

**AN ETHICAL ASSESSMENT OF WASTE MANAGEMENT AT
THE GREAT EAST ROAD CAMPUS OF THE UNIVERSITY OF
ZAMBIA**

By

MUBANGA MWANSA

**A Dissertation submitted to the University of Zambia in partial fulfilment of the
requirements for the degree of Master of Arts in Applied Ethics**

The University of Zambia

2014

DECLARATION

I, Mubanga Mwansa, declare that this dissertation:

- (a) Represents my own work;
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ABSTRACT

The aim of this study was an ethical assessment of waste management on the Great East Road campus of the University of Zambia and to assess if there was a formal waste management strategy on the campus to preserve the integrity, stability, and beauty of the campus holistic ecosystem. The objectives of the study were: 1) To investigate the situation regarding guidelines or policies on waste management at the University of Zambia; 2) To describe the situation regarding the management of waste on the Great East Road campus of the University of Zambia; and 3) To investigate the attitudes of members of staff, students, and other stakeholders towards waste management on the Great East Road campus of the University of Zambia.

The significance of the study was to ascertain the actual situation regarding waste management on the University of Zambia Great East Road campus and to sensitise administration, staff and students to their involvement in such management by taking greater ownership of the campus conditions.

This was a case study design and the methodology used was qualitative involving an ethical evaluation. The methods involved primary and secondary sources. The primary data involved observations, in-depth interviews and focus group discussions with selected stakeholders such as students, residents, administrators, technicians, cleaners and some officials from the waste collector, Lusaka City Council (LCC) and the Zambia Environmental Management Agency (ZEMA) (formerly Environmental Council of Zambia (ECZ)). The secondary data involved information on relevant literature from appropriate books, journals, internet and newspapers. Observations were carried out by the researcher by moving around the boundaries of the UNZA campus. The purposive sampling method was employed in coming up with the sample of 116 participants (68 male / 48 female) for in-depth interviews. Convenience sampling was used to select participants in the 10 FGDs. An ethical evaluation was made by applying the Land Ethic, Environmental Virtue Ethics, the Ethics of Care, and the Tragedy of the Commons.

The research findings highlighted many problems related to a lack of adequate waste management that contribute to untidy, unhealthy and unacceptable conditions on the UNZA campus. These arise from unhealthy practices by some departments and schools, from shortcomings in the UNZA administration, from failure to attend to the drainage system and other issues related to the Resident Engineer's Department, and to lack of adequate personal responsibility on the part of both students and staff. Ultimately, however, the accumulation of problems all pointed to the lack of an official policy or guidelines with more explicit emphasis on the central importance of effective waste management for the health of residents and the wellbeing of the natural environment. With reference to the research questions, the study concluded: 1) There is no official policy or guidelines in existence on waste management on the UNZA campus; 2) Solid waste is collected from various locations on the UNZA campus, transported to three designed waste dumpsites for onward transmission to the LCC landfill facility off campus; and 3) There is a general failure on the part of both students and staff to take personal responsibility for waste management. The ethical evaluation concluded that despite some positives, the practice of waste management on the UNZA campus is by no means satisfactory and that there is a critical need for a recognised formal policy to be established. Consequently, it is urgently recommended that the UNZA administration should formulate a formal waste management policy or guidelines. Furthermore, all the stakeholders should participate in the prioritising of waste management on the University of Zambia campus.

DEDICATION

To my wife Lydia, my children Renic and Elita (late), who all wished me every success, encouragement and were with me all the way both in thought and in reality, who I owe this work of knowledge and love to.

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LIST OF ABBREVIATIONS

CYPC	Commonwealth Youth Programme Centre
EAP	Educational Administration and Policy Studies
ECZ	Environmental Council of Zambia
FGDs	Focus Group Discussions
GER	Great East Road
HSS	School of Humanities and Social School
LCC	Lusaka City Council
LCCWMU	Lusaka City Council Waste Management Unit
MADC	University of Zambia Moveable Assets Disposal Committee
MRF	Material Recycling Facility
NTS	Not to Scale
PLC	Public Limited Company
RCRA	Environmental Protection Agency Resource Conservation and Recovery Act
UN	United Nations
UNZA	University of Zambia
UNZASU	University of Zambia Students Union
ZEMA	Zambia Environmental Management Agency

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CHAPTER ONE: INTRODUCTION

1.1 Background

Waste management has been identified as “the collection, transportation and disposal of waste” (Environmental Protection and Pollution Control Act, 1990: 21), or as relating to “solid waste collection, transportation, sorting, recycling, treatment, composting, energy recovery, incineration and disposal” (Lusaka City Council (Municipal Solid Waste Management) by-laws, 2004: 1). “Collection” refers to the removing of waste or materials which have been separated for the purpose of recycling from a storage point; “transportation” refers to the moving of waste from one place or location to a designated place or location; “waste” refers to garbage, refuse, sludge and other discarded substances resulting from industrial and commercial operations, and from domestic and community activities; and “disposal” refers to the storing, handling, processing, treatment, utilisation and final location of waste so as to avoid undesirable effects on the environment (Environmental Protection and Pollution Control Act, 1990: 21).

Waste management is the process undertaken to reduce the effect of materials produced by human activity on health and the environment. Waste management could also be referred to as the collection, transportation, processing, recycling or disposal, monitoring of waste materials, and recovery of resources from it. It could involve solid, liquid, gaseous or radioactive substances, with different methods and field of expertise for each. The methods or practices of waste management differ for schools and markets, for residential and industrial producers, for rural and urban areas, and for developing and developed nations.

Municipal solid waste (or garbage) is the type of waste consisting of everyday items humans consume and discard, that is, food waste, yard waste, containers and product packing, and other inorganic waste (appliances, newspapers, clothing, food scrapes, boxes, disposable tableware, office and classroom paper, furniture, wood pallets, rubber tires, and cafeteria waste) from residential, commercial, and institutional sources.

There are two major forms or types of waste, that is, municipal waste (or municipal solid waste) and industrial waste. Other forms are agricultural waste and sewage sludge. Municipal solid

waste is divided into household/domestic and commercial waste (Environmental Council of Zambia, 2001:104). There is also another form or type of waste called hazardous waste which is corrosive, infectious, ecotoxic, irritant, explosive, flammable, toxic or otherwise harmful to humans, animals and/or the environment. This type involves hospital and clinical waste among others (Environmental Council of Zambia, 2001:106).

Zambia has been struggling with strategies on how to manage waste over the years. Due to rapid population growth, mining, trading, and extensive urbanisation since the country's independence in 1964, the generation of municipal solid waste has been so enormous for the nation's waste management authorities that they have been failing to cope. The situation has been like this for years. As a result, diseases like cholera and dysentery among others have been more prevalent and have been much more frequent or worse in the rainy season. The existence of such a situation could be attributed to a lack of seriousness on the part of government and the local authorities. The Zambia Environmental Management Agency (ZEMA) (formerly Environmental Council of Zambia (ECZ)) had been charged with the responsibility of coming up with a meaningful waste management strategy for the whole nation in which all areas relating to the management of waste as well as major stakeholders should be involved.

In order to minimise waste and ensure its safe disposal, Zambia has adopted the following regulatory measures:

- (a) Environmental Protection and Pollution Control Act, 1990, which gave the former Environmental Council of Zambia (now Zambia Environmental Management Agency) authority to give specific or general directions to District Councils on their functions in relation to the collection, transportation, and disposal of waste operations, that is, waste management regulations to do with licensing, transportation, landfill activities, and waste disposal sites;
- (b) Local Government Act and Council By-Laws – which spelled out the functions of the local authorities in regard to solid waste management;
- (c) Public Health Act, Cap 535 – which is in the line of disposal of solid and liquid waste and which imposed duties on the local councils (Environmental Council of Zambia, 2001: 108).

The general problem(s) with Zambian cities and towns is the rapid rate of uncontrolled and unplanned urbanisation in addition to rapid population growth. This high rate of urbanisation implies a rapid accumulation of refuse. Waste management is thus a problem in these cities and towns with heaps of uncontrolled garbage, road-sides littered with refuse, streams blocked with garbage or rubbish, disposal sites constituting a health hazard to nearby residential areas, the inappropriate disposal of toxic wastes, and so on.

The Lusaka City Council (LCC), which is responsible for Lusaka District in which the University of Zambia Great East Road campus is situated, has come up with some guidelines or systems on how to serve conventional and peri-urban areas respectively. Therefore, in order to implement an effective waste collection service in the conventional housing and commercial areas of Lusaka, the Lusaka City Council Waste Management Unit (LCCWMU) has established partnerships with private waste management companies (Lusaka City Council Waste Management Unit, 2009). LCCWMU has divided the city into twelve Waste Management Districts and in these districts (with the exception of one) waste collection is out-sourced to the private waste management companies through franchise contracts (ibid.). The LCCWMU stipulates a franchise contract as one which provides a private waste collector with the sole right and obligation to collect and transport waste from all premises in a franchised waste management district, and provides for the responsibility of the waste collector awarded the setting and collecting of waste fees for the services provided. It also provides for the waste collector to determine the type of waste receptacles (bags, bins or containers) to be used subject to LCC's approval. The LCC in support of the waste management system has elaborated or involved the Lusaka City Council (Municipal Solid Waste Management) by-laws of 2004. On the basis of these by-laws, all waste generators in Lusaka: residents, commercial outlets, institutions, industry and so on had to register with their respective waste management companies, utilise their services and pay the corresponding fee(s) (Ibid). LCCWMU views all other ways of waste disposal, among them, use of refuse or garbage pits or the burning of waste even in one's own background or backyard as illegal (Ibid.). The University of Zambia administration has through the offices of the Dean of Students, the Horticultural Officer, and the Resident Engineer tried to

follow to a certain extent the Lusaka City Council's requirements on waste management practices.

Waste management is regulated by the Environmental Protection and Pollution Control Act, 1990, and the Lusaka City Council (Municipal Solid Waste Management) by-laws, 2004 (for Lusaka city). The Lusaka City Council has a Waste Management Unit, which is responsible for the co-ordinating of activities related to municipal solid waste management within the Lusaka city area. On the other hand, the Zambia Environmental Management Agency (ZEMA) (formerly ECZ) gives specific and/or general directions to District Councils regarding their functions relating to the collection and disposal of waste operations under the Local Government Act. Above all, the ZEMA's principal function is to conserve the environment and prevent/control pollution so as to provide for the health and welfare of humans, animals, plants, and the environment (Environmental Protection and Pollution Control Act, 1990).

This study is an ethical assessment of waste management on the Great East Road campus of the University of Zambia. It is concerned with ethical issues. These ethical issues could be problems or situations that require one or an institution to select between alternatives or options that should be evaluated as right or wrong, or as ethical or unethical. In other words, ethical issues could be conflicts of right or wrong, or ethical or unethical, or could be situations forcing alternatives or options on an entity seeking ethical behaviour. Furthermore, these could be issues pertaining to or dealing with morals or the principles of morality, or to right and wrong in conduct, or being in accordance with the rules of standards for right conduct or practice. Therefore, in waste management, ethical issues usually arise, and the holistic environment of the University of Zambia Great East Road campus is no exception.

1.2 Statement of the problem

The University of Zambia's population has grown drastically over the years since it was opened in 1966, where rapid human population growth has surpassed by far the partial stagnant infrastructure and building construction developments, and as a result there has been an increase in waste output causing a major concern for the health of the environment. The waste or garbage has not all been ending up in the bins as a first step of waste disposal. Some members of the

community have been throwing waste anywhere anyhow other than in a bin, while a few others have been throwing waste in locations that were not designated as dumping sites thereby causing a health concern. This kind of behaviour leads to pollution of the environment which, if not checked, can bring about diseases which can affect the University of Zambia community.

1.3 Aim

The aim of the study, therefore, is to investigate and evaluate how waste is being managed on the Great East Road campus of the University of Zambia. As the University of Zambia is an academic institution, the study focuses on institutional waste management.

1.4 Objectives

The objectives of the study were:

1. To investigate the situation regarding guidelines or policies on waste management at the University of Zambia.
2. To describe the situation regarding the management of waste on the Great East Road campus of the University of Zambia.
3. To investigate the attitudes of members of staff, students, and other stakeholders towards waste management on the Great East Road campus of the University of Zambia.

1.5 Research questions

1. What is the situation regarding guidelines or policies on waste management at the University of Zambia?
2. What is the situation regarding the management of waste on the Great East Road campus of the University of Zambia?
3. What are the attitudes of members of staff, students, and other stakeholders towards waste management on the Great East Road campus of the University of Zambia?

1.6 Theoretical framework

The ethical theoretical framework of this study involved the Land Ethic, Environmental Virtue Ethics, the Ethics of Care, and the Tragedy of the Commons. These theories will act as guides for the collection of data and for the evaluation of the findings.

1.7 Design, Methodology and Methods

This was a case study design involving qualitative methodology with an ethical component. The methods involved primary and secondary sources. The primary data involved observations, in-depth interviews and focus group discussions with selected stakeholders such as students, residents, administrators, technicians, cleaners and some officials from the waste collector, Lusaka City Council (LCC) and the Zambia Environmental Management Agency (ZEMA) (formerly Environmental Council of Zambia (ECZ)). The secondary data involved information on relevant literature from appropriate books, journals, internet and newspapers. The findings were analysed by identifying common themes.

1.8 Significance of the study

The significance of the study was to ascertain the actual situation regarding waste management on the University of Zambia Great East Road campus and to sensitise administration, staff and students to their involvement in such management by taking greater ownership of the campus conditions.

1.9 Delimitations of the study

The Ridgeway Campus (which accommodates the School of Medicine), Marshlands Village, and the Institute of Economic and Social Research have not been included in the study because of their geographical location outside of the Great East Road campus, although they are all in Lusaka city. Furthermore, the situation regarding waste management at private universities has not been considered, nor has consideration been given to the extent to which outsiders moving through the campus may be responsible for littering.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Waste management at the University of Zambia Great East Road campus is a subject of paramount importance. Zambia is one of the countries in the underdeveloped and developing world, in which many of the universities have no policy or guidelines on waste management or are yet to develop them. What is available in these countries is a national waste management strategy or policy encompassing the whole country and not one specifically focussed on any particular university or college. In relation to the University of Zambia, what follows is a brief outline of waste management policies in some universities in the United Kingdom, in India, in United States, in South Africa, in Nigeria, and Tanzania.

2.2 United Kingdom

2.2.1 University of Aberdeen

The university's main objective is to review opportunities and implement measures to reduce the volume of waste generated and to increase the proportion of that waste which is recycled in accordance with the principles of the waste hierarchy, by embedding waste management into corporate policies and processes (University of Aberdeen, 2011: 1).

2.2.2 Cardiff and Vale University Health Board

The main aim of the waste management policy is to provide instructions on the classification, management, training and audit with respect to waste management. This is to ensure that the storage, handling, transport, treatment and/or disposal of waste generated by the institution is managed to minimise the risks of harm to human health, damage to the environment or detriment of the local amenity (Cardiff and Vale University Health Board, 2011: 4).

2.2.3 University of Derby

The following directives are enshrined in the mission statement of the waste management policy of the University of Derby: the university should reduce waste arising from its operations and implement good waste management practices using the "cradle to grave" approach; the university should reduce its consumption of materials whenever practicable and encourage and

enforce re-use and recycling by its staff and students; where practicable one should buy and promote the use of environmentally friendly products, meaning or implying that use of non-renewable resources or products that are polluting in their production and use must be avoided; and one should purchase items with minimal packaging and ensuring that the product be durable and repairable (University of Derby, 2011: 4). The objective is that each member of the university should take reasonable steps to minimise the waste they produce. Where there are materials that are no longer required, a hierarchy of options must be followed, that is, reduce, re-use, recycle and dispose (University of Derby, 2011: 1-2).

2.2.4 University of Dundee

The university recognises the importance of waste management within its overall environmental policy and has specified areas of action on waste. It is envisaged that waste impacts the social, environmental and economic aspects of the sustainable development and the good governance of the university. The university is committed to the hierarchy of reducing, re-using, recycling and giving consideration to the whole life cycle of resources when specifying procurement at all levels (University of Dundee, 2001: 1).

2.2.5 Middlesex University

The university has in place a code of practice for waste management with the intention to maximise the use of resources, proactively reduce negative environmental impact, reduce costs, and ensure compliance with waste management legislation. According to this code of practice, the university is committed to managing waste responsibly, reducing waste sent to landfills and maximising the re-use and recycling of waste. It is emphasised that for all entities that produce, keep or dispose of waste, the university is compelled to comply with legal provisions (Middlesex University, 2008: 1).

2.2.6 University of Sussex

The university in its waste management policy has adopted the principles of the “best practicable environmental option” in the delivery of its waste management services. The intention is to apply a “waste hierarchical approach”, that is, to reduce, re-use, recycle and recover waste products in preference to the disposal of waste to landfills. The university takes into account the

legal requirement for all those who produce, keep or dispose of waste of any type to comply with the various regulations and the “Duty of Care” under environmental protection legislation (University of Sussex, 2007: 2).

2.2.7 University of Hull

The University of Hull encourages its members to minimise avoidable waste and reduce waste sent to landfill by considering the “value for money” and environmental benefits of each waste option to ensure that materials no longer required, are then managed according to the following waste hierarchy of reduction, re-use, recycling, use and responsible disposal. The university’s implementation plan aims to deliver the United Kingdom Government’s objective of diverting 45% of waste from landfill. The university waste management strategy is in three stages: (1) to separate waste stream that will help reduce the number of weekly waste collections; (2) to provide a waste depot strategy; and (3) to create a managed central area for collection of segregated waste streams (University of Hull, 2013: 1-2).

