

Environmental Sanitation Dilemma in the Tamale Metropolis, Ghana

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Abstract—The 21st century has been characterized by rapid urbanization with its associated environmental sanitation challenges especially in developing countries. However, studies have focused largely on institutional capacity and the resources needed to manage environmental sanitation challenges, with few insights on the attitudes of city residents. This paper analyzes the environmental sanitation situation in a rapidly urbanizing Tamale metropolis, examines how city residents' attitudes have contributed to poor environmental sanitation and further reviews approaches that have been employed to manage environmental sanitation. Using secondary and empirical data sources, the paper reveals that only 7.5 tons of 150 tons of total daily solid wastes generated is effectively managed. The findings suggest that the poor sanitation in the city is influenced by two factors; poor attitudes of city residents and weak institutions. While poor attitudes towards environmental sanitation has resulted in indiscriminate disposal of waste, weak institutions have resulted in lack of capacity and pragmatic interventions to manage the environmental sanitation challenges in the city. The paper recommends public education on environmental sanitation, public private partnership, increased stakeholder engagement and preparation and implementation of environmental sanitation plan as mechanisms to ensure effective environmental sanitation management in the Tamale metropolis.

Keywords—Environmental sanitation, developing countries, waste management, developing countries, Tamale, urbanization.

I. INTRODUCTION

GLOBAL statistics have highlighted the alarming rate of urbanization in developing countries especially in Africa where there is an estimated urban population of 54% in 2030 [1], with cities gaining an average of five million residents every month [2]. This phenomenal growth has been described as 'galloping' and 'wild' [3], to express not only the uncontrolled nature of urban growth but also the ecological and sanitary consequences often associated with the growth and the implications they may have on human health and well-being [4].

According to [2], equity and sustainability are critical factors that arise from increasing urbanization as city authorities strive to harmonize the spatial, social and environmental aspects of cities. Although cities in the developing countries present real opportunities for increasing

energy efficiency, reducing disparities in development and improving living conditions, they are not without challenges. Increasing urbanization in these cities often results in pollution, poor environmental sanitation, outbreak of diseases, unemployment and lack of adequate shelter. However, research has shown that environmental sanitation is the single most important factor that endangers human health and sustainable management of the natural environment in cities in developing countries especially in Ghana [5]-[7].

Focusing on environmental sanitation, the World Health Organization defined it as the control of all those factors in man's physical environment which exercise or may exercise a deleterious effect on his physical development, health and survival [8]. Although environmental sanitation in Ghana has often been cited as a major environmental and human challenge, it remains an ignored issue [6]. Despite the increasing environmental sanitation related research efforts in Ghana and in other developing countries over the past two decades [9], [10], each year poor hygiene, mismanagement of liquid and solid wastes and lack of sanitation facilities contribute to the death of hundreds of poor people [11]. Emphasizing sustainability of cities in Ghana, basic environmental sanitation challenges include poor enforcement of environmental laws, inadequate sanitation facilities and unsafe disposal or storage of waste in/around houses and streets which provide habitats for vectors causing diseases such as typhoid fever and diarrhea in the urban areas.

Increasing urbanization in cities in Ghana is rapidly depleting and degrading the natural environment and worsening environmental sanitation conditions as there is increasing number of overcrowded informal settlements characterized by inadequate housing and poor provision of infrastructure such as water supplies, sanitation and waste management services. Additionally, the perceived job openings and trade prospects in Ghanaian cities have become the attraction bait for the rural population. The resultant effect has been the aggravation of the environmental sanitation conditions contributing to slum development in many cities including the Tamale metropolis.

Efforts to combat poor environmental sanitation and to create a functional urban environment in cities in Ghana have been enshrined in the Millennium Development Goals (MDGs). The MDGs are global commitment to reduce poverty especially in developing countries and seek to ensure environmental sustainability [12]. Focusing on environmental sanitation, the MDGs seek to reduce by half the proportion of people without sustainable access to safe drinking water and

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basic sanitation, and to achieve significant improvement in the lives of at least 100 million slum dwellers by 2020 [12].

