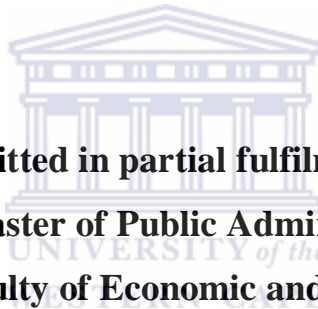


**AN EXAMINATION OF THE IMPLEMENTATION OF AN  
ECOLOGICAL SANITATION PROJECT AS AN  
INSTRUMENT OF THE ENVIRONMENTAL SANITATION  
POLICY OF GHANA: THE CASE OF KUMASI METROPOLIS**

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**A mini-thesis submitted in partial fulfilment of the requirements  
for the degree of Master of Public Administration in the School of  
Government, Faculty of Economic and Management Sciences,  
University of the Western Cape**

**Supervisor: Dr Isioma Ile**

**15<sup>th</sup> October 2010**

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## DECLARATION

I declare that *An Examination of the Implementation of an Ecological Sanitation Project as an Instrument of the Environmental Sanitation Policy of Ghana: the Case of Kumasi Metropolis* is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Joyce Ekuful

15<sup>th</sup> October 2010



Signature.....

## **DEDICATION**

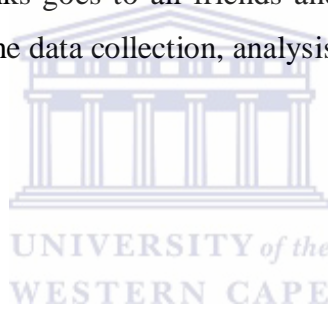
I dedicate the thesis to my sweetheart Mark



UNIVERSITY *of the*  
WESTERN CAPE

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My first thanks goes to the Almighty God for my life and the strength to write the thesis. I also appreciate the home support I got from my parents: Adjoa Larbia and Kodwo Ekuful and all my siblings. I will never forget the financial support I received from the *Katholischer Akademischer Ausländer-Dienst* (KAAD). They gave me a scholarship for one master programme but when I got the opportunity to do two masters' at the same time, they willingly supported me. My gratitude as well goes to the Institute for Development Research and Development Policy (IEE) for making it possible for one to be able to undertake two masters' programme at the same time, especially to Dr. Gabriele Baecker for giving the recommendation that I can go ahead with the double degree. My highest appreciation goes to my Supervisor Dr Isioma Ile for the help in shaping the whole thesis. A big thanks goes to all friends and course mates who helped me directly or indirectly in the data collection, analysis and writing the thesis up.



## 10 KEY WORDS

Sanitation

Ghana

Environmental Sanitation Policy

Policy implementation

Projects

Ecological sanitation

Metropolis

Planning guidelines

Finance

Awareness creation





## **ABBREVIATIONS AND ACRONYMS**

CBOs	Community-Based Organisations
CONIWAS	Coalition of Non-Governmental Organisations in Water and Sanitation
CWSA	Community Water and Sanitation Agency
EAWAG	Swiss Federal Institute for Aquatic Science and Technology
Ecosan	Ecological Sanitation
EPA	Environmental Protection Agency
GDP	Gross Domestic Product
GPRS	Growth and Poverty Reduction Strategies
IHE	Institute for Hydraulic Engineering
IWMI	International Water Management Institute
KMA	Kumasi Metropolitan Assembly
KNUST	Kwame Nkrumah University of Science and Technology
MDGs	Millennium Development Goals
MLGRDE	Ministry of Local Government, Rural Development and Environment
MMDAs	Metropolitan, Municipal and District Assemblies
MWRWH	Ministry of Water Resources, Works and Housing
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organisations
OPDs	Out-Patient Departments
PMBOK	Project Management Body of Knowledge
PTCS	Participatory Total Community Sanitation

SANDEC	Department of Water and Sanitation in Developing Countries
SEHU	Environmental Health Unit
SPSS	Statistical Package for Social Sciences
UN/DOALOS	United Nations/ Division for Ocean Affairs and Law of the Sea
UNEP/GPA	United Nations Environmental Programme/Global Programme of Action
UNESCO	United Nations Educational, Scientific and Cultural Organisation



## **ABSTRACT**

### **AN EXAMINATION OF THE IMPLEMENTATION OF AN ECOLOGICAL SANITATION PROJECT AS AN INSTRUMENT OF THE ENVIRONMENTAL SANITATION POLICY OF GHANA: THE CASE OF KUMASI METROPOLIS**

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The generation of large volumes of solid and liquid wastes in urban and peri-urban areas of Ghana is a big problem for the people and government of Ghana. It contributes to the outbreak of many diseases in the country such as malaria, diarrhoea and typhoid fever. In managing the situation, a new concept called ecological sanitation (ecosan), which focuses on reuse of waste, has been introduced in the country.

The objectives of the thesis were to criticise the environmental sanitation policy by analysing its content in relation to policy implementation arrangements, to discuss programmes and projects identified under the policy, to critically examine the implementation of an ecosan project as a way of achieving the goal and objectives by outlining its implementation processes, prospects and challenges, and to make appropriate recommendations.

The analysis and discussion of the thesis were based on both primary and secondary data. The primary data, on one hand, were collected on the prospects and challenges that exist in the implementation of ecosan projects from Kumasi metropolis. The secondary data, on the other hand, were from books, journals and websites.

From the research analysis, it emerged that the policy allows the implementation of many sanitation projects including ecosan. Secondly, stakeholders see ecosan to be a good approach to reduce waste generation in the country. However, the main challenges that exist in promoting the concept are inadequate financial

support, unavailability of implementation guidelines and lack of knowledge about concept details.

It is therefore argued that financial support, implementation guidelines and awareness-creation activities should be available in the implementation of ecosan in the metropolis. Government, private organisations, companies and individuals should each contribute their quota in the support and processes.

15<sup>th</sup> October 2010



# **CHAPTER ONE**

## **INTRODUCTION AND BACKGROUND OF THE STUDY**

### **INTRODUCTION**

Ensuring clean surroundings to prevent the outbreak of diseases is desirable in Ghana. However, the existences of issues such as rapid urbanisation with its associated problems such as changing life styles and increasing population are leading to the generation of large volumes of waste in the country. Although some efforts are being made by the authorities and organisations in the country to address these problems, there is still the need for more concrete data and research into these efforts for specific strategies to be developed.

The environmental sanitation policy of Ghana declares the intentions of government in helping reduce the large volumes of waste that are generated. Nevertheless, it is important to examine the approaches and tools adopted in the policy to reduce the volumes of waste in order to ensure their efficiency, effectiveness and sustainability.

### **STATEMENT OF THE PROBLEM**

In the revised environmental sanitation policy of Ghana (Ministry of Local Government, Rural Development and Environment, 2007:12-15), which comprises strategies to maintain a safe physical and natural environment for human settlement, the policy focus areas and their associated challenges were identified. The focus areas included capacity development; information education and communication; legislation and regulation; sustainable financing and cost recovery; monitoring and evaluation; level of service; and research and development. It was mentioned among other challenges under level of service that there are inadequate means of final treatment and disposal of wastes. Additionally, there is the challenge of mainstreaming alternative use of wastes that are generated. Furthermore, there is the problem on management of the large

volumes of waste that are generated because of increasing population and changing lifestyles of the people. Under the focus of research and development it was mentioned that there is inadequate collection of data to help in planning and managing sanitation services.

These challenges are contributing to the outbreak of diseases which affect the health and other activities of the people. In Accra, for example, sanitation-related diseases like diarrhoea, intestinal worms, cholera and typhoid fever were recorded as the highest causes of death in 2005 (Accra Metropolitan Assembly Health Service, 2005). This shows that when these large volumes of waste which are generated mostly in the urban areas are managed properly, lives will be saved whilst economic, political and other important activities improve.

One way of addressing the challenges on how to manage the large volumes of waste and mainstreaming alternative use of the waste generated, the new concept called ecological sanitation (ecosan) is being implemented through projects in pilot phases in the country ( Larbi, 2006:5). Ecosan simply seeks to bridge the gap between sanitation and agriculture as the different forms of wastes (mostly the bio-degradable wastes) are recycled into fertilizer and other products for re-use. In the case of the ecosan project at Buobai in Kumasi metropolis, for example, co-compost or comlizer fertilizers are produced from two forms of waste, which are municipal solid waste and faecal sludge for farming (Olufunke and Kone, 2008:1-2).

Considering the fact that there is a need to ensure the availability of adequate data and research findings to promote the planning and management of sanitation services, it was seen necessary to embark on the study of the thesis to find out the objectives, processes and challenges that exist in the implementation of an ecosan project as an instrument of the sanitation policy in the case of the co-composting project in Buobai in Kumasi metropolis.

## **SIGNIFICANCE OF THE STUDY**

It is anticipated that the findings of the thesis will contribute to effective implementation of ecosan in the country. This is because the objectives, implementation processes and exact challenges hindering the implementation of ecosan will be made known. This will enable the project to be promoted on a larger scale in the metropolis and in the country. Also, it will enable proper strategies to be developed to address the problems associated with it.

In addition, the research findings will help improve the sanitation policy of the country as there will be the need to revise the policy again. At the moment, there is not enough information on ecosan in the policy document which needs research to make the necessary information available for them to be included.

Last but not least, the findings will contribute to the achievement of target 10 the Millennium Development Goals (MDGs). It is the aim of the government of the country to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. The outcome of the thesis will therefore make known some issues to tackle towards the achievement of this target and whether ecosan can be considered as one of the best approaches to improve sanitation.

## **OBJECTIVES OF THE STUDY**

The objectives of the study are to:

- Critique the environmental sanitation policy of Ghana.
- Identify and discuss projects and programmes being implemented as instruments of the policy.
- Discuss the nature of sanitation in Kumasi metropolis.
- Discuss the nature of an ecosan project in Kumasi metropolis.
- Develop the theoretical framework underlining policy implementation and ecosan projects.
- Examine if ecosan projects' objectives contribute to the attainment of the goal and objectives of the sanitation policy.

- Identify and discuss challenges and opportunities for effective implementation of ecosan from the perspective of stakeholders.
- Make appropriate recommendations to improve the implementation of ecosan projects.

## **RESEARCH QUESTIONS**

Based on the objectives, the thesis seeks to answer the following research questions:

- Do the objectives and content of the environmental sanitation policy provide for the implementation of every form of sanitation services?
- What projects and programmes as instruments are in place to ensure the implementation of the environmental sanitation policy?
- Is the nature of sanitation in Kumasi Metropolis capable of ensuring a healthy life?
- Is the nature of the ecosan project in Kumasi Metropolis capable of promoting good sanitation?
- What theoretical framework underlines policy implementation and ecosan?
- Does the implementation of ecosan projects contribute to the attainment of the goals and objectives of the environmental sanitation policy of Ghana?
- Are there challenges and opportunities for effective implementation of ecosan from stakeholders' perspective?
- What recommendations will lead to the improvement of ecosan projects?

## **RESEARCH ASSUMPTIONS**

Considering the research questions and objectives the following research assumptions are made. Firstly, the objectives of the environmental sanitation policy of Ghana are wide enough to allow the usage of diverse tools in its implementation. The content of the policy made provision for the implementation processes of the policy. Secondly, the programmes and projects that are



implemented in the country from the sanitation sector are capable of helping achieve the goals and objectives of the policy. Thirdly, the current sanitation practices and facilities in Kumasi metropolis need further measures to ensure a healthy life for the inhabitants. Fourthly, the nature of ecosan projects in Kumasi can contribute to improving the sanitation situation.

In addition, there are theories that lay the foundation for examining implementation of ecosan in the country. Furthermore, ecosan can contribute to achieving the goal and objectives of the sanitation policy. However, there are challenges and prospects in the implementation processes of ecosan which still needs research in order to make appropriate recommendations.

### **CONCEPT CLARIFICATION**

For the purpose of easy understanding, concepts such as policy, policy implementation, project, policy instrument and ecological sanitation (ecosan) found in the research topic will be explained in this section.

#### **Policy**

A policy can generally be seen as an outline of basic principles that need to be followed in achieving set objective and goals. Policies make known the intentions of government or an organisation to undertake some actions in a country or society. According to Elledge et al. (2002:6), 'policy is the set of procedures, rules and allocation mechanisms that provide the basis for programmes and services.' They set priorities and, most of the time, allocate resources for their implementation. Policies provide the framework or guidelines for organisations and institutions which want to work in a particular sector. It is defined simply by De Coning (2006:3) as "statement of intent", which means it is a declaration of what a government or an organisation wants to achieve. In the public sector, a policy is a formal statement or white paper of government's intentions to achieve certain objectives in a country.

For the aims and objectives of a policy to be achieved, its processes should be managed. Policy management involves a series of interconnected activities

ranging from policy analysis, formulation; implementation, monitoring and evaluation which are held within an institutional or organisational setup. Policy analysis is about thinking of the public problems. That is applying intellect to the problems of the public. Policy formulation refers to the purposeful articulation and narrowing down of policy options to handle public problems. This normally happens within groups such as legislative committees, interest group offices and special commissions. Implementation, which is the third step in the management process, refers to carrying out or accomplishing what has been agreed upon to be the best solution to the problem. Policy monitoring and evaluation is the last step in the process. Some scholars consider evaluation to be the last step because monitoring is seen to occur in all the other steps of the management process. That is monitoring takes place as each stage is observed to see if everything is moving on as expected. Evaluation is the assessment of the impact or result of the policy in addressing the public problem (Mac Master, 2004:8-9). For the purpose of the thesis, policy implementation is elaborated in the subsection below.

### **Policy Implementation**

Implementation is noted to be one of the key factors to assess the success of a policy. As Brynard and De Coning (2006:180) put it “successful implementation is the final acid test for policy to be successful”. Scholars have defined policy implementation in diverse ways based on different understandings and purposes. Van Meter and Van Horn (1975:447) defined it as follows: “policy implementation encompasses those actions by public and private individuals (or groups) that are directed at the achievement of objectives set forth in prior policy decisions.” Brynard and De Coning (2006:183) also defined it as the “conversion of mainly physical and financial resources into concrete service delivery outputs in the form of facilities and services, or into other concrete outputs aimed at achieving policy objectives.” These definitions point out that implementation takes place after a statement of intent has been declared and the actions of the implementation should be channelled towards the achievement of set objectives.

There are three generations of research into implementation as outlined and discussed by Brynard and De Coning (2006:184-186). These are the first or

classical generation, the second generation and the third or the analytical generation. The first generation is based on the assumption that implementation happens automatically once a policy is declared by the government. The second generation, which evolved based on the weaknesses of the first generation, holds that implementation is a complex process and does not occur as it is assumed to be by the first generation thinkers. The third generation, accepted the argument of the second generation, but added that it is not enough to recognise the importance of implementation and conduct researches on them. It is equally important to accumulate and compare knowledge from different studies and case studies so that if possible a theory or a model can be developed for policy implementation.

### **Project**

Mac Master (2004:13) defined a project as “a series of activities, which has a specific objective to be completed, within certain specifications, has defined start and end dates, and consumes resources such as finance, personnel and equipment.” This means a project should have a specific date, resources and objectives. There are differences between projects and operations. Whilst projects are unique, exist for a limited time, bring about revolutionary improvement, create disequilibrium within the status quo, have temporal resources, involve risks and uncertainties and focus on specified goals, operations on the other hand are repetitive, have a stable environment, involve evolutionary change, evolve in equilibrium, have stable resources and people play their roles based on experiences (Van Baalen and De Coning, 2006:222).

The explanations given to a project so far bring out some features which are grouped into scope, time, cost and quality. These features determine the deliverable objectives of a project. To ensure balance within these features there is a need for management. The management of these core features needs other best practices to provide the means to achieve the deliverable objectives. These other practices are integration, human resources, communication, risk and procurement and contract. All these areas together form the principles of the Project Management Body of Knowledge (PMBOK) (Van Baalen and De Coning, 2006: 223-225). These principles are explained below.

### **Policy instruments**

Policy instruments are tools or approaches which policy makers adopt in addressing policy problems. According to McDonnell and Elmore (1987:136 and 146), when the legislators and the executives are making deliberations on ways of solving problems on the policy agenda, responses to these problems are chosen based on the available solutions that may be advocated or the resources available. This may be in the form of money, knowledge, political support and organisational capacity. In a different categorisation, six issues are significant in choosing a particular approach in addressing a policy problem. These issues are institutional context, governmental capacity, fiscal resources, political support and opposition, information and past policy choice. A tool or a combination of them may be chosen to address problems where applicable.

McDonnell and Elmore (1987:136-144) categorised policy instrument into four groups. These are mandates, inducements, capacity building and system-changing.

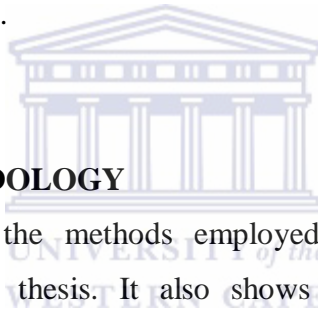
Despite these four groups of policy instruments, projects and programmes are as well considered as policy instruments. According to Van Baalen and De Coning (2006:214-221), programmes and projects are the instruments through which policies are implemented. They provide the systematic steps to allocate resources, plan, manage risks and control finances in implementing a policy. Whilst programmes consist of long-term different activities which are implemented in a well-coordinated form, projects are simple temporal processes where resources are mobilised to undertake a unique task with a specified time and cost.

### **Ecological sanitation (ecosan)**

Ecology, on one hand, is generally seen as an aspect of biological science that deals with the relationship and interaction between living organisms and their surroundings (Nathanson, 2000:9). It is about the environment because it deals with the surroundings of human and other living beings and how they interact. Sanitation, on the other hand, is understood to be the services and facilities required in ensuring a healthy, user friendly and convenient management of waste at all levels (United Nations Environment Programme, 2004:15). The issue of health is paramount when it comes to sanitation and for that, every means possible

to reduce the outbreak of diseases in the society needs to be considered under sanitation.