2.3 India

2.3.1 Delhi City

Delhi maintains a community container infrastructure, and most residents and other waste generators bring their waste to temporary storage centres or points. In a service organised by non-governmental organisations and the Delhi Municipal Committee, in co-ordination with resident welfare associations, private door-to-door waste collection service is provided by waste-pickers to high-income, middle-income and low-income households in Delhi municipality. The service providers take the waste to the temporary storage centres or points, extracting the valuable materials before discharge. Delhi relies on well-organised waste disposal in three controlled disposal sites, but without environmental protection measures (UN-Habitat, 2010: 58).

2.3.2 Bengaluru City

In place is a strong political commitment to improving and modernising collection, with high-level performance goals and a mixed system approach. A mix of the municipality and private operators provide a direct, daily door-to-door primary collection system to 70% of Bengaluru citizens in high-income, middle-income and some low-income and slum areas. Private

contractors provide services in the central business district and in the better-off residential areas. The handcarts used by the door-to-door collectors are directly unloaded into large vehicles, including auto-tippers and state-of-the-art compactors, for transportation to the processing or disposal sites, making most of the city effectively bin free. The exception is a few low-income areas on the city boundaries and in old settlements, where the municipality provides less frequent and less regular waste collection services from community waste collection. Open dumping still accounts for nearly 10% of the waste. Bengaluru waste goes to two new modern landfills constructed near processing plants. These landfill sites are operated by the private sector based on public-private partnership models (UN-Habitat, 2010: 53).

2.4 United States

2.4.1 San Francisco City

A private contractor (Recology) has a legal monopoly on collection of waste in San Francisco. A mandatory recycling and composting ordinance require all residents and businesses, to separate their waste, that is, 3-programme system of using black, blue and green 240-litre wheeled carts. Generators segregate materials and split-chamber trucks simultaneously pick up garbage and recyclables. Single-chamber side-loading vehicles pick up compostables. Most streets are swept mechanically once per week while high-traffic areas are swept daily. Departments of Environment and Public Works staff, working with business owners and residents, have developed innovative programmes to encourage best practices and to implement clean-up projects at events such as street fairs, and to solve seasonal problems. San Francisco's discards are hauled 85 km to Waste Management's Altamont Landfill and Recology's Jepson Prairie Compost Facility 96.5 km away (UN-Habitat, 2010: 78-79).

2.4.2 Iowa State University

Iowa State University is more concerned with the hazardous waste management and minimisation. Hazardous waste includes chemicals, computers and electronics, appliances, and fluorescent tubes, to mention a few. Environmental Health and Safety ensures proper hazardous waste management by administering the Environmental Protection Agency Resource Conservation and Recovery Act (RCRA) Programme, and other applicable State and local rules or policies. RCRA regulates the generation, storage, and disposal of hazardous waste items, and

mandates that generators of hazardous waste implement waste minimisation practices, university personnel are required to adhere to federal, State and local hazardous waste regulations and policies set forth in the Iowa State University Management of Unwanted Materials Manual and all other applicable programmes and policies. The university personnel is prohibited from discharging or allowing or causing to be discharged hazardous waste to land, surfaces, water, and sanitary or storm-water systems of Iowa State University (Iowa State University, 2013: 1).

Iowa city has concentrated on recycling the waste. The emphasis is on waste volume reduction at the source and recycling. Iowans generate approximately 3.2 million tonnes of waste annually, and approximately 2 million tonnes of that is landfall each year. The contents of Iowa's waste-stream include non-hazardous and hazardous, residential, commercial, and industrial waste, that is, according to a 1990 Iowa Department of Natural Resources study, paper (37.8%), yard and food wastes (15.3% and 11.5% = 26.8%), plastics (6.8%), rubber plus leather and textiles (5.8%), glass (4.8%), wood (3.9%), and reminder (mainly sand left over from foundry casting operations) (7.8%) (Iowa Environmental Issues Series, 2013: 1-2).

2.4.3 Illinois State University

Illinois State University has in place recycling programmes in order to reduce the stream of waste products. The university uses recycling because it is of the view that this waste management activity conserves natural resources, landfill space, and reduces waste disposal costs. In promoting the recycling programmes, the university makes conscious efforts to reduce solid waste and helps sustain recycling markets by not discriminating against recycled products. It is envisaged that for the recycling programmes to be economically feasible, additional markets need to be developed so that the value of recovered materials is greater than the cost to collect, transport, process, and remanufacture recyclables. To achieve this view of supporting the development of such markets, the university must purchase products with recycled content. The university's goal is to purchase 25% of its disposable products made from recycled content. Therefore, the policy's three components are designed to save resources, reduce solid waste, and improve markets for recycled products (Illinois State University, 2013: 1).

The university's waste management policy emphasises the following: (1) in recycling – the university is devoted to campus wide recycling collection and supports the development and implementation of such for all campus units; (2) in waste reduction – the university deems volume reduction as a number one priority of the solid waste management plan. All campus constituents must reduce the volume of their solid waste stream; and (3) in procurement of recycled products – the university does not discriminate against, and preference is given to, products made with recycled material content whenever cost, specifications, and availability are comparable (Illinois State University, 2013: 2).

2.5 South Africa

Most South African universities have introduced and developed environmental policies that include components on waste management over the years. Some of these universities have even introduced study programmes in environmental studies at both undergraduate and postgraduate levels.

2.5.1 University of KwaZulu-Natal

In the mission statement, of the University of KwaZulu-Natal, it is stated that the university management and its community should do the following: (1) “conserve the physical environment and foster a culture of responsible, ethical, sustainable use of natural resources”; and (2) “provide holistic education which promotes an awareness of social responsibility and sound ethical practice in a diverse society” (University of KwaZulu-Natal, 2010: 1).

It is further emphasised in the institutional environmental policy documents, that the university should observe and be mindful of the following: (a) being conscious of the necessity for the protection of the integrity of the environment and the conservation of natural resources and biodiversity at local, regional and international levels; (b) being desirous of establishing and maintaining on its campuses an environment conducive to excellence in all its activities; and (c) being committed to a programme of sustainable development which takes into account the needs and aspirations of its own user communities in association with consideration of equity, environment and future generations (University of KwaZulu-Natal, 2010: 1).

According to Principle 7 of the same environmental policy, the university is to enact effective control over any activities on its campuses which could or may generate harmful waste substances, cause environmental damage or be harmful to health, and it is to undertake environmental audits of any such activities occurring on its campuses. In addition, waste management and pollution control on the university campuses should emphasise accountability, prevention, treatment and re-use (University of KwaZulu-Natal, 2010: 2).

2.5.2 Rhodes University

The chief goal of Rhodes University is to pursue a policy of environmental best practice in order to assist in creating an environmentally sustainable future. In its policy aims, it has included the following: (1) reduction of campus waste; and (2) improvement of hazardous waste identification and management on campus (Rhodes University Environmental, 1998: 2).

One of the cardinal areas covered by the university's environmental policy objectives is resource use with respect to waste, energy and water. On waste, it aims to improve its management of both general and hazardous waste produced on campus by doing the following: "minimising (reducing and/or recycling) wherever possible its solid and liquid waste streams at all discharge points on campus; using recycled products wherever feasible; adopting a purchasing policy sensitive to environmental concerns; identifying and minimising hazardous waste on campus; ensuring satisfactory disposal of waste (hazardous and general) that could not be re-used or recycled; and conducting a regular waste audit to assess improvement of waste management strategies on campus and to communicate these results to relevant parties" (Rhodes University, 1998: 2-3).

2.5.3 University of Witwatersrand (or Wits University)

Wits University has emphasised on recycling its waste as the main component of its waste management programme. Consequently, it has contracted a private international firm whose duty is to manage the general waste and recycle it. All this is done with the participation of both staff and students. Before this general waste management and recycling contractor was contracted, only 7% of the waste was being recycled, but after this contractor took over, it moved to 51% being recycled (Knoll, 2009: 18). The contractor provides medical and chemical waste

removal service while the university's ground staff deals with the garden refuse removal which they take to a composting facility on campus. The contractor provides an additional service of fat trap cleaning which involves emptying the fat traps of the major kitchens on campus and sending the organic component of this waste to a composting facility designed to handle such waste. In this process, the used cooking oil goes towards a new bio-fuel initiative (ibid.: 19).

Wits University has also included on its waste management list e-waste such as old computers, televisions, fridges, microwaves and radios which are stored in a special facility and collected periodically for recycling when storage space is full. As for the computer hard drives, they are crushed on site as a security measure and the crushed material is sent for recycling (ibid.). An industrial shredder is also based on the West campus of the university for shredding confidential documents whose end product (paper) is then baled for recycling.

There are wheelie bins in place throughout the university campus. The bins rose to 500 in 2009 from 300 in 2007 due to the increased student population (ibid.). Knoll has noted that this is the most hygienic waste collection system as it is easier to load waste in vehicles by means of side loaders, a mechanism by which the contents of the bin are tipped into the truck (ibid.). These bins are washed at the wash-bays which have drainage facilities, and they are sanitised with approved biodegradable solvents after they have been unloaded (ibid.). This is done on a daily basis. The bins are off-loaded at a Material Recycling Facility (MRF) on the West campus, whether the waste has been pre-stored or not. The MRF is housed in a building that is custom-built to deal with recycling. At the MRF, the waste is tipped into a hopper which feeds it along a conveyor belt. Workers in protective clothing (including masks and gloves) sort the waste by picking out the different recyclables from the unsorted waste and separating the different plastics, that is, cool drink bottles, plastic packaging, and milk bottles from the pre-sorted waste (ibid.). The plastics are baled separately according to type and colour because the melting and chipping processes are different. Generally, the recyclables are baled according to type on site at the MRF. On a weekly basis, the facility is washed and sanitised (ibid.).

Knoll has further noted that awareness campaigns and education that were being done on site have helped in the promotion of individual recycling initiatives which had come on stream as a

result of requests from both students and staff, taking into consideration the fact that a new generation of school children or students were coming to the university and that they had been taught about recycling in schools (ibid.: 20-21).

2.6 Nigeria

In general, Nigeria has an environmental policy for the whole nation. The universities do not have any direct environmental policies neither do they have any waste management policies nor guidelines to guide or assist them on how to manage waste in their university campuses. The administration of these institutions just manages waste in a general way. What is notable, however, is that the universities provide experts (that is, lecturers and researchers) to assist the Nigerian Government to come up with strategies on how to manage waste on a national level. It has not been an easy task for the government because Nigeria is a very populous country with very huge turnovers of waste generated every day. The government and some private firms have difficulties coping with this situation. Consequently, universities come under this national waste management policy just like any other areas of the country.

2.6.1 Lagos City

Lagos is the largest city in Nigeria with a population of over ten million inhabitants, resulting into a generation of large quantities of municipal solid waste reaching approximately four million tonnes annually and half a million tonnes of untreated industrial waste (Kofoworola, 2006: 1). The State Government has set up various waste management agencies to keep its streets and neighbourhoods clean but has only achieved minimal success due to the fact that more than half of the waste is left uncontrolled from the streets and the various locations due to the inadequacy and inefficiency of the waste management system (Ibid.). Problems of municipal solid waste management in Lagos are based on the following: (i) improper collection systems; (ii) lack of adequate waste collection equipment and vehicles; (iii) indiscriminant dumping of waste; (iv) lack of continuity and implementation of government policies; (v) existing municipal solid waste management practice in Lagos; and (vi) existing recovery and recycling practices of municipal solid waste in Lagos.

2.6.2 Ibadan City

In Ibadan city, three governmental agencies are charged with the responsibilities of managing the environment. They are: (i) the Local Government Councils (five of them); (ii) the Ibadan Solid Waste Management Authority; and (iii) the Ministry of Environmental and Water Resources (Omoleke, 2004: 267). Ibadan city is faced with a problem of open and indiscriminate dumping of waste, human and animal faeces, including inside streams. Most houses in the heart of the city have no toilet facilities. Piles of decaying garbage which are substantially domestic in nature dominate strategic locations in the interior of the city including the Ibadan-Lagos express way (Ibid.). The waste in such dumpsites is a source of air and water pollution, land contamination, health hazards and environmental degradation. This promotes risks such as bad odour, aesthetic nuisance, fire outbreak, water pollution, proliferation of insects, flies, cockroaches, rats and other small and dangerous insects which can endanger public health through breeding of ailments such as dysentery, cholera, diarrhoea, yellow fever, plague and filariasis. The fumes and carbon monoxide from atmospheric pollution may cause and also aggravate bronchial and asthmatic disorder (Ibid.).

The factors that characterises the environmental culture in Ibadan are as follows: (1) high rate of illiteracy; (2) ignorance; (3) uncivil culture of indiscriminate waste littering such as throwing of waste on bare ground; (4) people's inability to maintain a sanitarily clean environment; and (5) reluctance of people to cooperate with the authority by disposing solid waste in illegal dumps, rather than the means provided by the government. Other factors that militate against a decent environment in Ibadan include: (i) uncontrolled population creating slum conditions; (ii) poor planning; and (iii) violation of town planning regulations (Ibid.).

2.7 Tanzania

2.7.1 Moshi City

The Moshi Municipal Council, a private contractor (on a pilot basis), and community-based organisations provide waste collection services. The private contractor provides services in one of three wards in the central business district. The Moshi Municipal Council serves the rest of the urban area and provides secondary collection in peri-urban areas where community-based

organisations and individuals are doing primary collection. Moshi has a controlled dumpsite (UN-Habitat, 2010: 70).

2.8 Zambia

2.8.1 Lusaka City

A mixed waste collection system is in place in Lusaka. The dual waste collection system is based on the city managing and monitoring a zonal monopoly system tailored to the demographics of different communities. All operators are responsible for marketing services, collecting fees, implementing collections, and meeting targets. Formal private-sector operators collect waste door-to-door, or provide skip buckets for larger generators or housing estates in the conventional or planned areas. Micro-franchising of primary waste collection via contractors to community-based organisations is the main coverage strategy in the peri-urban or informal areas. This accounts for a total official coverage rate of 45%, however, this does not include the more than 30% of households, which are served by unregistered informal collection service providers. The Lusaka City Council organises street sweeping differently, with performance contracts by zone. Although the city hosts the only engineered sanitary landfill, illegal dumping in drains, quarries and open places takes place on a wide scale (UN-Habitat, 2010: 66-67).

2.8.2 University of Zambia Great East Road campus

Since the university's first in-take of students in 1966, there has been no known environmental policy or guidelines on waste management to be followed. The University of Zambia administration on its own, and also through the Office of the Dean of Students, the Horticultural Department, and the Resident Engineer's Department, has been following to a certain extent the Lusaka City Council's requirements on waste management practices.

Lusaka city is zoned (or divided into districts) by Lusaka City Council Waste Management Unit and the University of Zambia Great East Road campus falls in or belongs to Zone C. The private waste management company granted the franchise contract for Zone C is Clean Fast Limited, as waste collection is out-sourced to the private waste management companies through franchise contracts for the various zones (or districts) (Lusaka City Council Waste Management Unit, 2009).

Consequently, the University of Zambia administration has come up with seven core values that would guide the implementation of the University of Zambia Strategic Plan of 2013 to 2017. One of these core values is on the “green environment”. The green environment value stipulates that the University of Zambia shall:

- (i) Uphold the common value to strive for better understanding of environmental issues, support environmental causes, and promote the protection of living organisms, including humans, from harmful actions that impact on the air, land and water; and
- (ii) Advocate for sustainable biodiversity management, ecologically friendly production and provision of goods and services for healthy living on earth and, especially in our immediate environments.¹

This core value has to trickle down from the University of Zambia administration to all the major stakeholders of the University of Zambia community if it has to bear any meaningful or valuable fruits to be proud of or to write home about, through the means of mass campaigns available on the University of Zambia Great East Road campus (UNZA campus), unlike a situation where a few lines are written down in blueprint by the University of Zambia administration and no sensitisation and conscientisation is promoted through the mass campaigns or any progressive means available. Henceforth, all the stakeholders of the University of Zambia community must be made to feel ownership of the University of Zambia institution by such means as involving them whenever designing, formulating and implementing initiatives such as institutional strategic plans if such initiatives are to succeed and/or be appreciated thereof. This University of Zambia’s core value on the green environment is yet to be seen or proven in the practical sense through the strategic goals and objectives that the institution has set for itself, if it could involve and/or make the UNZA community feel ownership of the institution. Furthermore, the Registrar gave a directive to the Office of the Dean of Students in early 2013 to form a “Keep UNZA Clean Committee” whose duty was to keep UNZA clean by involving the participation of all stakeholders (cf. chapter 5, section 5.2). From the researcher’s investigations, it would appear that, apart from the “keep UNZA clean” campaign mounted by the School of Education, no other School had implemented any specific programme to help protect the environment.

In addition, some environmental studies courses have been introduced in all the various schools on campus. But the Schools of Education, Engineering, and Natural Sciences have established

¹ The University of Zambia, *Strategic Plan 2013-2017* (2012), p. 17.

departments for environmental studies programmes such as Department of Environmental Education, Department of Civil and Environmental Engineering, and Department of Geography and Environmental Studies respectively. This is an indicator that environmental issues can no longer be ignored as they ought to be addressed in one way or the other.

There has been no study so far done on the Great East Road campus of the University of Zambia on waste management. This study aims at filling the gap. The purpose of this research is to examine the situation with regard to waste management at the University of Zambia Great East Road campus and to make an ethical evaluation of the overall situation.

CHAPTER THREE: THEORETICAL FRAMEWORK

3.1 Introduction

The ethical theoretical framework does not only serve the purpose of informing the ethical evaluation but also serves as a guide in the collection of relevant data for the study. Therefore, an ethical theory is a systematic clarification or logical description of a particular view about what is the nature and basis of good or right. The theory provides reasons or norms for judging acts to be right or wrong and attempts to give a validation or substantiation for these norms. It provides ethical principles or strategies that embody certain values. These can be used to decide in particular cases or circumstances what action should be chosen and carried out (Mackinnon, 2012: 9). Ethical theories address questions about morality, that is, concepts such as good and evil, right and wrong, virtue and vice, justice and crime, and so forth. The study of ethics involves systematising, defending, and recommending concepts of right and wrong behaviour. It refers to reasonable and well-founded standards of right and wrong that prescribe what human beings ought to do, that is, rights, obligations, benefits to society, fairness, or specific virtues. It also refers to the study and development of one's ethical standards, that is, feelings, laws, and social norms.