Despite attempts by the international community, and national and local governments, environmental sanitation especially waste management continues to be a major challenge in Ghana. Studies have identified low priority accorded to environmental sanitation on the political agenda of many African countries including Ghana as key factor resulting in poor environmental sanitation, as these countries struggle with equally important issues such as hunger, health problems, unemployment and even civil war [13]. However, there are few insights on how city residents' attitudes have contributed to the worsening state of environmental sanitation in developing countries, particularly Ghana [10].

This paper examines the state of environmental sanitation in a rapidly urbanizing Tamale metropolis, the role of city residents' attitudes to environmental sanitation, and institutional strategies to manage the environmental sanitation

challenge.

II. STUDY AREA AND METHODS

A. Study Context

With an annual population growth rate of 3.5%, the Tamale metropolis is one of the fastest growing cities in Ghana. Tamale is the capital of the Northern Region and the fourth largest city in Ghana and has a total population of 371,351 [14]. With a total land area of 922km², Tamale has three sub-metropolitan areas and is located in the heart of the Northern Region, the only district with metropolitan status among 20 districts in the region. It lies between latitude 9.16° and 9.34° N and longitudes 00.36° and 00.57W and shares boundaries with Savelugu-Nanton District to the north, Tolon-Kumbungu District to the west, Central Gonja District to the South-West, East Gonja to the South and the Yendi Municipal Assembly to the east (see Fig. 1).