Ecosan, which is seen as a paradigm that brings these concepts together, is a sustainable, non-polluting system based on recycling which ensures that germs that exist in wastes are destroyed, resources are conserved and the gap between agriculture and wastes is closed (Arno, et al., 2008:20). That is, it simply seeks to bridge the gap between sanitation and agriculture and ensure the re-use of wastes. Here ecology is taken to mean agriculture, where human beings interact with the environment to produce food. Also, instead of leaving the wastes (especially degradable ones) to pollute the environment, they are recycled into something useful. Although the principles of ecosan have been in existence for many years, it is only recently that it is promoted on a larger scale world-wide (Winblad, and Simpson-Hébert, 2004:7).



## **RESEARCH METHODOLOGY**

This section describes the methods employed in collecting, analysing and presenting data for the thesis. It also shows the limitations and problems encountered in the processes of the research.

### **Research design**

To get the needed information to meet the objectives of the thesis, both primary and secondary data were used. The primary data, which involved field research in Kumasi, helped to get information from stakeholders such as farmers and the implementing organisations on the prospects, challenges and processes in the implementation of ecosan in the field. Workers of the ecosan project for example were the best to give information on the process of the project. Farmers, however, were chosen because they are key stakeholders when it comes to the usage of the ecosan fertilizer. The primary data also involved observations.

The secondary data helped in gathering information on the objectives of ecosan in general, the objectives and contents of the Environmental Sanitation Policy of

Ghana and the theoretical framework. This was done through literature reviews from books, journals and the Internet.

The project in Buobai, Kumasi, was chosen as a case study because its implementation has created some level of awareness about ecosan in the metropolis (Cofie and Doulaye, 2008:2).

### **Data collection**

During the field research, both quantitative and qualitative methods were employed in gathering the data within two months from 15<sup>th</sup> August to 15<sup>th</sup> October, 2009. Qualitative methods were applied because some workers of the implementing organisations of the ecosan project were interviewed based on semi-structured questions to ascertain the processes, prospects and challenges they encounter in the implementation process. Due to limited time, only three of them were interviewed. These workers were the deputy director of the Waste Management Department of the KMA, in the person of Mr Prosper Kotoka. Another worker in the same department, Mr Morrison, was once the deputy director of the ecosan project, and lastly Mr Noah Adamtey of IWMI. These interviews took approximately 30 minutes.

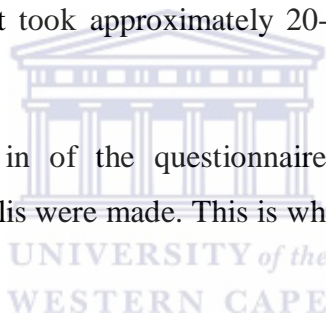
Quantitative methods were also used because structured questions were used in interviewing the farmers. Farmers in four peri-urban communities around Kumasi filled 150 questionnaires. These communities are Buobai, Kwaso, Jachie and Feyiase. The questionnaires were filled in at these communities because they were near to the project site and it was assumed the farmers might have some knowledge of the project. The questionnaire was made up of both open- and closed-ended questions. With the open-ended questions, the respondents were given the chance to express their general views. The closed-ended questions on the other hand, had nominal and ordinal scaled answers. The ordinal scale had answers between 1 and 4: 1 at some point means extremely positive whilst 4 means extremely negative. In other cases, it was vice versa.

Accidental sampling was used to select the cases in the target population. It is a non-probability sampling method which is also called haphazard or convenient

sampling (Kalton, 1983:90). It is a kind of sampling where the respondents are selected in any way. This means anyone who fits into the target group was interviewed. This kind of sampling can be biased and therefore generalisation on the entire population cannot be made (Kalton, 1983:91). However, since there is no known sampling frame of the target population, which is crucial for random sampling, this method was seen to be appropriate.

Before the main filling in of the questionnaire, it was pre-tested to check if it was applicable. With that pre-test, relevant changes were made before starting to administer the questionnaire. Two research assistants were employed to help in administering the questionnaire due to the large research sample. After the researcher had met the research assistants to explain the concept to them, and going into the field together for a day, the group was then divided among the different communities. It took approximately 20-30 minutes to administer each questionnaire.

Apart from the filling in of the questionnaire, personal observations about sanitation in the metropolis were made. This is where relevant pictures were taken at certain vantage points.



### **Data processing and analysis**

For the analyses of the closed-ended questionnaire for the farmers, because of the large number, the descriptive statistics tool of Statistical Package for Social Sciences (SPSS) was used. The results of the analyses were then entered in Microsoft Excel to draw the needed graphs. However, Microsoft Word was used to draw the tables. These were interpreted in relation to the objectives of the thesis. With the open-ended questions, the common themes of the contents were summarised done and presented in relation the thesis.

The interviews of the workers were analysed done by interpreting the answers they gave systematically in relation to the objectives of the thesis. In situations where the answer of one interviewee was related to the other, a common conclusion was drawn from them.

The critique of the environmental policy was done by picking the principles of the scientific management theory and the administrative theory one after the other and relating them to the policy to see which ones were covered. This was done to come out with the strengths and weaknesses of the implementation arrangements in the policy document.

In addition, the analyses of projects and programmes under the policy, and the observations that the author made about sanitation in general in the metropolis, were based on the governance and systems theory.

### **Limitations and ethical statement**

The first limitation of the thesis is that the primary data did not cover wide views from many other stakeholders of ecosan in the study area. For example, views of consumers were not included. This was due to limited time for the data collection. However, the available information was used and conclusions were drawn.

Secondly, the sample size of the target population was not representative enough. In the case of the farmers, for example, although there was no known sampling frame, one can easily say that 150 are not representative. Moreover, the number of personnel interviewed from the implementing organisations was also not representative enough. Therefore, generalisation of the research findings based on the primary data is not possible.

Thirdly, the arrangement of the answers for the ordinal scales was not consistent. This therefore made the data processing sometimes confusing since at some point those choosing 1 were those giving positive responses whilst at other point, those choosing 1 were giving negative responses.

The Last but not the least of the limitations, since there are no accepted theories of policy implementation, it became necessary to use a combination of management and political theories which were at some points not connected directly to the topic at hand.

An ethical statement worth mentioning was the choice of words during the field research. The choice of words was very important since wastes and faecal sludge



had to be mentioned many times. In some traditions in Ghana, especially with the Akans, it is not appropriate to mention some words when talking to people without first pleading with them and then expressing the word idiomatically. Since this was already known, in administering the questionnaires, appropriate words in the local language were used.

In addition to the ethical statement, all the respondents were assured of confidentiality and anonymity with any information they provided.

### **OUTLINE OF THE STUDY**

There are four chapters in the thesis. Apart from this introductory part, which is Chapter One, the next chapter constitute the theoretical framework/literature review. That is a discussion of theories used to explain the research problems and objectives and of literature related to the research topic. The second chapter also discusses in detail the policy background and context of the thesis. Chapter Three focuses on the research findings and Chapter Four gives the conclusions and recommendations of the thesis. There is an annex apart from these main chapters, where information considered to be relevant for more understanding is attached.

## **CHAPTER TWO**

### **THEORETICAL FRAMEWORK AND LITERATURE REVIEW**

This chapter is divided into four sections. The first section describes the theories adopted for the thesis. Section two gives an overview of the country profile as well as the background and objectives of the environmental sanitation policy of Ghana. It also gives details of the roles and organisational structure of metropolises from the policy document. Moreover, it describes some programmes and projects that are taking place in the country to achieve the goal of the policy. Section three presents the nature of sanitation and ecosan in Kumasi metropolis. Section four gives the conclusion to the chapter.

### **THEORETICAL FRAMEWORK**

A theory “is a comprehensive, systematic, consistent and reliable explanation and prediction of relationships among specific variables” (De Coning and Cloete, 2006:27). It is based on various concepts and models to fully explain and predict future events. With this definition and explanation, one can say that when a particular theory is considered, many variables or concepts come together to explain a particular reality or predict future events. This section presents four theories. They are the scientific management theory, the administrative theory, the systems theory and the governance theory.

#### **Scientific Management Theory**

Scientific management theory is seen to have started the modern era management theories. It was first developed by Frederick Taylor and so it is popularly referred to as Frederick Taylor’s Scientific Management. Taylor’s social background in the industrial revolution period, where autocratic management mixed with inefficiencies and injustices was the order of the day, influenced him to develop this theory (Olum, 2004:12-13).

According to Taylor (1911:4-7), the management of any organisation, programme or project should bring “maximum prosperity” to both the employer and the

employee. Maximum prosperity on the side of the employer is not only about increase in profit or dividends but also the development and progress of all branches of the organisation so that the functioning of the organisation will be permanent. On the part of the employee on the other hand, it is not about higher salaries only, but includes development that will help the individual to attain the highest efficiency. The interest of these two groups should be the same and none should be downplayed. If the employee will need additional training to be more efficient, management should help him/her to attain that training. It should not be to the cost the employee.

New duties, burdens and responsibilities need to be adopted by managers, which never existed in the past. These duties are categorised into four principles.

First and foremost, there should be the development of science of work to replace the old rules-of-thumb methods. This is where management need to gather traditional knowledge which was possessed by the workforce, classify, tabulate and reduce them into rules and regulations which will guide the daily work of the organisation. Secondly, management should select the right employee and give him/her the appropriate training. The cost of the training should not be for the employee as it used to be in the past but for management. Thirdly, management and the workforce should cooperate in their work in every way possible in accordance to the rules and regulations set by management. Last but not least, there should be equal division of responsibility among management and the workforce according to their respective abilities. The workers should not be given responsibilities which are above their level of knowledge and could easily be handled by the manager. It is only the combination of these principles with the creativity of the workforce that will lead scientific management to achieve efficiency (Taylor, 1911:27-29).

It is mentioned by Olum (2004:13) that from an economic point of view, the scientific management theory achieved great success as it led to higher productivity in the industrial set-ups.

This theory is of interest in the thesis because it indicates that when it comes to management, which is a very important aspect of the implementation process, there are important principles that need to be followed. These principles should be easily available to managers so that they can achieve “maximum prosperity”. This in the case of the environmental sanitation policy and ecosan, will help achieve improved sanitary conditions.

### **Administrative Theory**

The administrative theory was developed by Henri Fayol and it focuses mainly on the roles and principles that management processes should follow (Olum, 2004:15). It is known that this theory was developed when Fayol rose to management position in a coal-mining and iron foundry company in France at a time where France was lagging behind Great Britain in industrial development (Kennedy, 1999:270).

Fayol developed fourteen principles of management: division of labour/specialisation, authority with responsibility, discipline, unity of command, unity of direction, subordination of individual interest to the general interest, remuneration of staff, centralisation, scalar chain or line of authority, order, equity, stability of tenure, initiative and *esprit de corps* (Olum, 2004:15). The explanations of these principles below are from Fayol (1949:20-42) and Kennedy (1999:270-276).

Division of labour and specialisation refer to the situation where tasks are shared among the employees based on their levels of professionalism and ability to work. It is based on the idea that as an employee concentrates on doing what he or she has special skills for, it will reduce waste of resources and increase the chance of getting a better job done. Moreover, it will be easier for one employee to teach another employee the specialised skill. As specialisation is seen to be part of the natural order it is needed for division of labour to take place.

Authority with responsibility is explained as being given the right to give orders and the right to expect obedience. A distinction is made between formal authority and personal authority. The formal authority is what the individual gets due to the

position held and the personal authority is what the individual has due to experiences and abilities, and for that matter, is able to command respect from the workers. These authorities therefore go with responsibilities.

For there to be discipline, which is the third principle, three things must be in place. Firstly, there should be good superiors at every level of the organisational structure. Secondly, there should be clear and fair agreement between the superiors and the subordinates. Thirdly, there should be the application of penalties. When there is discipline, the organisation will move on smoothly and without it, nothing meaningful will come out of the organisation.

The fourth principle, of unity of command, indicates that for any activity that needs to be undertaken by a subordinate, the command should come from only one superior. When commands come from more than one source, there will be confusion as to which way to choose.

For the fifth principle, of unity of direction, it is explained that, in achieving the same objective, there should be one head and one plan of activities. This will ensure unity of action and coordination of effort leading to the achievement of objectives.

The principle of subordination of individual interest to the general interest was based on the anticipation that as individuals or groups manage the affairs of an organisation conflicts may arise. This may be due to ignorance, selfishness, ambitions, laziness and other weaknesses of human nature which may lead to the loss of the interest of the organisation. Therefore this principle is there to remind all always to see the interest of the organisation as the priority.

The seventh principle, of remuneration of personnel, is about paying for the services rendered by the workers. This remuneration can either be in the form of cash or in kind but in all situations what is important is the satisfaction of the employee so that they will continue to work. This is the principle which was given the most detailed explanation by Fayol in the sense that he explained the various modes of payment that can be used for workers, both junior and higher managers.

The eighth principle, of centralisation, is about the distance between the manager and the employee. When the chain between them is long, there is the possibility for the employee to be decentralised intentionally or unintentionally and incorporate some personal ideas into the implementation of the activities. Centralisation and decentralisation are all important based on the particular situation in time.

The principle of scalar chain/line of authority discusses the line of communication from or to the ultimate authority. To ensure effective communication among the superiors who may be heading different sections of the organisation, there should be 'gang plank' or general meetings so that feedback can be given with less waste of time.

The tenth principle, of order, talks about everything being in place for work to move on. A distinction is made between material order and social order. In terms of material order, material resources that are needed for production should be provided and in terms of social order, a working place should be provided for each employee and the employee should occupy that place.

Equity is concerned with the treatment of employees with kindness and justice so that they can be loyal and respond to duties with all devotion. Equity should be applied with no force but with good sense, good nature and experience.

The twelfth principle, of stability of tenure of personnel, is concerned with the ability to sustain the workforce. This is because it takes time to train an employee to undertake a particular task and so if that employee does not work for a long time with that skill before being moved to another sector or out of the organisation completely, it is a loss to the organisation.

Initiative is about thinking out a plan and implementing it successfully. In terms of initiative, employees are to approach their duties with energy and enthusiasm, which is possible if they get the needed freedom. This will let them come out with their best. However, initiatives should be maintained within their limits with much care and trust.

The last principle, of *esprit de corps*, is about harmony and union among the workers of the organisation. It goes in line with the other thirteen principles; that is, when all the other principles are in place, there will be harmony and unity among the personnel of the organisation. The principle of unity of command especially should be adhered to and pitfalls such as divide and rule and abuse of written form of communication should be done away with to improve the harmony.

Apart from these principles, there are five other primary roles that management should play. These are to plan or forecast, organise, command, coordinate and control. According to Olum (2004:15), these principles and roles developed by Fayol are currently practiced actively by management in many public and private organisations as they are seen to be very helpful.

The administrative theory, like the scientific management theory, adds up to the principles of management. The administrative theory was added in the thesis because it has many principles and therefore helps to critically analyse the policy document on provision made for its implementation.

### **Systems Theory**

To explain systems theory, it is important to understand the concept 'systems'. A system has been defined differently by many authors. Boulding (1985:9) defined it as "any structure that exhibits order and pattern." That is, a system should function with no chaos. It is also seen as "a set of inter-related parts" (Stewart and Aryes, 2001:81). From these definitions one can say that a system is made up of two or more interrelated parts and these parts function together smoothly without any problem.

Systems theory, which is seen to be difficult to specify, is from the general systems theory proposed by Kenneth Boulding (Stewart and Aryes, 2001:81). Boulding discussed how the earth can be viewed as a system and within it many sub-systems can be found. These include the physical system, the biological system, the social system, the economic system and the political system (see Boulding, 1985).

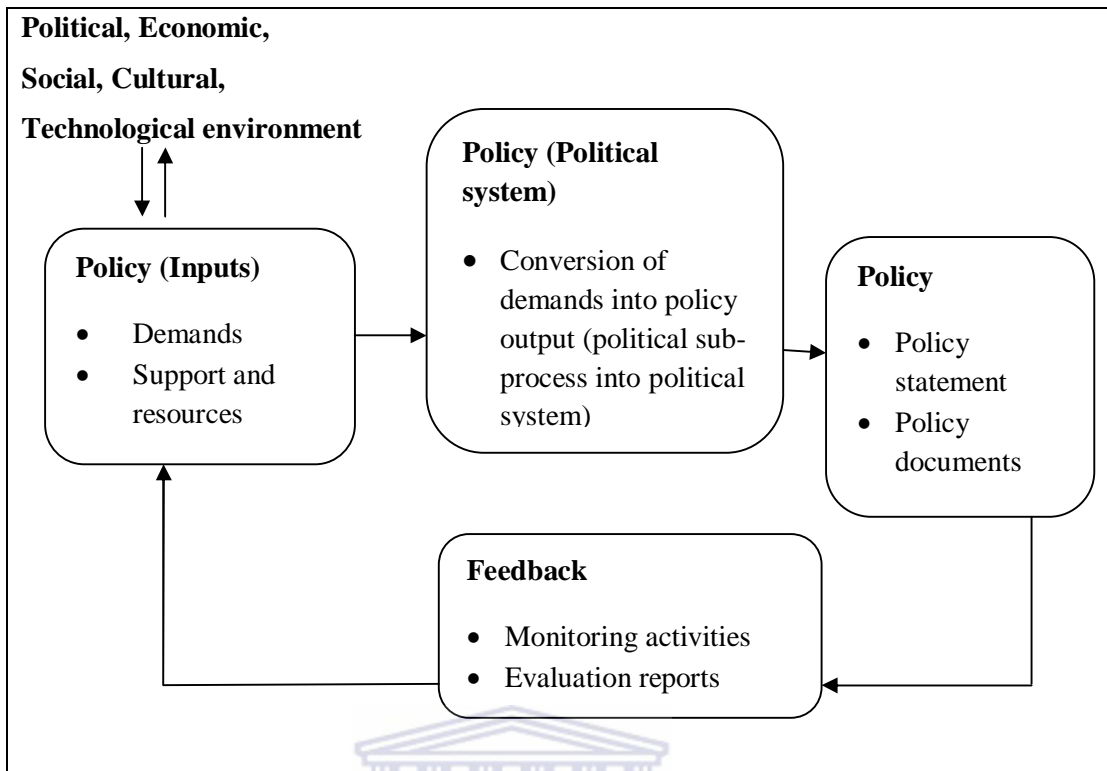
For the purpose of this thesis, the political system theory or the input-output model introduced by David Easton and its relationship to policy implementation will be explained.