In traditional ethics, moral consideration moves in both directions, from humans to humans and back, while in environmental ethics, moral consideration moves in only one direction, that is, from humans to the natural environment. Human beings reason and have a capacity for moral awareness. This is what distinguishes humans from non-humans because non-humans cannot be morally aware. Hence, in this study, moral consideration is being extended to the University of Zambia Great East Road campus natural environment.

3.2 The Land Ethic

Aldo Leopold's Land Ethic is an ethical theory that emphasises how a human being is a member of a community of interdependent parts that make up an ecosystem. It is important to emphasise that human beings do not stand outside of the ecosystem but are an intrinsic part of it. Hence the ecosystem is affected by their behaviour towards it. Land Ethic is a theory that focuses on the holistic ecosystem rather than on individual members. For Leopold, "land" is the ecosystem, and

he compares the circulation of energy through the biota, the land's living organisms, to a fountain (Wenz, 2001: 149). In his view, he sees all living organisms in the form of a biotic pyramid through which energy (which comes from the sun) flows upwards as a "food chain". The biotic pyramid is comprised of different layers: soil at the bottom followed by water, plants, animals, mammals, and humans at the apex of the pyramid. This is Leopold's holistic picture of land. He observes that land is a fountain of energy flowing through a circuit of soils, plants, and animals, and that food chains are the living channels that conduct energy upward while death and decay return that energy to the soil (ibid.). Energy is retained as it keeps going round the circuit, and its flow depends on the complex structures of relations between living things. Leopold (1948) defines environmental ethical behaviour as follows: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise" (as quoted in Keller, ed., 2010: 200). In this study, the focus is on the manner in which human members of the University of Zambia Great East Road campus holistic ecosystem take responsibility for their actions in relation to the natural environment.

3.3 Environmental Virtue Ethics and the Ethics of Care

The Ethics of Care is very closely related to Virtue Ethics. Hence, both are being considered together here. However, whereas Virtue Ethics focuses on developing habitual character traits in people, the Ethics of Care focuses on the particular specific context in which care is expressed and the emotions that accompany it.

Virtue Ethics aims to promote habitual moral behaviour in people. It emphasises moral character in contrast to emphasising moral duties or rules or the consequences of actions. A virtue is a character trait which is well entrenched in its possessor. It is concerned with honest actions, emotions and emotional reactions, choices, values, desires, perceptions, attitudes, interests, expectations and sensibilities. A virtue is only acquired by repeated performance of good actions so that a habit of acting in this way becomes a character trait. The possessor of the virtue(s) must be a person of a certain complex mindset. This mindset is the whole-hearted acceptance of a certain range of considerations as reasons for action (Hursthouse, 2012: 2). Hence, moral actions are those that a virtuous person will normally perform. In this study, Virtue Ethics focuses on human moral behaviour towards the natural environment.

Environmental Virtue Ethics are an extension on traditional Virtue Ethics. They focus on the proper dispositions or character traits for human beings that they ought to possess regarding their interactions and relationships with the environment. For instance, an environmentally virtuous person is disposed to respond, both emotionally and through action, to the environment and the non-human individuals (whether inanimate, living, or conscious) that populate it in an excellent or fine way (Sandler, 2010: 253). Therefore, an environmental virtue is merely the disposition to act according to the rules, principles, or norms of action of the correct environmental ethic. On this account, environmental virtues are strictly instrumental and subordinate to right action. One first determines what is the right way to act or behave regarding the environment, and then determine which character dispositions tend to produce that behaviour. Those dispositions are the environmental virtues (*ibid.*: 255).

The Ethics of Care (or Care Ethics) is a moral theory or a normative theory that implies that there is moral significance in the fundamental elements of relationships and dependencies in human life. It is another influential version of Virtue Ethics (Athanasoulis, 2004: 8). Virtue Ethics focus on habitual virtues in people. The virtues have to do with the whole person in general and all the time. These virtues become part of one as one will behave in such and such a manner or way in conformity with such virtues; whilst in the Ethics of Care focus is not on habitual virtues but on individual particular context in human relationships and dependencies, such as, parents have a moral responsibility to care for their children or children are dependent upon their parents or guardians, the elderly are dependent on their children or other care-takers or that children have a moral responsibility to care for the elderly, a nurse has a moral responsibility to care for her patients, a government has a moral responsibility to care for its citizens, and so on. This is in order to safeguard and promote the actual specific interests of those involved. The Ethics of Care, normatively, seeks to maintain relationships by contextualising and promoting the wellbeing of care-givers and care-receivers in a network of social relations. It is often defined as a practice rather than a theory; “care” involves sustaining and meeting the needs of others. It builds on the motivation to care for those who are dependent and vulnerable, and it is inspired by both memories of being cared for and the idealisations of self (Sander-Staudt, 2014: 1). The Ethics of Care puts emphasis on traits valued in intimate personal relationships such as

sympathy, compassion, fidelity, and love. In particular, “caring” refers to care for, emotional commitment to, and deep willingness to act on behalf of persons with whom one has a significant relationship (Beauchamp and Childress, 2009: 36). It is a theory developed by feminists in the second half of the twentieth century. Care-focused feminism is a branch of feminist thought, informed primarily by the Ethics of Care as developed by Carol Gilligan (1982) and Nel Noddings (1984). Gilligan stated in her two moral thinking modes that men tend to embrace an ethic of rights and justice that uses quasi-legal terminology and impartial principles, accompanied by dispassionate balancing and conflict resolution, whilst women tend to affirm an ethic of care that centres on responsiveness in an interconnected network of needs, care, and prevention of harm. However, this does not mean that caring is restricted to women. The core concept in an Ethics of Care, then, is caring for and taking care of others (ibid.). Noddings characterised caring as an act of “engrossment” whereby the one-caring receives the cared-for on their own terms, resisting projection of the self onto the cared-for, and displacing selfish motives in order to act on behalf of the cared-for. She located the origin of ethical action in two motives, the human affective response that is a natural caring sentiment, and the memory of being cared-for that gives rise to an ideal self (Sander-Staudt, 2014: 3).

Traditional ethical theories such as utilitarianism and Kantian deontological ethics developed ethical theories based on an understanding of society as the aggregate of autonomous, rational individuals with an emphasis on rules, duties, justice, rights, impartiality, universality, utility and preference satisfaction; on the other hand, the Ethics of Care, developed on the understanding of the individual as an interdependent, relational being. It emphasises the importance of human relationships and emotion-based virtues such as benevolence, mercy, care, friendship, reconciliation, and sensitivity. In the Ethics of Care, the family is the primary sphere of morality where a person can cultivate and inherit his or her character.¹ It is widely applied to a number of moral issues and ethical fields, including the natural environment (as in this study), bioethics, and public policy. It has progressed from private and intimate spheres of life to political theory and social movement aimed at broader understanding of, and public support for, care-giving activities in their breadth and variety (Sander-Staudt, 2014: 1). In this study, the Ethics of Care,

¹ New World Encyclopaedia, Ethics of Care, http://www.newworldencyclopedia.org/entry/Ethics_of_care (accessed 10th February, 2014).

as in Virtue Ethics above, focuses on human moral behaviour towards the natural environment of the Great East Road campus of the University of Zambia.

3.4 The Tragedy of the Commons

“The Tragedy of the Commons” is an approach promoted by ecologist Garrett Hardin (1968) in which a dilemma arises from a situation in which individuals, acting independently and rationally according to their own self-interest, behave contrary to anyone’s or the whole group’s long-term best interests by depleting some common resource or a shared limited resource. This individual rationality and self-interest leads the “commons”, or non-regulated areas, to disaster (Pojman, 2004: 897). This approach is often referred to in connection with sustainable development, meshing economic growth and environmental protection, and has had an effect on numerous current issues, including the debate on global warming. The “commons” can include the atmosphere, fish stocks, forests, national parks or game reserves, oil wells, mines, lakes, oceans, rivers and any other shared resource(s).

The Tragedy of the Commons, for instance, could develop as follows. At an open pasture available to all herdsmen, it is expected that each herdsman will try to keep as many cattle as possible on the commons. This kind of arrangement may work reasonably satisfactorily for years or centuries because wars or conflicts, poaching, and disease keep the numbers of both people and animals well below the carrying capacity of the earth. However, there eventually comes the day of reckoning when the long-desired goal of social stability becomes a reality and this is when the inherent logic of the commons remorselessly generates tragedy (Hardin, as referred to in Pojman, 2004: 902). The free access and unrestricted demand for a finite resource ultimately reduces the resource through over-exploitation, temporarily or permanently. This happens because the benefits of exploitation accrue to individuals or groups, each of whom is motivated to maximise use of the resource to the point at which they become dependent on it, while the costs of the exploitation are borne by all those to whom the resource is available (which may be a wider class of individuals than those who are exploiting it). In turn, this causes demand for the resource to increase, which causes the problem to snowball until the resource collapses (even if it retains a capacity to recover). The rate at which depletion of the resource is realised depends primarily on three factors: (i) the number of users wanting to consume the

common in question; (ii) the consumptiveness of their uses; and (iii) the relative robustness or healthiness of the common.²

Hardin, in principle, argues against relying on conscience as a means of policing the commons, suggesting that this favours selfish individuals over those who are more altruistic or selfless. In the context of avoiding over-exploitation of common resources, Hardin concludes by restating Hegel's maxim, "freedom is the recognition of necessity". He suggests that "freedom" completes the Tragedy of the Commons. By recognising resources as commons in the first place, and by recognising that they require management, as such Hardin believes that humans "can preserve and nurture other and more precious freedoms" (as quoted in Pojman, 2004: 912-914). For our purposes, "the Tragedy of the Commons" is availed of in an extended sense with reference to the overall UNZA campus environment both natural and human.

² Daniels, Brigham. Emerging Commons and Tragic Institutions, *Environmental Law*, Vol. 37 (2007), pp. 515-571 at 536, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1227745. Papers.ssrn.com. (accessed 25th June, 2014).

CHAPTER FOUR: METHODOLOGY AND METHODS

4.1 Introduction

This chapter explains the design, methodology and methods used in the collection of data for the research. It clarifies the boundaries of the Great East Road campus of the University of Zambia and the various schools and other sites relevant to the study.

4.2 Design, Methodology and methods

This research involved a case study design. The methodology used was qualitative involving an ethical component. The methods involved primary and secondary sources of data. The primary data collection methods involved observations, in-depth interviews and focus group discussions with selected stakeholders such as students, residents, administrators, technicians, cleaners and some officials from the waste collector, Lusaka City Council (LCC) and the Zambia Environmental Management Agency (ZEMA) (formerly Environmental Council of Zambia (ECZ)). The secondary data involved information on relevant literature from appropriate books, journals, internet and newspapers. Observations were carried out by the researcher by moving around the boundaries of the UNZA campus. The findings were analysed by identifying common themes.

4.3 Location of study

The location of the study is the University of Zambia Great East Road campus situated in Lusaka city in the Lusaka Province of the Republic of Zambia (see map in figure 4.1 below on page 27). Waste dumpsites can be seen on the map. The Great East Road campus comprises eight schools (Agricultural Sciences, Education, Engineering, Humanities and Social Sciences (HSS), Law, Mines, Natural Sciences, and Veterinary Medicine), three locations of students hostels, three canteens, a clinic, and four locations of staff residential houses (Canada Court, Elliott Court, Handsworth Court, and UNZA Junior Staff Housing Complex).

UNIVERSITY OF ZAMBIA GREAT EAST ROAD CAMPUS, LUSAKA

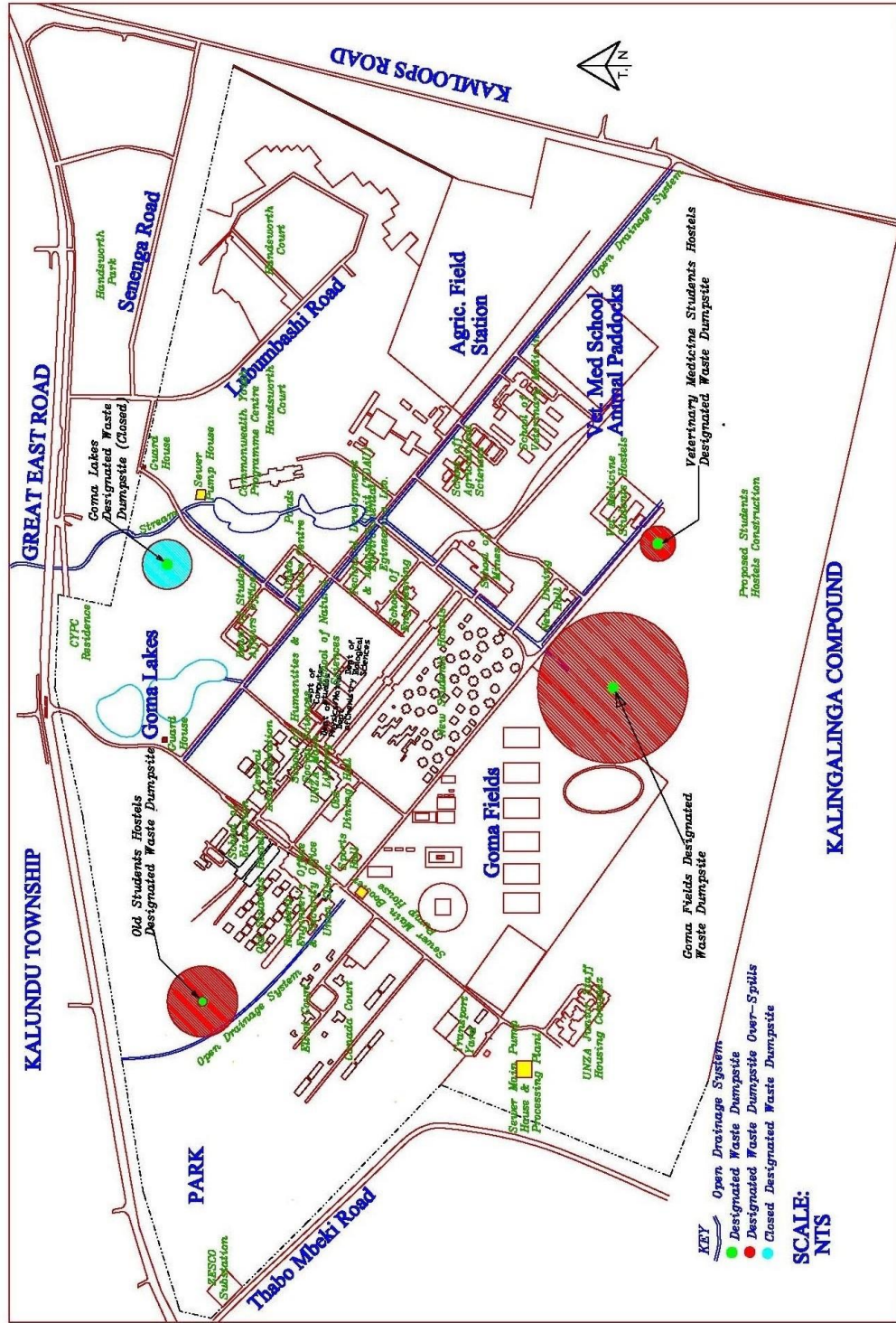


Figure 4.1: Map of the UNZA Great East Road campus in Lusaka city.
 Source(s): 1983/84 UNZA Calendar (LL/GEOG/UNZA), UNZA Development Master Plan of 2007 to 2013
 edited by Kabaso Lukwesa (Geomatic Engineer), and the researcher, 16.06.2014.

4.4 Sample size

Purposive sampling method was employed for in-depth interviews (cf. table 4.1). The total number of persons interviewed was therefore 47 (40 male / 7 female). A larger sample would very likely have produced similar findings and be simply a duplication of data once saturation point had been reached.

Table 4.1: Sample of respondents interviewed.

	Male	Female	Totals
Members of Staff resident on UNZA campus	10	0	10
Administrators	5	2	7
Technical Staff	11	0	11
Students Hall Representatives (2010/11 academic year)	3	4	7
Horticultural Officer	1	0	1
Resident Engineer's Representatives	4	0	4
ZEMA Representative	1	0	1
LCC Representative	1	0	1
Waste Collector's Representative	1	0	1
UNZA Clinic Representatives	1	1	2
Stores Controller	1	0	1
Mechanical Superintendent	1	0	1
Totals	40	7	47

In the in-depth interviews, participants were selected in the following manner as being representative of those relevant to the issue of waste management: 10 members of staff resident on UNZA campus (2 Canada Court, 2 Elliot Court, 2 UNZA Junior Staff Housing Complex, and

4 Handsworth Court); 7 administrators (3 Dean of Students, 1 Education, 1 HSS, 1 Law, and 1 Registrar's); 11 technicians (1 Agricultural Sciences, 2 Engineering, 3 Mines, 3 Natural Sciences, and 2 Veterinary Medicine); 7 students hall representatives (1 International old hostels, 1 Kafue new hostels, 2 Kalingalinga new hostels, 1 Kwacha old hostels, and 2 Soweto new hostels); 1 Horticultural Officer; 4 officers from Resident Engineer's Department; 1 officer from ZEMA; 1 officer from LCC; 1 officer from waste collector (Clean Fast Limited); 2 officers from the UNZA clinic; 1 Stores Controller; and 1 Mechanical Superintendent.

Convenience sampling was used to select participants in the 10 FGDs as described in table 4.2 below. There were six student groups (3 male / 3 female) and four groups of cleaners (2 male / 2 female). The total number of participants in these groups was therefore 69. The questions (as shown in appendices xii and xiii) were presented by the researcher to the various groups and he took notes of group responses. These responses were checked as soon as possible after the discussion.

