

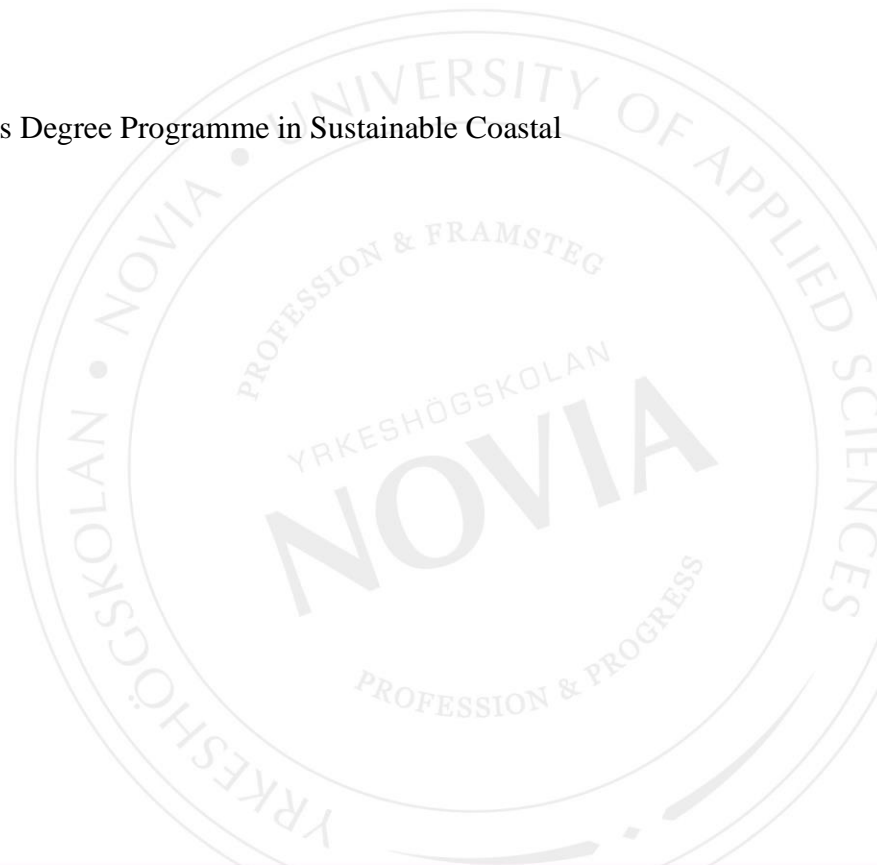
Municipal solid wastes management in Cameroon: “Case study Buea Municipality”

Municipal Solid Waste Management in Cameroon.

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Bachelor's thesis : Natural Resources Degree Programme in Sustainable Coastal
Management

Place and year: Raseborg 2021



BACHELOR'S THESIS

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Degree Programmed: Sustainable Coastal Management

Specialization: Natural Resources

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Title: Municipal solid wastes management in Cameroon: "Case study Buea, Municipality"

Date December 1, 2021 Number of pages: 25

Abstract

The rapid economic and industrial growth in developing countries like Cameroon has led to a huge problem when it comes to municipal solid waste management; as such this research project was aimed at examining the municipal solid waste management by Hygiene et salubrite du Cameroun (HYSACAM) in Buea - Cameroon, through the review of articles on municipal waste management and visits of the various dump sites in the Buea Municipality. I did a review of municipal solid waste management in Finland which helps in making recommendations. Findings from this study reveal that the Buea Municipality partnered with a waste management company HYSACAM to help reduce the poor condition of waste disposal in the environment, yet the municipality was still faced with ills related to waste management. All this attributed to limited personnel's, lack of effective legislation, limited equipment's, and lack of community participation. I did recommend that community participation should be enhanced through massive sensitization; effective laws should also be put in place to govern effective waste management. HYSACAM should also employ and train its personnel's and also buy effective equipment's.

Language: English (UK) Key words: Waste Management, Buea Municipal, HYSACAM, And Waste Composition.

Abbreviations

MSW: Municipal Solid Waste

ELY: Centre for Economic Development, Transport and the Environment.