According to Easton (1957:384), when the political system is considered from other social systems, variables such as inputs, the political system and outputs are seen in it. The variable input is very important to keep the political system functional. These inputs enter the political system and the system processes them into outputs. These outputs do have consequences for the environment where the inputs come from and the political system as well. Two items constitute the inputs and these are demands and support, which come from the environment. The outputs on the other hand, come out in the form of decisions and policies.

Easton (1965:38-39) defined demand as “an expression of opinion that an authoritative allocation with regard to a particular subject matter should or should not be by those responsible for doing so”. That is, demands refer to the needs of the people to be addressed by the political authorities. To him, demands should be specific, simple and directly expressed. Demand can be explicit in writing or orally or implied through actions and also it can be external through the environment or internal within the political system.

Support as an input is very important to make demands functional. Support can come from the community, the regime or rules governing the system and the government (Easton, 1957:390-396). As the demands from the environment are given the necessary support the political system is then motivated to take a decision or come out with a policy. Feedback from these policies, through monitoring of activities in the implementation stage and evaluation of reports, enters the political system as input again to continue the processes. Figure 1 shows the various stages of systems theory.





**Figure 1: System theory adapted to policy**

Source: Adapted from De Coning and Cloete, 2006: 42

Systems theory is applied in policy analysis as a model and it is seen to be one of the valuable tools (De Coning and Cloete, 2006: 40). Although it is normally employed in policy-making to aid decision-making through the systems analysis, it also becomes useful when it is employed in analysing implementation strategies so that decision makers can get information from the recommendations (Stewart and Aryes, 2001:91).

When systems theory is applied to management, it helps the manager to look at the organisation in a broader sense by considering the various parts of the organisation before making a decision. It also helps management to interpret the pattern and inter-relationship that exist among the various parts of an organisation (Olum, 2004:18). It is moreover argued that one additional value of systems theory is where its description of the relationship between the variables either stabilises the environment or triggers a new demand. With that the policy making processes is seen to be cyclical and not a start-stop process (De Coning and Cloete, 2006:43).

On the other hand, some disadvantages with the systems theory are that it says nothing about what actually happens in the political system. It does not make the political system transparent to other stakeholders outside the political system, so that it is considered to be a “black box”. Also, it says very little about political change, which is an important issue in policy making, or why certain policies evolve as a result of the political change. In addition, systems theory assumes that the policy making process is logical and orderly whilst in actual fact there is sometimes disorder and it is characterised by many other factors which in the end influence the policy decision (De Coning and Cloete, 2006:43).

Systems theory is applied in the thesis because it brings out the fact that feedback from the implementation and other further stages of policy need to enter the system for the necessary adjustment to be made. Here, challenges and prospects in the implementation of ecosan projects under the sanitation policy that may come out of the thesis need to be seen as inputs for re-consideration in the political system for a new political decision and policies.

### **Governance Theory**

The word ‘govern’ according to Storey et al (2008: 5) comes from a Greek word which means “to steer”. Today, it is defined as to ‘rule with authority’, ‘direct and control’ or ‘regulate’. Governance as a term has gone through different stages of development till recent times. It “refers to the way in which collective impacts are produced in a social system” (Hill and Huppe, 2002:13). Governance theory at the beginning was used to explain the process aspect of government or the steering actions of political authorities. In recent times, it is explained to mean more cooperative form of governing where the state and non-state actors participate. It is even explained generally to include the co-ordination of the actions of individual and basic organisations at the domestic and grassroots level (Bang, 2003:27-28).

According to the Public Governance Model propounded by John Carver (2001:3-12), public organisations are creatures of the public or the citizens of the country and so the public owns these organisations. Since it is difficult for the large group of people to meet and make decision, there is a need for an *owner-representative*

role to be created where a board is created to speak on behalf of the entire public. The public make their interests known to the board directly or indirectly through interest or pressure groups. Since it is not good for the board to implement the will of the public and at the same time make decisions, it is important for them to employ the services of management. Management which is made of professionals and scientists should be provided with all needed materials to work, be it power, funds or resources. The board therefore controls management whilst fulfilling the public will.

The public governance model which Carver (2001:20-27) claims to be a complete theory of governance, is based on the social contract philosophy of Rousseau and the Greenleaf's concept of servant-leadership. For Carver, it guides the wisdom of the board or decision makers to the most important issues. It also enables the board to exercise control over management but not intruding into their activities. Moreover, it provides the basis to assess whether roles have been fulfilled and interests met. From the point of view of the thesis, it brings out the points that the problems and challenges of the people should be paramount in decision making at the top of the hierarchy, and people at the implementation level of policies should be provided with all their needs for effective and efficient provision of goods and services.

Considering the top-down and bottom-up approaches in policy implementation, the top-down theorists, including Van Meter, Van Horn Sabatier, Mazmanian and Lowi on one hand, analyse the implementation process based on the assumption that control of implementation is hierarchical. Also they hold that only legally mandated activities should be the focus. This approach underestimates the role of the street-level actors and organisations in political interaction and bargains (Ewalt, 2001:6-7; Brynard and De Coning, 2006:188-192).

The bottom-up approach on the other hand concentrates on the street-level actors and organisations, service deliverers and policy targets in the study of implementation. Some of the theorists of the bottom-up approach are Hjern and Porter, Hull and Hjern, Lipsky, Rein and Rabinowitz and Berman.

These theorists from both sides agree that implementation is complex, dynamic and multilevel. What really differentiates them is which actors and organisations they consider to be very important. The top-down do not focus on the sub-national context whilst the bottom-up disregard the centralised policy control (Ewalt, 2001:6-7; Brynard and De Coning, 2006:188-192). From the point of view of the governance theory, all the actors discussed by both the top-down and the bottom-up theorists are important and their actions need to be coordinated in policy implementation.

As an advantage, governance theory is seen to be one way of combining the top-down and bottom-up approaches. Scholars are researching how to combine these two approaches, and a number of studies which are specifically outside the domain of implementation have proven to do that. These include Institutional Analysis and Development, Network and Network Management, and Governance. Governance theory is seen in this light because it spells out the multivariate characteristics of policy, takes into consideration the design and operation of policy structures and their actions, and brings in the input of social actors in negotiation and policy implementation (Ewalt, 2001:7-8).

Although governance is seen to be outside implementation, it is also seen to be connected to implementation through the concept of legitimacy. This is where the power of the decision makers, which is legal, ensures directly the availability of resources, promotes cooperation and sustains partnership. It is further argued that New Public Management, which is an organisational theory, focuses on effectiveness, efficiency and quality of service, and it fit into the governance theory which is political (Ewalt, 2001:7-8). This point is raised to support the idea that effectiveness, efficiency and quality of service are other characteristics of the governance theory.

As societies are growing and organisations are becoming complex to manage under central bureaucracy, there is the need for new governance systems. The new governance system allows government to share power and consult citizens at every level. The table 1 shows some differences between governance and normal bureaucratic implementation and why governance is seen to be better.

**Table 1: Differences between governance and bureaucratic implementation**

<b>Bureaucratic implementation</b>	<b>Governance</b>
Concerned with general public interest	Concerned with results that citizens value
Focus on equity	Focus on quality and value
Operate administrative system	Focus on production, separate service from control, expand customer choice, provide incentives, measure and analyse results and enrich feed back
Specify function and authority, structures	Identify mission, customers, service and outcome
Follow rules and procedures	Identify problems, solve them and continuously improve process

Source: Adapted from Ewalt, 2001:14-15

According to the study of Tsiboe and Marbell (2004:46 and 80) on waste disposal problems in Accra, Ghana, waste management in the country can be effective if the local people become part of the process. This is because as they participate, they become more committed; the feeling of alienation is removed and sustainability is assured. This is possible if governance comes into play and involvement of the people at the lower level is welcomed. In their findings, they realised that because the relationship structure in the Accra Metropolitan Assembly was hierarchical and there was a lack of stakeholder involvement, the waste management strategies were not succeeding. Also, other hindrances were lack of resources and poor management.

Connecting this theory to the thesis, it buttresses the objective to find out the challenges that exist in the implementation processes of ecosan from the stakeholders' perspective. Here the views of the local people are involved as in the case of the farmers, as well as people engaged in the process itself.

## COUNTRY PROFILE AND OVERVIEW OF THE ENVIRONMENTAL SANITATION POLICY OF GHANA

### Country Profile



**Map 1: Map of Ghana**

Source: Thrift, 2007: 1

The population of Ghana for 2007 was estimated to be 22.4 million with an intercensus population growth rate of 2.7%. The Gross Domestic Product (GDP) in 2007 was estimated to be 744.5 million Ghana cedis with a growth rate of 6.3%. Since Ghana is mainly an agricultural country, the agriculture sector contributes 34.3% of the GDP, which is the highest contributing sector of the economy. The main export commodities are cocoa, timber and wood products, gold, diamonds, bauxite and manganese. In terms of geography, the land area of the country is 238,533 sq km (Ghana Statistical Service, 2008:8-24).

Concerning the level of education, 51 % of the adults in the country are literate in English and/or a local language. Considering the political history, Ghana became independent from colonial rule in March 1957, and in the period to January 1993, it experienced three military governments and three civilian governments. Since then, there has been a stable democratic system under the fourth republic constitution of 1992 (Frempong, 2008:185-186). Since the thesis focuses on sanitation, the paragraphs that follow will give the country's profile on health and sanitation.

Malaria is one of the main frequently reported cases of sicknesses at the Out-Patient Departments (OPDs) of hospitals in the country. Other frequently reported cases are diarrhoea, intestinal worms, upper respiratory infections and skin diseases, which are mainly caused by poor sanitation (Ghana Statistical Service report, 2005:2).

According to the Ghana Human Development Report (2007:46-47), only 58% of the population dispose of their solid and liquid waste in a public dump whilst the rest dump theirs in other places such as gutters, rivers and pits and in the bush. Moreover, only about 20% of the population has access to toilet facilities. These situations contribute to the deplorable sanitation conditions, hence the outbreak of diseases. Table 2 shows in detail the various means through which people dispose of their solid and liquid waste in the country in terms of locality and regions.

**Table 2: Means of solid and liquid waste disposal by regions and residence in percentages**

Locality	Solid waste disposal					Liquid waste disposal			
	Collected	Burned	Buried	Public dump	Dump elsewhere	Sewage system	Street	Gutter	Compound
Urban	8.4	8.2	3.7	67.0	12.7	8.1	29.9	73.1	24.9
Rural	1.5	7.5	4.1	49.2	37.7	1.3	47.0	6.9	44.8
<b>Region</b>									
Western	2.2	4.5	4.0	59.6	29.7	3.2	34.7	23.7	38.4
Central	0.8	6.4	2.6	69.3	20.9	2.0	41.0	20.4	36.6
Greater Accra	19.5	12.2	4.6	51.4	12.3	14.4	19.3	38.9	27.4
Volta	2.4	12.0	6.1	47.0	32.5	1.3	41.4	9.6	47.7
Eastern	2.2	10.0	5.2	56.5	26.1	2.0	31.6	17.8	48.6
Ashanti	1.3	3.3	2.6	78.9	13.9	3.8	39.5	28.4	28.3
Brong Ahafo	0.9	3.4	2.4	70.3	23.0	1.3	54.6	7.3	36.8
Northern	2.1	9.4	2.5	30.4	55.6	2.0	62.7	8.5	26.8
Upper East	3.3	16.4	5.7	13.2	61.4	4.1	52.5	6.1	37.3
Upper West	2.3	4.6	6.0	21.1	66.0	2.3	67.4	4.8	25.5
Total	4.8	7.8	3.9	57.6	25.9	4.5	39.0	21.1	34.6

Source: Ghana human development report, 2007:47



Although the country wants to achieve all the MDGs, including access to basic sanitation, which falls under target 10 of goal 7, available information is inadequate in showing the status of that target. For example, the Ghana MDG report (2006) was more detailed on the status of water provision but had no information on sanitation. This means the sanitation sector is still not getting adequate attention to ensure development.

### **Overview of the environmental sanitation policy of Ghana**

To protect and safeguard the environment is a responsibility expected of all citizens of Ghana (The 1992 Constitution of the 4<sup>th</sup> Republic, chapter six, article 41 (k)). This ensures that issues concerning human surroundings are not disregarded in the governance affairs of the country.

Current policies of government are formulated based on the 1992 constitution and this is the basis of all rulings in the country. As policies are formulated by bodies of government, likewise the environmental sanitation policy of Ghana was formulated by the Ministry of Local Government and Rural Development (MLGRD). The Ghana national environmental sanitation policy was first formulated in 1999. It was formulated by the Environmental Health Unit (SEHU) within the Policy Division of the MLGRD in consultation with other ministries and agencies such as the Metropolitan, Municipal and District Assemblies (MMDAs), Ministries of Science and Technology, Education and Health, educational institutions and the private sector (Tayler and Salifu, 2005:2).

The policy was developed based on the realisation that less than 40% of the urban residents have waste collection services and less than 30% of them have toilet facilities. The rural areas on the other hand had worse sanitation conditions and services. These problems were caused among others by lack of national vision on sanitation, weak enforcement of the sanitation legislation and lack of manpower for planning and managing sanitation issues. Another reason for the development of the policy was to support the provision of potable water because the government realised that it is not possible to provide potable water without proper sanitation (environmental sanitation policy, 1999:1-2).

The policy had a spectrum of strategic objectives and targets which needed to be achieved by the year 2020. These objectives were:

- Formal establishment of environmental sanitation as a sub-sector within the development programmes;
- Rationalisation of institutional objectives and functions at all levels;
- Establishment of a national environmental sanitation policy coordination council within the MLGRD;
- Establishment of a national environmental sanitation day;
- Development and strengthening of the community's role in environmental sanitation;
- Development of human resources and strengthening institutional structures for managing environmental sanitation;
- Assignment of the delivery of a major proportion of environmental sanitation services to the private sector through contract, franchise, concession and other arrangements;
- Development of a strong legislative and regulatory framework, and capacity for supervising environmental sanitation activities and enforcing standards;
- Promotion of research to review sanitation technologies;
- Identification and dissemination of cost-effective, appropriate, affordable and environmentally friendly technologies;
- Adoption of the cost recovery principle in the planning and management of environmental sanitation services (environmental sanitation policy, 1999: 2).

The associated targets to be reached by 2020 are:

- National environmental sanitation day is established by legislation and observed regularly;
- The national environmental sanitation policy co-ordination council is established within MLGRD;
- Environmental sanitation technologies are under regular review and continuous improvement;
- All solid wastes generated in urban areas are regularly collected and disposed of in adequately controlled landfills or by other environmentally acceptable means;
- All excreta are disposed of either in hygienic on-site disposal systems or by hygienic collection, treatment and off-site disposal systems;

- All pan latrines are phased out (by 2010);
- At least 90% of the population has access to an acceptable domestic toilet and the remaining 10% has access to hygienic public toilets;
- Hygienic public toilets are provided for the transient population in all areas of intense public activity;
- Active sanitary inspection and vector control programmes are in place and the incidence of malaria, bilharzia and other vector-borne diseases is falling;
- Environmental standards and sanitary regulations are strictly observed and enforced;
- The majority of environmental sanitation services are provided by the private sector (environmental sanitation policy, 1999:3).

The zeal for decentralisation in the country as documented in the 1992 constitution of Ghana made the MLGRD and assemblies below it have direct responsibility for the policy. Whilst the MLGRD will play coordination roles at the higher governmental level, MMDAs will ensure the management of waste, public health, environmental monitoring and evaluation at the metropolitan, municipal and districts levels. The allied ministries were to play supporting roles that suit their sectors. For example, the Ministry of Education was responsible for hygiene education whilst the Ministry of Health was to provide health data and contribute to health education (Ministry of Local Government, Rural Development and Environment, 1999:4-6). These arrangements make the national and sub-national institutions of government relate and interact, horizontally and vertically to achieve a common goal as described by Ile (2010:53-56) under the concept of intergovernmental relations. According to her, these governmental institutions will need quality leadership, quality planning, good service delivery, proper coordination, and the ability to delegate to be able to achieve set goals.

The provision of sanitation services will, however, mainly remain in the domain of the private sector. Individuals, communities and community-based organisations (CBOs) will ensure hygienic practices in the communities (Ministry of Local Government, Rural Development and Environment, 1999: 3-4).

An assessment of the policy in 2005 by Tayler and Salifu, (2005:3-4) showed that there had been some achievement of the targets. For instance, the national

environmental sanitation policy co-ordination council had been established and it was functioning and sanitation week was celebrated every year. However, there were many challenges which made a revision of the sanitation policy a necessity. Some of the challenges that were mentioned were that the supporting ministries had their own priorities and therefore did not carry out their roles to achieve the sanitation policy. Additionally, the role of an important agency called the Community Water and Sanitation Agency (CWSA) was not spelt out in the policy document. Therefore, the revised policy should address these challenges by making it clearer on the role of the ministries and all agencies.

Based on recommendations such as these, the policy was revised in 2007 and approved by the executive arm of government (the cabinet) on 25<sup>th</sup> March 2010 (Think Ghana, 2010). The revised policy outlined and discussed components constituting environmental sanitation in the country. These included the proper disposal of all forms of waste be it solid, liquid, industrial, domestic, health-care and hazardous ones. It also included issues concerning the control of pests and vectors of diseases, storm-water drainage management, burial of dead people, proper rearing of animals and sanitation education. With that, the overall goal of the policy was stated clearly as follows:

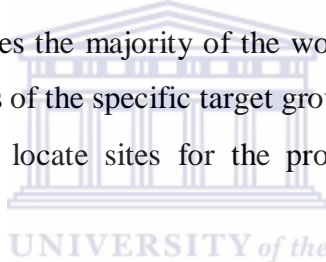
Consistent with the national socio-economic development framework..., the overall goal of the Environmental Sanitation Policy is to develop a clear and nationally accepted vision of environmental sanitation as an *essential* social service and a major determinant for improving health and standard of living in Ghana (revised environmental sanitation policy-draft final, 2007: 11).