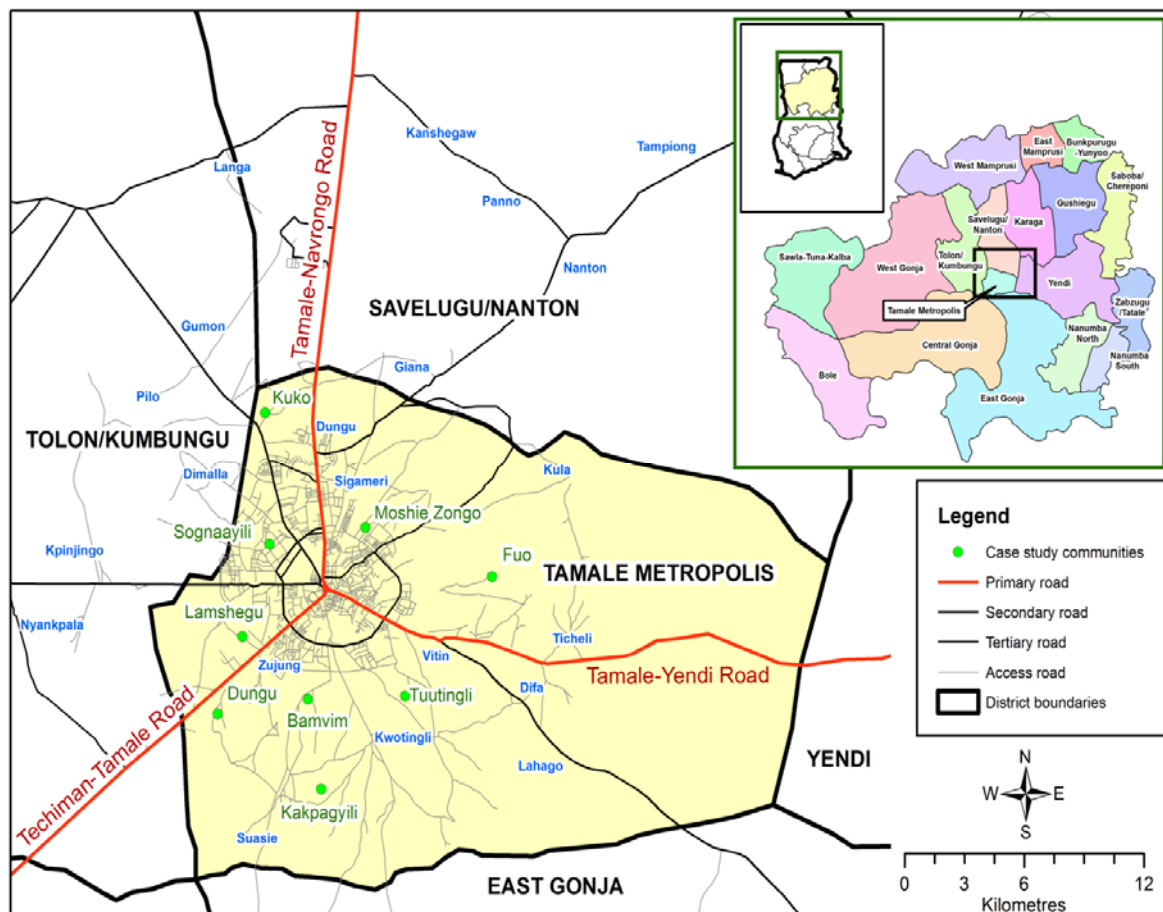


Fig. 1 Geographical location of Tamale

Given its concentric structure, Tamale is developing in all direction and has become the hub for immigrants from within and outside the Northern Region. As one of the fastest growing cities in the country, Tamale is challenged with poor environmental sanitation especially in the area of solid and liquid wastes management, which happens to be the single

greatest problem in the metropolis.

B. Study Approach

This paper is based on a research work undertaken in the Tamale metropolis from August 2011 to July 2012. Regarding the approach and methods used, literature review focusing on

the various environmental sanitation management practices to understand and establish the peculiarity and uniqueness of environmental sanitation in Tamale was undertaken. The study further reviewed departments' and other consultancy reports from some of the decentralized institutions in the Tamale metropolis such as Waste Management Department (WMD), Environmental Health and Sanitation Department (EHSD), Environmental Protection Agency (EPA) and Zoomlion Ghana Ltd. These documents were very useful in appreciating the state of environmental sanitation in the city and also aided in identifying the key stakeholders (institutions and non-institutions) involved in managing environmental sanitation in the Tamale metropolis.

Having identified the key stakeholders, six institutions were purposively selected and involved in the study based on their activities, understanding and involvement in environmental sanitation in the city. These institutions included: Tamale Metropolitan Assembly (TaMA) responsible for the physical and socio-economic development of Tamale; WMD responsible for the collection and disposal of waste; Zoomlion Ghana Ltd, a private waste management institution responsible for keeping Tamale clean, green and healthy; EPA ensures sustainable management of air, land and water; EHSD responsible for clean household level environmental sanitation; and the Sub-metropolitan Assemblies that ensure healthy environment within the sub-metropolitan areas. Officials from these institutions were engaged in institutional surveys using semi-structured interviews and telephone conversations.

At the community level, the purposive sampling method was used to select 9 suburbs from a total of 250 suburbs across the metropolis as case studies, and they include Kukuo, Sognaayili, Moshie Zongo, Lamashegu, Fuo, Dungu, Tuutingli, Bamvim and Kakpagyili. These communities are centrally located and emerging suburbs with varying degree of environmental sanitation challenges (see Fig. 1). The heads (traditional leaders) of the various communities (9) and 10 residents from each community were interviewed for the purposes of gaining first hand data on the state, conditions and causes of environmental sanitation in the metropolis.

Data gathered from both the household and institutional levels were presented to the participants in a focus group discussion at the community and institutional levels. The focus group discussion was useful in harmonizing, clarifying and addressing any inconsistencies that had occurred.

III. RESULTS AND DISCUSSIONS

A. Basic Characteristics of the Tamale Metropolis

A study by the Tamale Metropolitan Planning and Coordinating Unit in 2011 reveals that there is a housing deficit of 40% in Tamale [15], a situation which has contributed significantly to the poor state of environmental sanitation in the Tamale metropolis in the form of slum development. Out of a total 45,269 households living in the metropolis, about 70% live in compound houses (one of the

common housing types in Ghana where many households live in different rooms in a single house but share facilities like kitchen, toilet and bathhouse). These compound houses are located in low class residential zones in Tamale close to the city centre and lack the needed environmental sanitation facilities such as toilets and refuse collection bins. Given the rapidly urbanizing nature of Tamale, the study findings revealed there is an increasing conversion of bath and toilet facilities by house owners into residential unit/room. According to some city residents, this situation is believed to have resulted in residents' appalling attitudes towards environmental sanitation.

With a total of 53% employment level, about 42% of the working population in the Tamale metropolis is engaged in agriculture while the remaining 58% are engaged in sales, services, transport and manufacturing [15]. The study findings suggest that the economic and commercial role of Tamale has served as bait for attracting immigrants into the city who tend to live in slums and unauthorized areas. This situation is believed by majority of residents to have contributed to poor environmental sanitation in the city.