EU: European Union

GCE: General Certificate of Education

HYSACAM: Hygiène et salubrité du Cameroun (a French acronym meaning hygiene and health in Cameroon)

CWASAF: Clean Water and Sanitation Africa

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1 Introduction

Municipal solid waste is one of the most critical environmental hazards affecting rapid growing urban areas in developing countries like Cameroon. The rapid population growth and economic development in urban areas has led to an increase in the production of solid waste by the inhabitants (Karishnamurti and Naidu, 2003). The waste generated from human and economic activities are often disposed because they are considered not useful. Solid waste arises from daily human, economic and industrial activities in which the materials are regarded as not valuable and as such they are disposed (Eric Achankeng, 2004). Cameroon as a developing country just like many other Sub – Saharan countries experiences massive population growth and urbanization and driving an exponential increase in the production of domestic and economic solid waste, this is estimated to be 5.5 million tons a year or 16,000 tons a day (Proparco, 2017). Moreover, Cameroon has still strived to develop a waste management that if well-structured could provide a model for its West and Central African neighbours. Due to low income in developing countries, very low budget is mostly allocated for waste management and as such open dumpsites are common (Haribol Acharya, 2016). The dumping of municipal solid waste is a very common practice carried out by the inhabitants of major cities in Cameroon. Improper waste management in urban areas of developing countries mostly give rise to some environmental hazards, serves as breeding grounds for disease vectors like mosquitoes, drainage from the waste also pollute the nearby water sources giving rise to diseases like malaria, typhoid and cholera. (Navarro Ferronato et al 2019)

When it comes to Municipal waste management there is a major differences between the developed and developing countries, including Cameroon. The developed countries have long come out with stronger strategies on how properly management waste to avoid any environmental and health hazards. All this was achieved through what is known as ‘ solid

waste hierarchy”, while the developing countries are overwhelmed and still battling with problems associated with improper waste management. The solid waste hierarchy is an internationally accepted and recommended ranked of waste handling using the following order from least to most preferred open burning, dump, landfill, incinerate, recycle, reuse, and prevent (Beukering et al. 1999; Adams et al 2000; Wright 2000; Hansen et al. 2002).

The increasing generation of waste within the cities of Cameroon including Buea is related to rapid economic growth, consumption amongst different groups of people, increase in commercial activities as well as household size. The management of municipal solid waste is handled by HYSACAM, this company is striving to help manage waste disposal in the Buea Municipality. Apart from HYSACAM, a Buea based organization known as CWASAF (Clean Water and Sanitation Africa) has as one of its objectives to create awareness through health education on hygiene and sanitation, waste management, environmental sustainability and clean up campaigns and to partner and collaborate with individuals, associations, governments to supply sustainable potable water, enhance proper garbage management and recycling (Bate, 2020). Despite all the measures put in place to manage municipal solid waste in the Buea municipality, the situation is instead getting worse. Waste is seen littering the streets of Buea. As such I had the urge to carry out a research in order to discover the factors related to the poor management of solid waste in the Buea municipality and also to propose recommendations which will help ameliorate the situation.

1.1 Background

The Buea municipal council is the Sub Divisional head quarter and South West Regional head quarter of Cameroon. The municipal council was created on the 29th of June 1977 by presidential decree No. 77/203. The Buea municipality has a surface area of 870 Sq.km, 67 villages, four distinct identified urban spaces as per outlined criteria (Buea station, Soppo, Molyko/Mile 17 and Muea) Figure 1. It is a highly complex community caught between a blend of urban, semi urban, rural and traditional settings. The United Councils and Cities of Cameroon (UCCC 2021). Buea Municipality is surrounded by the following features; to the north by tropical forest on the slope of mount Cameroon (4100m above sea level). The mountain range extends to the beautiful sandy beaches of Atlantic Ocean. The municipality also share boundary with other major towns like the City of Limbe to the South West, Tiko municipality to the South East, Muyuka municipality to the East and Idenau district to the West. With an equatorial climate, temperatures are moderate with a slight seasonal variation (rainy and dry season).Buea has moderate economy with agricultural, administrative, business, tourism and the financial sector taking the central stage of the town. The United Councils and Cities of Cameroon (UCCC 2021).

The Buea municipality has an estimated population of above 200.000 inhabitants and annual growth rate of 5% as per UN projections for urban population growth rate for Africa. The municipality constitutes mostly of the Bakweris (the indigenes) in the villages and a highly cosmopolitan population within the urban space putting the indigenes at a minority Tassang Andrew et al (2020). The Bakweri language spoken by the natives is equally written and documented. English and French are two official languages used for general interaction while pidgin is the lingua franca. Literacy rate is on the rise with some 60-75% of the youths having access to education.(UCCC 2021).