Table 4.2: Focus Group Discussions.

	Male	Female	Totals
First year EAP students, Education (2010/11 academic year)	8	7	15
Second year Geography students, Natural Sciences (2010/11 academic year)	6	9	15
Third year students under HSS (2010/11 academic year)	0	7	7
Fourth year students under HSS (2010/11 academic year)	3	0	3
Cleaners from Thandi Hire Services	7	10	17
Cleaners from Maxlin Cleaning Company	4	8	12
Totals	28	41	69

4.5 Ethical issues

Participants were adequately informed in advance of the purpose of the study; their consent to participate freely was obtained; they were assured of anonymity and confidentiality with regard

to their input; and they were assured that the study would not involve any risks to themselves or to their work situations.

4.6 Ethical evaluation

An ethical evaluation was made by applying the ethical theories outlined in chapter three to the findings, namely, the Land Ethic, Environmental Virtue Ethics, the Ethics of Care, and the Tragedy of the Commons.

CHAPTER FIVE: FINDINGS, DISCUSSION AND ANALYSIS

5.1 Introduction

This chapter presents the findings, discussion and analysis of waste management at the Great East Road (GER) campus of the University of Zambia (UNZA). The findings will now be discussed with reference to the three research questions identified earlier:

1. What is the situation regarding guidelines or policies on waste management at the University of Zambia?
2. What is the situation regarding the management of waste on the Great East Road campus of the University of Zambia?
3. What are the attitudes of members of staff, students, and other stakeholders towards waste management on the Great East Road campus of the University of Zambia?

The discussion will proceed to follow this order of questions.

5.2 What is the situation regarding guidelines or policies on waste management at the University of Zambia?

This discussion will involve the wider context of the roles that the Lusaka City Council and the Zambia Environmental Management Agency play in waste management at the University of Zambia. The Head of the Waste Management Department at the Lusaka City Council said that the Council had no direct dealings with the University of Zambia administration.¹ He mentioned that the Council had contracted private waste collectors to service various areas (zones) of Lusaka city. Each zone was assigned to a particular waste collector who was responsible for collecting waste or garbage in that zone for onward transmission to the LCC landfill facility on one edge of the city for final disposal.

The Environmental Inspector at ZEMA clarified that the Zambia Environmental Management Agency (ZEMA) (formerly Environmental Council of Zambia) was operating under Environmental Management Act No. 12 of 2011 by enforcing requirements of the law on waste management on the Great East Road campus with reference to sections 53-63 which are under the theme of waste management. The key areas referred to are as follows: interpretation of waste

¹ Personal communication, 13th April 2012.

management; general prohibition and duty of care; waste licences; role of local authorities in waste management; designation of waste control areas; extended producer responsibility; cessation of activity relating to hazardous waste; site restoration orders; emergency situations; responsibilities of agency; and regulations relating to waste management. He advised that the university administration should familiarise itself with guidelines in Statutory Instrument No. 71 of 1993 on Medical Preparations (Labelling and Package Leaflets) Regulations, Statutory Instrument No. 125 of 2001 on Hazardous Waste Management Regulations, and on Environmentally Sound Management of Healthcare Waste practice, which is concerned with the major and minor sources of waste, segregation, packaging, labelling, colour coding, internal (primary) and external (secondary) storage, collection and transportation of health care wastes.²

ZEMA's Act (the Environmental Management Act, No. 12 of 2011) is still new to UNZA campus. This new form of legislation may require ZEMA to sensitise the university administration about it. It is a revised and improved legislation on the 1990 Environmental Protection and Pollution Control Act (as amended by Act No. 12 of 1999) Chapter 204 of the Laws of Zambia. The new Act is broader in scope than the old Act. The differences in the two from each other can be seen in their preambles. The two preambles provide as follows:

- (i) An Act to provide for the protection of the environment and the control of pollution; to establish the Environmental Council and to prescribe the functions and powers of the Council; and to provide for matters connected with or incidental to the foregoing;³ and
- (ii) An Act to continue the existence of the Environmental Council and re-name it as the Zambia Environmental Management Agency; provide for integrated environmental management and the protection and conservation of the environment and the sustainable management and use of natural resources; provide for the preparation of the State of the Environment Report, environmental management strategies and other plans for environmental management and sustainable development; provide for the conduct of strategic environmental assessments of proposed policies, plans and programmes likely to have an impact on environmental management; provide for the prevention and control of pollution and environmental degradation; provide for public participation in environmental decision-making and access to environmental information; establish the Environment Fund; provide for environmental audit and monitoring; facilitate the implementation of international environmental agreements and conventions to which Zambia is a party; repeal and replace the Environmental Protection and Pollution Control Act, 1990; and provide for matters connected with, or incidental to, the foregoing.⁴

² Environmental Inspector, personal communication, 13th April 2012.

³ Environmental Protection and Pollution Control Act, 1990, as amended by Act No. 12 of 1999, the Laws of Zambia Cap 204.

⁴ Environmental Management Act, No. 12 of 2011.

ZEMA has zoned Lusaka and the UNZA campus is in one of the zones. Each zone has an Environmental Inspector who is responsible for co-ordinating various environmental issues including those that cover waste management.⁵ This development is still in its infancy stage and, at the university campus, the stakeholders are not yet aware of this development.

A female student said she was unaware of any inspectors or waste collector coming from LCC or ZEMA to investigate waste management on the Great East Road campus of the University of Zambia. Once in a while, however, she could see the cleaning contractors (proprietors) conduct an inspection.⁶ A male student said that institutions like LCC and ZEMA were unheard of regarding waste management on campus. He suggested that if the university had a link with such institutions, then, there would be an improvement in waste management.⁷ Another male student said he was only aware of Finance Bank Zambia Limited and Barclays Bank Zambia PLC who had helped with extra bins on campus perhaps as part of their corporate responsibility.⁸ Another female student and a male student both said that they had never seen or heard of any role that LCC and ZEMA played on the GER campus of the University of Zambia in waste management.⁹

A member of staff resident on UNZA campus said that LCC and ZEMA have not been directly involved in waste management on campus. He observed that the only outside institutions involved were the contracted cleaning contractors and the waste collector.¹⁰ Another member of staff resident on UNZA campus also observed that LCC and ZEMA were not directly involved in waste management on UNZA campus. He believed these institutions should be involved. On the waste collector, he observed the collector was doing something but more ought to be done.¹¹ The researcher also did not observe any activities being carried out by LCC and ZEMA regarding the management of waste on campus.

⁵ Environmental Inspector, personal communication, 13th April 2012.

⁶ A students hall representative of a female block (Soweto 6), personal communication, 25th May 2011.

⁷ A students hall representative of a male block (International 6), personal communication, 27th May 2011.

⁸ A students hall representative of a male block (Kalingalinga 5), personal communication, 28th May 2011.

⁹ A students hall representative of a female block (Kafue 4), personal communication, 28th May 2011, and a students hall representative of a male block (Soweto 4) and also University of Zambia Students Union (UNZASU) Health and Sanitation Secretary – Council of Hall Representatives, in 2010/11 academic year, personal communication, 27th May 2011.

¹⁰ Fourth resident, Handsworth Court, personal communication, 15th April 2012.

¹¹ Fifth resident, Elliot Court, personal communication, 16th April 2012.

The Assistant Registrar (Administration) in the Registrar's Office and the Senior Administrative Officer (Residences) in the Office of the Dean of Students both indicated that the university administration had not yet formulated any waste management policy for the University of Zambia.¹² The Horticultural Officer and the Maintenance Engineer in the Resident Engineer's Office both also stated that there was no formal written policy on waste management in existence.¹³ However, the informal policy on the ground is that the university community tries to keep the formal structures and environmental surroundings clean and in a certain organised manner by maintaining a cleaning practice and an informal waste management approach on a daily basis. However, the informal policy has its own inadequacies where accountability is concerned.

Ten members of staff¹⁴ who are resident on campus and who were interviewed in March/April, 2012 mentioned that there was no official form of waste management observed on campus. The more common practice was for each one to make use of a bin in their homes and use a pit in their backyard to dump and burn waste when necessary. New pits were dug when the old ones were full. Few among the residents had contracted a waste collector to service or empty their bins at least once a week for disposal of waste to an external LCC landfill facility off campus. One student said he had never seen any waste management policy or guidelines from the University of Zambia administration. He was only aware of activities on health and sanitation – a clause contained in the UNZASU Constitution.¹⁵ Another student said that she was only aware of the regulation under the Office of the Dean of Students of punishing those who threw waste out of windows once caught.¹⁶

¹² Assistant Registrar (Administration) in the Registrar's Office, personal communication, 20th February 2012, and Senior Administrative Officer (Residences) in the Office of the Dean of Students, personal communication, 21st February 2012.

¹³ Horticultural Officer, personal communication, 23rd February 2012; and Maintenance Engineer in the Resident Engineer's Department, personal communication, 24th February 2012.

¹⁴ First staff resident (Handsworth Court), second staff resident (UNZA Junior Staff Housing Complex), third staff resident (UNZA Junior Staff Housing Complex), fourth staff resident (Handsworth Court), fifth staff resident (Elliot Court), sixth staff resident (Canada Court), seventh staff resident (Canada Court), eighth staff resident (Handsworth Court), ninth staff resident (Elliot Court), and tenth staff resident (Handsworth Court).

¹⁵ A students hall representative of male block (Soweto 4), personal communication, 27th May 2011.

¹⁶ A students hall representative of female block (Kafue 4), personal communication, 28th May 2011.

The dominant group feeling of one female student focus group discussion was that there was a lack of awareness of any guidelines or policy on waste management from the University of Zambia administration.¹⁷ A male student focus group discussion reacted similarly and further observed that there was no orientation on waste management given to the students in their first year of study.¹⁸ The dominant feeling of another female student focus group discussion proposed that a policy should be initiated and a student association formed on waste management so that everyone participated.¹⁹ Another male student focus group discussion proposed that the University of Zambia administration should formulate a waste management policy, and that the policy should be made through participation and contribution from expert departments.²⁰

A cleaners focus group discussion proposed that a policy be put in place, and stressed that such a guide would assist in changing the attitudes of students and members of staff towards waste management. In their view this would also impose sanctions and penalties on would-be offenders and help improve the situation.²¹

As a first step to keep UNZA clean, the Registrar gave a directive to the Office of the Dean of Students on 22nd February 2013 to form a “Keep UNZA Clean Committee”. The composition of membership would be from all schools, departments, units, and directorates, as well as the students body. This Committee is now chaired by the Dean of Students and is under the Office of the Registrar. Committee meetings are held on a fortnightly basis. The Committee has recommended that every Friday between 08.30 and 09.30 hours, members of staff should be involved in collecting litter or waste within their areas of operation. The Office of the Dean of Students and the School of Education so far have implemented this practice. The Deans of the other schools and Heads of various departments have been written to and reminded of this practice.²² However, this Committee is still in its infancy stage and more is yet to be done in the practical implementation of its recommended policy.

¹⁷ A second year Geography class (female focus group of 9) in the School of Natural Sciences.

¹⁸ A second year Geography class (male focus group of 6) in the School of Natural Sciences.

¹⁹ A third year female student focus group of 7 in the School of Humanities and Social Sciences.

²⁰ A fourth year male student focus group of 3 in the School of Humanities and Social Sciences.

²¹ Cleaners (male focus group of 4) from Maxlin Cleaning Services.

²² Dean of Students, personal communication, 27th June 2013.

On behalf of the university administration, the Keep UNZA Clean Committee entered into an arrangement with a company (DNM Creations) based in the Chilenje township of Lusaka. This company has already installed bins and liners in some localities on the UNZA campus, and is yet to install some more. DNM advertise waste bins and the company maintains these bins at its own expense. The arrangement with UNZA for now is informal. The Office of the Dean of Students intends to propose a Memorandum of Understanding with this company.²³ Commitment by the parties concerned to this arrangement is yet to be seen or proven with time.

The terms of reference of the Keep UNZA Clean Committee are as follows: it is under the Office of the Registrar of the University of Zambia; it is tasked to sensitise the University of Zambia academic and non-academic staff on the need for the maintenance of a clean and green environment; it is intended to encourage UNZASU, Council of Hall Representatives and students associations and clubs to change the mindset of students towards the maintenance of a clean UNZA environment; it aims to mobilise resources from schools, departments, directorates and units to contribute towards the sourcing of tools and consumables for use in the cleaning exercise; it is further intended to mobilise other stakeholders within and outside UNZA to partner in the keep UNZA clean activities; and finally it is to liaise with the Horticultural Department for technical and operational guidance.²⁴

5.2.1 Section summary

This section has clarified that there is no official policy or guidelines in existence on waste management at the University of Zambia. It has outlined what some members of the university community have observed or know in regard to the existence of a waste management policy or guidelines on the UNZA campus. Students, staff and cleaners interviewed stated that they were not aware of any waste management policy or guidelines on campus. Notably, it was mentioned that no part of the first year orientation programme was focussed on waste management. The majority of students interviewed in the focus group discussions expressed the need for management to come up with a policy or guidelines on waste management.

²³ Ibid.

²⁴ Terms of reference document in the Office of the Dean of Students, 27th June 2013. (cf. appendix xiv.)

5.3 What is the situation regarding the management of waste on the Great East Road campus of the University of Zambia?

The Great East Road campus of the University of Zambia (henceforth the UNZA campus) produces solid waste and other kinds of waste. In this study, waste is defined as any substance or object that the user discards, or any matter either liquid or solid which is discharged or deposited in the environment by the user (or owner). Although the study is concerned mainly with solid waste, other kinds of waste produced within the university campus and how they are disposed of are also mentioned because they affect the community and environment as well. In general, solid waste is produced by all schools and all other stakeholders throughout the UNZA campus (cf. table 5.1 for a summary of different types of waste disposed of in diverse sectors of the UNZA community). It is collected in bins, as temporal storage, in offices, lecture rooms/theatres and laboratories, and then transported and disposed of at the three designated waste dumpsite(s) on campus which are discussed below.

5.3.1 UNZA campus designated waste dumpsites

The UNZA campus has three designated waste dumpsites, namely: Veterinary Medicine hostels (one skip), old students hostels (one skip), and the east of Goma fields (two skips). The dumpsites were originally four. The fourth dumpsite that was situated in the gum trees of the Goma lakes was closed and its skip shifted to the Goma fields dumpsite so that there were two skips there. The reason for closing the Goma lakes designated waste dumpsite was because once the skip was full, waste would litter the frontage of the UNZA campus and the Goma lakes area.²⁵

The Veterinary Medicine students hostels dumpsite single waste collection skip is littered with waste all around it (see figures 5.1 and 5.2). Although the volume of waste is not as enormous as the two other dumpsites, it lacks proper maintenance. Much of the waste which surrounds the skip in the form of plastic bags and light paper is blown around by the wind.

²⁵ Dean of Students, personal communication, 27th June 2013.

Table 5.1: Schools, Departments, and other areas which produce different types of waste.

Schools, Departments, and other areas	Types of waste disposed of
UNZA Administration and others Admin. Offices/Departments	Papers, plastic bags, plastic bottles and containers, paper cartons, glass bottles, and foodstuff leftovers.
Students Hostels	Mainly papers, plastic bags, plastic bottles and containers, tins, paper cartons, glass bottles, and foodstuff leftovers.
Horticultural Department	Grass and leaves.
Resident Engineer's Department	Plays facilitating role only. Deals with both liquid waste and solid waste.
School of Veterinary Medicine	Animal carcasses, animal manure (dung), clinic and laboratory waste (syringes and bottled chemicals).
School of Natural Sciences	Lubricating oil, metal chips, welding rod stables, sheet metal pieces, saw dust, wood pieces, discarded nails screws, solder remains, animal carcasses, remains of experimented plants, laboratory waste, and chemical waste.
School of Engineering	Metal chips, wood shavings, electrical and electronic waste, and concrete blocks remains.
School of Mines	Rock waste (waste ore), chemical waste, and waste soils.
School of Agricultural Sciences	Poultry manure (chicken dung), chicken feathers, cattle manure (dung), and pig manure (both liquid and solid).
Schools of Education, HSS, and Law	Papers, plastic bags, plastic bottles and containers, and glass bottles.
UNZA Clinic	Sharps (needles and syringes), vials of medicine, surgical blades and suturing needles, dirty dressings, and foodstuff leftovers.
Residents on UNZA campus	Papers, plastics, house dirty, tins, and foodstuff leftovers.
UNZA Central Stores	Redundant/obsolete items from various schools and departments, for example, computers, printers, photocopiers, typewriters, office furniture, office equipment, and vehicles.
UNZA Mechanical Workshop	Used/obsolete vehicle parts, used lubricants, and used/obsolete vehicle batteries.

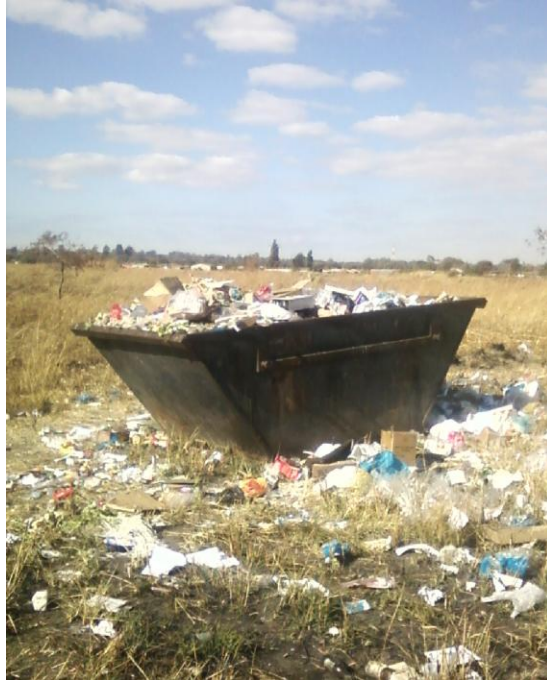


Figure 5.1: Veterinary Medicine students hostels designated waste dumpsite (1st view).