Policy principles that will guide actions towards the achievement of the goal were outlined. In addition, specific objectives, actions and measures were declared, based on seven policy focus areas and challenges. The policy focus areas and challenges are the following: capacity development, information education and communication, legislation and regulation, sustainable financing and cost recovery, monitoring and evaluation, level of service, and research and development.

In the case of level of service, for example, the underlying principle is to ensure that every choice that individuals, organisations or agencies in the country will make to provide sanitation service should reflect the effective demand of the people in the country. Also any technology which will be adopted should conform to regulations in order to safeguard the interests of all.

Specific objectives, actions and measures were developed based on this principle. For example, with the objectives to ensure effective containment and decrease in the negative effects from poor sanitation situations, and to support adequate treatment and disposal of wastes, the following actions and measures are to be taken:

- MMDAs should prepare their own strategic plans;
- MMDAs should ensure that minimum standards are met whereby the private sector does the majority of the work and carries out services that meet the interests of the specific target groups including the vulnerable;
- MMDAs should locate sites for the proper treatment and disposal of waste.



The objective to respond effectively to the problem of increasing volumes of waste and to change waste streams due to increasing population and changing life-styles, the actions to be taken are as follows:

- Provision of services and facilities that will ensure the primary separation of solid wastes at the household level;
- Development of community and public level and programmes that will increase the access to sanitation services;
- Provision of adequate systems that can manage waste water treatment re-use and disposal.

The arrangement made for the implementation of the revised policy was the allocation of responsibilities for all identified stakeholders. This was the case in the original policy document, just that in the revised policy, the responsibilities were explained in detail and it included many other allied sectors not identified in the first one. Ministries and institutions such as the Ministry of Energy, the

Ministry of Transport, the Ministry of Harbours and Railways, Ghana Statistical Service, Ghana Standard Board and Town and Country Planning Department were some other sectors given roles to play. This was based on the argument that environmental sanitation is a public good and that the poor sanitation practice of one person affects all. For that matter the responsibility rest on all citizens and sectors to ensure a clean environment (revised environmental sanitation policy-draft final, 2007: 13-30).

For the purpose of the thesis, the roles of metropolises and the private sector will be highlighted.

The roles of the metropolises were classified into five basic functions. These basic functions are as follows:

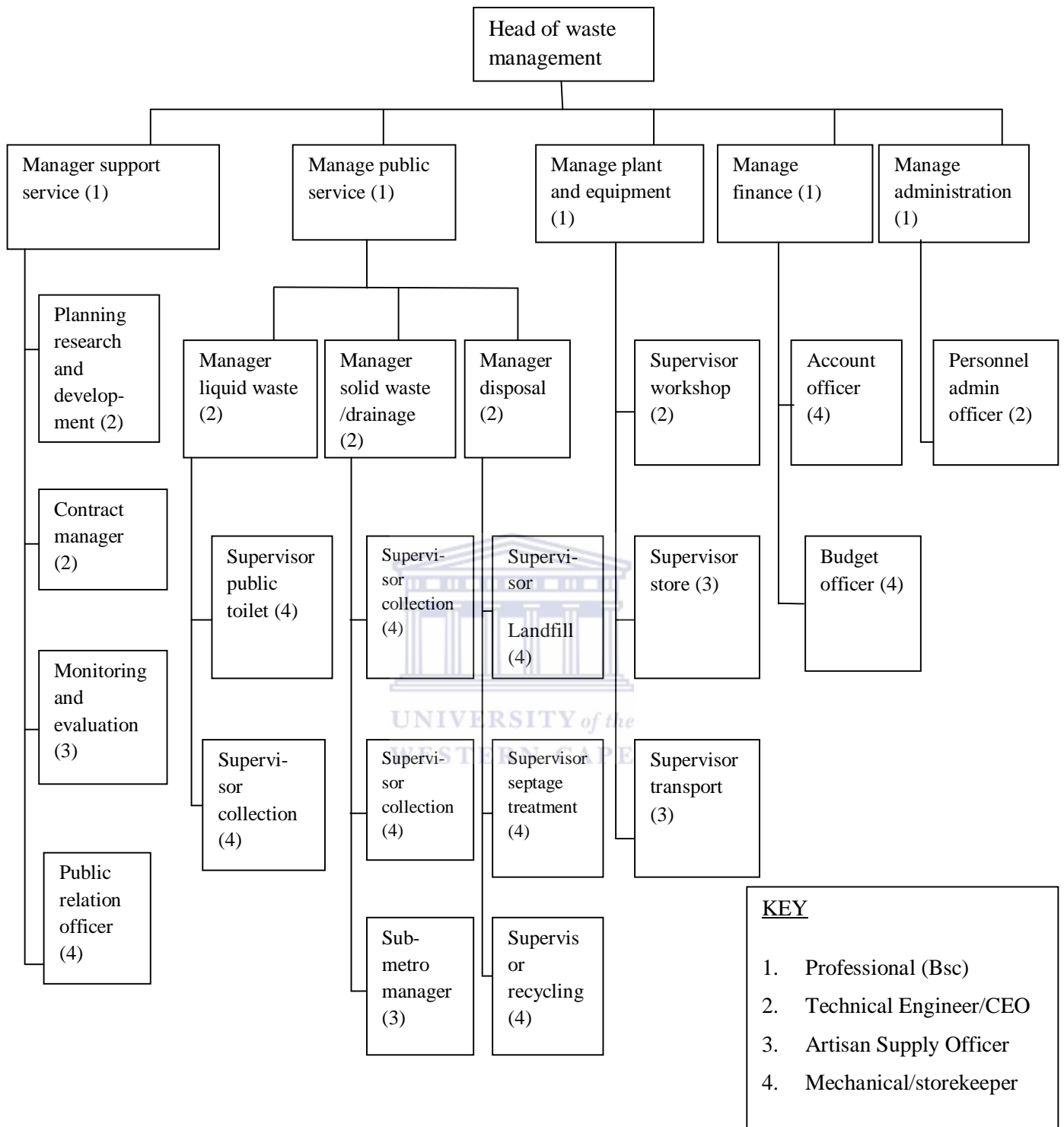
- Ensuring waste management which includes the collection and sanitary disposal of all forms of wastes being solid, liquid, excreta, industrial, health care and hazardous substances. This must be done by the Waste Management Department and they will carry out this service directly or indirectly through contracts or franchises. When it is through contracts or franchises with private organisations, the assembly should still carry out about 20% of the waste management duties.
- Promoting public health management. All issues concerning environmental sanitation including pest and vector control, food hygiene, sanitation education, inspection and regulating sanitations rules, burial of dead people, animal rearing which form part of public health management shall be undertaken by the environmental health and management department of the metropolis.
- Ensuring environmental monitoring. This is where the environmental protection and enforcement division need to be formed within the environmental health and management department in collaboration with the Environmental Protection Agency (EPA), to ensure that environmental rules and regulations are followed. It will also involve continuous public education. Even if the department contracts the private sector to carry out

these tasks, it will still be responsible for imposing sanctions on those who disobey the regulations.

- Provide facilities related to environmental sanitation. The works department shall provide infrastructure such as public toilets and gutters in conjunction with the environmental health and management department.
- Ensuring planning, monitoring and maintaining public relations. Alongside the sanitation service provisions, the assembly needs to monitor how effective these services are, identify the problems associated with them and provide appropriate solutions, engage in short-and medium-term planning to meet the needs of the communities (Ministry of Local Government, Rural Development and Environment, 2007:26-27).

Metropolises are to carry out their responsibilities based on the organisational chart (Figure 2) below:





**Figure 2: Organisational chart for the metropolitan assembly: waste management department**

Source: Adapted from Ministry of Local Government, Rural Development and Environment, 2007: 33.



In the revised policy, the private sector comprises Non-Governmental Organisations (NGOs), CBOs and private companies. They are to provide the bulk of the sanitation services under the supervision of the public sector, especially MMDAs, through contracts, vouchers, franchises or concessions. Their roles include the following:

- Provision and management of septic tankers;
- Construction, rehabilitation and management of public baths and toilets;
- Collection of solid waste from households, institutions and communal containers;
- Cleaning of specified areas and facilities such as the street, drains, markets, lorry parks;
- Provision and management of waste treatment, recycling and disposal equipments;
- Control of pests in public areas;
- Operation and maintenance of sewerage collection and treatment systems;
- Leasing of equipment and maintaining workshop services;
- Provision of maintenance of meat shop or abattoir services;
- Managing cemeteries and crematoria (Ministry of Local Government, Rural Development and Environment, 2007: 28)

### **Overview of projects and programmes under the environmental sanitation policy**

Many projects and programmes are currently taking place in the country, both from the public and the private sector, in addressing the various challenges hindering the achievement of sustainable sanitation. One can talk of the programmes and projects of a private company called Zoomlion Ghana which is operating in all the ten regions of Ghana. Through partnership and contracts with the public sector, it engages in the provision of services such as solid and liquid waste collection, public places cleansing, operation and maintenance of landfills and dump sites, pest control services, landscaping and beautification services, assembling, sale and hiring of waste management equipment and capacity-

building of personnel. Their services cover domestic, industrial and governmental needs (Zoomlion Ghana Limited, 1-7).

A coalition of NGOs was formed in 1989 when there was a lack of equity in the provision of urban and rural water, and they focus on water and sanitation. It is called the Coalition of NGOs in Water and Sanitation (CONIWAS). The coalition is now made up of about 50 private sector actors and government agencies and their focus has been extended to cover everything under the MDGs. The work of most NGOs in the sanitation sector in Ghana falls into four categories. These are the direct delivery of service such the building of sanitation facilities for rural communities, community institution building where they encourage the participation of people to address their own problems, advocacy and capacity building (Thrift, 2007: 15).

Larbi (2006:4-5) in discussing current efforts to improve the sanitation situation in Ghana identified the implementation of some innovative programmes and projects. These are the social marketing of sanitation, Participatory Total Community Sanitation (PTCS), innovative financing schemes (revolving funds and sanitation credit schemes) and experimentation with new technologies and projects such as ecosan. Social Marketing of sanitation is where commercial marketing concepts are adopted to influence people to adopt proper sanitation methods voluntarily to change certain behaviour so that the society will benefit in the long run. PTCS is where efforts are made to instil behavioural change among community members through sensitisation, empowerment and institutional building. The innovative financing scheme is where NGOs and banks through the Districts Assemblies provide loans to households and organised groups for the building of toilets and other sanitary facilities.

When it comes to ecosan, which will be elaborated in this section, as a new technology and project being implemented in the country, it is mentioned by Thrift (2007: 15-16) that only a few organisations are engaged in it. However, it is possible that the projects may be in existence but there is no extensive documentation on them. Some of the identified projects in Ghana are the ecologically designed Valley View University campus in Dodowa, Accra, a

biogas project in Kumasi, a faecal sludge composting plant in Accra, waste water irrigated agriculture and co-composting of faecal sludge and solid wastes pilot project in Buobai, Kumasi, by the International Water Management Institute (IWMI) and 'Kokrobite School' ecological village. Apart from these, there are other informal markets for raw faecal sludge in Bolgatanga, Tamale and Manya Krobo. The use of waste water for irrigated agriculture is practiced everywhere in the country.

These ecosan projects which are implemented in Ghana are either by private organisations, and/or a partnership between NGOs and the government. This is because these approaches are seen to be more effective. For example, the biogas project in Kumasi was built by an organisation called Friends for the Mentally Handicapped Children (Thrift, 2007:15) and the co-composting project in Buobai, Kumasi, is run by government institutions and other international organisations (Cofie and Doulaye, 2008: 1).

In general terms, there are four broad categories of ecosan projects that are implemented worldwide. These are rural upgrading, peri-urban (suburbs) and urban upgrading, a new urban development and non-residential project (Werner et al, 2003: 21-23). The rural upgrading is a classical ecosan project where farming households in rural areas get support to establish the ecosan systems and then the households themselves handle the processing and use of the fertilizer (mainly excreta) on their farms. The peri-urban and urban project takes place in cities and towns where existing sanitation systems are converted into ecosan systems. In such cases, because of the difficulty of outright conversion, the ecosan solutions of reuse are built around the existing sanitation systems. Mostly in such projects, it takes external service providers or the government to help in processing the fertilizers and sending them to farmers or to the reuse site.

The new urban development is the type where new dwellings are built by the government, private developers or the individuals in an ecological way. With that, all components of sanitation can be integrated in the construction and can either be the responsibility of the households or external service providers to handle the processing of the fertilizer. The non-residential project refers to ecosan systems in places such as schools, hospitals, hotels and offices. It can be in the

form of upgrading or new development and the handling of the fertilizer may either be in the hands of the users or external service providers (Werner et al 2003: 21-23). The project for consideration as a case study in the thesis is a peri-urban and urban upgrading project type, which is one of the few main ecosan projects in Ghana.

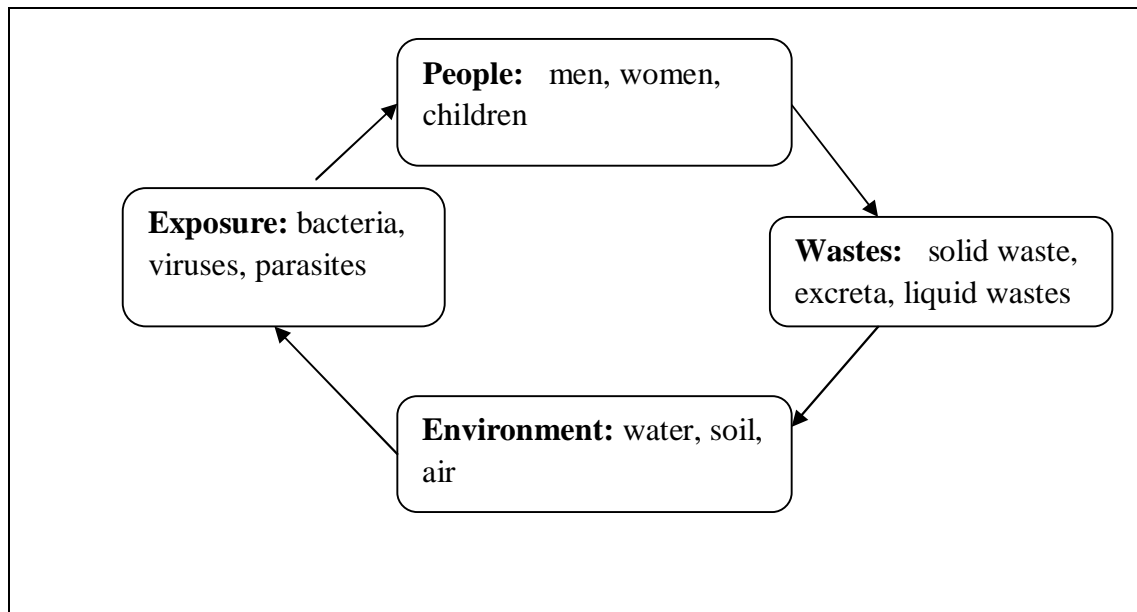
Ecosan encompasses all components of sanitation be it solid waste, excreta (urine and faeces), rain water and grey water (water from bathing, washing, etc.) and they all have their own ways of treatment to make them re-useable. Organic solid waste can be treated through composting or anaerobic digestion to form fertilizer. Rainwater can be treated through filtration or biological treatment to be supplied or for groundwater recharge. Grey water can be treated through constructed wetlands or wastewater ponds for irrigation. Faecal sludge can be treated through composting and drying to be used as fertilizer or anaerobic digestion for biogas. Lastly, urine can be treated through hygienisation by storing or drying it for liquid or dry fertilizer (Werner et al, 2003:18). Figure 3 shows how in ecosan, wastes can be treated for reuse and not released to pollute water bodies and the environment in general. Specifically, the arrows under the building show that instead of allowing the waste water from the house directly into the river, it is rather channelled into ponds, compost sites and other projects for treatment. The treated water is then directly brought back to the house for use or used in farming to get produce.



**Figure 3: Ecosan - closing the loop in wastewater management and sanitation**

Source: Werner et al, 2003: 17

The introduction of ecosan makes the already existing sanitation management conventional. The conventional sanitation therefore refers to the traditional or normal sanitation management where the end results of the sanitation systems are not considered and so bring about health and environmental problems (Werner, et al, 2003:10). In excreta management, for example, conventional sanitation can either be on-site sanitation systems like pit latrines or off-site systems like water closets which have a central sewage treatment point, but the end result which is not given proper attention brings negative consequences. In most parts of the world, the basic practice is to collect domestic liquid waste in water-borne sewer systems, treat them at a central point and then discharge the effluent into surface water bodies. In this practice, the downstream effects of the discharges are overlooked as most of the faecal sludge and other forms of wastes are not well treated (Panesar and Bischoff, 2008: 2). These discharges end up polluting the water bodies which cause the outbreak of sanitation-related diseases. The vicious cycle of infections caused by the conventional approach is shown by Figure 4 below.



**Figure 4: Vicious cycle of infection caused by conventional sanitation**

Source: Adapted from Esrey et al, 2001: 9

Apart from the health issues, there are other problems which this ecosan aims to address. One can mention the problem of water shortage where lack of fresh water for drinking is causing many deaths in most part of the world but the conventional practice of flushing toilets continues to waste more of it. This may make the use of water for flushing a criminal act (Pinnekamp, 2007: 5). In addition, one can mention the problem of food insecurity. Instead of retrieving the nutrients contained in the faecal sludge and other forms of waste and treating them for re-use in agriculture, it is overlooked in the conventional system. As conventional agriculture is becoming less popular because of the use of many chemicals, which can affect health, likewise conventional sanitation is also becoming less popular now because of its health implications and other current problems that it does not address, which means it is not sustainable. Therefore, there is a need for a paradigm shift to where health aspects will be taken from the holistic level and the re-use sanitation approach will be emphasised.