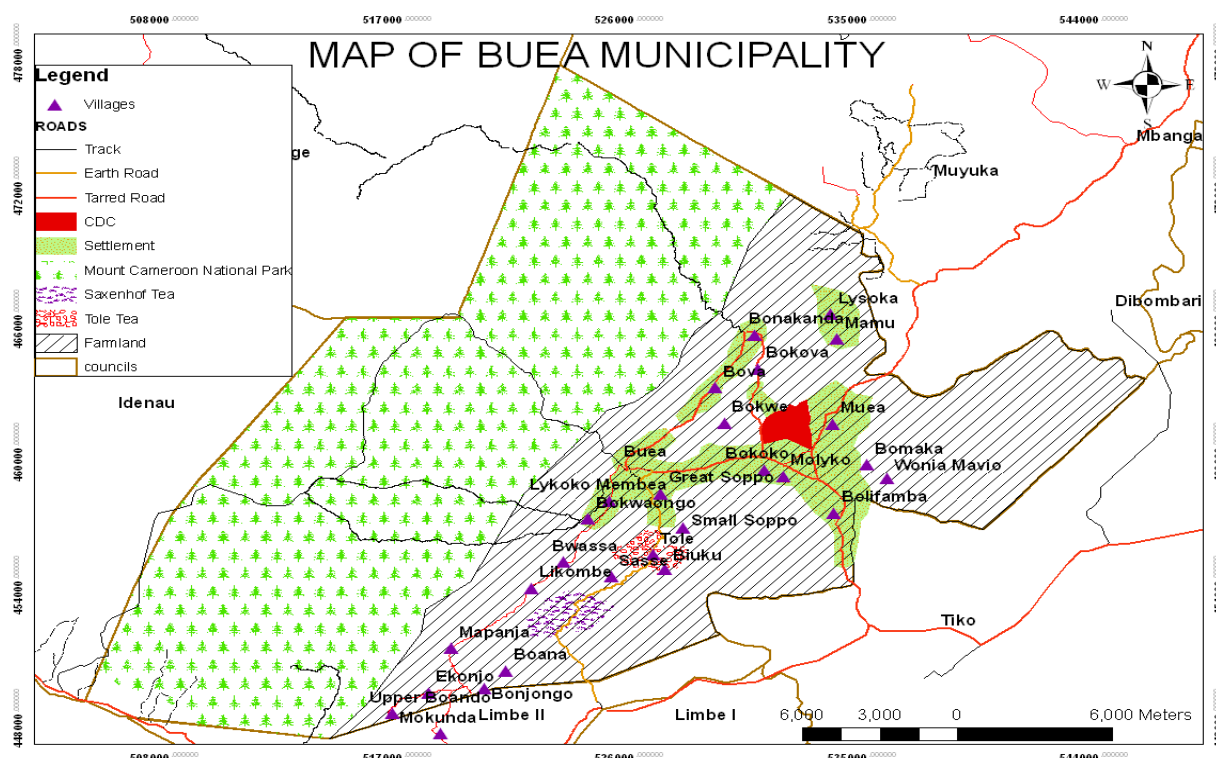


Figure 1: The Map Buea Municipality

Source: Buea Municipality

1.2 Problem Statement

The inappropriate open dumping of waste poses a serious threat on the environment and the health of the population especially in urban areas of developing countries like Cameroon. Due to insufficient funds, urban cities in Cameroon including Buea are struggling to deal with the proliferation of municipal solid waste. The global production of municipal solid waste has greatly doubled over the past ten years and it is expected to reach 2.5 billion tons per year in 2025 as a result of the urban development, commercialization and change in consumption patterns (Baboucar, 2015).

The set back or problems involved in municipal service delivery in terms of waste management in urban areas of developing countries like Buea is often attributed to low financial and human resources, mismanagement, corruption and lack of transparency and

accountability. The above mentioned problems coupled with the rapid urban growth which often leads to the generation of waste in most cities in developing countries have outweighed the ability of the municipalities to provide appropriate waste management services (Bate, 2020).

Just like most cities in the less developing countries in Africa, the Buea municipality is greatly overwhelmed with the challenges in managing the growing waste due to the increase economic and population growth. The collection and disposal of waste has been and is still a major problem in the Buea Municipality, before the Buea municipality partnered with HYSACAM, the Buea Municipality could not still handle the volume of waste generated daily. According to Mr. Michel Ngapani the Regional Manager of HYSACAM during the commissioning ceremony of the partnership with the Buea Council said “for over 10 years now, the hygiene and sanitation situation in the Buea Municipality has been unbecoming” (Baboucar, 2015).

The department in the Buea municipal council in charge of hygiene and sanitation has tried to properly manage waste in Buea yet their efforts aren't enough. The streets of Buea have been transformed into waste bins and this has resulted to increase in endemic diseases like malaria, typhoid and cholera. Most often the inhabitants sometimes fail to use the garbage cans allocated for them by the council. The major challenges mostly faced by HYSACAM include limited equipment's, poor access to neighborhoods, people's negative attitude towards waste disposal (Baboucar, 2015).

1.3 Research Objectives

This research has as its main objective to examine the municipal management by HYSACAM in Buea municipality. This main objectives was then broken down into specific objectives and they included the following: firstly to identify the type of waste

generated most in the Buea municipality, secondly to examine the different ways HYSACAM uses to manage the municipal solid waste in the Buea municipality, thirdly to identify the challenges faced by HYSACAM in the course of managing solid waste in the Buea municipality. Lastly reviewing the strategies put in place to manage municipal solid waste in Finland.