Source: Photo taken by the researcher, 12.06.2013.



Figure 5.2: Veterinary Medicine students hostels designated waste dumpsite (2nd view).

Source: Photo taken by the researcher, 12.06.2013.

Goma fields dumpsite has two waste collection skips (see figures 5.3 and 5.4). They are not enough to cope with the waste from the new student hostels, lecture rooms, and offices. A large area immediately surrounding the skips is littered with waste which is comprised of papers, plastics, foodstuff leftovers, and glass/plastic bottles/containers, among other type of waste. Some of this waste is normally blown by the wind in all directions but mainly into the Goma fields westwards and southwards. Once in a while some burning is done to this waste surrounding the skip. The dumpsite is frequented by scavengers who help themselves to certain components of the dumped waste as is the case at the old students hostels dumpsite.



Figure 5.3: Goma fields designated waste dumpsite (1st view).

Source: Photo taken by the researcher, 28.07.2013.

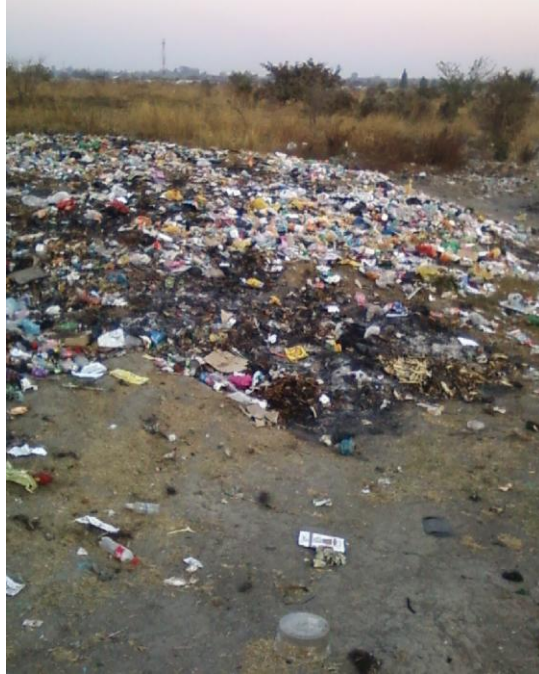


Figure 5.4: Goma fields designated waste dumpsite (2nd view).

Source: Photo taken by the researcher, 28.07.2013.

At the old students hostels designated dumpsite (west of Africa students hostels), waste is littered all over the area beyond the single waste skip which is positioned there for waste collection (see figures 5.5 and 5.6). The area covered with waste is quite vast. The waste includes mainly papers, plastics, tins, glass and plastic bottles/containers, foodstuff leftovers, plastic bags, and carton boxes. On the south west side of the dumpsite passes an open drainage, which comes from the UNZA clinic heading westwards, while on the south of the drainage is Elliot Court. The drainage is only maintained within the clinic area. Beyond the clinic, it is not maintained until it reaches the Great East Road in the west. It is full of grass and shrubs and, as it passes through the dumpsite, the waste is also dumped or littered into the open drainage for a very long stretch. This waste is not collected, and the waste covering a vast area around the waste skip is not collected either. It is disposed of indiscriminately to decompose whilst some of it is picked by scavengers. Sometimes the waste around the skip is burnt.

The fourth designated dumpsite, the use of which was discontinued by the Office of the Dean of Students in 2012, is still being used illegally on a small scale by unknown people. Plastic and

glass bottles/containers, tins, papers, and plastics are dumped on the closed dumpsite as well as in some locations at the Commonwealth Youth Programme Centre (CYPC) residential area.



Figure 5.5: Old students hostels designated waste dumpsite (1st view).

Source: Photo taken by the researcher, 3.08.2013.



Figure 5.6: Old students hostels designated waste dumpsite (2nd view).

Source: Photo taken by the researcher, 3.08.2013.

5.3.2 The University Administration and the Office of the Dean of Students

Waste from offices, lecture rooms/theatres, laboratories, library (or libraries), and students hostels is handled by the staff of the contracted cleaning contractors. They take the waste to designated waste dumpsites from the areas that they service and from the temporal waste storage such as bins.²⁶ The Assistant Registrar (Administration) added that at Central Administration offices, just like offices elsewhere on campus, the solid waste produced is initially deposited in bins as temporal storage, and then disposed of at the designated waste dumpsite(s) on campus. This is done on a daily basis. He further stated that the Office of the Dean of Students is responsible for waste disposal from these designated waste dumpsites. The Office of the Dean of Students is also responsible for the cleaning of students hostels. The campus surroundings and the cleaning contractors assigned to the students hostels are under the Dean of Students direct supervision.²⁷ The Horticultural Department comes under the Office of the Dean of Students and it is responsible for the three designated waste dumpsites on campus, the campus surroundings, and the contracted waste collector.

5.3.3 The Horticultural Department

The Horticultural Department produces grass and leaves as waste and it manages the three designated dumpsites and the campus surroundings.²⁸ The grass and leaves are disposed of by first being amassed or stored in a confined area and left to decompose, then, thereafter, taken for use in gardens at UNZA nursery as manure in-put in addition to the chicken manure used in these gardens.²⁹ Furthermore, on behalf of the university administration, the Horticultural Department has sub-contracted an outside waste collector (Clean Fast Limited) to collect waste and transport it to the Lusaka City Council landfill facility outside the campus for disposal. The waste collector collects the waste skips three days a week for disposal and whenever the University of Zambia administration calls upon the waste collector.³⁰ The current arrangement between the University of Zambia administration and Clean Fast Limited is that waste collected

²⁶ Assistant Registrar (Administration) in the Registrar's Office, personal communication, 20th February 2012.

²⁷ Senior Administrative Officer (Residences) in the Office of the Dean of Students, personal communication, 21st February 2012.

²⁸ Horticultural Officer, personal communication, 23rd February 2012.

²⁹ Ibid.

³⁰ Ibid.

from the Great East Road campus of the University of Zambia designated waste dumpsites is to be transferred to the Lusaka City Council designated waste dumpsite (landfill) outside campus.³¹ Residents on campus (that is, members of staff) have to make individual or private arrangements with the waste collector for the collection of the waste for disposal from their homes or residences to the LCC waste dumpsite (landfill) outside campus. These designated waste dumpsites act as temporary storage centres for the waste collected from different localities on the campus before the waste collector comes for final disposal of the waste outside campus at the Lusaka City Council landfill facility.

The role of the Horticultural Department is to do as follows: (i) to liaise with students associations that are concerned with environmental cleanliness through sensitisation campaigns on proper waste management; (ii) to purchase a skip truck or refuse truck or garbage collection truck; and (iii) to build a market where all vendors on campus could operate from centrally so that the waste generated was confined to one area or dumpsite rather than being scattered throughout campus. The Horticultural Department currently had no transport available at its disposal because all its vehicles broke down years ago without repair or replacement. It had to hire or book a vehicle through the Transport Officer's Office.³²

5.3.4 The Resident Engineer's Department

The role of the Resident Engineer's Department is to deal with repairs, maintenance, and the acquiring of appropriate facilities in the implementation or facilitation of the practices and norms of good waste management in caring for sewerage pumps, water pumps and incinerators, among others.³³ It deals with two types of waste, that is, liquid waste and solid waste. Its role is a facilitative one, which is, building concrete platform(s) where waste is to be dumped (at dumpsites) and constructing incinerators to be used by the clinic, laboratories, and students hostels. The department has an annual budget based on liquid waste or waste water for the management of the sewerage plant, mainly for repairs and replacement of pumps. Solid waste needs to be collected on a daily basis in order to reduce garbage or waste accumulation, and units which produce sensitive waste such as the clinic and laboratories need a special waste disposal

³¹ Finance and Administration Director at Clean Fast Limited, personal communication, 13th April 2012.

³² Horticultural Officer, personal communication, 23rd February 2012.

³³ Maintenance Engineer in the Resident Engineer's Department, personal communication, 24th February 2012.

system such as incineration. The department is assisted by the university administration with regard to the purchasing of replacement spares or parts of the sewerage pumps that are too expensive for the departmental budget to handle.

The sanitary situation on the UNZA campus is not adequate. For instance, water in students hostels does not reach higher floors, especially during peak hours, resulting in students coming down to lower floors for their various needs. The Resident Engineer's Department has been servicing the borehole water pumps so that all floors (lower and higher) receive adequate water with high pressure. The department has also been repairing and replacing sanitary fittings and other pipes, and working hard towards addressing inadequacies of water supply. It has also been advising the Office of the Dean of Students regarding the purchasing of sanitary requirements for hostel ablutions. When materials are bought, the Resident Engineer's Department provides the labour and expertise in what is needed for repairing and replacing.³⁴ There is a pressure gauge for monitoring the entire UNZA campus on the water pressure in the water network in the Resident Engineer's Office.³⁵

Most of the UNZA campus is connected to the UNZA sewerage pumping line, that is, schools, offices, hostels, staff houses and Transport Yard.³⁶ Handsworth Court Section A houses and Lubumbashi B flats use septic tanks and a soak-away system.³⁷ The Commonwealth Youth Programme Centre (CYPC) accommodated on the UNZA campus is included in this arrangement. The CYPC school has a sewer pumping station which pumps waste water (sewage) to the Lusaka Water and Sewage Company line along Kamloops Road. When there is a pump failure the waste water (sewage) is discharged into the nearby stream which flows into a nearby compound called Ng'ombe on the northeast.³⁸ However, the CYPC staff houses use septic tanks. The residents of Ng'ombe use the stream water for washing clothes, for bathing, children swim in, for making building bricks or blocks, and for irrigating their gardens.³⁹

³⁴ Maintenance Engineer in the Resident Engineer's Department, personal communication, 24th February 2012.

³⁵ Acting Deputy Resident Engineer, personal communication, 21st June 2013.

³⁶ Acting Sewerage Plant Supervisor, Acting Welding Supervisor, and Acting Plumbing Supervisor, personal communication, 14th June 2013.

³⁷ Acting Deputy Resident Engineer, personal communication, 21st June 2013.

³⁸ Ibid.

³⁹ Acting Sewerage Plant Supervisor, Acting Welding Supervisor, and Acting Plumbing Supervisor, personal communication, 14th June 2013.

Sections B and D houses in Handsworth Court discharge waste water (sewage) into the CYPC school sewer pumping station.⁴⁰ The remaining majority of the houses (Sections C, E and F) and all flats, east and south of Handsworth Court, are all connected to the Lusaka Water and Sewerage Company line along Kamloops Road for direct waste water (sewage) discharge.⁴¹

The Resident Engineer's Department, however, faces some problems in its operations. Roots, underground grow up through both the water and sewerage pipes at certain junctures and this causes blockages. Some water and sewerage pipes are old and as a result open up in due course. They develop rust with time and some have a reduced diameter due to chemicals used over-time. Furthermore, when cleaning of leaves and sand on the roof tops of buildings is not done regularly, the down pipes for draining the rain water become blocked resulting in the creation of pool water on roof tops.⁴² The roots of the rubber trees in particular penetrate through the manholes and the joints of the water supply pipes causing blockages (see figure 5.7). Another reason for blockages is as a result of items thrown into manholes and gullies (see figure 5.8) which are left partially open. Such items are mutton cloth, bottles (both plastic and glass), pants, towels, sacks, toothbrushes, and other small items. Members of the university community throw these items into the manholes and gullies.⁴³

⁴⁰ Acting Deputy Resident Engineer, personal communication, 21st June 2013.

⁴¹ Acting Sewerage Plant Supervisor, Acting Welding Supervisor, and Acting Plumbing Supervisor, personal communication, 14th June 2013.

⁴² Maintenance Engineer in the Resident Engineer's Department, personal communication, 24th February 2012.

⁴³ Acting Sewerage Plant Supervisor, Acting Welding Supervisor, and Acting Plumbing Supervisor, personal communication, 14th June 2013.



Figure 5.7: Manhole under a rubber tree in Car Park B by School of Natural Sciences.

Source: Photo taken by the researcher, 23.07.2013.



Figure 5.8: A gully (an opening point of a closed drainage system (covered passage)). Source:

Photo taken by the researcher, 28.07.2013.

The new hostels under construction near the School of Veterinary Medicine on the southeast are sponsored by the Ministry of Education and supervised by the Ministry of Works and Supply. A concern for the future is raised that when the construction of the hostels is complete, there is likely to be a greater pressure on the sewer system affecting both the Lusaka Water and Sewerage Company and the UNZA campus systems.⁴⁴ The storm-water drainage system has also brought in some challenges. Most open channels are disfigured by roots so that water cannot pass smoothly, and channels along the roads are closed by sand sediments. Hence, during the rainy season, the roads are flooded in certain areas of UNZA campus because the drainage system is blocked. The roads then become impassable to pedestrians and motorists. The UNZA campus drainage system involves two types, that is, sewer drainage and storm-water drainage (open drainage). Storm-water drainage leads water to the Goma lakes (see figure 5.9). Sewer drainage leads sewer water to pumps that are positioned near the Sports Hall (main booster pump house) and Transport Yard where the main sewerage plant (pump house and processing plant) is located (see figures 5.10, 5.11 and 5.12). It is then directed to the Lusaka Water and Sewerage Company pump house at Mass Media Complex outside UNZA campus on the southwest.

⁴⁴ Acting Deputy Resident Engineer, personal communication, 21st June 2013.



Figure 5.9: Open drainage system between Veterinary Medicine Students hostels and the defunct New Dining Hall.

Source: Photo taken by the researcher, 21.07.2013.



Figure 5.10: UNZA main booster pump house near the Sports Hall.

Source: Photo taken by the researcher, 3.08.2013.



Figure 5.11: UNZA sewerage main pump house near Transport Yard.

Source: Photo taken by the researcher, 3.08.2013.



Figure 5.12: UNZA sewerage main processing plant near Transport Yard.

Source: Photo taken by the researcher, 3.08.2013.

5.3.5 The School of Veterinary Medicine

The School of Veterinary Medicine produces animal carcasses, animal manure (dung or droppings), clinic and laboratory waste (for example, syringes and bottled chemicals).⁴⁵ These various categories of waste are disposed of as solid waste in bins, as temporal storage, in offices, lecture rooms/theatres, and laboratories. Thereafter, they are disposed of through dumping in backyard pits (landfill) and burning the waste when the pits are full. The cleaners also take solid waste for disposal to the nearest designated waste dumpsite on campus as an alternative. The following are disposed of in this way: animal carcasses through open burning; animal dung or droppings used as manure or fertiliser in the school gardens; and clinical and laboratory waste through dug out pits and burning waste when the pit is full just like solid waste.⁴⁶ The biological waste, that is, animal carcasses is disposed of through incineration or open burning as stated above, while chemical waste (liquid) and laboratory waste (liquid) is taken to a neutralising tank. This is part of the design of the school. After the liquid waste is neutralised, it is poured into (or joins) the normal sewer system when the waste has been rendered harmless.⁴⁷ All these activities in the School of Veterinary Medicine take place on a daily basis. The researcher observed that most of the animals that died in the Veterinary clinic, among them dogs, were stored in fridges temporally before disposing them of through open burning since the incinerators were not functioning.

On the south of the School of Veterinary Medicine, between the school and the Veterinary Medicine hostels, the researcher observed that some waste is dumped in some isolated locations in portions. These comprised plastic and glass bottles, plastic bags, papers, grass and plant remains, and so forth. In this same area, some of the waste is dumped in the unfinished building structures.

⁴⁵ Senior Technician, Central Services, and Chief Technician, Clinical Studies Department, personal communication, 29th February 2012.

⁴⁶ Senior Technician, Central Services, personal communication, 29th February 2012.

⁴⁷ Chief Technician, Department of Clinical Studies, personal communication, 29th February 2012.

5.3.6 The School of Natural Sciences

The School of Natural Sciences produces lubricating oil, metal chips, welding rod stables, sheet metal pieces, saw dust, wood pieces, discarded nails screws, solder remains, animal carcasses, remains of experimented plants, laboratory waste, and chemical waste.⁴⁸ The school produces the following: (i) lubricating oil, metal chips, welding rod stables, and sheet metal pieces from the mechanical workshop; (ii) saw dust, wood pieces, discarded nails and screws from the carpentry workshop; (iii) solder remains from the electronic workshop; and (iv) laboratory waste and chemical waste from the laboratories. These various categories of waste are disposed of as follows: lubricating oil is drained into the main sewer drainage system; metal pieces are kept for re-cycling, but also sold out to outside organisations and/or individuals; saw dust is usually collected by the surrounding community for their personal use (for example, for poultry); and wood pieces are disposed of in the same manner as solid waste.⁴⁹ The Department of Chemistry produces solid waste and chemical waste. They are disposed of as follows: solid waste through bins, as its done in all other schools and departments on campus, as temporal storage, in offices, lecture rooms/theatres, and laboratories and then disposed of in designated waste dumpsite(s) on campus; ordinary chemical waste through the sewer drainage system; and hazardous chemicals are kept in residue bottles which are later on collected by ZEMA or chemical experts who are contracted from outside campus.⁵⁰ The Department of Biological Sciences produces solid waste, chemical waste, animal carcasses, and remains of experimented plants. These are disposed of by using the same disposal methods as in the other school departments. Past examination scripts are disposed of through incineration; chemical waste through the normal drainage (sewer) system; animal carcasses through incineration; and remains of experimented plants through designated waste dumpsite(s) on campus.⁵¹ All these activities in the School of Natural Sciences take place on a daily basis. Although the School may once in a while hire a recycling company, this was not mentioned by any of the focal persons interviewed. In addition, the waste produced or generated by the Senior Staff Canteen accommodated in the school is disposed of at the designated waste dumpsites on campus via temporary storage in the bins of the canteen.