B. Understanding Environmental Sanitation in Tamale

The study findings showed that the Tamale metropolis generates a total of 150 tons of solid wastes and 3,050 gallons of liquid waste daily. Out of these figures, about 87% of solid waste and about 92% of liquid waste are generated by households. Solid and liquid wastes constitute 70% and 30% respectively of the total waste generated in the Tamale metropolis. In terms of waste composition, solid waste forms the bulk (70%) of total waste generated in the Tamale metropolis comprising polythene (35%), plastic (20%), paper (10%) and other materials such as pieces of broken woods (5%). The city residents pointed out that the dominance of polythene waste is a result of increasing proliferation of hawkers who are mainly immigrants, and food vendors in the city. The waste management situation is particularly appalling in the suburbs close to the central business districts (e.g. Moshie Zongo).

However, the study findings revealed that only 7.5% of the total solid wastes generated are effectively managed. According to the WMD, inadequate personnel, resources (e.g. vehicles), and waste management logistics (e.g. waste collection containers) are factors accounting for poor waste management. For example, the entire Tamale metropolis comprising of 250 suburbs is served by only 13 WMD personnel instead of 35 personnel with only 78 communal containers for waste collection when not less than 1000 containers are needed to ensure effective environmental sanitation management in the metropolis. This situation affirms the argument in the literature that environmental sanitation in developing countries is accorded low priority by city authorities [13].

Besides, the study findings revealed that the weak institutional capacity has resulted in the poor management of the land fill site. The land fill site as shown in Fig. 2 has been left over two years without any treatment due to financial

constraints. According to the WMD, not less than GH¢100,000 (US\$ 66,600) is needed weekly to maintain the land fill site, a financial commitment which the city authorities' claim cannot be met due to inadequate resources. Ideally, the land fill site is supposed to be treated weekly to avoid or minimize any hazards such as outbreak of diseases but the study findings indicate that since 2010 the land fill has not received any treatment. As a result, residents living close to the facilities lamented the awful conditions of stinking heaps of waste from the land fill site.



Fig. 2 The state of the Tamale landfill site

Despite the apparent weak institutional capacity to manage environmental sanitation in Tamale, the interviews with the city residents revealed that the poor attitudes of some city residents appear to be the major cause of poor environmental sanitation. Majority of city residents interviewed admitted that they have engaged in acts of indiscriminate disposal of wastes. As illustrated in Fig. 3, indiscriminate disposal of solid waste mainly plastic and polythene materials has become a communal practice in the metropolis causing urban blight. Although some city residents attributed the indiscriminate disposal of waste to lack of refuse collection and management system, the study findings suggest that majority of them littered the streets on purpose. One city resident commented that: "... the Zoomlion workers (private waste management institution) have been paid to clean the city, if we don't litter the streets, they won't have any work to do ...". This quote emphasizes the apathy some of the residents in the metropolis have developed towards environmental sanitation, a situation which has resulted in heaps of wastes on the road sides.



Fig. 3 Indiscriminate dumping in Tamale Metropolis

Another aspect of city residents' attitudes towards

environmental sanitation which is worth noting is indiscriminate defecation. Some residents attributed the indiscriminate defecation to inadequate public toilet facilities in the metropolis. One resident explained the situation: "... this suburb has only two public toilets, meanwhile most of the houses here don't have toilet facilities in them. Some people defecate in the bushes around because they can't walk long distances to or queue at the public toilets ...". The study findings showed that indiscriminate defecating by some residents in open spaces and surrounding bushes has contributed significantly to the cases of cholera and diarrhoea in the city as shown in Fig. 4. Areas designated for public uses such as public open spaces and schools have been converted into places of convenience by some residents of Tamale metropolis.