Research Questions

- What are the types of waste generated most in the Buea Municipality?
- What are the different ways HYSACAM uses in managing MSW in the Buea Municipality?
- What are the various challenges faced by HYSACAM in the course of managing solid waste in the Buea Municipality?
- What is the strategy used by the municipalities in Finland to manage solid waste.

2 Research Methodology

This research project is based on secondary data, a review of research articles, relevant standard statistics gathered from the Buea municipal council and visits to the various dumpsites in the Buea Municipality. I followed the approach of Nkingwa (2018) used for a case study in Tanzania. I also did a SWOT analysis to clearly come out with the Strength, Weakness, opportunities and threats associated with the management of waste in the Buea Municipality. The information gathered describes how waste is being managed in Buea municipality with the help of HYSACAM. In the first section of this work I explained the types of solid waste generated, ways in which the waste is managed and finally the challenges faced by HYSACAM in the management of waste. The second section, I briefly explained how waste is properly disposed in Finland as an example of a well-functioning system. Lastly I recommended possible measures which can be used to properly manage the waste which if fully implemented will help manage the waste in the Buea Municipality.

3 Waste in Buea – literature review

The term waste has different meanings to different people because what a person sees as useless could be very useful to someone else. According to the Cambridge dictionary, waste refers to any unwanted matter or material of any type after useful substances or parts have been removed (Cambridge dictionary). Waste is mostly generated from human, commercial and industrial activities. If the local authorities failed to correctly collect, transport and dispose of wastes, it mostly leads to serious environmental and health hazards (Coad, 2006).

3.1 Types of waste

Waste is produced by humans, agricultural, commercial and industrial activities. They are conveniently classified based on their source for example Municipal waste, industrial waste, agricultural waste energy waste etc. they can also be classified as hazardous or non-hazardous.

Municipal waste: These are wastes which are mostly generated from households, offices, and commercial agencies. Such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries.

Agricultural waste: These are waste which are generated as a result of agricultural activities, they include animal slurries, spray residues, empty containers, nylon bags, tress, branches etc. sewage sludge always result from the treatment of industrial and domestic waste. The main components of agricultural waste include animal manures silage effluents. Like sewage sludge, these comprises of fine grain, organic rich particles (Saunders, 2013).

Industrial waste: this refers to the waste which are generated as a result of industrial processes and comprises of a wide range materials it includes general factory garbage, packaging materials organic waste, acids, alkalis and metal. If these wastes are not properly disposed, it can pose serious health problems to the people living in the area. Industrial waste is relatively limited in Buea due to the scarcity of industries (Saunders, 2013).

Biomedical Waste: this refers to waste which are mostly generated from medical facilities, they include infectious and pathological waste. This waste can be very dangerous if not properly handle (Baboucar, 2015)

Radioactive waste: this waste arises mainly from nuclear power generation, military weapons, medical and industrial establishments also produces smaller quantities of

radioactive waste. These wastes can either be classified according to their radioactive properties or their source of origin (Saunders, 2013)

3.2 Characteristic of municipal solid waste

In order to better understand the magnitude of the problems associated with improper waste management, it is very important for us to know the characteristics of waste generated.

Municipal solid waste includes food residue, wood waste, paper, textiles rubber and plastics (Hui et al, 2014).

Classification of Solid waste: Solid Waste is classified into the following:

- **Non – biodegradable waste:** these are waste that cannot be degraded by micro-organisms and as such remain in the environment. Some are hazardous while others are not. Example of non-biodegradable waste includes plastics, nuclear waste, and glass.
- **Biodegradable waste:** these are waste which can be degraded by natural processes example include kitchen waste, animal dung, papers, etc.

3.3 An overview of municipal solid waste

It is of utmost importance to clearly understand some terminologies, according to Buenrostro *et al.* (2001), the indifferent use of terminologies always results in a misunderstanding which may contribute to wrong or inconsistent interpretation of results because the source being analysed is not clear. According to Cointein (2006) municipal solid waste refers to a non-air and sewage emissions generated within and disposed of a municipality, including household rubbish, commercial refuse, construction and demolition debris, dead animal and abandon vehicles. Generally municipal solid waste is generated from household, commercial and industrial activities.