## **THE CASE OF SANITATION SITUATION AND ECOSAN IN KUMASI METROPOLIS**

### **Background and sanitation situation in Kumasi Metropolis**

The population of Kumasi based on the 2000 population and housing census was estimated to be 1 170 270 at a growth rate of 5.6% (Owusu, 2005:57). It is the second largest city in Ghana after Accra and it is the capital of the Ashanti Region of Ghana where the people are predominately Akans. The Akans constitute 81.8% of the people there (Ghana Statistical Service, 2005: 2 and 2008:8). The metropolis is governed by an assembly where two-thirds of the members are voted into power based on non-party elections and one-third based on government appointees including the metropolitan chief executive. To reduce complex socio-economic, urbanisation and management situations that normally confront metropolis in the country, sub-metropolitan district assemblies are created below them. Kumasi Metropolitan Assembly (KMA) for that matter has four sub-metropolitan assemblies (Aryee and Crook, 2003: 8-9).

Kumasi lies in the wet forest belt of Ghana and it experiences a lot of rainfall as compared to the northern part of the country. Its temperature ranges from 20.7 to 33.6°C (Thrift, 2007:2). Due to this, urban and peri-urban agriculture is very important there. This is because it contributes to food security and increases the income of the urban and peri-urban poor. It is estimated that 70 ha of land are under urban farming for tubers, cereals and vegetables whilst in the peri-urban areas it is 12,000 ha. However, research shows that urban and peri-urban agricultural soil lacks organic matter and nutrients (Vodounhessi and Von Muench 2006: 2) which means there is a need for nourishment.

When it comes to the issue of health and the prevalence of preventable diseases in this area, malaria tops the list with a value of 44% and diarrhoea is the third with 4.3% (Ghana Statistical Service, 2005: 2 and 2008:8).

Historically, the provision of sanitation services in the metropolis from colonial times till the 1980s was from the public sector only. It was only during the 1980s that the experiment with public-private partnership proved to be successful and so was continued to be adopted (Thrift, 2007:2). Currently there are many private

companies as well as NGOs providing sanitation services in the metropolis from all angles (Oduro-Kwarteng and Van Dijk, 2008: 115).

Research undertaken by Ketibuah, et al. (4) showed that in Kumasi, organic wastes are the highest form of household wastes generated which calls for appropriate means to make them reusable. It is estimated that on a daily basis, 860 tonnes of solid wastes are generated. In addition, 500m<sup>3</sup> of faecal sludge is generated in a day. If these wastes are not well treated, they end up polluting a river in the city called the Wewe River and other water bodies (Olufunke and Kone, 2008:1-2). Landfill is seen as one option to manage these wastes but the questions by Diaz (2006: 1325-1326) about landfill still remain unanswered due to uncertainties of the consequences. The questions are: will the liquid, gas and other emissions from landfills cause problems to the society, and for that matter how long should they be monitored? Which other land areas should be earmarked for future landfills when one area is full?

### **Ecosan in Kumasi Metropolis**

Although there are other ecosan projects in Kumasi, the focus will be on the co-composting project in Buobai. This is because its implementation has increased awareness of excreta and solid wastes based fertilizer among the people in the region (Olufunke and Kone, 2008:1-2).

Buobai is a community which is situated 15 km away from the centre of Kumasi and the co-compost project there is a pilot research action which seeks to link sanitation and agriculture. It was started in 2002 by a joint cooperation of the IWMI, Department of Water and Sanitation in Developing Countries (SANDEC) of the Swiss Federal Institute for Aquatic Science and Technology (EAWAG), Kwame Nkrumah University of Science and Technology (KNUST) and the Waste Management Department of KMA (Olufunke and Kone, 2008:1-2). Considering the explanation given to the types of ecosan projects earlier, it is the type which upgrades peri-urban and urban sanitation systems for agriculture and involves the assistance of inter-governmental organisations and the local government. This is because of the difficulty of the individual households to switch facilities immediately.



The components of sanitation used in this project are excreta (faecal sludge) and solid bio-wastes (Olufunke and Kone, 2008:1-2) and they are processed into fertilizers. When it comes to the preparation of the ecosan fertilizer, which at one point was called co-compost and at another time called *comlizers* (because of the addition of other components), the two sets of waste needed are firstly gathered. The municipal solid waste from the households, markets and other public places are brought to the project site from the metropolis, they are sorted into different fractions like stones, plastics, nylons, papers, metals, textiles, wood, and organic solid wastes. The organic wastes are then separated for use. The human excreta on the other hand, are from the septic tanks and the public toilet sludge from the pit latrines. The two are then mixed up, dewatered on a drying bed and composted. These sets of waste are used because they complement each other (Olofunke and Kone 2008: 1-2). The faecal sludge is relatively high in nitrogen and moisture whilst the solid waste is high in organic carbon and has good bulking quality (Strauss et al, 2003:17).

Researches conducted on the co-compost indicate that after the process, it maintains a high level of potassium and phosphorus but is low in nitrogen, which is also necessary for plant growth. The nitrogen is lost especially during the drying of the faecal sludge which contains the ammonium component of nitrogen (Adamtey et al, 2009:17 and 2430). This means farmers will need a large quantity of the co-compost for a small piece of land. This therefore calls for the enhancement of the nitrogen content if the interest of the farmers is to be considered. This is because the separate application of co-compost and inorganic nitrogen was assumed to be risky and labour intensive for the farmers. Therefore, the appropriate way to top up nitrogen level with the inorganic nitrogen should be at the production level. To do that, either ammonium sulphate or urea is mixed with the co-compost for both the organic and the inorganic elements to contribute 50% to the nitrogen content of the fertilizer. The new fertilizer which comes out after the enhancement of the nitrogen is named *comlizer*. That is excreta-based compost fertilizer mixture (Adamtey et al, 2009:17 and 2430).

Since faecal sludge is of great concern when it comes to ecosan, as it is known to contain more pathogens in comparison to urine, it is important to elaborate how these pathogens are killed to ensure safety. Some of the pathogens contained in faeces are bacteria, viruses, protozoa and helminths. They only affect public health when they get into the field or water bodies, or get to a person directly when the person does not wash their hands properly after visiting the toilet or drink water or eat food contaminated with them (Strauss et al, 2003: 3).

It was mentioned in the description of projects and programmes under the sanitation policy that faeces can be treated by composting and drying for fertilizer. These processes ensure increment in storage time, temperature, dryness, pH, ultraviolet radiation, and competing natural soil organisms which makes the survival of the pathogens impossible (Winblad and Simpson-Hébert, 2004: 12). Most pathogens survive below temperatures of 5°C (degree Celsius) and die very quickly at high temperatures like above 40°C (Winblad and Simpson-Hébert, 2004:12). Due to that, as temperatures increase during composting and drying, most of them are killed.

Considering the pH, it is argued that highly alkaline conditions render the pathogens inactive and so alkaline is added during the process. In terms of ultraviolet radiation, it has also been observed that the presence of solar radiation reduces the survival time of the pathogens in the soil or on crops. When it comes to competing natural organisms, the presence of other organisms affecting each other by predation, release of antagonistic substances and competition for nutrients reduce the life-span of the pathogens. The pathogens are adapted to living in the gut of human beings and are therefore not able to compete well with organisms in the general environment. Moreover, these pathogens entering the environment are anaerobic and are easily overcome by the aerobic environment they find themselves (Winblad and Simpson-Hébert, 2004: 12).

## **CONCLUSION TO THE CHAPTER**

The chapter described four theories that are applicable to policy implementation and management. These theories were the scientific management theory, the administrative theory, the systems theory and the governance theory. The scientific management theory and the administrative theory informed the research of some principles to be followed in project implementation. Systems theory showed the importance of considering challenges in the implementation to be necessary for the continuation of the process whilst governance indicated the need to incorporate challenges from both the top and the bottom.

In addition, the chapter gave an overview of the environmental sanitation policy of Ghana and the nature of ecosan in Kumasi metropolis. The chapter that follows presents the findings of the research.



## **CHAPTER THREE**

### **RESEARCH FINDINGS**

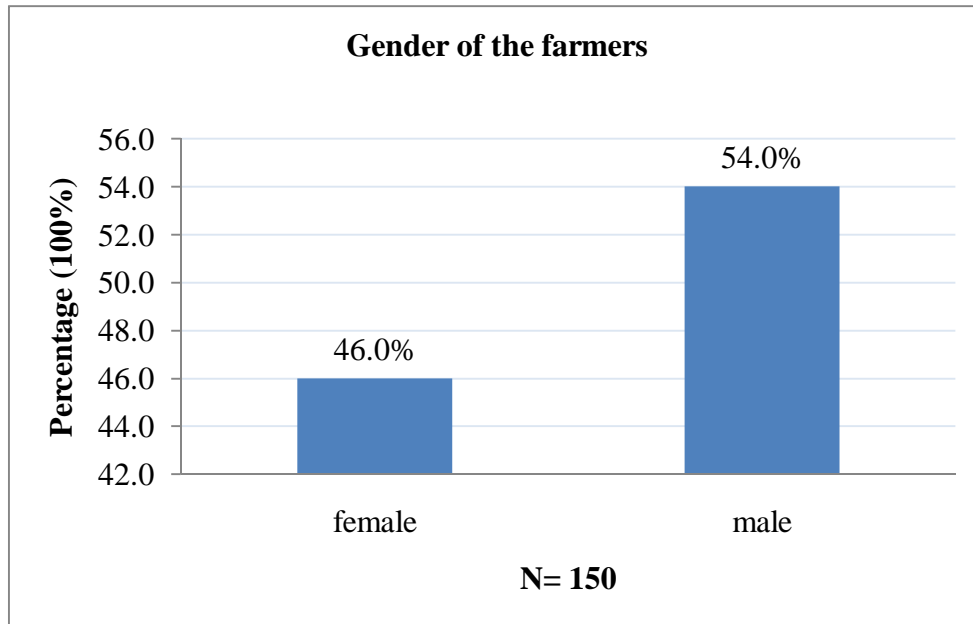
This chapter has six sections. The first section shows the findings of the demographic characteristics of the interviewees of the questionnaire which serve as background information. Section two then presents the findings in the analysis of the sanitation policy. The third section presents the findings as the programmes and projects under the policy were examined. Section four presents the observations made about sanitation in Kumasi. Section five presents the findings in the analysis of the objectives of ecosan in relation to the objectives of the sanitation policy. Section six presents the findings in the analysis of the views of the targeted stakeholders, which constitutes the prospects and challenges of ecosan in the municipality.



#### **DEMOGRAPHIC CHARACTERISTICS**

The demographic characteristics of the farmers interviewed focus on features such as gender, age, level of education, religion, ethnic groups and type of crops they produce which are considered to have influence on their perceptions.

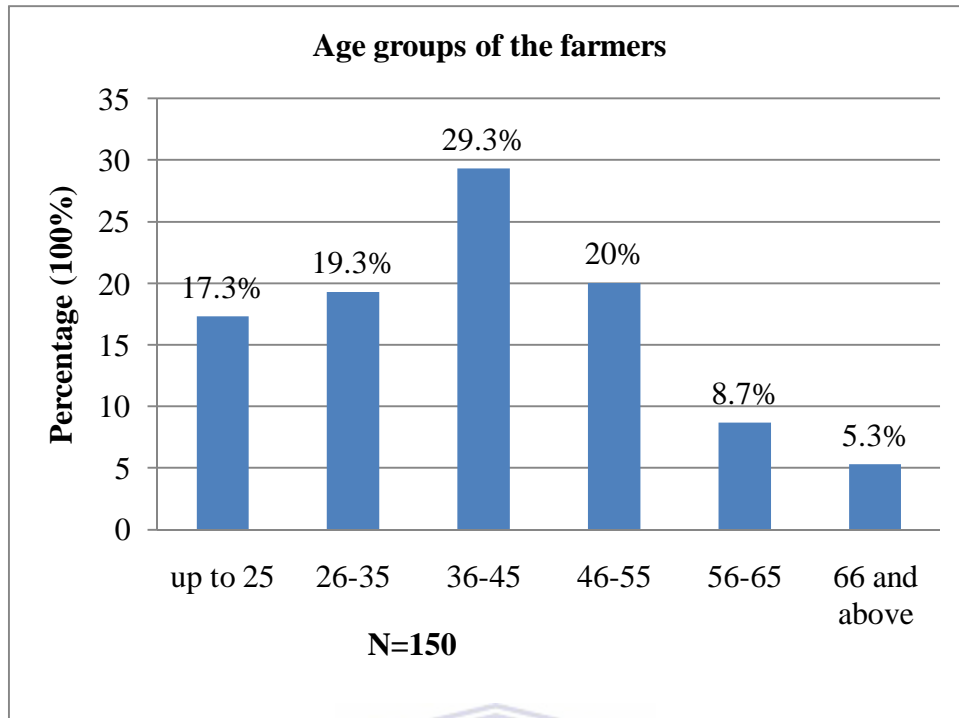
Looking at the gender of the respondents in the first place, it was realised that out of the 150 respondents, 69 (46%) were females and 81(54%) were males, which means the percentage of men interviewed was higher than of women. All the same, both sexes were represented in the survey. Figure 5 shows the distribution of the percentage for the gender of the respondents.



**Figure 5: Gender of the farmers**

Source: Author's empirical results

The mode age (age with highest frequency) of the respondents falls within 36-45 years, representing 44 (29.3%) of the sample; 30 (20%) were within 46-55 years, 29 (19.3%) were within 26-35 years, 26 (17, 3%) were up to 25 years, 13 (8.7%) were within 56-65 and 8 (5.3%) were 66 and above. The ages of the respondents were categorised before the survey and that limited the types of central tendencies to calculate and other analysis that can be measured. Although it is impossible to exactly get the mean age, the rough analysis gave a mean value of 2.99. This shows that the average age falls within the age groups of 26-35 and 36-45. The median value of 3.00 depicts that the central age falls within 36-45. When the respondents are grouped into two, between those who are above and those below 25 years, 124 (82.7%) were above 25 years. Figure 6 displays this analysis.



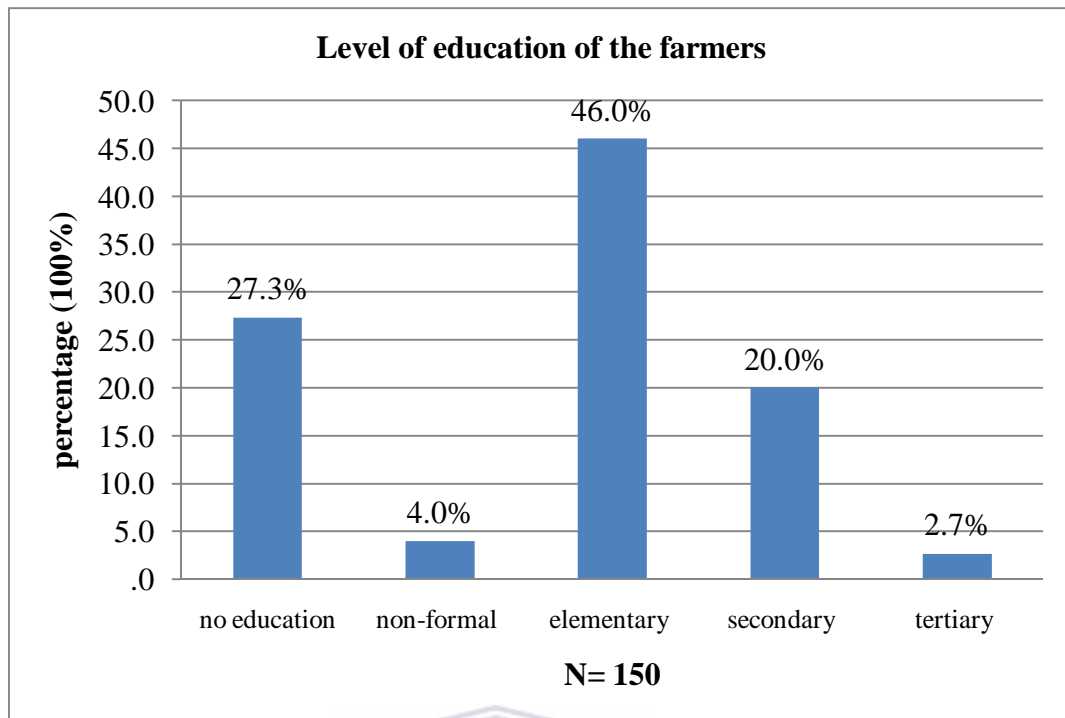
**Figure 6: Age groups of the farmers**

Source: Author's empirical results

In terms of level of education, 69 (46%) representing elementary school<sup>1</sup> was the mode of the level of education; 41 (27.3%) had no education, 30 (20%) had secondary education, 6 (4%) had non-formal education<sup>2</sup>, and 4 (2.7%) had tertiary education. This shows that 109 (72.7%) had some form of education and could be considered literate. Only 41 (27.3%) were completely illiterate. Figure 7 shows the educational level of the respondents.

<sup>1</sup> Elementary school means the person completed grade 9 which in Ghana also mean junior high school.

<sup>2</sup> Non-formal education is where a person did not pass through the normal education system but attended evening or adult classes in the community to be able to do basic reading and writing.



