolis (Acheampong 2010). At the local authority level, the MMDAs are responsible for operational matters relating to environmental health. For example, the Waste Management Department of each Assembly is directly charged with the responsibility for solid and liquid waste management while the medical officers of the health departments are in-charge of the inspection, monitoring and enforcement of bye-laws for safeguarding good public health conditions.

Targeting Sanitation as the Cornerstone of Public Health

Sixty (60) percent of the respondents of the field survey attributed environmental health problems in the Accra metropolis to environmental related diseases and sanitation. This view is sup-

ported by WHO/UNICEF (2010) which stress that sanitation is a cornerstone of public health because improved sanitation contributes enormously to human health and wellbeing, especially for girls and women. The two international organisations stress that effective sanitation interventions can help to reduce the risk of contracting diarrhoeal diseases by a third. For example, using proper toilets and hand washing - preferably with soap - prevents the transfer of bacteria, viruses and parasites found in human excreta which otherwise contaminate water sources, soil and food. As has already been mentioned, this is a major cause of diarrhoea, the second biggest killer of children in developing countries and Ghana. In addition to the various target groups that participated in the survey, interventions for improving sanitation in the Accra metropolis and Ghana in general should also target schools and school children because it will help to improve learning and the health of children. It is important to provide schools with private and separate toilets for boys and girls and facilities for hand washing with soap.

Proper Understanding of Hygiene and Environmental Health

Eighteen (18) percent of the respondents cited environmental health education as an effective solution to environmental health problems in the metropolis. In addition, 34.6 percent of the respondents pointed to individuals in the metropolis as the biggest contributor to the worsening environmental health conditions. Therefore, promoting good understanding of hygiene and environmental health is particularly important. The World Bank's (2013) research findings lend support to this recommendation. The Bank describes hygiene and sanitation promotion as a broader concept than hygiene education. Hygiene education is concerned with teaching people about how diseases spread; for example through the unsafe disposal of excreta or by not washing your hands with soap after defecation. However, research and field experience show that mere hygiene education rarely results in a desirable and sustained behaviour change; people's belief systems about health run deep and resist change. In other words, simple technical knowledge is not, by itself, a powerful motivator for behaviour change. Hence, more needs to be done than just 'educating' people to change or adopt new hygiene practices. According to the World Bank

(2013), health is seldom the most effective motivator for adopting hygienic behaviours. It argues that cleanliness, modernity, self-respect, a sense of purity, elimination of bad smells and other factors are frequently cited as more powerful motivators than health among those who adopt better hygiene and/or sanitation. For hygiene promotion to be more effective, it should focus on trying to affect two, or at the most three, key behaviours which should be chosen carefully to satisfy the following requirements (World Bank 2013):

- ♦ Reflect the objectives of the project and the needs of the project beneficiaries.
- ♦ Maximize the positive impact on public health.
- ♦ Be amenable to change through well-designed and implemented interventions; challenges from major social, cultural and economic barriers should be minimized.

Effective Involvement of Major Groups and Stakeholders

In order to effectively address the causes of environmental health challenges in the Accra metropolis, the respondents recommended effective communication with the relevant target groups which included traders, market women, transporters, industries, schools, media houses and NGOs. As is suggested by Fried (2012), the key players in the environmental health sector in the Accra metropolis and Ghana in general include a broad range of stakeholders from the public and private sectors and public-private partnerships (PPP) at the community, local and central government levels. The World Bank (2013) supports this view and recommends that communication should be inspired by what local people already do, build on what they already know, and come from trusted sources.