3.4 Municipal solid waste management

The rapid economic and social development has led to an increase in the production of municipal solid waste in the Buea municipality as such there is a need to implement proper waste management in order to limit the environmental and health hazards associated with improper management of waste. The process of waste management is entirely the responsibility of the municipal authorities and involves the right organizational, managerial, technical and cooperation between the various stakeholders in both the private and public sector (Baboucar, 2015). The Buea municipal council partnered with a waste company known as HYSACAM, this waste company managed the municipal solid waste in Buea by providing waste cans at the junction of each street to help in the collection of waste. They are also involved in door-to-door collection of waste. The wastes are transported with the help of waste trucks to the site where they are disposed. At the waste site, they are waste pickers who are allowed to select materials which could be recycled, most at times this waste pickers are not well equipped with personal protective equipment as such they are exposed to health hazards and also there is a chance for them to be attacked by reptile like snakes. HYSACAM practice landfill a process of disposal at a permitted facility where solid waste is permanently placed in or on land in compliance with rules. The limitations of landfill include the drainage of waste liquid into the water sources which contaminates and cause harm to humans, the waste sites are breeding ground for rodents and reptiles that are harmful to humans. Improper management of municipal solid waste can result to harmful effects to the human, plant, animal and the environment in general. The inappropriate waste management is one of the major challenges faced by developing countries, Kofoworola (2007).

3.5 A review on the concept of waste management hierarchy

The concept of waste management is a program put in place in respect to options of actions on solid waste management in regards to sustainability. Figure 2 shows the stratified options from top to bottom “Prevention, reuse, recovery, (recycle, compost and energy), incineration, landfill, dump and open burning” (Hansen *et al.*, 2002, Beukering *et al.*, 1999). This concept is bent on extracting the maximum visible benefits the waste product and also to produce minimum amount of municipal solid waste. There are some controversies and debates to this concept on the appropriate order. According to Fagan *et al.*, (2001) the most appropriate thing to do is to first prevent waste (this could be done through sensitization), then seek to minimize (which could be achieved through increase in efficiency and careful design), and to recovery (this involves recycling, composting).

Despite proven evidence of the waste management hierarchy model, there are still some loopholes and evidence that points to some of its limitation, as the ranking of priorities is seriously questioned (Beukering *et al.*, 1999, Adams *et al.*, 2002). These authors both disagree on the model arguing that the concept is based mainly on environmental effects. However although there are some disagreements on the ranking priorities, the waste management hierarchy provide the nation and municipalities with varieties options to choose which method best suit them to manage their solid waste, and as such we can say with certainty that the content of waste management hierarchy is been used as the basis of solid waste management with lot of progress on the preventive measures (Achankeng, 2004).