⁴⁸ Chief Technician, School Workshop, Physics Department, Technician I, Chemistry Department, personal communication, 1st March 2012, and Chief Technician, Biological Sciences Department, personal communication, 2nd March 2012.

⁴⁹ Chief Technician, School Workshops, Department of Physics, personal communication, 1st March 2012.

⁵⁰ Technician I, Department of Chemistry, personal communication, 1st March 2012.

⁵¹ Chief Technician, Department of Biological Sciences, personal communication, 2nd March 2012.

5.3.7 The School of Engineering

The School of Engineering produces metal chips, wood shavings, electrical and electronic waste, and the remains of concrete blocks.⁵² These various categories of waste are disposed of as follows: (i) metal chips through designated waste dumpsite(s) on campus; (ii) wood shavings sold to the general public; and (iii) concrete block remains which are picked by the general public, especially the university community, from the school backyard for their personal use at their homes.⁵³ The Department of Electrical and Electronic Engineering also produces electrical and electronic waste such as old equipment or obsolete equipment (that is, test instruments, power supply instruments, signal generators and frequency counters) which are taken to the University of Zambia central stores for disposal through selling to the university community and/or to the general public. Whatever was not sold is then disposed of through the contracted waste or garbage collector by dumping them at one of the designated dumpsites on campus.⁵⁴ All these activities in the School of Engineering take place on a daily basis.

5.3.8 The School of Mines

The School of Mines produces rock waste or waste ore, chemical waste, and waste soils.⁵⁵ It produces waste rock which is dumped at the school dumping bay outside the school building. It is then collected at no fee from the school's dumping bay by interested members of the university community and/or general public for their personal or private use at their homes in their building projects.⁵⁶ The Department of Metallurgy and Mineral Processing produces waste ore (rock) and chemical waste. This waste is disposed of as follows: waste ore (rock) is dumped at the school's dumping bay (and is not harmful); and chemicals used in chemical analysis of mineral ores are disposed of after being neutralised to an area provided for by the school (outside the school).⁵⁷ The Department of Geology produces waste rocks and soils. These are disposed

⁵² Senior Technician, Mechanical Engineering Department, personal communication, 2nd March 2012, and Senior Technician, Electrical and Electronic Engineering Department, personal communication, 20th March 2012.

⁵³ Senior Technician, Department of Mechanical Engineering, personal communication, 2nd March 2012.

⁵⁴ Senior Technician, Department of Electrical and Electronic Engineering, personal communication, 20th March 2012.

⁵⁵ Chief Technician, Mining Engineering Department, Senior Technician, Metallurgy and Mineral Processing Department, and Acting Analyst Geochemical laboratory, Geology Department, personal communication, 20th March 2012.

⁵⁶ Chief Technician, Department of Mining Engineering, personal communication, 20th March 2012.

⁵⁷ Senior Technician, Department of Metallurgy and Mineral Processing, personal communication, 20th March 2012.

of as follows: (i) waste rocks and soils from crushers are dumped at a waste bay outside the school as rubble, where individuals or interested persons from the university community could pick them from for their private or personal use in their building projects; and (ii) chemical waste, for example, acids and waste extraction solutions, from the laboratories are poured down the school drainage system and into the collection pit at the base of the school. This chemical waste has been neutralised in the process. Water with neutralised chemical waste is then finally (machine) pumped into the main university open drainage system which flows into the Goma lakes.⁵⁸ The water carrying waste from the other laboratories in the school follows the same system as above by first being poured into the collection pit before being pumped into the main open drainage system (like the one in figure 5.8) which operates through an external link. All these activities in the school of Mines take place on a daily basis. But still there is another option where the chemical waste is disposed through the main sewer drainage system. For this method no neutralisation is done and no confinement to a collection pit at the base of the school.

5.3.9 The School of Agricultural Sciences

The School of Agricultural Sciences produces poultry manure or chicken manure (dung), chicken feathers, cattle manure (dung), and pig manure (both liquid and solid).⁵⁹ These various categories of waste are disposed of as follows: poultry manure is taken by some members of the university community for use in their own gardens; chicken feathers are disposed of through the use of designated waste dumpsite(s) on campus; cattle manure is taken by some members of the surrounding community for their garden and farm use, while the school also uses it in the school gardens. Students also use it in their projects, that is, developing compost manure. Pig manure undergoes a process whereby the manure is swept into the furrow and then into the septic tank where the process of the separation of liquid and solid takes place. The liquid then goes into the soak-away while the solid is later on taken for use in the school gardens or by any interested persons for manure for their garden and/or farm use.⁶⁰ All these activities in the School of Agricultural Sciences take place on a daily basis.

⁵⁸ Acting Analyst, Geochemical Laboratory, Department of Geology, personal communication, 20th March 2012.

⁵⁹ Senior Technician, Animal Science Field Station, Department of Animal Science, personal communication, 22nd March 2012.

⁶⁰ Ibid.

5.3.10 The Schools of Education, Humanities and Social Sciences, and Law

The administrators from the Schools of Education, Humanities and Social Sciences, and Law said that the schools produce solid waste as the major waste. This waste is disposed of in a routine manner on a daily basis through bins, as temporal storage and then to designated waste dumpsite(s) on campus. These bins are kept in offices, lecture rooms/theatres and laboratories. However, confidential and sensitive documents (that is, confidential letters and minutes, examination papers and results) are shred and burnt after their duly valid use.⁶¹ Waste such as redundant or obsolete office furniture and office equipment (for example, bookshelves, office desks and chairs, cupboards, tables, file cabinets, computers, printers, photocopiers, scanners, air-conditioners, overhead projectors, and machines of different kinds) are handed over to UNZA central stores through the Registrar for disposal. Damaged furniture for lecture rooms, are sent to the carpentry section of the Resident Engineer's Department for repair so that they can be used again. Alternatively, carpenters are sent to repair the furniture in the schools. The School of Education has two or three science laboratories which produce laboratory waste which include chemical substances (waste) which are disposed of through the sewer drainage system just as in science schools on campus.

5.3.11 The UNZA Health Services (UNZA Clinic)

The Acting Sister-In-Charge of the UNZA clinic clarified the manner in which three different types of waste are disposed of: (a) sharps (needles and syringes), vials of medicine, surgical blades and suturing needles are disposed of after use in a backyard pit where they are burnt once the pit is full; (b) dirty dressings are disposed of through labelled yellow bin(s) and later emptied into the backyard pit; and (c) foodstuff leftovers and any other dirty objects are disposed of through labelled black bin(s) which are later emptied into the backyard pit. These activities take place on a daily basis. She further added that in the past, since the clinic had no incinerator of their own to use, they were able to use the Kalingalinga clinic incinerator at a fee although this is no longer the case anymore.⁶²

⁶¹ Senior Administrative Officer, School of Education, Assistant Registrar (Academic), School of Humanities and Social Sciences, and Senior Administrative Officer, School of Law, personal communication, 22nd March 2012.

⁶² Senior Registered Nurse and Midwife at the University of Zambia Clinic, at the time of the interview she was acting Sister-In-Charge, personal communication, 23rd February 2012.

Furthermore, it would appear that the university clinic was not aware of health complaints of the university community in relation to poor waste management on campus, probably because of the way patients present the symptoms of their condition. However, there is no health record of disease due to poor waste management. What is on the ground, for instance, is that a worker who burns things would present coughing, and a worker with soiled hands would present diarrhoea due to lack of observing hygiene rules.⁶³

5.3.12 UNZA Central Stores

Departments identify and list the items which are no longer useful, and which are redundant or obsolete for channelling to UNZA central stores for disposal. These items include computers, printers, photocopiers, typewriters, office furniture, and office equipment. Permission is sought from the Registrar for the disposal of items which central stores present before the Moveable Assets Disposal Committee (MADC) for consideration. The Committee then approves or disapproves of disposal and determines the disposal method, that is, through internet secret bidding, external auctioneers, internal open auction sale, donating to the under privileged in society, and/or dumping items at recommended dumpsites of LCC at a fee if such items have not been bought.⁶⁴

5.3.13 UNZA Mechanical Workshop section

The UNZA mechanical workshop is under the Resident Engineer's Department with a mechanical superintendent in charge of the section. The workshop is responsible for the general maintenance of the UNZA vehicles and maintains an inventory. It produces waste such as used and obsolete vehicle parts, used lubricants and used or obsolete vehicle batteries. There is a bin for used and obsolete vehicle parts including emptied lubricants containers positioned at the workshop. The bin is emptied once full by the Horticultural Department at one of the three designated waste dumpsites on UNZA campus for onward transmission by the waste collector to the external LCC landfill designated waste dumpsite. Used lubricants are disposed of in designated lubricant disposal drums at the workshop which members of the university community collect in containers from for their building and farm projects. The demand is quite

⁶³ Medical Licentiate Practitioner at the University of Zambia Clinic, personal communication, 23rd February 2012.

⁶⁴ Stores Controller, UNZA Central Stores, personal communication, 19th December 2013.

high. Used vehicle batteries are sold through UNZA central stores to the university community. The acid from damaged batteries is disposed of in the designated lubricant disposal drums, while the battery parts are disposed of in the bin for used and obsolete vehicle parts. Old or non-functioning vehicles are handed over to central stores through the Registrar to be disposed of through internal auction.⁶⁵ Used lubricants are not poured on the ground in accordance with workshop practices and safety standards.

5.3.14 Researcher's observations of UNZA campus surroundings

The researcher moved around the boundaries of the UNZA campus making the observations as briefly summarised in table 5.2 below. These observations will now be discussed in greater detail (cf. map of the UNZA campus as given in chapter 4).

The Goma fields are littered with plastic bags, papers, plastic bottles and containers, and paper cartons in most places as there is a lack of bins in the area. Some of these materials are blown from the designated dumpsite which is situated on the eastern side of the Goma fields. The waste is more on the southern part of the fields. Furthermore, the lack of bins to cover the Goma lakes and the gum trees area results in the littering of waste by the people who use the area for picnics and studying. The few bins in the area are being under-utilised or not used at all.

On the southern wall fence of the UNZA campus, on the border with Kalingalinga compound, waste is thrown over the wall fence into the UNZA campus as a dumping ground. This includes the area next to the small gate (through passage from UNZA campus to Kalingalinga and vice-versa) which is situated in the central position of the southern wall fence (see figures 5.13 and 5.14). The waste includes plastic bags, remains of foodstuffs, plastic bottles, tins, papers, plastic waste bags filled with waste, sacks filled with waste, and up-rooted plants. The dumping is done all along the wall fence. Notably, some parts of the wall fence in certain locations have been knocked down so that these points have become illegal entry points into the UNZA campus. Waste is also dumped in certain places on the outside along the wall fence.

⁶⁵ Mechanical Superintendent, UNZA Mechanical Workshop, personal communication, 31st January 2014.

The stream from the Commonwealth Youth Programme Centre (CYPC) school runs northwards across the Great East Road through some residential areas. It acts as part of the sewage carrying waste water from the CYPC school and from a few Handsworth Court staff houses (sections B and D) that are connected to the CYPC school sewer pumping station whenever there is a pump failure resulting in waste water being discharged into the stream. During the rainy season, the stream occupies also a place northeast of the UNZA Christian Centre (western side of CYPC school) growing into a lake like or pond during the period and becoming dry for the most part of the dry season reducing to a mere shallow stream. This lake or pond is mainly occupied by reeds and smells of sewage throughout the year.



Figure 5.13: UNZA/Kalingalinga wall fence (southeast of campus) on Kalingalinga side.

Source: Photo taken by the researcher, 23.07.2013.

Table 5.2: Summary of researcher's observations.

Area	Observation
Goma fields	Littered with plastic bags, papers, plastic bottles and containers, and paper cartons in most places as there is a lack of bins in the area. Some materials are blown from the designated waste dumpsite which is situated on the eastern side of the Goma fields.
Goma lakes and gum trees	Waste littered around by people who use the area for picnics and studying due to insufficient bins. The few bins in the area are under-utilised or not used.
Southern wall fence of the UNZA campus on the border with Kalingalinga compound	Waste is thrown over the wall fence into UNZA campus as a dumping ground, for example, area next to the small gate (UNZA/Kalingalinga passage), all along the wall fence, and also on the outside in certain places. Some parts of the wall fence in certain locations have been knocked down so that these points are (illegal) entry points into campus.
Stream running from CYPC School area northwards across Great East Road through some residential areas.	Stream acts as part of the sewage carrying waste water from CYPC school and from a few Handsworth Court staff houses (sections B and D) that are connected to the CYPC school sewer pumping station whenever there is a pump failure resulting in waste water being discharged into the stream. During the rainy season, the stream occupies a place northeast of the UNZA Christian Centre (west of CYPC school) to form a lake or pond during the period and becoming dry for the most part of the dry season reducing to a mere shallow stream. This lake or pond is mainly occupied by reeds and smells sewage throughout the year.
Elliot Court	Residents use bins and/or waste backyard pits for disposing of waste. In this area there is no careless dumping of waste. Some residents have contracted the waste collector to empty their bins at least once a week.
Canada Court	Residents use bins and waste backyard pits for disposing of waste. The waste backyard pits in this area are mainly outside their flat yards in the nearby surrounding small bushes and shrubs. Once these pits are full, they are buried and fresh ones dug. Some residents have contracted the waste collector to empty their bins at least once a week.
UNZA junior staff housing complex	Waste is disposed of in waste backyard pits which are dug by the residents in the north, east, west, and south of the housing complex. Pits are buried once they are full and fresh ones are dug. In this area no one has contracted a waste collector to empty his/her bin.
Handsworth Court	Most of the residents use the waste backyard pits. Some of these waste backyard pits are dug in small bushes and spaces between houses or between houses and flats. Once these pits are full, the waste is burnt before burying them. New pits are dug as replacements. Some residents have contracted the waste collector to empty their bins at least once a week.
Handsworth Police Post (eastern of UNZA campus at the end of Handsworth Section E houses (east))	A few old vehicles which are not in a functioning or usable state are dumped at the Police Post.
Handsworth Court entrance (northeast of UNZA campus), Senanga/Lubumbashi Roads entrance to UNZA campus	Along the fence, on the outside, there is some isolated waste dumping which is left unattended to.
UNZA Main Library	Outside bins full and waste littered down around the bins.
Open drainage system that heads westwards of UNZA clinic at the point it passes the old students hostels designated dumpsite	The open drainage system is littered with waste and it's not maintained.
Kwacha Big Flat students hostel (old students hostels)	Dog moving about the waste bins to check on the foodstuff leftovers.



Figure 5.14: UNZA/Kalingalinga wall fence at small gate (south of the campus).

Source: Photo taken by the researcher, 20.08.2013.

At Elliot Court the residents seem to have confined waste to bins and/or waste backyard pits. There is no careless dumping in this area, and some of the residents have contracted a waste collector to empty their bins. The Elliot Court side which is west of the Goma fields is littered with some waste along the outside of the fences of the first two houses. This waste in the form of plastic(s) and paper(s) is that which has been blown by the wind mostly from the fields or grounds.

Canada Court is comprised of flats. The residents use bins and waste backyard pits. The type of waste backyard pits the residents use are mainly outside their flat yards in the small bushes or shrubs that surround these flats. Once these pits are full, they bury them and dig fresh ones, although some of the residents have contracted a waste collector to empty their bins at least once a week.

At UNZA junior staff housing complex waste is dumped in waste backyard pits which are dug by the residents in the north, east, west, and south of the housing complex. Once pits are full,

they bury them and dig new or fresh ones. In this area which is surrounded by small bushes, no one has hired a waste collector.

At Handsworth Court the waste backyard pits are used by most of the residents. Some of these waste backyards pits are in the small bushes or spaces between the houses or between houses and flats. Some of the residents in this area have contracted the waste collector to empty their bins at least once a week. Others use both backyard pits and a waste collector. Once the backyard pit is full, the waste is burnt before burying it. At Handsworth Police Post, which is situated on the eastern side of the UNZA campus near the fence at the end of Section E houses, there are a few old vehicles which are not in a usable state dumped there. On the northeast side of the UNZA campus at the entrance to Handsworth Court residence along the fence, on the outside, as one comes to the Senanga/Lubumbashi Roads entrance to UNZA campus, there is some isolated waste dumping which is left unattended to.

The UNZA main library outside bins are most of the time full with waste littered down around them and normally not emptied on time (see figures 5.15 and 5.16).

The open drainage system which heads westwards of UNZA clinic at the point that it by passes the old students hostels designated dumpsite is littered with waste and it's not maintained (see figure 5.17).

The waste especially that of foodstuff leftovers, in bins and at dumpsites, normally attract the attention of dogs and cats on campus (see figure 5.18).

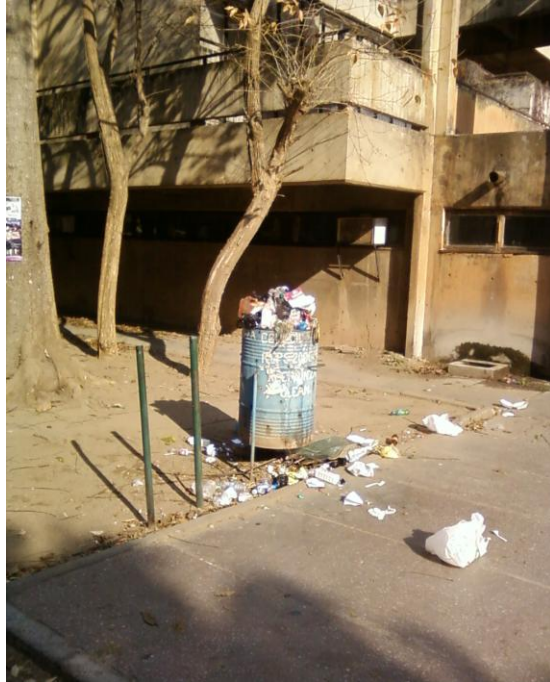


Figure 5.15: UNZA library (waste bin outside the library building on the eastern side).