**Figure 7: Level of education of the farmers**

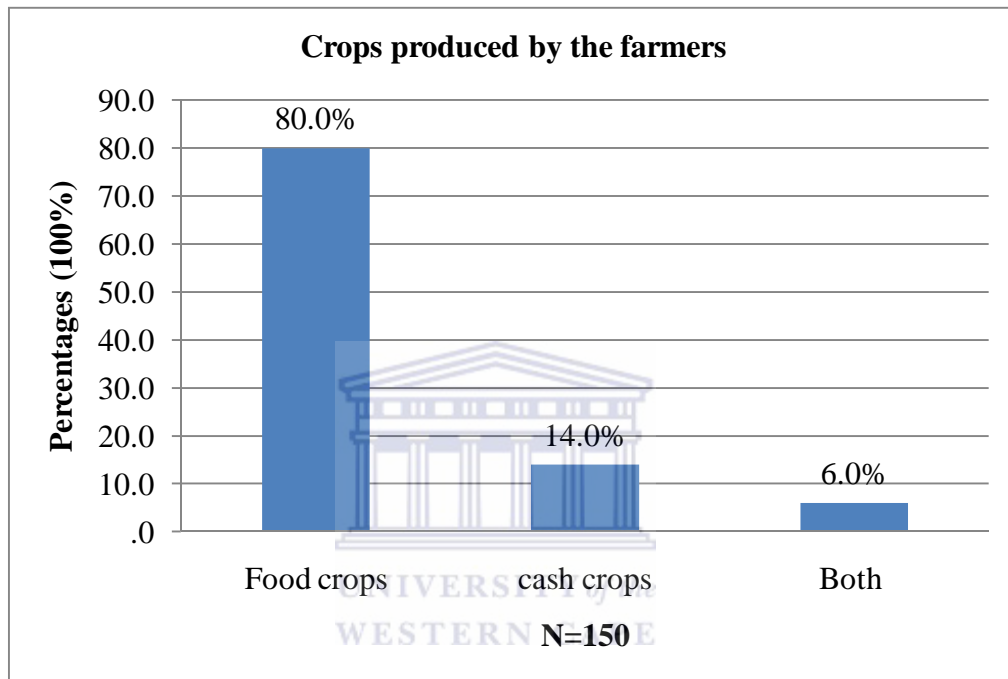
Source: Author's empirical results

Considering the marital status of the respondents, the majority of them were married with 99 (66%) of them having that status and 29 (19.3%) were single, 16 (10.7%) were divorced and 6 (4%) were widows or widowers.

In terms of religious affiliation, 102 (68%) were Christians, 20 (13.3%) were Muslims, 11 (7.3%) practiced African traditional religion, 15 (10%) had no religion and 2 (1.4%) had other religions. This means the majority 135 (90%) of the respondents were religious.

There are many ethnic groups in Ghana, which is mainly based on linguistic and cultural difference. The main groups include Akan, Ewe, Ga, Guan and Hausa. Taking these major ethnic groups into consideration, the Akans were in the majority and constituted 107 (71.3%) of the sample. Ewes and Gas were 7 (4.7%) each. There were 13 Hausas (8.7%), 2 Guans (1.3%), and 14 (9.3%) were of other ethnic groups. This is understandable because the study area is predominantly Ashantis and they are Akans.

As Many as 120 (80%) of the respondents were involved in the production of food crops such as vegetables, cereals, tubers and plantains, 21 (14%) produced cash crop like cocoa, cashew and coffee and 9 (6%) produced of both cash crops and food crops. Most, 111 (74%) had their farms in the peri-urban areas whilst 39 (26%) had their farms in distant villages. Figure 8 shows the different crops produced by the respondents.



**Figure 8: Crops produced by the farmers**

Source: Author's empirical results

### **CRITIQUE OF THE ENVIRONMENTAL SANITATION POLICY**

This section of the research findings has two focuses. It first of all brings out the differences as the original and the revised environmental sanitation policies of Ghana are compared. It then brings out the strengths and weaknesses of the revised policy when it comes to management and implementation arrangements made for programmes and projects under the policy.



## **Differences between the original and the revised Environmental Sanitation Policy of Ghana**

A look at both policies as they were briefly presented in chapter two shows some similarities and differences. In terms of the similarities, both policies generally were to address the poor sanitation situation in the country which is strength for both. Secondly, both policies had some objectives to be achieved.

With the differences which are many, the first point is the fact the objectives and targets of the original policy were generally stated without grouping them based on any specific focal areas considered to be very important. Likewise, the challenges and problems seen to hinder proper sanitation were generally stated. This approach made the outline of the objectives and challenges not to be in detail. The revised policy, however, has its objectives, targets, actions and measures outlined and based on the six focal areas, which are seen to be very important in promoting proper sanitation in the country. The challenges that are discussed are in detail and are also based on these focal areas.

Secondly, in the original policy document, what constitutes environmental sanitation was not defined. That makes it difficult for one to really understand what is meant by environmental sanitation and factors that constitute it. The revised policy, however, describes what constitutes environmental sanitation by saying that it includes the proper collection, disposal and treatment of solid wastes, liquid wastes, industrial wastes, health-care wastes and excreta. It also includes issues concerning food hygiene, pest and disease control, stray animal control, environmental education and inspection.

In the original document, there was no discussion of how the implementation of the policy would lead to the achievement of other developmental goals in the country. On the contrary, the revised policy indicates how the policy has bases from the constitution of Ghana and has influence on the achievement of the Ghana's Growth and Poverty Reduction Strategies (GPRS) and the MDGs, and the revised policy promotes the New Partnership for Africa's Development (NEPAD).

In the original document, not all the main actors who are important in the implementation stage were identified. For example, a key actor like the Ministry

of Water Resources, Works and Housing (MWRWH) was not identified. This makes it incomplete because water and sanitation normally moves hand-in-hand. In addition, the identified actors were not fully clear in their roles and responsibilities. This situation is improved in the revised policy. The roles of all the actors mentioned are explained in detail and many other actors who were not in the original document are now identified. It is important to identify actors to ensure coordination and collaboration of support.

The original document did not provide any organisational chart on how the implementation process should be managed. This is not the case in the revised version. Here, different structures are provided at almost every level of the implementation stage in the public sector. For example, there is a structure of how the national environmental health and sanitation department of MLGRD, now MLGRDE (Ministry of Local Government, Rural Development and Environment) should be involved. Also the Waste Management Department of the metropolitan and municipal assemblies have their own separate structures. There was a structure for metropolitan and municipal environmental health departments as well. Furthermore, the district environmental health and management departments had their own structure. Apart from the structure, the levels of professionalism and education for each level of the organisation chart are also determined. This structure can be seen as an important management tool to ensure efficiency and effectiveness.

Last but not least, the concept of co-composting, which is an aspect of ecosan, is mentioned in the revised policy as one way of treating waste for re-use in the country. This was not the case in the original document. This shows how detailed the revised policy was by incorporating diverse concepts.

### **Critique of the revised policy**

For the objectives of the policy to be achieved, it must be implemented through management and administrative procedures. In that regard, the analysis of the revised policy in this sub-section is based on scientific management theory and administrative theory.

Considering the principles of scientific management theory developed by Taylor, one can link the first principle of developing a science of work to replace existing

rules to the revision of the objectives and focus of the original policy to say that it is indirectly applied. This is where the revised policy is serving as the new science of work. Here, ideas and inputs from different angles are sorted to develop in detail the procedures and measures to achieve sustainable sanitation in the country.

Taylor's second principle, of selecting the right employee is also considered in the policy as there is a suggestion on the kind of professionals that should be employed to fit each level of the organisational structure.

However, the third principle, where the workforce and management should cooperate in the workplace is not clearly explained in the policy document on how that can be done.

Likewise, Taylor's fourth principle, ensuring equal division of labour among management and the workers is also not clearly stated. Although there is a division of responsibilities, it is not clear enough if these responsibilities will be equally shared among the workers. Moreover, although workers at the lower levels of the organisational chart may be employed based on a lower level of competence and knowledge, it is not certain whether, when it comes to the actual implementation, they will be given only the tasks they are capable of doing.

Applying the fourteen principles of administrative theory of Henry Fayol and considering the first principle, which is division of labour and specialisation, one can say that provision is made for it in the policy. In the first instance, all the major stakeholders in the implementation process are identified and their roles are spelt out. The individual citizens, communities, CBOs, NGOs, the private sector, ministries, agencies, metropolis, municipalities and districts are given specific roles to play to achieve the objectives of the policy. These stakeholders may not be specialists in their respective roles, but the fact that duties are shared to reduce repetition and waste of resources is a good approach. In addition, as the case of the metropolitan assemblies show in Chapter Two, the organisational chart in the revised policy indicates that different aspects of waste management are to be handled by different management heads and under each aspect also, the tasks are subdivided. For example, under the head of the waste management are five sub-management heads in charge of support service, public service, plant and

equipment, finance and administration distinctively. Each of these sub-management heads also has many other levels of the division of labour.

The second principle of Fayol is about authority with responsibility, where any authority given should be backed by responsibilities, and this is seen in the revised policy. All positions identified on the various organisational structures from the ministerial level to the individual level go with authority and responsibility. For example, the MLGRDE has the overall authority over the policy decision making, implementation, monitoring and evaluation. Therefore, it has the overall responsibility to ensure that all actors and stakeholders play their roles well to achieve the goal of the policy. In the same vein, the head of the environmental health management at the district level has authority over the workforce within the district and so has the responsibility to ensure that those in his/her jurisdiction do their work well and proper sanitation is assured.

Measures to ensure discipline, which is the third principle of administration theory, were not clearly specified in the revised policy. Although it is indicated that professionals should take up management positions in the implementation process whilst technical engineers, artisans and other officers would take up supervisory roles, it is difficult to be sure of discipline. Also, free and fair agreement between management and the subordinates depend on the level of professionalism exercised by the management team and the extent to which the interests of the workforce are addressed. Since the application of penalties is an important factor when it comes to discipline, it would have been good if it had discussed how those who go contrary to the interests of management would be penalised. However, this was not so in the revised document. Although sanitary inspections and law enforcements are to take place at the individual, household, community, offices, commercial and industrial levels, there is no specific information on the kind of penalties that will be imposed on offenders.

When it comes to Fayol's fourth principle, unity of command, where subordinates need to take commands from only one superior in undertaking a particular task, this is indicated in the revised document. It is shown, for example, in the organisational structure for metropolis in Chapter Two. There one sees that sub-managers and supervisors have one overall head that they have to take command

from in undertaking a responsibility. In addition, the direction of the lines of the chart show that commands will normally come from one source.

The unity of direction principle, which is the fifth principle of administrative theory, that there should be one head and one plan of activities, is not fully guaranteed in the document. Although there may be one head for a department, this does not imply directly that that department will have its own plan of activities. It is possible that their plan of activities is in connection with another department. In the case of the metropolitan assembly structure, when it comes to the management of public services, there are three departments. These departments have their own management heads be it for liquid waste, solid waste/drainage and disposal. Although it is possible that these departments may have their plan of activities, it is also possible that due to the interrelationship of their work, they may have one general plan of activities. This is however, not clearly indicated in the revised document.

With regard to Fayol's sixth principle, the subordination of individual interests to the general interests, this is categorically stated for management procedures. The call on all actors and stakeholders to see environmental sanitation as a public good indicates that. This is where the improper disposal of wastes by individuals is seen not to be good for the common interest of all. This is because when it comes to environmental issues, the outbreak of a disease may not affect only those who engaged in improper practices, but may affect all.

Concerning the remuneration of workers, although it is implied that workers employed in the public or private sector will be remunerated, nothing is mentioned about it in the revised policy. There is nothing indicated on how they will be motivated so that they can give out their best at their workplace. For example, information is provided on how the procurement of equipment and supplies can be standardised to reduce the cost of operations and maintenance but nothing is mentioned on how workers will be motivated either in cash or in kind to boost their morale.

When it comes to centralisation, which is concerned with the distance between managers and employees, and having a look at the organisational structure for the metropolis, one can say that the distance between top management and the

employees at the lower levels is the average. The structure is not tall to the extent that the employees at the lower levels will be completely decentralised for them to carry out their personal activities. Moreover, it is not very short where top management will be fully in control of the activities of the employees at the lower level which will prevent them from incorporating their own creativity in their work.

The tenth principle of Fayol's administrative theory is the scalar chain or line of authority, which discusses the means of communication among superiors and lines of communication from the ultimate authority to the employees at the lower levels and vice versa, was not considered in the revised document. There is no information on when and how supervisors should meet to share information on the outcome of the activities of the various departments.

With the principle of order, which ensures the availability of material resources and space for the workers, one can say that it is partly addressed in the revised policy. Material order, how the public and the private sector should procure equipment and other materials needed for operation, is discussed. However, there is no information on how social order will be provided. In other words, nothing is mentioned on how working spaces will be provided for the employees.

The eleventh principle of administrative theory, equity treatment of employees, the twelfth principle of stability, the tenure of employees, the thirteenth principle, initiatives by employees and the last principle, *esprit de corps*, which discusses harmony among the personnel, none of these are discussed in the revised policy. This means there were no intensions for these principles.

## **DISCUSSION OF SOME PROJECTS AND PROGRAMMES IMPLEMENTED UNDER THE ENVIRONMENTAL SANITATION POLICY**

The implementation arrangement made in the revised environmental sanitation policy is broad, which allows the implementation of diverse programmes and projects. This is exhibited in the many actors and stakeholders who were identified with the roles they have to play and their responsibilities. In addition, the objectives and their associated actions and measures which were outlined

under the focal areas of the policy make room for many programmes and projects to take place in the country.

The involvement of the private sector with the example given about Zoomlion Company, where their projects are seen in almost every town and city in the country, is something which is much supported by the policy. This is because the private sector is to carry out the bulk of the programmes and projects of the policy. Likewise the involvement of the government institutions and individuals is equally important. The building of sanitation facilities, community institution building and participatory total community sanitation, advocacy, capacity building, social marketing of sanitation, innovative financing schemes and ecosan projects, which were described in Chapter Two, all fit under the environmental sanitation policy.

The governance theory explains the need for individuals, private organisations and state institutions to cooperate in running the affairs of a country. Therefore, the implementation of many different programmes from different organisations and sectors will satisfy the needs of the different categories of people in the country.

All the same, these projects and programmes need constant monitoring and evaluation. Systems theory indicates that as the policy is implemented through programmes and projects, feedback from them through monitoring and evaluation needs to re-enter the political system as demands and support so that the policy can be adjusted where possible. For that matter, the effectiveness and efficiency of these programmes and projects can only be assessed if they are monitored and evaluated, and then feedback from them is channelled to the appropriate authorities for action.

## **DISCUSSION OF THE NATURE OF SANITATION IN KUMASI METROPOLIS**

This section focuses on the examination of the observations made by the author specifically concerning urban solid waste disposal in Kumasi metropolis during the data collection stage of the research.

The observation made during the data collection was that, although efforts are being made to manage waste in the metropolis, there is still much more to be done. People still dump rubbish anyhow by the road sides and at swampy areas. Some places are provided with containers to collect the rubbish from households, communities, worksites and offices before they are sent to the landfill or treatment site. However, these facilities are woefully inadequate so the few which are provided become full and people start dumping their refuse on the ground. This refuse disperses as the wind blows. Sometimes also, the scattering of the refuse is caused by delay in collecting the refuse from the containers. Figure 9 shows how a rubbish container can become full, and to prevent spill-over or due to laziness, people start dumping refuse around it. Figure 10 shows how people dispose of their refuse indiscriminately by the road-side.



**Figure 9: Dumping refuse by a full container**

Source: Author's picture





**Figure 10: Dumping of refuse by the road side**

Source: Author's picture

In the description of the public governance model by Carver, it was mentioned that public organisations are created by the citizens of the country to work on their behalf. The board of governors of the public organisations, since they are not capable of providing all services themselves, employ professionals to work for them. They have to provide these professionals with all their needs in terms of resources for them to work well. Looking at the situation in Kumasi where sanitary facilities provided are not sufficient, means the board of governors are not playing their roles well. The metropolitan assembly representing the government of the country in this situation is not making enough resources available either directly by itself or indirectly through the private sectors to ensure clean environment in the country.

Good governance does not only require the input of government to ensure improved living conditions. It also includes the involvement of the individual citizens and the private sector. With the issue of individuals disposing waste indiscriminately in the city is not an act of government but about the negative attitude and behaviour of the people. If people acknowledge that their act can lead

to the outbreak of diseases which will not affect them alone, they will not engage in those practices. In the case of the private sector, both profit making and non-profit making, if they are able to engage in the awareness creation programmes, that some of them promise and provide sanitary facilities to support the government, good sanitation can be assured in the country. Moreover, if private companies which have contracts and partnerships with the public sector respond to their duties such as collecting the rubbish at the vantage point regularly, the limited containers will not be over-filled, let alone refuse spreading out in the communities.

### **DISCUSSION OF ECOSAN ENABLING THE ATTAINMENT OF THE GOAL AND OBJECTIVES OF ENVIRONMENTAL SANITATION POLICY**

In the comparisons between the original and revised policies, it was mentioned that ecosan was identified in the revised policy as one way in solving the sanitation problems in Ghana. Moreover, it is identified through the literature reviews that it is one of the programmes and projects being run currently in the country under the revised policy. This indicates that the goal and objectives of ecosan are in line with those of this policy and if the objectives of ecosan are achieved, the project will contribute to the objectives of the sanitation policy.

Having a critical look at the goal of the policy, it is noted that improved health conditions and standard of living is the focus. In line with that, ecosan also aims to improve the health conditions and standard of living of the people as the gap between sanitation and agriculture is bridged. That is, as clean environment is provided to improve health conditions, good soil conditions will be provided to boost agricultural practices, hence improving the standard of living.

As identified in the literature review, the policy has the objectives to ensure effective containment and decrease in the negative effects from poor sanitation situations; to support adequate treatment and disposal of waste; to respond effectively to the problem of increasing volumes of waste and to change waste streams due to increasing population and changing life-styles. Similarly, these are the objectives and targets that ecosan wants to achieve and the challenges it seeks to address. It seeks to decrease the negative effects of poor sanitation, ensure

adequate treatment of waste, reduce the volumes of waste generated and ensure that there is a paradigm shift from the conventional way of treating wastes.

## **CHALLENGES AND OPPORTUNITIES FOR EFFECTIVE IMPLEMENTATION OF ECOSAN PROJECTS**

This section comprises the analysis of the perception of some staff of the implementing organisations of ecosan and the farmers interviewed.

### **Perspective of the workers of implementing organisations**

The perception of the implementing organisation about the project will be based on the interviews with the three workers from the implementing organisations.

#### ***Quality of the fertilizer***

The quality of the fertilizer was of great concern to the implementers of the project. Mr Adamtey mentioned that the quality has therefore been tested and it is proven to be of standard quality. He explained that when the first phase of the project ended in the year 2003, it was realised the co-compost was low in nitrogen. Therefore, the second phase, which started in 2004 focused mainly on developing ways to enrich the nitrogen content of the fertilizer. This led to the start of research into the production of *comblizers*.

The scientific tests on the *comblizers* were conducted at the University of Ghana, Legon in Accra, and so far the tests prove the *comblizers* to be of good quality. This will reduce the work load and cost to farmers in the sense that they will not need to buy a lot of co-compost fertilizers for a small piece of land, and they will also not need to combine artificial fertilizers and compost themselves.