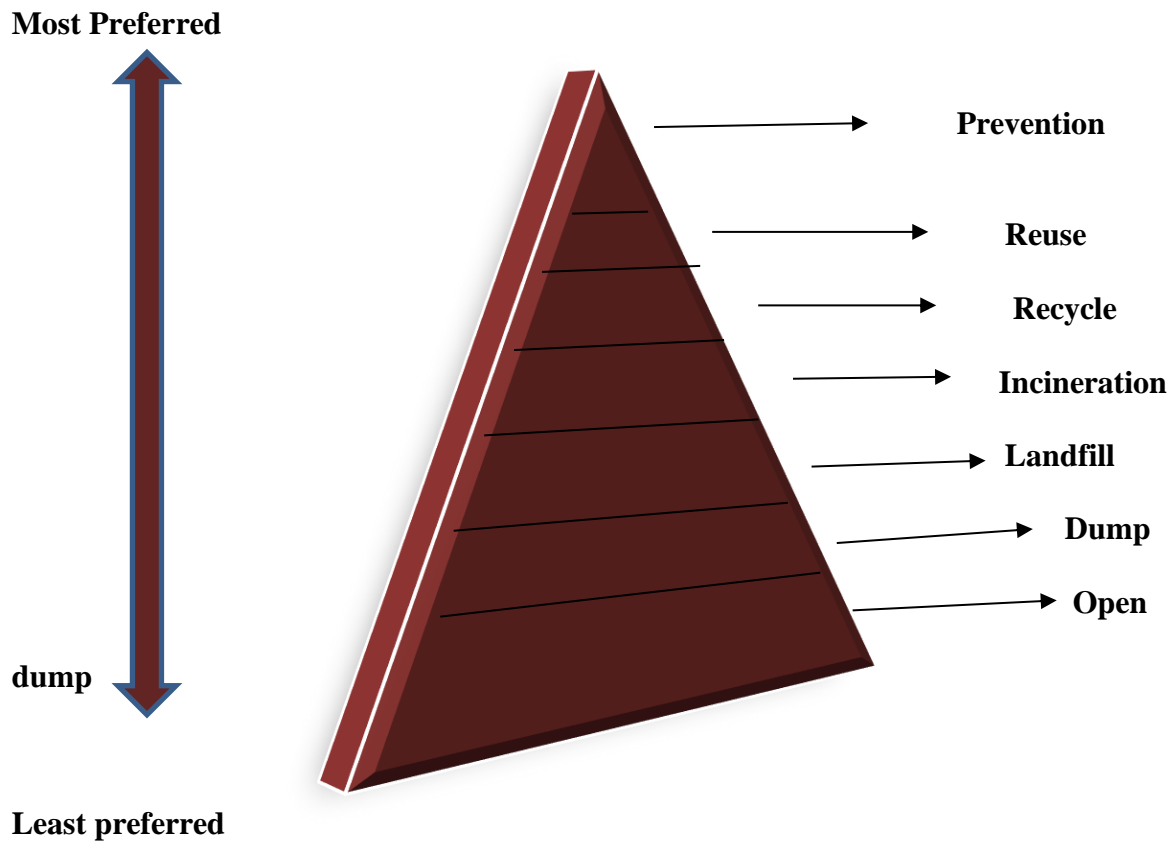


Figure 2: The waste management hierarchy

Sources: Eric Achankeng, 2004

The rapid development of Buea has attracted so many people from different cities and regions of Cameroon. Some come for educational purposes, commercial and political unrest in the country as such there's an increase in population in Buea. According to Rakesh Gir *et al.*, (2010) the generation of waste is an inevitable consequence of urbanization and industrialization. The municipal solid waste generated in Buea is as a result of commercial activities and consumption; these include waste from market places, commercial establishments, institutions and households. Figure 3. The type of waste generated include plastics, nylons, rubbers, rusted metals, torn dresses and useless textile material, vegetable matters, spoiled electronics, wooden objects, bottles and other glass objects, food residue, grasses (Baboucar, 2015).



Figure 3: Waste disposal site at Ndongo – Buea beside the field

Photo credit: Author, March 19, 2021

3.6 The different ways HYSACAM uses in managing MSW in the Buea municipality.

The management of solid waste in the Buea municipality is carried out entirely by a hygiene and sanitation company known as Societe Hygiene et Salubrite du Cameroon (HYSACAM). The contract was signed on September 20, 2010. The branch manager presented a strategy in which he uses the map of Buea to demonstrate the routes in which the HYSACAM Trash trucks will use to get into the various communities and quarters in the City. Elvis Tah (2010). To these effect 30 trash cans of 9 meters were placed in strategic points for waste collection (Figure 4). HYSACAM also did door to door service collecting waste from individual dust bins. Garbage trucks always carry municipal solid waste from the strategic points in quarters where the big trash cans were placed, they also do door to door collection of waste, this waste were transported to the final disposal site located at an isolated area at Mussaka. Finally HYSACAM uses the Landfill method in

which the waste products are buried. “(<https://cameroonpostline.com/hysacam-begins-cleaning-buea/>)”.



Figure 4: Trash cans at Santa Barbara – Buea beside the New GCE board

Photo credit: Author, June 20, 2021

3.7 Challenges faced by HYSACAM in the course of managing solid waste in the Buea municipality.

Before the Buea Municipal Council signed a contract with HYSACAM in 2010, the city of Buea was experiencing serious problems associated with waste management. When HYSACAM finally came into the picture, they were able to come out with strategies to help curb the waste management problem. But after a short while HYSACAM started facing some challenges in respect to waste management. Enjema Judith, the HYSACAM’s head of technical landfill of Buea branch reveals that the inhabitants of Buea are very stubborn and are responsible for the improper waste disposal in the city; she also added that the Buea Municipal council is not helpful “(<https://www.greenvision.news/hysacam-feels-frustrated-in-buea/>)”. The council whose responsibility was to sensitize the

population on the advantages and disadvantages of waste management seems not to be helping the situation “(<https://www.greenvision.news/hysacam-feels-frustrated-in-buea/>)”. Trash cans have been put in strategic places for appropriate collection of waste but people will instead prefer to litter the surroundings rather than throwing the dirt’s into the cans. More over the initial contract stated that HYSACAM was supposed to collect 80 tons of garbage per working day, but due to the rapid increase in population, the rate of waste generation has increased as such they usually collect up to 104 tons of waste per day, which is still not enough due to lack of equipment’s, skilled labour and finances they are unable to meet up with the appropriate management of municipal waste. Azore Opio (2015) HYSACAM Feels Frustrated in Buea.