Source: Photo taken by the researcher, 13.08.2013.



Figure 5.16: Waste bin by the graduate statue (near the UNZA library).

Source: Photo taken by the researcher, 12.12.2013.



Figure 5.17: Open drainage system near old students hostels dumpsite filled with waste.

Source: Photo taken by the researcher, 9.12.2013.



Figure 5.18: Dog moving about waste bins at Kwacha Big Flat students hostel (old students hostels)

Source: Photo taken by the researcher, 6.02.2014.

5.3.15 Discussion on problem areas identified

5.3.15.1 Designated and unofficial waste dumpsites

The researcher has observed that waste skips at designated dumpsites are not properly maintained and emptied regularly or on time by the waste collector. The designated waste dumpsites are an eyesore because the sites usually have the waste skips filled to capacity and waste littered all around them covering a vast area. This attracts scavengers, dogs, cats, and crows among others. Furthermore, illegal or unofficial waste dumpsites are either left unattended to or are rarely attended to, for example, on the south of the UNZA campus along the wall fence with Kalingalinga compound where waste is littered on the inside (campus side) by some of the residents of the compound and these waste is uncollected, probably left to decompose. In addition, although the Resident Engineer's Department was supposed to build concrete platforms at the three designated waste dumpsites, this has not been done. These unofficial waste dumpsites are also a health menace.

Furthermore, waste could be hazardous. For instance, animals such as cattle have eaten plastics which were disposed of in open surroundings on campus instead of bins. These plastic bags do not decompose, and they were found in the animals stomachs where they could not be digested, instead the more the animal ate the more they accumulated. This reduced the size of the stomach and hence the animal could not eat too much and eventually it died.⁶⁶ Other waste such as engine oil and acids disposed of in unofficial or illegal waste dumpsites were harmful as they killed insects, small animal species and plants in the soil.

5.3.15.2 Open burning

Open burning of animal carcasses including those of dead animals at the Veterinary clinic is not healthy for the surrounding community and environment. The fumes can carry unhealthy particles that may cause diseases to those that breathe in or inhale such air in the surrounding environment and beyond. The open burning method is also used by members of staff resident on campus as well as by the UNZA clinic. Two student focus group discussions observed that

⁶⁶ Senior Technician, Animal Science Field Station, Department of Animal Science, personal communication, 22nd March 2012.

burning of waste should be regulated or done at particular times or waste taken elsewhere off campus and burnt.⁶⁷ This burning activity carried out at dumpsites is illegal as no guidance has been given by UNZA administration or any other mandated authority. Furthermore, clinical and laboratory waste is disposed of through dug out waste backyard pits without being neutralised thereby running the risk of contaminating the soil and affecting the ground water.

5.3.15.3 The Resident Engineer's Department

The role of the Resident Engineer's Department in waste management is a facilitative one. For instance, among other responsibilities, the department is supposed to repair or acquire incinerators for the UNZA clinic and for the Office of the Dean of Students although this has not taken place. The department is faced with inadequacies in its operational planning such as lack of certain positions which are supposed to provide information, for example, Planning Engineer, Resident Architect, Quantity Surveyor, and Maintenance Foremen.⁶⁸ Moreover, there are insufficient vehicles to use when carrying out the status inventory of infrastructure, plant and equipment.⁶⁹ Furthermore, although the department is currently trying to maintain or upgrade the sewerage system to meet the current enlarged population on the UNZA campus; this is not possible due to inadequate funding and lack of priority support from the UNZA administration. Indeed, additional challenges with regard to the sewerage system, the water network and the drainage system are foreseen as new buildings are planned and student hostels are already being constructed.

5.3.15.4 Sewer drainage system

The sewer drainage system on the UNZA campus often suffers blockages due to a number of factors disposed of through the system such as sanitary pads, clothes, condoms, plastics, thick papers, and other undesirables for the sewer system. The other problem is that, in some sectors of the campus, the roots of the rubber trees penetrate through the manholes and the joints of the water supply pipes causing blockages.⁷⁰ Another challenge the sewer drainage system faces is

⁶⁷ First year students of the EAP class (female focus group of 7) in the School of Education and fourth year students (male focus group of 3) in the School of Humanities and Social Sciences.

⁶⁸ Maintenance Engineer in the Resident Engineer's Department, personal communication, 31st January 2014.

⁶⁹ Ibid.

⁷⁰ Acting Sewerage Plant Supervisor, Acting Welding Supervisor, and Acting Plumbing Supervisor, personal communication, 14th June 2013.

the chemical and laboratory waste disposed of through it. Furthermore, these blockages are serviced by workers from the Resident Engineer's Department who have inadequate protective clothing which exposes them to the possible danger of contracting disease as most of the chemical waste is toxic.⁷¹ The Maintenance Engineer mentioned that used chemicals from the science schools (laboratories) were disposed of through the sewer drainage system and not through the open drainage system because the chemicals would pollute the environment, for example, plants, frogs, lizards, and fish among others would perish; and also that the used chemicals could cause harm to human life.⁷² The UNZA campus sewer drainage system is already over-stretched and there is need for a major overhaul and upgrading of the whole system if it is to move with the ever expanding student population and increase in buildings.

The storm-water or open drainage system is not adequately serviced so that the passages are open and clear from various kinds of blockages, worse of, especially during the rainy season when the drainage system suffers from some water-logged conditions in certain locations on the UNZA campus. Presently, there is no proper practice or guidelines in place to see that the open drainage system is maintained regularly throughout campus.

The stream at the CYPC school which runs across the Great East Road through some residential areas acts as a medium for carrying waste water which contains sewer affluent. This poses a health hazard for the people who use that water for various purposes or needs in those residential areas it runs through in the north. The sewer affluent comes from the sewer pump house which is not in use.

The designated waste dumpsite at the old students hostels (west of Africa students hostels) is situated next to two UNZA water boreholes in the area. As the two boreholes channel water to the main water reservoir facility based at the gum trees in the north of the campus (north of the School of Education), the waste which is littered around the waste skip can promote soil pollution. This carries the risk of contaminating the ground water as some of the waste littered around this area is toxic and the threat of infection can be even more acute during the rainy

⁷¹ Maintenance Engineer in the Resident Engineer's Department, personal communication, 31st January 2014.

⁷² Ibid.

season. On the other hand, the risk may be minimal as most boreholes are sixty to eighty metres deep. Nevertheless, a proposal for the closure of this waste dumpsite from some sectors of the UNZA community has been heard.

5.4 What are the attitudes of members of staff, students, and other stakeholders towards waste management on the Great East Road campus of the University of Zambia?

In-depth interviews were carried out with 47 participants between 2011 and 2013. A breakdown of this sample was given in table 4.1 in chapter 4 clarifying who the other stakeholders are. Furthermore, ten focus group discussions were carried out between 2011 and 2012 as described in table 4.2 in chapter 4. What follows are typical of the comments made during these interviews and discussions.

5.4.1 Failure to make adequate use of bins

Group responses from FGDs⁷³ revealed the following problems with regard to bins: (i) edibles such as groundnuts, bananas, oranges, and cobs of maize were thrown anywhere other than in the bins; (ii) bins were not adequate throughout campus; (iii) bins were not emptied on time; (iv) bins in the library, lecture theatres/rooms, and toilets were not adequately utilised; (v) most female toilets on campus lacked pad or sanitary bins; and (vi) bins and the designated waste dumpsites were not regularly serviced. The first staff resident mentioned that the attitude of students and staff towards waste management was bad as it lacked the educational awareness on waste management, as he had observed that they threw litter anywhere anyhow and that there were inadequate bins on campus.⁷⁴ In his case he had contracted a waste collector who emptied his bin once a week from his residence.⁷⁵ The second staff resident said that he used a bin inside his house but once it was full he emptied it in his backyard pit as final stage of disposal, and when necessary he also used burning.⁷⁶ He also concurred with the first staff resident and the FGDs that the attitude was not good as waste was littered anywhere anyhow on the campus

⁷³ Second year students of the Geography class (female focus group of 9) and (male focus group of 6) in the School of Natural Sciences; first year students of the EAP class (female focus group of 7) and (male focus group of 8) in the School of Education; third year students (female focus group of 7) and fourth year students (male focus group of 3) in the School of Humanities and Social Sciences; and female focus group of 10 cleaners from Thandi Hire Services.

⁷⁴ First staff resident (Handsworth Court), personal communication, 27th March 2012.

⁷⁵ Ibid.

⁷⁶ Second staff resident (UNZA Junior Staff Housing Complex), personal communication, 14th April 2012.

environment instead of using available bins and designated dumpsites. The third staff resident also mentioned that he used a bin inside the house and once it was full he emptied it in his backyard pit and when the backyard pit was full he buried it and dug a new one.⁷⁷ He also observed that the UNZA community did not observe any form of proper waste management strategy as waste was littered everywhere in form of plastics, papers and food leftovers among others. He also concurred with FGDs and the other staff residents that the general attitude of students and staff was bad as one eating, for instance, groundnuts, bananas, oranges and cobs of maize would drop the residues anywhere other than the bins.⁷⁸ The fourth and fifth staff residents mentioned that they used a bin inside they homes, but for final disposal the fourth staff resident had contracted a waste collector to be collecting waste from his residence twice a week whilst the fifth staff resident used his backyard pit and burning.⁷⁹ The sixth staff resident said he used a bin inside his home and then refuse bags for final disposal, when the refuse bags were full he threw them in his backyard pit.⁸⁰ The eighth staff resident mentioned that he had contracted a waste collector to be collecting waste from his residence once a week but when the waste collector was late he occasionally used a backyard pit.⁸¹ The tenth staff resident used a bin inside the house and once full emptied it into plastic sacks which were picked by the waste collector once a week.⁸² Two female hall representatives mentioned that once the bins were full at the hostels bins bay, the students started throwing or dumping waste on the floor or ground besides or next to the waste bins.⁸³ Another students hall representative added that this situation worsened over weekends and public holidays when the cleaners were off duty.⁸⁴ Another students hall representative pointed out that some hostels floors or levels did not have a bin resulting into unnecessary dumping of waste anywhere on such floors or levels, because students had to go to the ground floor where the bins bay was, for waste disposal, and in some hostels there was only one bin at the bins bay, which was insufficient.⁸⁵

⁷⁷ Third staff resident (UNZA Junior Staff Housing Complex), personal communication, 14th April 2012.

⁷⁸ Ibid.

⁷⁹ Fourth staff resident (Handsworth Court) and fifth staff resident (Elliot Court), personal communication, 15th April and 16th April, 2012 respectively.

⁸⁰ Sixth staff resident (Canada Court), personal communication, 16th April 2012.

⁸¹ Eighth staff resident (Handsworth Court), personal communication, 16th April 2012.

⁸² Tenth staff resident (Handsworth Court), personal communication, 20th April 2012.

⁸³ A students hall representative of a female block (Soweto 6) and a students hall representative of a female block (Kwacha Big Flat), personal communication, 25th May and 27th May, 2011 respectively.

⁸⁴ A students hall representative of a male block (International 6), personal communication, 27th May 2011.

⁸⁵ A students hall representative of a female block (Kafue 4), personal communication, 28th May 2011.

5.4.2 Irresponsible attitude of students and staff

The careless attitude of most students towards waste management is of great concern. For instance, some members of the UNZA community throw waste or litter anyhow anywhere on campus despite the fact of rubbish bins being available nearby.⁸⁶ Some students throw liquid waste in bins, others leave dirt or waste on sinks in kitchens and bathrooms including on cupboards, while others leave waste behind doors on the outside of the room after sweeping on the understanding that it is the job of cleaners and Horticultural workers to clean up; others do not use bins in lecture theatres/rooms and toilets; others leave (paper) waste on desks and floors in lecture theatres/rooms; some throw waste through hostel windows or from the balconies.⁸⁷ Self-critical awareness amongst students seems not to be in place. The male students are more on the extreme. It was mentioned that whereas hygiene was a priority at secondary or high school, it was not a priority at the university.⁸⁸ It was further noted that gender was reflected in the food packages that were disposed of such as biscuits and sweet wrappers for female students, and beer bottles and containers for male students.⁸⁹ The cleaners observed that the attitude of students towards waste management was not good in general because of their carelessness in discarding or throwing away of waste and in the use of toilets (especially male toilets).⁹⁰ In focus group discussions (FGDs), it emerged that students believe that it was the responsibility of the UNZA authorities to manage the waste on campus. They felt the UNZA administration was not doing enough in terms of the existence of formal policy or guidelines on waste management, inadequate supervision of departments responsible for maintaining and cleaning the campus surroundings and waste disposal, inadequate sensitisation and insufficient mass campaigns on waste management. However, it was also clear that students lacked the self-critical awareness to

⁸⁶Senior Administrative Officer (Administration), Office of the Dean of Students, personal communication, 16th July 2013.

⁸⁷ Second year students of the Geography class (female focus group of 9) and (male focus group of 6) in the School of Natural Sciences; first year students of the EAP class (female focus group of 7) and (male focus group of 8) in the School of Education; third year students (female focus group of 7) and fourth year students (male focus group of 3) in the School of Humanities and Social Sciences; and cleaners (female focus group of 10) from Thandi Hire Services.

⁸⁸ Students: second year Geography class (female focus group of 9) and (male focus group of 6) in the School of Natural Sciences.

⁸⁹ A second year Geography class (male focus group of 6) under the School of Natural Sciences.

⁹⁰ Cleaners: (female focus group of 8) from Maxlin Cleaning Services, (female focus group of 10) from Thandi Hire Services, (male focus group of 7) from Thandi Hire Services, and (male focus group of 4) from Maxlin Cleaning Services.

take responsibility for their contribution to the problem. The cleaners in the FGDs were also of the view that the UNZA authorities, students, and the staff were not concerned much about waste management on UNZA campus adopting a kind of passive or laissez-faire attitude towards waste management. Some students hall representatives interviewed mentioned that there was an attitude problem among students in the disposal of waste, for instance, like using windows to throw small forms of waste such as onion peels among other forms, throwing waste when standing on balconies, throwing or dumping waste next to a bin even when the bin was not full or was almost empty, others left waste or dirty behind the hostel door (outside) after sweeping their room, some dumped waste on the kitchen sinks and cupboards and left it for the cleaners to remove, and others dumped waste just anywhere in the surroundings.⁹¹ These students hall representatives concurred with the FGDs on the students careless attitude as their observations were very similar to the FGDs. The fourth staff resident mentioned that there was a laissez-faire attitude amongst both students and staff as there was indiscriminate disposal of waste generated from homes, lecture theatres/rooms, hostels, offices, and campus surroundings despite having bins on campus.⁹²

With regard to staff members, some also did not make adequate use of bins in offices and on the campus surroundings just like some students did in the lecture theatres/rooms, hostels and general environment.⁹³ Further observed that most staff residents were fond of using backyard pits and few employed waste bin collection services.⁹⁴ Not only some members of the UNZA community but also it is quite clear that some members of the general public who pass through the UNZA campus throw waste anywhere on campus and residents from nearby Kalingalinga compound litter waste along the campus southern wall fence (on the inside mostly).

⁹¹ A students hall representative of a female block (Kalingalinga 1), a students hall representative of a male block (International 6), a students hall representative of a female block (Kwacha Big Flat), a students hall representative of a male block (Kalingalinga 5), and a students hall representative of a female block (Kafue 4), personal communication, 25th, 27th, 27th, 28th, and 28th May 2011 respectively.

⁹² Fourth staff resident (Handsworth Court), personal communication, 15th April 2012.

⁹³ Senior Administrative Officer (Administration), Office of the Dean of Students, personal communication, 16th July 2013.

⁹⁴ Second staff resident (UNZA Junior Staff Housing Complex), third staff resident (UNZA Junior Staff Housing Complex), sixth staff resident (Canada Court), seventh staff resident (Canada Court), eighth staff resident (Handsworth Court), and ninth staff resident (Elliot Court), personal communication, 14th, 14th, 16th, 16th, 16th, and 18th April 2012 respectively.

5.4.3 Shortcomings in UNZA Administration

There are problems with the manner in which the UNZA administration has been operating. For instance, leaking pipes in toilets, laboratories, and kitchens are not attended to in good time and lack quality workmanship.⁹⁵ When the UNZA administration shuts down water on the UNZA campus, it does not inform students and/or the UNZA community beforehand in most cases.⁹⁶ The UNZA administration has not been seen to bring the stakeholders on board when formulating policies or strategic plans for the institution, for instance, such as the core value on the green environment whose implementation is yet to be seen. The UNZA administration is supposed to fund, which is yet to be seen, the construction and procurement of incinerators for the UNZA clinic, laboratories, and students hostels for incineration of solid waste, laboratory waste, and sanitary pads among other forms of waste. Sanitary pads have been singled out as one of the undesirable materials blocking the sewer drainage system on campus as they are mainly disposed of through this system.⁹⁷ In place of incineration, backyard pits apart from the designated dumpsites have taken precedence. UNZA administration has also let inadequacies take over the institution's operational planning in that positions such as Resident Architect, Quantity Surveyor, Planning Engineer, and Maintenance Foremen, which provide vital information, are lacking in the establishment.⁹⁸ UNZA administration has further been unable to adequately support the institution's status inventory of infrastructure, plant, and equipment by failing to provide adequate transport for the assignment(s) on a routine basis.⁹⁹ Furthermore, the UNZA administration does not adhere to the needs of the Horticultural Department which is at the centre of waste management strategy. The University of Zambia administration has taken a laissez-faire attitude towards waste management instead of taking a serious interest, more especially towards the shortcomings in the needs of the Horticultural Department such as appropriate and sufficient machinery, and re-enforcement of human resource to meet the demands of the UNZA campus and not the inadequate situation prevailing.¹⁰⁰ Waste management does not seem to be a priority for the UNZA administration. Most of the

⁹⁵ A fourth year male student focus group of 3 in the School of Humanities and Social Sciences.