Traders, Market Women and Transport Union Members

The interviewees from the Accra Metropolitan Assembly (AMA) indicated that for the past few years, the Assembly has been campaigning vigorously to propagate proper means of disposing refuse, especially in the market places, as a strategy to keep the city clean. Meanwhile, some major markets like Mallam Atta do not have enough refuse collection containers. With over a population of 1,000 people, this market had only two refuse collection containers, which also

served households in the neighbourhood. The inadequacy of refuse collection containers is seriously retarding the waste collection process in markets in the metropolis. Consequently, the traders and residents are compelled to indiscriminately dump refuse around the waste containers whenever they are full mainly because the containers are not regularly emptied. Agboghoshie is one of Accra's biggest foodstuff markets. Its location makes it accessible to people from various parts of the metropolis. Customers prefer to shop in this market because of the cheap prices of foodstuffs and other products. According to Bitlegma (2013), appropriate storage facilities are non-existent as frozen chicken and meat are displayed in the open at the mercy of flies. This makes food poisoning a possibility and some of the vegetables lose their state of freshness and nutritional value due to poor handling methods.

Industry and Environmental Health

The Focus Group Discussions (FGD) identified industrial development, trade and transport as major causes of environmental health problems in the Accra metropolis. As Szreter (2004) argues, the apparently compelling logical inference is that industrialisation has helped to improve human welfare and health. The participants of the FGD argued that the lure and the material benefits of industrialisation and the unsustainable consumption and production practices in the Accra metropolis entail environmental health risks that must be effectively prevented and/or mitigated. Akabzaa and Darimani's (2001) research findings on the causes of urban health challenges in Tarkwa attributed to the mining industry support the views of the FGD participants. Mining activities are contributing to respiratory tract infections in the town, with an annual average of 840 reported cases. Pneumonia and pulmonary tuberculosis follow, with annual reported cases of 199 and 109 respectively. Industry-related diseases in the Accra metropolis include vector-borne diseases such as malaria, schistosomiasis and onchocerciasis; respiratory tract diseases, especially pulmonary tuberculosis and silicosis; skin diseases; eye diseases; accidents; and mental cases. The FGD participants called for environmental health policies and strategies that positively impact human welfare and living standards of the population in a sustainable manner. The United Nations Economic Commission for Africa's (2017) push for the adoption of green industrial-

sation lends great support to the FGD participants' recommendations.

Schools, Media Houses and NGOs as Platforms for Environmental Health Management

Participants of the Focus Group Discussion (FGD) organised for students of University of Ghana Business School unanimously stressed the need to use schools in the Accra Metropolis and other parts of Ghana for promoting good environmental health management practices. One of the participants argued thus:

"The Government and environmental health players should see schools in the country as the central ground for demonstrating and promoting effective environmental health management practices. Most schools in Ghana already have curricula on environmental health issues and therefore offer excellent opportunities for popularising and showcasing the best sanitation and hygiene practices in a sustainable manner."

The World Bank (2013) advised that schools may be better places for enforcing certain good environmental health behaviours in children than the home. For example, schools can provide an arena where sanitation and certain positive hygienic behaviours such as hand washing with soap before eating and after going to the toilet can become a normal habit at a young age. However, hygiene promotion in schools should go beyond teaching and enforcing certain habits. According to the World Bank (2013), research has shown that children will more willingly change behaviour if they are having fun and if they are following their peers. Imitation is one of the most successful forms of learning. The Bank therefore advises that developing and implementing school sanitation and hygiene programmes should consider the following issues:

- ◆ School sanitation facilities: The main users of the facilities are children and designs need to be appropriate. This is particularly critical for young children around the age of 4 to 5 who are just starting to use the toilet and will be put off if toilets are too large, dirty or dark.
- ◆ Getting the message right: Schools provide an arena for influencing children's behaviour. Direct hygiene education may have limited effect in triggering behaviour change; investigations focused on children's behaviours, attitudes and interests are needed to develop the right hygiene promotion strategy.
- ◆ Coordination: The Ministry of Education sets educational policy and regulates schools,

while water and sanitation may be the responsibility of a different ministry. It is important to facilitate collaboration between these ministries, so that resources can be effectively directed at sound and consistent approaches.

- ◆ Linking home with school: Schools are part of the larger community and must be supported by its members. A school water, sanitation and hygiene programme will only be effective if it is reinforced and supported within the community, and the homes of the students. Hence, a school sanitation and hygiene programme needs to be embedded within the context of a larger community water, sanitation and hygiene programme if it is to reach its full potential.