Furthermore the workers at the final dumping ground at Musaka (outskirts of Buea) equally complains of regular threat from the separatist fighters, that always accuses the workers of concealing corpses of people shot by the soldiers, this mostly result to attack and injured by the armed separatist and they are forced to quit from their job as such the company is faced with the challenge of sending workers to the dumping site for fear of abduction. Journal du Cameroun (2018)

After analysing the research questions related with the management of municipal waste in the Buea municipality, I realized so many gaps which influence the poor management of solid waste in Buea; as such I deemed it necessary to review the municipal solid waste management in a more developed country so as to make recommendations which will help improve the situation in Buea Cameroon. Contrary to Cameroon, Finland Sort it’s waste at home before taking it to waste containers. In Finland, paper and cardboard, glass packaging, metal, plastic, mixed waste, hazardous waste, electrical equipment and batteries are usually sorted separately. ”Finns are very aware and concerned about environmental problems,” Sirje Stén, (waste specialist from the Ministry of the Environment). This is precisely why I chose Choose Finland a contrast to Cameroon.

3.8 An overview of municipal solid waste management in Finland

According to the Finnish Environment Institute (2011a), Waste refers to the object in which an individual doesn't have needs for it or substances meant to be discarded or object which have legal backings to be disposed. Furthermore the content of some waste objects may be hazardous, causing harm to the human system and to the environment. Municipal solid waste in Finland refers to all the mixed waste (for example kitchen garbage, glassware, packaging materials). This waste is mostly generated in the household, commercial centres, industries, public and private institute (Sari, 2013). According to Sokka *et al.*, (2007) sections of the municipal solid waste generated is composed, recycled, some are incinerated or gasify and the rest are landfilled.

The waste framework directives (Directive 2008/98/EC) coined the basic concept that governs the definitions related to waste management (from the definition of waste, recycling and recovery). The waste framework directives present principles that helps appropriate waste management that will not endanger the environment and the health of individuals. EU member states manage municipal solid waste following the waste management hierarchy, with the prevention being the top priority followed by preparation for re-use, recycling, recovery and finally disposal. (European Commission 2012a). The Finnish waste legislation and policy is based on the EU waste hierarchy, all the waste generated in Finland is controlled by the waste legislation. Special laws are put in place to control waste like radioactive wastes which are very dangerous to both the environment and human life (Finnish Environment Institute 2011b). Despite the fact that Finland waste policies or legislations is mostly based on EU Principles, Finland has specific legislation on some particular waste related aspects which are not included in the EU legislation (Finnish Environment institute 2010a). The general objectives of all these legislations and policies are to maintain and support sustainable development, promoting the recycling of

resources, preventing health hazards and environmental pollution associated with inappropriate waste management (Sari, 2013).

The Finnish waste decree and Decision 659/1996 of the Council of state cover the transports of municipal solid waste with the whole of Finland. The municipal solid waste management is well organized in Finland. The Finland waste Act ensures there is professional collection, transportation and disposition of waste is well documented and reported to the National waste Register, kept in the possession of the Regional centres for Economic Development, Transport and the Environment (ELY) Centre for Economic Development, Transport and the Environment

Municipal waste management in Finland is one of the basic necessary services which must be carried out to avoid any health and environmental hazards, and it is an integral part of infrastructure of the municipalities. Waste management comprises the collection, transportation and treatment system which is properly organized by municipalities.

According to Jätelaitosyhdistys (2011b) municipalities are under the obligation to organized municipal solid waste management. Finland currently has 40 regional firms in charge of waste management which provides waste management services to 350 municipalities (Centre for Economic Development, Transport and the Environment). The waste companies nationwide are responsible for collecting, transporting, handling and utilization of services. The Municipal waste companies in well-organized in a very special ways in which they cooperate industries and organizations in order to appropriately manage the waste produced (Jätelaitosyhdistys, 2011b). A general tendency for the whole country is the further reduction of the number of landfills in operation. Also, waste management operators are increasingly interested in moving toward waste incineration SARI PIIPPO (2013) Municipal Solid Waste Management in Finland. Sorting of waste helps collect materials suitable for recovery.

4 SWOT Analysis

The main agency responsible for the collection, transportation and disposal of municipal solid waste in the Buea municipality is HYSACAM. The aim of this SWOT analysis is to identify the gaps in the management of municipal solid waste and come out with recommendations which will help ameliorate the situation. This SWOT is a literature review based on qualitative and descriptive in nature.

Strength

The endeavours made by HYSACAM to provide trash cans at the junction of most streets, helps to ease the collection of waste, there is also door-to-door collection of waste. There is high rate of unemployment in Buea as such HYSACAM turns to get labour at a cheaper rate since many people will be willing to work at a cheaper salary. The budget allocated by the government for effected waste management will help solve the problem of inappropriate waste management.

Weakness

There is lack of waste segregation as such it's very difficult for HYSACAM to sort biodegradable from non-biodegradable waste. The population is not well sensitized and educated on municipal solid waste management as such they react poorly on waste management. The lack of funds is also a weakness which prevents the effective municipal waste management. There are no government laws and regulations to control municipal solid waste management. During the dry season places are very hot as such if there is a tendency for unpleasant odour to come out from the trash cans which pollute the environment.