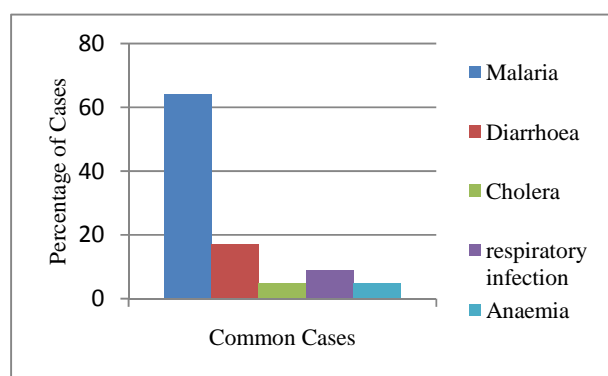


Fig. 4 Five common reported cases (diseases) in Tamale metropolis
 Source: Derived from EHSD report

C. Effects of Poor Environmental Sanitation on the Development of Tamale

The study findings indicated that poor attitudes of city residents towards environmental sanitation coupled with weak institutional capacity has affected the development of the metropolis in a number of ways. First, the city authorities mentioned that poor attitudes towards environmental sanitation are a major cause of choked sewerage system with solid waste. As a consequence, flooding has become a normal phenomenon accompanying rainfall in the metropolis. This situation does not only worsen the environmental sanitation conditions but threatens the lives of residents especially during heavy downpour.

As illustrated in Fig. 4, the poor state of environmental sanitation in the metropolis has contributed to various infectious diseases such as malaria, cholera and diarrhea. Also, the city residents reported high incidence of early mortality rates in the metropolis which they believe poor environmental sanitation is a key contributory factor. The residents' perception, regarding mortality rates and environmental sanitation, was confirmed by official government's report which showed that mortality rates among children below the age of five are significantly higher in the three northern regions compared to any other region in Ghana [16].

Another effect which was strongly expressed by the city residents is pollution. According to them, environmental pollution has become an accepted practice in the Tamale metropolis. Inadequate environmental sanitation facilities and poor attitudes coupled with poor management of the landfill site appeared to have posed considerable health risk to residents of the metropolis especially those living close to the landfill site. Supporting this is a study by United Nations Environment Program which revealed that city residents living in close proximity to landfill sites and refuse disposal sites particularly in developing countries are greatly exposed to severe health hazards resulting from pollution of drinking water and soil [17]. As earlier mentioned, the Tamale landfill site has not received treatment since 2010 due to financial constraints. According to the residents, this situation has resulted in the flow of effluents especially during heavy downpour from the site into ground water which poses health risk to them. The study findings revealed that the pollution problem is compounded by the incidence of indiscriminate defecation in open spaces and bushes in the metropolis, which literature suggests endangers human health [5]-[7].

D. Approaches for Managing Environmental Sanitation in Tamale

Similar to the situation in other developing countries, the environmental sanitation management efforts in the Tamale metropolis are based on two key legislations: Local Government Act (Act 462) and the EPA Act (Act 490). The Local Government Act (Act 462) establishes the sub-metropolitan areas as functional and effective community-based structures for ensuring good environmental sanitation in the urban environment, and creates a platform for and mandates the TaMA to initiate programs for the management of environmental sanitation. The EPA Act, Act 490 provides a supporting framework for safeguarding clean and healthy environment in the metropolis. The Act mandates the EPA to regulate the implementation of government policies on the environment in the metropolis.

Although study findings revealed that there are indications of legislation enforcement in Tamale including the restoration of environmentally threatened ecosystem such as the forest reserves and agricultural residential areas in the metropolis (e.g. Nyohini and Gumani suburbs), poor coordination among the environmental sanitation institutions (e.g. EPA, TaMA, EHSD and WMD) has become a daunting challenge. As a result, there is no environmental sanitation policy or plan. As one of the fastest growing cities in Ghana, the lack of comprehensive environmental sanitation plan/policy to guide effective management of environmental sanitation in the city was attributed by the institutional interviewees to poor coordination and collaboration between the institutions.

The study findings showed that poor attitudes of the city residents have also reflected in the management of environmental sanitation in the metropolis. According to some city residents, individuals, groups of persons and institutions contravene the environmental sanitation legislations with impunity as a result of their political affiliations. Poor

attitudes of politicians and traditional authorities were mentioned by the city residents as the major challenge impeding the implementation of environmental sanitation legislations. For example, the residents in Gumbihini suburb were dissatisfied with their sub chief who had sold out a piece of land demarcated for a public toilet facility to a private developer. The residents explained that efforts to retain the land for its original use proved futile as a political party chairman intervened and got the case withdrawn from court. These poor attitudes of some traditional leaders and politicians in the city have been contributing to poor environmental sanitation, as they appear to render the enforcement of the legislations (e.g. Act 462) ineffective.