The participants of the FGD identified media houses and NGOs as major stakeholders for sustainable development. These stakeholders have capacity to educate the population through the dissemination of relevant information to raise awareness on environmental health issues through talk shows on radio and television, conferences, publication of relevant information in newspapers, journals, social media channels and on the internet.

CONCLUSION

The worsening environmental health conditions in the Accra metropolis constitute fundamental human health and sustainable development challenges that must be effectively fixed. With increasing urbanisation, growing concentrations of people with very low incomes and the expansion of informal settlements, it is likely that more and more residents of the metropolis will rely on public or shared environmental health facilities. It is obvious that impacts of poor environmental sanitation on human health include direct medical expenses associated with treating sanitation-related illnesses and lost income through reduced or falling productivity and government expenditure on provision of health services. Poor sanitation also leads to reduced income from tourism (due to high risk of contamination and disease) and clean-up costs. The capacity to initiate appropriate policy reforms and provide supportive legal and regulatory frameworks; stimulating relevant research on key issues to generate objective information; strengthening capacity in urban environmental health management; and organising continuous monitoring and evaluation

of urban environmental health policies and programmes must be top priorities of the Accra metropolis and the Government of Ghana. Managing urban environmental health conditions in the metropolis requires an integrated approach and close collaboration between communities, local authorities, the government, industries, traders, transporters, media houses, NGOs and international development partners. The integration of environmental health considerations in the development policies and programmes of the Accra Metropolitan Assembly (AMA) and effective application of urban environmental management systems will significantly help to improve environmental health challenges in the metropolis and contribute to achieving SDG 6 in Ghana.

RECOMENDATIONS

To ensure consistent, systematic and effective management of urban environmental health challenges in the Accra metropolis, it is recommended that AMA adopts urban environmental management systems as a guiding framework. Environmental policies, objectives and targets with pre-determined indicators that provide measurable goals and a means of determining urban environmental health performance levels need to be formulated. Legislation of environmental health laws and regulations is vital for improving urban environmental health conditions in the metropolis. This requires conducting research to generate vital data and information to inform policy revision, decision-making and proper urban development planning. Sustainable financing strategies including application of the polluter pays principle. It is also important to deploy effective information, communication and education systems to raise awareness of the population and key stakeholders on environmental health challenges and how best to redress them. In addition, strengthening human and institutional capacity and improving hygiene and sanitation services are vital strategies for redressing the poor environmental health conditions in the Accra metropolis, including application of the polluter pays principle.

Continuous monitoring and evaluating the performance of urban environmental health policies, programmes and projects in the metropolis are also essential for remedying the current poor environmental health conditions. Monitoring is a continuing function that uses systematic collection of data on specified indicators to provide management and stakeholders of on-going de-

velopment interventions with indications of the extent of progress towards achieving the set of objectives and the use of allocated resources. The roles of individuals and institutions responsible for ensuring quality environmental health conditions in the metropolis must be well planned, coordinated, monitored, evaluated and appropriate corrective measures taken. This certainly requires comprehensive data collection and analysis. Monitoring and evaluation provide suitable frameworks that can be used to generate information for effective decision-making and policy advocacy purposes. It will also allow the various actors to feedback information for ensuring that the best urban environmental health practices are promoted.

ACKNOWLEDGEMENTS

I hereby acknowledge, with profound gratitude, the assistance of the staff of International Centre for Enterprise and Sustainable Development (Vincent Mensah Bio, Millicent Iddrisu, and Seth Nuamah) who participated in collecting field data for the preparation of this paper. I am especially grateful to Portia Oware Twerefoo, Thomas Akgyekum Kyeremeh and Samuel Anuga, all former post-graduate students of University of Ghana, for assisting in the field data collection and analysis.

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Paper received for publication on January 2019
Paper accepted for publication on March 2019