Opportunity

The involvement of Medias, schools and non-governmental organizations would play an important role in effective waste management. Municipal solid waste management will also serve as a means of employment thereby reducing the unemployment in the Buea municipality. The recycling of waste will help in the production of new product, thereby limiting the disposal of product which could be transformed into useful product. A proper waste management will help reduce the transmission of diseases like cholera, typhoid and malaria. A clean and healthy city will also attract investors as such contributing to economic growth of the city.

Threat

The on-going Anglophone crises in the south west region stand as the greatest threat when it comes to effective municipal solid waste management in that some workers might be abducted for not abiding to the rules of the separatist fighters. The sensitization might be confusing and disturbing to some people because they won't be managing waste the way they were initially handling it. Sufficient funds might not be disbursed to effectively enhance the waste management. The inappropriate waste management will lead to an increase in communicable diseases.

5 Discussion and Conclusion

5.1 Discussion

With respect to this research, more interviews should have been conducted with the council officials as well as HYSACAM head of operations. Waste management in the town of Buea is mainly carried out by HYSACAM and finance by the government through its municipal councils. However, the practice is mar or impair by inadequate finance, equipment, technology and access roads into some localities that limits the appropriate

handling of the rising solid waste generated in Buea owing to its rapid population growth in recent years due to other factors and also the on-going crisis in the Country.

In Finland for instance, there is more and more realization that waste can be a useful source of raw materials and energy; metals, glass, and textiles have been collected before and put to new use (Nelles et al., 2016). Finns are aware of the necessity to separate waste, leading to the introduction of new disposal technologies, and increased recycling capacities.

In Finland, waste policy aims to promote the sustainable use of natural resources and to ensure that waste does not endanger human health or harm the environment. Both in theory and in practice this is being enforced by the ministry of the environment in accordance to the national policy and the European Union. This has made Finland to stand out as a role model for various nations to follow.

Cameroon however, has the intentions for a better waste management system but it's usually in theory as towns and cities in Cameroon exhibit the burdens of waste management. This is as a result of inadequate financial resources, low levels of enforcement of regulations and poor governance which often lead to poor solid waste management services. Veronica Ebot Manga et al (2008)

5.2 Conclusion

In Cameroon, these policies exist in the waste management text but are hardly abided to by the concern stakeholders. This therefore requires that more be done to upgrade the waste management techniques in the Buea and Cameroon at large.

The rapid economic growth in cities of developing countries like Cameroon has led to a major challenge when it comes to municipal waste management. According to our case study, Buea is one of the major cities in Cameroon and also the capital of the South West

Region which is rapidly growing economically and as such attracting many people from all over the country. The population increase is also due to the current political unrest happening in the region. When compared to the past it shows that the Buea municipality has improved when it comes to the municipal waste management by partnering with HYSACAM which is a waste management company. Even with the presence of HYSACAM, the Buea Municipality is still facing a major challenge when it comes to solid waste management ranging from collection, sorting of the waste for recycling, transportation and disposal. Apart from insufficient practices by HYSACAM, there is also a problem of poor legislation, lack of population's participation, low level of awareness on proper waste management, lack of well-trained personnel's to handle the waste. All these factors have contributed to the poor management in the Buea Municipality when compared to the municipal waste management in Finland which has a well-coordinated system following the waste management hierarchy to manage the municipal solid waste most importantly the population are well sensitized on to waste management as such making the work much easier. In order for Buea Municipality to maintain a sustainable waste management, population's participation and better waste management practices needs to be incorporated.

6 Recommendations

1. Laws and policies need to be put in place to maintain appropriate waste management and defaulters will be fined for not respecting the laws.
2. The population's needs to be massively sensitized on the hazards associated with improper waste management with that they will fully participate on the waste management process. The sensitization could be done through seminars (educating the community leaders and other personalities on waste management, the leaders will then

carry the message to their various communities and educate them), TV and Radio stations, social Medias, religious gatherings, etc.

3. The municipal council needs to ensure transparency and accountability from all those handling finances geared towards municipal waste management.
4. HYSACAM needs to provide the public with sufficient trash cans to each community in order to ease the collection of waste, thereby avoiding littering the environment as such reducing the hazards associated with improper waste management.
5. HYSACAM should employ well trained personnel's that will help do the job; regular trainings should also be organized to build up their skills while working.
6. HYSACAM should effectively incorporate the aspects of recycling of waste; this will go a long way to reduce the burden of waste in the environment.
7. Measures needs to be put in place which will help encourage the recycling of waste, transforming it into useful product.
8. HYSACAM should ensure that they make provisions of sufficient trucks that will help in the transportation of the waste collected from the communities

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