E. Improving Environmental Sanitation in Tamale: Future Directions

Central to this paper is the understanding of the state of environmental sanitation in the Tamale metropolis and the contribution of poor attitudes of city residents to environmental sanitation challenges. The paper has established an abysmal state of environmental sanitation in Tamale, which reflects the situation in many cities of developing countries. The poor environmental sanitation in the Tamale metropolis is characterized by poor attitudes of residents and weak capacity of waste management institutions, which has resulted in indiscriminate disposal of wastes, inadequate environmental sanitation facilities, and low priority accorded to environmental sanitation by city authorities. Regarding the approaches to environmental sanitation, the paper has identified lack of environmental sanitation plan/policy and weak enforcement of legislations due to the poor attitudes of traditional leaders and politicians, as the underlying challenges impeding effective implementation of environmental sanitation legislations in Tamale.

With poor and apathetic attitudes of city residents, the paper recognizes the need for environmental sanitation education in the metropolis. City authorities should capitalize on the availability of mass media to enlighten, engage and involve the city residents in environmental sanitation and related issues. City residents should have easy access to environmental sanitation information especially on ways of ensuring good environmental sanitation as well as its associated benefits. This has the potential of reducing the high level of apathy among residents and to minimize indiscriminate disposal of wastes as well as reducing the number of environmental sanitation health related cases.

As an effort to ensure effective enforcement of environmental sanitation legislations, the paper advocates for more collaboration and coordination between the traditional/local leaders of each suburb within the metropolis and the city authorities. Environmental sanitation institutions should make conscious efforts to build cordial relations with the traditional leaders through regular visits and engagement.

The paper recommends close collaboration and engagement of the private sector in environmental sanitation management. The city authorities through the WMD should engage more

private waste management companies to ensure effective management of wastes. Given the huge sums of money needed in managing environmental sanitation especially the land fill site and the low priority accorded to environmental sanitation, the paper proposes that a 'special fund' be created solely for environmental sanitation management in the cities of developing countries, particularly the Tamale metropolis. This fund should be created by the city authorities from their internally generated fund and should target at procuring basic environmental sanitation facilities such as waste collection bins, and providing support to the environmental sanitation personnel.

Moreover, the paper proposes that the city authorities in consultation with the various key stakeholders involved in environmental sanitation should prepare an environmental sanitation plan for the city. As earlier mentioned, the lack of environmental sanitation plan in Tamale has contributed to the low priority accorded to environmental sanitation by city authorities. The formulation of an environmental sanitation plan to guide the management of environmental sanitation in the Tamale metropolis would contribute towards improving the environmental sanitation conditions in the city.

IV. CONCLUSION

This paper has discussed the environmental sanitation conditions and practices in the Tamale metropolis amidst increasing urbanization. The paper has revealed that the underlying causes of the appalling state of environmental sanitation and the weak approaches used in managing it are largely attitudinal. The paper established two levels of environmental sanitation challenges: poor residents' attitudes and weak institutional capacity. The paper identified city residents' attitudes to be the major cause of poor environmental sanitation. Issues relating to indiscriminate disposal of wastes and defecation were noted to be associated with the poor attitudes of residents. The weak institutional capacity has resulted in city authorities' inability to effectively manage environmental sanitation and it reflects what literature reports [6], [10]. Issues such as lack of environmental sanitation plan and weak enforcement of environmental sanitation legislations have ensued as a result of weak institutional capacity.

In response to these challenging situations in Tamale, the paper recommends environmental sanitation education, preparation environmental sanitation plan, collaboration and engagement of environmental sanitation stakeholders and a conscious effort to fund environmental sanitation in the metropolis. It is believed that conscious adherence to and application of the recommendations made by the paper would help improve the environmental sanitation situation in the city, and those in other developing countries, and better position Tamale to play its role as the commercial and industrial hub of the northern Ghana. It would further create an environmentally livable and socially inclusive urban environment for residents of the city

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