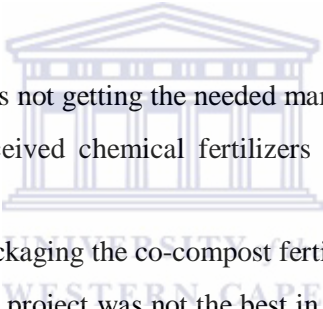
From this, one can give the interpretation that the usage of co-composting alone which is completely organic, is going to be difficult for farmers especially those who engage in large-scale farming. They will then need the *comblizers*. With that, one can say that inorganic fertilizers cannot be completely disregarded. This is because an aspect of it will always be needed in the production of *comblizers*. This will therefore call for the employment of professionals who will be able to mix these organic and inorganic components of the fertilizer so that there will not be

any negative consequences, both to the farmers who will be using them and the consumers of the agricultural produce.

Likewise, all equipment and machinery required needs to be provided. This is in line with the tenth principle of order in the administrative theory, which talks about the provision of all resources needed in the implementation process.

### ***Continuation of the project***

At the time of the field research, the production of the fertilizer had paused for some time and due to that, the staff members interviewed were asked the reason for the pause. Mr Morrison mentioned that it was because the site for dumping waste was changed from Buobai to another community called Dompase. Therefore there were arrangements at the new site for the co-compost production. The interview with Mr Kotoka also revealed that the project had paused for the following reasons:

- 
- The co-compost was not getting the needed market;
  - Some farmers perceived chemical fertilizers to give faster yield than the co-compost did;
  - The problem of packaging the co-compost fertilizer after production;
  - The location of the project was not the best in the sense that larger-scale farmers were far away from Kumasi so it would be better to locate the project closer to farming communities;
  - The co-compost was seen to be expensive so it would be better to subsidise the price farmers needed to pay for the fertilizer.

Mr Adamtey of IWMI showed that the only challenge leading to the pause of the project was finance. When financial support is made available, the project will continue.

With the issue of the location of the project in terms of its closeness to the Buobai community, which also came up in Buobai community, where some people complained during the data collection that the faecal sludge was giving a bad smell, which made life unbearable in the community. Mr Adamtey explained that the site for the pilot project is not a problem. The reason for the complaint is that, apart from the co-compost project, there was another project of the KMA at

Buobai, where they deposit all the faecal sludge from the metropolis. It was mentioned that in a day, about hundred (100) tankers came to dispose of faecal sludge from the whole metropolis whilst the co-compost project only needed about three tanks. This over-disposal was not well managed and started giving the bad smell. However, by the time of the data collection, the metropolis has changed the venue for the disposal of the municipal solid and faecal sludge to Dompouse Landfill Site, which was being managed in partnership with a private company.

Despite the fact that the co-composting project in Buobai may be on a small scale, it is still appropriate if the project is situated far away from the community. This is because water from these waste gets stagnant in some areas and flies moving from them to the communities can lead to the outbreak of diseases. Mr Kotoka about mentioned that people who are involved in large-scale farming are mostly found away from the metropolis, hence the need to situate the project far away from the towns and cities but closer to farming areas. This will help reduce the cost of transport for farmers.

This challenge can be addressed effectively if these ideas are considered as input from the environment entering the political system for governmental decisions to be taken, as systems theory suggests. It should be stated clearly in the policy document that the location of the ecosan project should be considered critically to minimise complaints from the communities and ensure the affordability of farmers' produce.

In the same regard, the other challenges mentioned, which are mainly about finance, also need to be seen as demands from the people. The political system needs to give it support by strategising in the policy-making process how financial support can be made available in the implementation stage of ecosan.

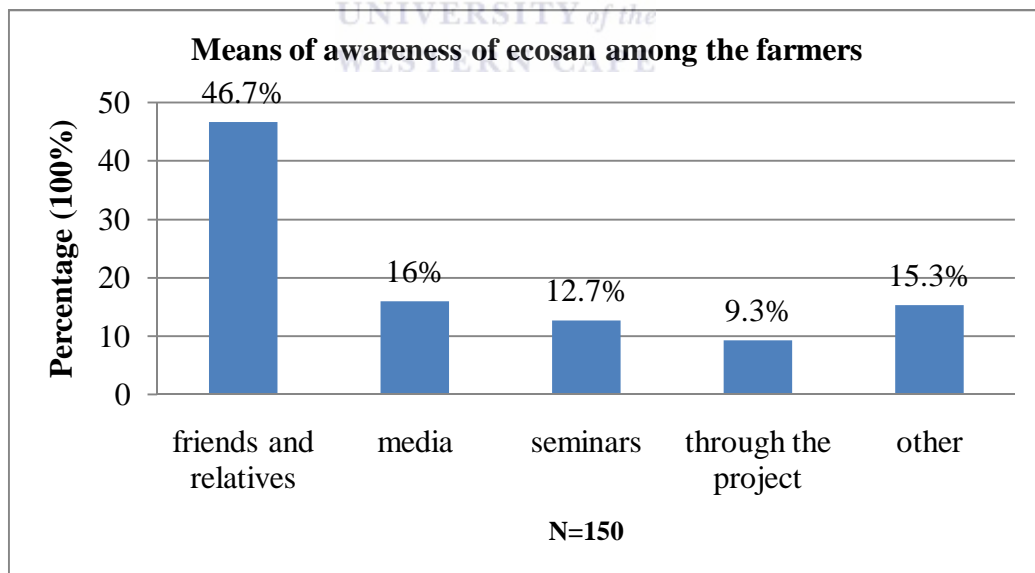
### **Perspective of farmers**

#### ***Level of awareness***

Based on the data collected, one can say that people in the research target are well aware of ecosan or the practice of using excreta and solid waste to produce

fertiliser. When the farmers were asked whether they had heard of the ecosan project, where human excreta and solid wastes are converted into fertilizer or had ever heard of the practice of using human excreta as fertilizer, of the 150 respondents, 122 (81.3%) said yes to the question, and only 28 (18.7%) said no. Of the respondents, 111(74%) said they had been aware of the process for more than a year and 39 (26%) had been aware of it for less than a year. This means, the awareness of the concept by the respondents who were to the affirmative has been for a long time.

From the analysis, it became clear also that the use of waste as fertilizer is an issue which is discussed among friends and relatives: 70 respondents (46.7%), the largest group, said they got to know about the whole concept and practice through friends and relatives, and 24 (16%) got to know of it through the media: radio, television and newspapers, 19 respondents (12.7%) got to know of it through seminars and training programmes, only 14 (9.3%) got to know of the concept through the implementation of ecosan projects in the metropolis, and 23 (15.3%) through other means. Figure 11 displays the means of awareness of the respondents.



**Figure 11: Means of awareness of ecosan among the farmers**

Source: Author's empirical results

Nevertheless, there is less knowledge of the exact processes through which the ecosan fertiliser is prepared. When the respondents were asked if they knew how

the fertilizer was prepared, 133 (88.7%) gave a negative answer and only 17 (11.3%) of them gave a positive answer. Even among those who gave a positive response, only a few gave an explanation of the process which was in line with what is in the literature review.

From these responses, it is clear that people have generally heard of the concept and practice but do not know much about what it takes to produce the fertilizer in question. That means either they do not investigate to know more about the concept and its implementation processes, or the information has not been made available to them.

***Interest/attitude about the fertiliser***

To get the general view of the attitude of the farmers towards the fertilizer, a number of questions were asked.

In the first place, the direct use of the fertilizer on the average was seen not to be dangerous to the farmers interviewed. They were asked if they saw any danger in using this fertilizer on their farm every planting season, based on four-ranked answers: no danger at all, no danger, there is danger, and there is higher danger. The analysis indicated that 74 (49.3%) said there was no danger at all, 44 (29.3%) said there was no danger, 16 (10.7%) said there was danger and another 16 (10.7%) said there was higher danger. Grouping them into two shows that 118 (78.7%) said there was no danger and 32 (21.4%) said there was danger in using the co-compost fertilizer. This analysis is presented in Table 3.

**Table 3: Farmers’ perceptions about danger in applying ecosan fertilizer on the farm every planting season**

<b>Scale</b>	<b>Frequency</b>	<b>Percentage (100%)</b>
No Danger at all	74	49.3%
No Danger	44	29.3%
Danger	16	10.7%
Extreme Danger	16	10.7%
<b>Total</b>	<b>150</b>	<b>100%</b>

Source: Author’s empirical results

Likewise, the majority indicated they would not feel unpleasant using the fertiliser, 81 (54%) said it would be very pleasant to use the fertiliser, 54 (36%) said it would be pleasant, 4 (2.7%) said it would be unpleasant and 11 (7.3%) said it would be very unpleasant to use the fertiliser. Table 4 shows this range of responses.

**Table 45: Farmers' perceptions of whether the application of ecosan fertilizer on farms will be pleasant or unpleasant**

Scale	Frequency	Percentage (100%)
Very pleasant	81	54%
pleasant	54	36%
unpleasant	4	2.7%
Very unpleasant	11	7.3%
<b>Total</b>	<b>150</b>	<b>100%</b>

Source: Author's empirical results

In the same vein, the conversion of these forms of waste into a fertilizer is seen to be a nice approach to reduce the large volumes of waste in the society: 117 (78%) said it was very good and 20 (13.3%) said it was a good approach. On the other hand, 5 (3.3%) said it was a bad approach and 8 (5.3%) said it was very bad. Table 5 presents these values.

**Table 5: Farmers' perceptions of whether this fertilizer production is a good or bad way to reduce waste in the society**

Scale	Frequency	Percentage (100%)
Very Good	117	78%
Good	20	13.3%
Bad	5	3.3%
Very Bad	8	5.3%
<b>Total</b>	<b>150</b>	<b>100%</b>

Source: Author's empirical results



To the majority, they expected even this fertilizer to yield a bigger harvest than the chemical fertilizer: 78 (52%) said they expected this yield difference very much, 47 (31.3%) indicated much expectation of this yield difference, 7 (4.7%) had little expectation of this yield difference and 18 (12%) did not expect any difference at all.

**Table 6: Farmers' expectations of whether ecosan fertilizer will increase yield as compared with chemical fertilizer**

Scale	Frequency	Percentage (100%)
Very much	78	52%
Much	47	31.3%
Little	7	4.7%
Not at all	18	12%
<b>Total</b>	<b>150</b>	<b>100%</b>

Source: Author's empirical results

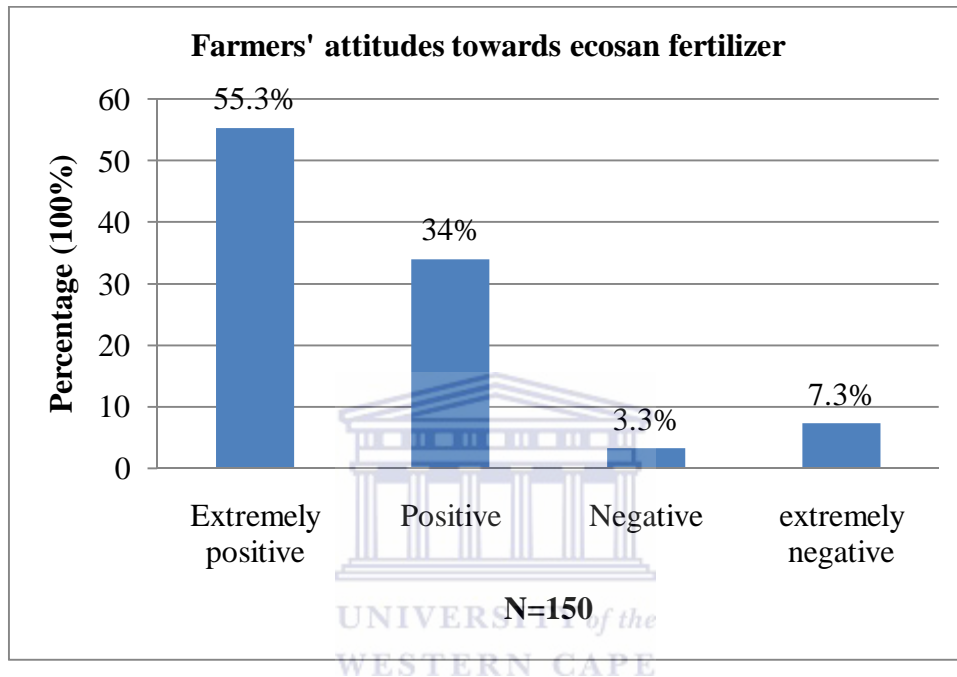
A larger number of the respondents in addition expected their customers as well not to have problems with them when they use the fertiliser: 64 (42.7%) thought their customers would strongly support them in using the fertilizer, 30 (20%) thought the customers would support them, 9 (6%) thought their customers would disapprove or not support them to use the fertilizer, and 47 (31.3%) believed the customers would strongly disapprove of their use of the fertiliser.

**Table 7: Farmers' perceptions of whether farmers' customers would approve their usage of ecosan fertilizer**

Scale	Frequency	Percentage (100%)
Strongly approve	64	42.7%
Approve	30	20%
Disapprove	9	6%
Strongly disapprove	47	31.3%
<b>Total</b>	<b>150</b>	<b>100%</b>

Source: Author's empirical results

In all, 83 (55.3%) stated categorically that they had an extremely positive attitude about the fertiliser, 51 (34%) said they had a positive attitude, 5 (3.3%) said they had a negative attitude and 11 (7.3%) said they had an extremely negative attitude about the fertilizer. Figure 12 gives a graphical view of this analysis.



**Figure 12: Farmers' attitudes towards ecosan fertilizer**

Source: Author's empirical results

From all these analyses, one can say that when it comes to the attitude or the personal interest of the farmers in using the fertiliser, there was no problem. This was because the majority had positive expectations and desires to use it.

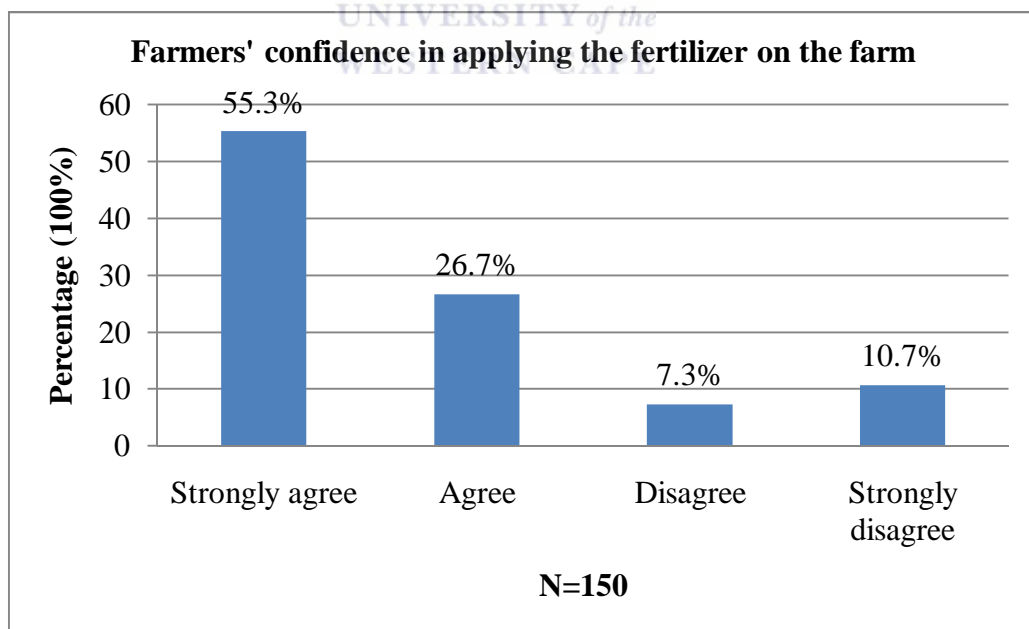
***Ease of transporting and using the fertiliser***

Being able to transport and use the fertilizer produced is a very important issue to consider. When the farmers were asked about the ease of transporting the fertilizer to their farms, 58 (38.7%) said it would be very easy for them to transport the fertilizer to their farms, 40 (26.7%) said it would be easy, 36 (24%) said it would be difficult and 16 (10.7%) said it would be very difficult. Therefore, the majority said it would be easy for them to transport the fertiliser to their farms.

Some of the main reasons given by those who said it will be easy are that they were staying very close to the project site and their farms were also close to the site. For that matter, it will be easier for them to carry the fertiliser themselves, either by wheel barrow and/or with head pans, to their farms. Some mentioned that they could employ family labour to carry the fertilizer to the farms. Others indicated that they had their own vehicles which they could use. Transport and labour cost was also seen to be low for some because of the short distance.

On the other hand, those who saw transport to be a problem gave the following reasons: their farms were very far, they did not have money to afford the transport and labour costs at all, there were no roads connecting to their farms and the fact that they did not need the fertilisers.

When it comes to the confidence in applying the fertilizer on the farm, that is the know-how in using the fertilizer, the majority of the farmers said they had the confidence to do so. 83 (55.3%) said they strongly agreed to have the confidence in applying the fertilizer. 40 (26.7%) said they agreed, 11 (7.3%) disagreed and 16 (10.7%) strongly disagreed. This analysis is presented in Figure 13.



**Figure 13: Farmers' confidence in applying the fertilizer on the farm**

Source: Author's empirical results

### *Community support*

Although a higher percentage of the respondents said there were no traditional or religious hindrances to using the fertilizer, when it came to support from people in the community and family members, they saw problems. In terms of the religious support, 122 (81.3%) said the teachings of their religions strongly approved the usage of the ecosan fertilizer. 17 (11.3%) said they approved, 6 (4%) said they disapproved and 5 (3.3%) said they strongly disapproved. Table 8 presents these values.

**Table 8: Farmers' perceptions of whether their religious teachings approved the use of the ecosan fertilizer**

<b>Scale</b>	<b>Frequency</b>	<b>Percentage (100%)</b>
Strongly approves	122	81.3%
Approves	17	11.3%
Disapproves	6	4%
Strongly disapproves	5	3.3%
<b>Total</b>	<b>150</b>	<b>100%</b>

Source: Author's empirical results

For the support from the community members, 7 (4.7%) said none of the people in the community would approve of their usage of the fertilizer. 87 (58%) said only a few of the people would support them. 32 (21.3%) indicated many would support them and 24 (16%) said all the people in the community would support them. This shows that getting community members' support may be difficult to the farmers. This analysis is presented in Table 9.

**Table 9: Farmers’ perceptions of the number of persons in their community would give support to the use of ecosan fertilizer**

Scale	Frequency	Percentage (100%)
None	7	4.7 %
Few	87	58%
Many	32	21.3%
All	24	16%
<b>Total</b>	<b>150</b>	<b>100%</b>

Source: Author’s empirical results

Likewise, considering the support from close relatives and friends who would eat some of the agricultural produce, 11(7.3%) of the respondents mentioned none of the close relatives and friends would agree, 80 (53.3%) said only a few would agree, 31 (20.7%) said many would agree and 28 (18.7%) mentioned all of them would agree. This is shown in table 10.

**Table 10: Farmers’ perceptions of the number of important persons (family members and close, friends) who would give support to the use of ecosan fertilizer**

Scale	Frequency	Percentage (100%)
None	11	7.3%
Few	80	53.3%
Many	31	20.7%
All	28	18.7%
<b>Total</b>	<b>150</b>	<b>100%</b>

Source: Author’s empirical results

***Discussion of the perspectives of the farmers***

From the above analyses of the perception of farmers on ecosan it is shown that there are prospects as well as challenges in the implementation of ecosan in Kumasi.

Considering the positive aspects, it is clear that when it comes to the general awareness of the concept of ecosan, it was not a problem because it was not new to the people. It is an issue which is sometimes discussed among relatives, friends, through the media and at seminars. Secondly, when it comes to the individual farmer, ecosan fertilizer is not something which is dangerous to their health. It will not give foul smell which will prevent them from using it. They even expected the fertiliser to help produce more and this is a good way in reducing large volumes of wastes which are generated in the towns and cities. Last but not least, the transportation of the fertiliser was not a problem since the site of the project is close to their farms. When the fertilisers get to the farm, they will be able to work with them without difficulties.

On the other hand, the identified challenges are that there is less knowledge of the processes through which the fertilizer is produced. This makes people lack a clear view of the benefits and consequences in the usage of the fertilizer or eating agricultural produce where ecosan fertilizer has been used. This challenge can be linked to the other challenges identified, about less support expected by farmers from people in the communities and their close relatives and friends to say that awareness is still an issue to address. They thought that because they may not know much about the fertilizer, they would not give their support.

Considering the findings that farmers expect their customers not to have problems with them when they use the fertiliser, but when it comes to support from close relatives and community members they may have problems, one can say that they thought the customers at the market would not ask what kind of fertilizer they used in growing their food-stuffs, but those whose are close to them may know. This also adds up to the problem of less knowledge.

Taking a clue from system theory, support as an input factor of the policy-making process is very important for the success of any decision-making. Likewise, support from the people in the community and close relatives is very important for the successful implementation of the ecosan project. This is because they can easily discourage the farmers from using the fertilizer. The personal positive interest of the farmers alone is not enough to guarantee the effective use of the fertiliser.

This therefore calls for effective awareness creation to explain the concept in detail by stressing how the fertilizer is produced and the benefits that the individual and the community may gain if this fertilizer is produced on a large scale. These challenges need to enter the policy-making process for a revision.



## **CHAPTER FOUR**

### **CONCLUSION AND RECOMMENDATIONS**

#### **CONCLUSION**

The background to the research explained how the existence of many challenges in the sanitation sector of Ghana is leading to the outbreak of diseases such as malaria, diarrhoea, cholera, typhoid fever and intestinal worms. Some of these challenges are the generation of high volumes of waste and inadequate means of disposing and treating these wastes. The desire in addressing these challenges has led to the implementation of many programmes and projects in the country. These include the implementation of ecosan projects where waste is transformed into useful resources to be used on farms and at household levels.

As these undertakings come under the Environmental Sanitation Policy of Ghana, the research sought to have a critical look at the objectives and focus of the policy to find out if it enables the implementation of all these programmes and projects. Since ecosan is a new approach and is of interest in the thesis, emphasis was placed on it as the thesis examined its objectives, implementation processes, prospects and challenges. This examination was based on the case of a co-composting of faecal sludge and municipal solid waste project in Buobai, a suburb of the Kumasi metropolis of Ghana. This project, although is in a pilot phase, produces ecosan fertilizers for urban and peri-urban agricultural practices. The examination and critiques were also based on some selected management, policy and political theories. These were Taylor's scientific management theory, Fayol's administrative theory, systems theory and governance theory.

Chapter Two explained that the current environmental sanitation policy is a revised form of the original one which was formulated in 1999. This revision was done the original policy was not broad enough. Also, the original objectives were narrow and the policy did not include the roles and responsibilities of many other important actors in the implementation of the policy. The revised version took care of some of the shortfalls of the original policy. The literature review



confirmed the implementation of many programmes and projects in the sanitation sector and how diverse their focuses were.

The analysis of the policy, as both the original and the revised documents were compared, confirmed that the revised version was broad and covered many issues. Some of the findings were that there was a specified goal for the revised policy. Additionally, the challenges and problems in the sanitation sector were categorised into six focal areas and the challenges under each focal area were identified. Likewise, the objectives, actions and measures of the policy were based on the focal areas. In addition, there was clear definition of what environmental sanitation is in the Ghanaian context. The relevance of the policy in relation to other developmental issues in the country was further discussed. The roles of all stakeholders and actors in the sanitation sector were explained. The organisational structures for the public institutions were provided, and lastly ecosan was identified as one of the ways that could be used to promote proper sanitation in the country.

The analysis of the revised policy, to assess the arrangements made for the implementation based on the scientific management theory and the administrative theory revealed that some principles which these theories propose can be seen in the arrangements whilst others cannot. When one takes the scientific management theory, the first principle of developing a science of work to replace the old rules, the second principle of selecting the right employee and giving them the right training were considered in the arrangement. However, the arrangement was not clear on the third principle of how management and the employees should cooperate and on the fourth principle of ensuring equal distribution of labour.

With administrative theory, it was found that the principles of division of labour, authority with responsibility, unity of command, centralisation and some aspects of the principle of order were considered in the implementation arrangement. On the other hand, the principles of discipline, unity of direction, subordination of individual interest to the general interest, remuneration of workers, scalar chain or line of authority, some aspects of the principle of order, equity of treatment of

employees, stability of tenure of employees, initiative and *esprit de corps* were not clearly stated in the document.

The analysis of the implementation of ecosan in Kumasi metropolis by considering the perceptions of some workers of the implementing organisations and of farmers who are key stakeholders of the fertilizers that are produced revealed the following. In the case of the personnel of implementing organisations, the quality of the ecosan fertilizer is assured if all the needed nutrients are added at the factory. The challenges that hinder the continuation of the project are inadequate financial resources and the appropriate location of the project.

From the perceptions of the farmers, it is clear that there is positive general awareness of ecosan. Secondly, the fertilizer is not perceived to be dangerous to the health of the farmers. In addition, transporting the fertilizer to the farms is not a problem since the project site is close to many of the farms and it will be easy for the farmers to apply the fertilizer on their farms. Nevertheless, there is less knowledge about the processes through which the fertiliser is produced. Also, the farmers thought they would get less support from close relatives, friends and community members if they used the fertiliser.

Systems theory encourages that feedback from the environment as programmes and projects are monitored should enter the political system for new policy decisions to be taken. Governance theory encourages the addition of the voices of individuals and non-state organisations to those of the state to ensure effective administration of the affairs of a country. It is therefore assumed that these challenges identified in the research will be channelled to the political system for appropriate decisions.

To conclude on the research assumptions, one can say that all of them were confirmed by the research findings.

## RECOMMENDATIONS

Based on the findings of the research, the following practical recommendations are made:

- It is important that all policies of government which have been in existence for a long time and which are seen not to cover important issues, must be revised as the environmental sanitation policy has been revised. Old rules and implementation actions and measures which are no longer practical in the current era should be removed, and should be replaced with arrangements which suit the present situation. This will let current development and technologies be incorporated for the advancement of the country.
- It is clear that even the revised environmental sanitation policy did not cover several important issues when it comes to the management of sanitation programmes and projects. It is therefore suggested that separate guidelines should be developed or the policy should be revised again to cover the following management issues:
  - The processes through which a high level of professionalism will be exercised in employing people to take up positions in the public sector. It should explain how the selection process should be based on qualifications and willingness of the prospective employee to work, and not be based on any personal interests of individuals in the management team. This process will ensure that good supervisors and managers are provided at every level of the organisational structure.
  - The guidelines or the revised policy should indicate clearly how offenders against the management rules will be penalised. Both the employees and management should agree on these rules so that none will feel that the rules have been imposed on them. When the offenders against the rules are punished, discipline will ensure that others are thereby deterred from breaking them.
  - The guidelines or the revised policy should instruct both subordinates and superordinates to put their personal interests aside

when it comes to the implementation of programmes and projects under the sanitation policy.

- The guideline or the revised policy should outline the processes by which each department or sub-department at the implementation level should develop its own plans of action to ensure efficiency and effectiveness. All these separate plans should be channelled towards the achievement of the objectives of the programmes or projects.
  - The welfare of the workforce in the implementation process is an aspect which was least considered in the policy document although they are very important for any action to take place. For that matter, the interests of the workforce should be reconsidered and means of motivating them to work harder should be incorporated. It should indicate the kind of bonus which will be made available to those who excel in their work.
  - Means of communication among managers should be included in the policy document or the guideline. It should be clearly stated whether they will meet weekly, monthly or yearly, to discuss plans and outcomes, and reports of each department will be sent round for all to read.
- When it comes to the problem of indiscriminate disposal of waste, all actors in the sanitation sector ranging from the national, metropolitan, municipal and district levels should include an aspect of sensitisation programmes in their activities. Better still, those who are already engaged in sensitisation should intensify them. This will encourage people to change their negative attitudes when it comes to the indiscriminate disposal of waste. Individuals and organisations whose responsibilities are to collect the rubbish should be motivated to do their work at the right time. Apart from that, there should be measures to punish people who continue to dispose of their rubbish indiscriminately and those who refuse to do their environmental sanitation work on time.

- There should be a way to monitor all projects and programmes being implemented as instruments of the environmental sanitation policy to examine their implementation processes, prospects and challenges so that appropriate measures can be taken based on the outcome, as is being done in the case of ecosan.
- Ecosan projects in Kumasi metropolis should be situated far away from the communities to prevent the people in the communities getting the foul smell which may come out during the processes. However, they should be closer to farming areas to reduce the transport cost to farmers.
- There should be an increase in creating awareness to let people know more about the ecosan fertilizer. They should be provided with adequate information on how the fertilizer is produced, and whether there will be any positive or negative effects on the individual and the community. This will increase the support that the farmers will get from the community members and close relatives.
- Since the research could not include the perceptions of many other important actors and stakeholders, like the customers of the farmers and relatives of the farmers, it will be relevant if further research is conducted based on these findings.

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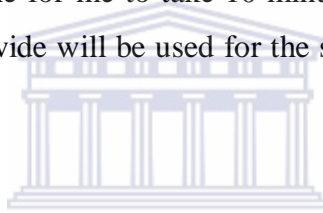
## ANNEX

### QUESTIONNAIRE

#### FOR FARMERS

Serial number of paper: .....

Good morning/afternoon Sir/Madam. I am Joyce Ekuful and I am doing a research on perceptions about ecological sanitation as part of my master programme. Is it possible for me to take 10 minute of your time? I promise that any information you provide will be used for the stated purpose and nothing else. Thank you very much.



Date: \_\_\_\_\_

Place of interview: \_\_\_\_\_

Time interview started: \_\_\_\_\_ Time interview finished:

\_\_\_\_\_

Interviewer: \_\_\_\_\_

#### Introductory questions

1. Have you ever heard of the ecological sanitation (ecosan) project where human excreta and solid wastes are converted into fertilizer before?

1. Yes                      2. No

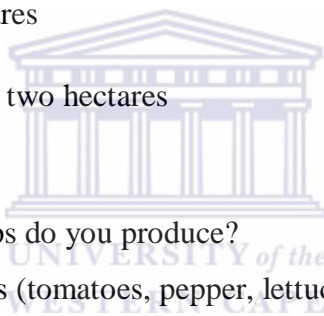
*If no, do not conduct the interview. Move to another person*

2. Are you already using this fertilizer in your farm?

1. Yes                      2.No

*If yes, do not conduct the interview. Move to another person*

3. Where is your farm?
  1. In town
  2. At the outskirts of town
  3. In a rural area far away
  
4. How large is your farm?
  1. Less than a hectare
  2. one hectare
  3. Two hectares
  4. More than two hectares
  
5. What kind of crops do you produce?
  1. Vegetables (tomatoes, pepper, lettuce, cabbage, okro, etc)
  2. Cereals (maize, wheat, rice)
  3. Tubers (yam, cassava, cocoyam)
  4. Cash crops (cocoa, cashew, coffee)
  
6. From where did you learn about ecosan?
  1. Media (radio, Television, Daily papers)
  2. seminars/training courses
  3. Friends and relatives
  4. Other (specify).....
  
7. When did you get to know about ecosan?
  1. Some weeks ago



- 2. Some months ago
- 3. A year ago
- 4. Two years and above

8. Do you know how this fertilizer is prepared?

- 1. Yes
- 2. No

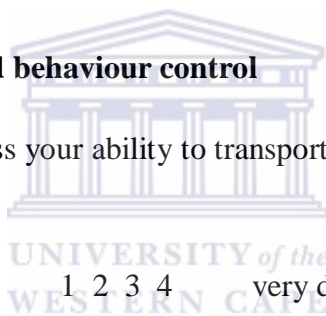
*If yes, continue from question 9. If no, move to question 10*

9. Explain how it is prepared.

.....

.....

**Indicators for perceived behaviour control**



10. How do you assess your ability to transport this fertilizer to the farm if you intend to use it?

- Very easy      1 2 3 4      very difficult

11. What is your reason for your answer to question 10?

.....

.....

12. In your opinion, do you agree, rather agree, rather disagree or disagree to this statement: 'I feel confident that I can apply this fertilizer at all times in my farm during every planting season when I want to use it.'

- Strongly agree      1 2 3 4      strongly disagree

### Indicators for subjective norms

13. In your own opinion, is it very likely, likely, unlikely or very unlikely that other farmers use this fertilizer in their farms?

Very likely                      1 2 3 4                      Very unlikely

14. What do you think about how many persons in your community will support you in using ecosan fertilizer?

1            none

2            Few

3            Many

4            all

15. What do you think how many persons who are important to you (family members and close friends) will support you intend using ecosan fertilizer?

1            none

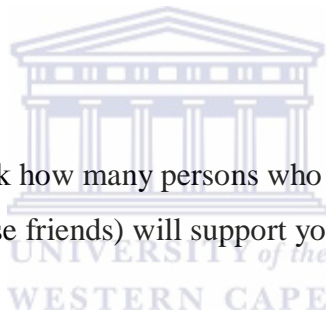
2            Few

3            Many

4            all

16. What do you think about this statement: The teachings of my religious group will strongly approve, approve, disapprove or strongly disapprove of my reusing human and domestic waste fertilizers in my farm.

Strongly approve            1 2 3 4            strongly disapprove





**Indicators for attitude**

17. In your opinion do you see any danger for your health in using this ecosan fertilizer as you prepare and use it?

No danger at all      1 2 3 4      high danger

18. Do you see this fertilizer as a very good, good, bad or very bad way to reduce wastes and dirt in the society?

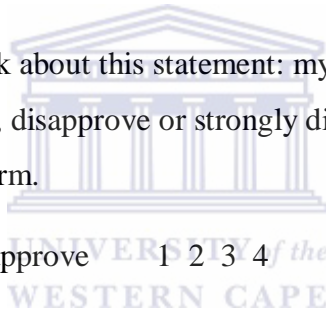
Very good              1 2 3 4      very bad

19. Will you expect that the fertilizer increase the yield of agricultural produce as compared with chemical fertilizer as you apply them in your farm?

Very much              1 2 3 4      not at all

20. What do you think about this statement: my customers will strongly approve, approve, disapprove or strongly disapprove of my using ecosan fertilizer in my farm.

Strongly approve      1 2 3 4      strongly disapprove



21. In all can you say that your attitude towards the use of ecosan fertilizer is.....?

Extremely positive    1 2 3 4      extremely negative

**Indicators for behaviour intentions**

22. What is your opinion about this statement: I will use ecosan fertilizer (made of human waste) in the future.

Definitely will              1 2 3 4      definitely will not

**Interviewee background information**

23. Sex of respondent
- 1. Female
  - 2. Male
24. Which age group do you fall under?
- 1. Under 16
  - 2. 16-20
  - 3. 21-25
  - 4. 26-35
  - 5. 36-45
  - 6. 46-55
  - 7. 56-65
  - 8. 66 or above
25. What is your marital status?
- 1. Single
  - 2. Married
  - 3. Divorced
  - 4. Widow
26. What Level of Education have you reached at the moment?
- 1. No education
  - 2. Non-formal education
  - 3. Elementary education
  - 4. Secondary education
  - 5. Tertiary education
  - 6. Other \_\_\_\_\_
27. What is your family size? (*Those who share your house*)
28. What is your religion?
- 1. Christian
  - 2. Muslim
  - 3. Traditional African religion
  - 4. No religion
  - 5. Other
29. To which ethnic group do you belong?
- 1. Akan
  - 2. Ewe
  - 3. Ga
  - 4. Hausa
  - 5. Guan
  - 6. Other (specify).....

## **GUIDE FOR THE INTERVIEW WITH THE EXPERTS**

1. What were the reasons for the implementation of the co-composting project?
2. How do you process the fertilizer?
3. When and why did the production of the fertilizer pause for some time?
4. It is mentioned that the co-composting will continue at Kuwait Waste management site. When is that going to start?
5. What is your perception about the reuse of wastes in the region? Is it sustainable?