⁹⁶ Ibid.

⁹⁷ Maintenance Engineer in the Resident Engineer's Department, personal communication, 24th February 2012.

⁹⁸ Maintenance Engineer in the Resident Engineer's Department, personal communication, 31st January 2014.

⁹⁹ Ibid.

¹⁰⁰ Senior Administrative Officer (Administration), Office of the Dean of Students, personal communication, 16th July 2013.

shortcomings in the UNZA administration are due to lack of guidance of a formal policy on waste management.¹⁰¹

5.5 Concluding remarks

The above findings with respect to the lack of any formal policy on waste management, the condition of the UNZA campus regarding waste management, and the careless and irresponsible attitudes of so many staff, students and others highlight the need for greater concern regarding the problem of waste management on the UNZA campus.

Although there seems to be some kind of routine system of waste management in place, the findings of this study indicate that more needs to be done so that the system becomes more formalised and responsive to the UNZA community and the environment. A visitor to the UNZA campus in 2012 drew attention to the problem (cf. appendix xv).¹⁰² He observed that general litter was notable, especially in the form of fast food containers presumably dropped by students. He noted such a situation was a poor reflection on both the UNZA administration's failure to manage the situation and on littering students. He wondered why the UNZA administration had failed to come up with a permanent workable solution given that the institution housed the cream of the academia in Zambia. While this is only the opinion of one outsider, nevertheless, it does reflect a picture of a campus that lacks adequate care for waste management. It is also in line with the findings of this study.

As this chapter has shown, there are many problems related to a lack of adequate waste management that contribute to untidy, unhealthy and unacceptable conditions on the UNZA campus. These arise from unhealthy attitudes and practices by some departments and schools, from the UNZA administration, from failure to attend to the drainage systems and other issues related to the Resident Engineer's Department, and to lack of adequate personal responsibility on

¹⁰¹A students hall representative of a female block (Kalingalinga 1), a students hall representative of a male block (International 6), a students hall representative of a male block (Soweto 4), Assistant Registrar (Administration) in the Registrar's Office, Senior Administrative Officer (Residences) in the Office of the Dean of Students, Horticultural Officer, seventh staff resident (Canada Court), ninth staff resident (Elliot Court), and tenth staff resident (Handsworth Court), personal communication, 25th, 27th, and 27th May 2011, 20th, 21st, and 23rd February 2012, 16th, 18th, and 20th April 2012 respectively.

¹⁰² Cummins K., UNZA litter needs cleaning , Zambia Daily Mail (29th August, 2012), letters to the editor column.

the part of both students and staff. Instead of taking personal responsibility for the mess, both students and staff seem to place the blame largely on the UNZA administration thereby failing to realise that the authorities alone cannot provide all the answers without the positive participation of the UNZA community in waste management strategies.

Ultimately, however, the accumulation of problems all point to the lack of an official policy or guidelines for a more explicit emphasis on the central importance of effective waste management for the health of residents and the wellbeing of the natural environment.

CHAPTER SIX: ETHICAL EVALUATION

6.1 Introduction

This chapter makes an ethical evaluation of the study with reference to the following ethical theories, namely, the Land Ethic, Environmental Virtue Ethics, the Ethics of Care, and the Tragedy of the Commons. The ethical evaluation focuses on three dimensions relating to the problem of waste management. The first avails of the Land Ethic of Aldo Leopold which is an environmental ethical theory that takes an holistic approach to the environment. It is applied to the more objective conditions of the UNZA campus environment with reference to waste management. The second avails of Environmental Virtue Ethics and the Ethics of Care and focuses on the attitudes of students, staff and others to waste management. The third avails of the Tragedy of the Commons and focuses on the importance of having an official waste management policy or guidelines.

6.2 The Land Ethic

The findings of the study have revealed that LCC and ZEMA have no direct roles to play on UNZA campus in waste management and that the UNZA administration has no formal waste management policy or guidelines in place. Furthermore, the UNZA campus designated waste dumpsites are not well maintained, are not emptied regularly or on time, and reflect negatively on the appearance of the campus. The practice of having designated waste dumpsites was intended to confine waste to certain localities for health reasons. However, careless dumping and poor maintenance of dumpsites carries risks to health in unhygienic conditions. The unofficial waste dumpsites on the UNZA campus are also a health menace. Furthermore, the practice of open burning of animal carcasses at the School of Veterinary Medicine and the burning of waste in backyard pits once they are full are common practices that are not sustainable and pollute the environment.

The waste water in the stream from CYPC school which runs across the Great East Road through some residential areas in the northeast of the UNZA campus carries sewer affluent which can be a health risk for those using the stream. The sewer drainage system often suffers blockages due to waste disposed of through the drainage system, and also due to the roots of rubber trees

penetrating through manholes and joints of the water supply pipes. Furthermore, the clinical/chemical and laboratory waste from science schools is also disposed of through the sewer drainage system. This waste is usually not neutralised and may contain toxic substances. The storm-water or open drainage system is not adequately serviced so that the passages are kept open and cleared from various kinds of blockages, especially during the rainy season when the drainage system suffers from some water-logged conditions in certain locations on the UNZA campus.

The holistic manner in which the integrity, stability and beauty of the UNZA campus is being preserved with regard to the findings of the study above show inadequacies in meeting Leopold's definition of environmental ethical behaviour. There is insufficient support to preserve the integrity of the UNZA environment, as different sectors of the campus are not interacting adequately to retain a desirable balance in the overall condition of the campus. While acknowledging the very good work being carried out by the Horticultural Officer in keeping the campus clean in addition to the more recent keep UNZA clean campaign, there is still much to be desired in upholding the aesthetic beauty of the campus environment as noted by a recent visitor to the campus. Furthermore, plastic materials such as bags, bottles and containers which are disposed of, especially through illegal dumpsites, backyard pits and anywhere else in the general surroundings on UNZA campus other than bins and/or designated dumpsites, pose a great risk as plastic materials are synthetic polymers and are not perishable nor consumable, which is very much unhealthy for the health of the holistic ecosystem of the campus. Plastic materials disposed of in such manner have a negative effect on or are injurious to the integrity (full health or fullness or comprehensiveness) and stability (general harmony and equilibrium) of the biotic community of the UNZA campus. For instance, animals such as cattle have eaten plastics which were disposed of in open surroundings on campus and died eventually because the plastics eaten accumulated in the stomach and were indigestible and as a result the animal took less food. The other kind of waste such as engine oil and acids which were disposed of in open surroundings or illegal waste dumpsites on campus caused harm and killed the insects, plants and small animal species in the soil.

6.3 Environmental Virtue Ethics and the Ethics of Care

The study revealed that members of the UNZA campus have failed to make adequate use of the available bins (cf. chapter 5, sections 5.3 and 5.4). This form of behaviour expresses an attitude that reflects the lack of both the virtue and the actual practice of care towards the UNZA campus natural environment. The study has also revealed that there is a similar irresponsible attitude amongst students and members of staff. It would appear that campus inhabitants in general lack the proper dispositions or character traits that they ought to possess in relation to their interactions with the environment. The researcher also observed this lack of responsibility with regard to the disposal of waste. The students focus group discussions felt in general that the UNZA administration was not doing enough in its supervisory capacity in regards to waste management as there was no adequate policy or guidelines available. It was noted that whereas hygiene was a priority at secondary or high school, it was unfortunately not a priority at the university. The findings also revealed that the male students tended to be more irresponsible than female students with regard to waste disposal and the careless use of toilets. The study further highlighted shortcomings in the UNZA administration with regard to waste management. Despite the above, however, it would be unjustified to say that no students or members of staff had positive attitudes to the environment. It would also be wrong to infer that the UNZA administration was doing nothing to manage waste on campus. Nevertheless, the overall findings reveal an overall attitude towards the campus environment which is either indifferent or non-existent with regard to a more positive appreciation of the importance of effective waste management procedures.

6.4 The Tragedy of the Commons

The study has revealed that there is no official policy or guidelines in existence on waste management on the UNZA campus. It has also revealed that there was no part of the first year orientation programme which focussed on waste management. These findings constitute “the tragedy of the UNZA campus commons”. Without any official policy or guidelines, waste management on campus results in a laissez-faire or anarchic attitude towards waste management by all the stakeholders concerned. In the absence of a policy or guidelines, the norms for regulating and motivating desirable and responsible behaviour towards the campus environment are lacking. In so far as so many of the stakeholders on campus, namely, members of staff,

students and administration, fail to take responsible ownership of the UNZA campus, everyone loses in the long run. The existence and implementation of a formal policy regarding attitudes to the campus environment must be given priority if waste management is to result in a clean environment for all.

6.5 Concluding remarks

The ethical theories applied above to the situation of waste management on the UNZA campus dovetail in a form of triangulation in pointing towards the need for greater care and concern for the environment (cf. table 6.1). The Land Ethic has shown how the natural environment of the campus is not being adequately respected with negative implications for the natural and human well being. Environmental Virtue Ethics and the Ethics of Care have revealed the lack of the required environmental sensitivity (attitudes) and practice among many stakeholders. The Tragedy of the Commons has highlighted the negative consequences of the lack of any official regulations with respect to the behaviour expected of all stakeholders.

Table 6.1: Triangulation of ethical perspectives

The Land Ethic	Environmental Virtue Ethics and Ethics of Care	Tragedy of the (UNZA campus) Commons
Interrelationships between humans and other elements in the natural environment	Attitudes and practices of stakeholders	Lack of official policy or guidelines
Degradation of natural environment	Lack of responsibility	Lack of ownership

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

The findings of the study have revealed that there are no guidelines or policies on waste management at the University of Zambia. Students, staff, cleaners, and some other members of the university community interviewed have stated that they were not aware of any waste management policy or guidelines on the UNZA campus. Therefore, the Tragedy of the Commons has highlighted the negative consequences of the lack of any official regulations or parameters on waste management with respect to the behaviour expected of all stakeholders as the tragedy of the UNZA campus Commons, raising the question of responsible ownership of the UNZA campus.

On the situation regarding the management of waste on the Great East Road campus of the University of Zambia, the findings have revealed that the designated waste dumpsites are not well maintained, are not emptied regularly or on time, and reflect negatively on the appearance of the UNZA campus. The careless dumping and poor maintenance of dumpsites carries risks to health in unhygienic conditions. There are also unofficial waste dumpsites on the campus which are a health menace. The practice of open burning of animal carcasses at the School of Veterinary Medicine and the burning of waste in backyard pits on the UNZA campus are common practices that are not sustainable and pollute the environment. The waste water which is discharged by occasional sewer pump failure into the stream at CYPC school which runs across the Great East Road through some residential areas in the northeast of the UNZA campus carries sewer affluent which can be a health risk for those using the stream. And also the sewer drainage system often suffer blockages due to the kind of waste disposed of through the drainage system, and due to the roots of rubber trees penetrating through manholes and joints of the water supply pipes. Furthermore, some toxic substances that have not been neutralised in the form of clinical/chemical and laboratory waste mostly from science schools disposed of through the sewer drainage system are a cause of concern. Therefore, the Land Ethic has highlighted that the environmental ethical behaviour has not been adequately upheld by the UNZA campus stakeholders as it has been coupled with negative implications for both natural and human wellbeing.

On the attitudes of members of staff, students, and other stakeholders towards waste management on the Great East Road campus of the University of Zambia, the findings have revealed that members of the UNZA campus have failed to make adequate use of the available bins, signifying a form of behaviour which expresses an attitude that reflects the lack of both the virtue and the actual practice of care towards the UNZA campus natural environment. The findings have further revealed that there is a similar irresponsible attitude amongst students and members of staff in that they lack the proper dispositions or character traits that they ought to possess in relation to their interactions with the environment. The study has also shown the lack of responsibility with regard to the disposal of waste amongst the members of the university community. Furthermore, the findings have brought to light the shortcomings in the UNZA administration with regard to waste management. Therefore, the Environmental Virtue Ethics and the Ethics of Care have highlighted the lack of the required environmental sensitivity (attitudes) and practice among many stakeholders.

7.2 Recommendations

1. The UNZA administration should formulate and implement an official or formal waste management policy or guidelines as the first step towards a proper and good waste management strategy. The policy or guidelines should adequately address the following among others: accountability, prevention, treatment and re-use; the undertaking of environmental audits; minimising (reducing and/or recycling) of both general and hazardous waste; and the adoption of a purchasing policy sensitive to environmental concerns.
2. An awareness of responsible waste management should be part of the first year students orientation programme.
3. The Office of the Dean of Students should ensure that the Horticultural Department is well equipped with modern, appropriate and adequate machinery, and be re-enforced with sufficient human resource in order to meet the mammoth demands of waste management on UNZA campus.
4. Waste disposal should be categorised starting from the first point of disposal or bin stage up to the last point or final disposal stage such as landfill or incineration or recycling and

so on. Biodegradable waste such as paper could be sold out by the UNZA administration to interested persons or organisations for recycling, while foodstuff leftovers could be used as manure in the gardens on campus and at UNZA nursery. As for non-biodegradable waste such as plastic and metal, recycling is the best option, and such waste could also be sold out to interested persons or organisations.

5. The Resident Engineer's Department should do more in providing constructive, reasonable, efficient and effective maintenance of the sewer and the open drainage systems on campus.
6. Campaigns on keeping UNZA clean and emphasising the benefits and importance of good waste management strategy should be encouraged through the various campaign methods on campus, that is, UNZA radio, students magazines, newsletters, leaflets, posters, bill boards, jingles, and so on.
7. Similar studies such as this one should be conducted on campus from time to time in the future as the University of Zambia expands, especially with new buildings being constructed and the enlargement of the student population, in order to ensure ongoing care and responsibility for waste management on campus.

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APPENDICES

Appendix I: In-depth interview schedule: University of Zambia Administration: Registrar's Office and Dean of Students Office

- (i) How do you manage waste on Great East Road campus?
- (ii) Do you have any guidelines or any policy?
- (iii) Is waste management an important concern for the university administration?
- (iv) In your annual budgetary planning, is waste management a priority?
- (v) Do you have a budget for it?
- (vi) Do you have any improvement plans for the future?
- (vii) Do you realise what effects and/or implications your way of managing waste has on the health of the university community?
- (viii) How do you manage the general environment of the Great East Road campus?
- (ix) Are the methods you are using in conformity with laws on the environment?
- (x) Are these methods adequate to protect the health of the environment?
- (xi) Do you have any campaign programme(s) on waste management for the university community?
- (xii) What is your working relationship with the Lusaka City Council (LCC) and Zambia Environmental Management Agency (ZEMA) formerly Environmental Council of Zambia (ECZ)?
- (xiii) What is the arrangement and understanding between the university administration and the refuse or waste collector who has been contracted by the university?
- (xiv) What is waste collector's full role or responsibility?

Appendix II: In-depth interview schedule: Members of Staff (Resident on UNZA campus)

- (i) Is there any form of waste management practice on the campus in your view?
- (ii) How do you dispose of your garbage or waste?
- (iii) Are bins everywhere?
- (iv) Are you aware of any guidelines or policy or campaigns from the university administration on waste management on the Great East Road campus?
- (v) Do you think the university community observes any form of waste management?
- (vi) What are the general attitudes of residents towards waste management?
- (vii) What are your views about waste management on campus?
- (viii) What are your suggestions on making improvements on waste management at the university?
- (ix) Where do you get information from about waste management on campus?
- (x) How do you assess the attitude of residents on waste management?
- (xi) What do you think about institutions involved in waste management on campus, that is, Lusaka City Council, garbage collector, ZEMA, cleaning contractors, and so on?
- (xii) How do you think waste management could be improved on Great East Road campus of the University of Zambia?

Appendix III: In-depth interview schedule: Waste Collector

- (i) What is your arrangement with the University of Zambia administration concerning waste management on the Great East Road campus?
- (ii) What programme(s) of waste management do you have for the Great East Road campus?
- (iii) What problems do you see?

Appendix IV: In-depth interview schedule: Lusaka City Council (LCC)

- (i) Does the Lusaka City Council play any role in waste management at the Great East Road campus?
- (ii) What kind of policy or practice or guidelines should the university administration follow in accordance with LCC requirements of waste management?
- (iii) Does the Lusaka City Council occasionally have some consultative meetings with the university administration on waste management on the Great East Road campus?
- (iv) What problems do you see?

Appendix V: In-depth interview schedule: ZEMA (formerly Environmental Council of Zambia)

- (i) Does the Zambia Environmental Management Agency (ZEMA) play any role in waste management at the Great East Road campus?
- (ii) What kind of policy or practice or guidelines should the university administration follow in accordance to ZEMA requirements of waste management?
- (iii) Does ZEMA occasionally have some consultative meetings with the university administration on waste management on the Great East Road campus?
- (iv) What problems do you see?

Appendix VI: In-depth interview schedule: University of Zambia Clinic

- (i) What health complaints do you receive from the university community related to waste management?
- (ii) What is your general view based on the health records situation?
- (iii) Does the clinic have any plans to protect the health of the university community resulting from possible failure of lack of proper waste management?
- (iv) How do you manage your waste?

**Appendix VII: In-depth interview schedule: University Schools: Administrators and/or
Technicians**

- (i) What kind of waste do you produce?
- (ii) How do you dispose of your waste?
- (iii) Does the waste you produce cause any health problem(s) to the university community?
- (iv) What programme or special plans do you have for waste management?
- (v) Do you have any general views on waste management on the Great East Road campus?
- (vi) What problems do you see?

Appendix VIII: In-depth interview schedule: Horticultural Officer

- (i) How do you manage waste on Great East Road campus?
- (ii) Do you have any guidelines or any policy regarding waste management?
- (iii) Is waste management an important concern for the university's horticultural wellbeing?
- (iv) What plans or strategies do you have for waste management on Campus?
- (v) Do you have any working relationship or arrangement with any outside organisation(s)?
- (vi) If so, what is the nature or the relationship or arrangement?
- (vii) What problems do you see?

Appendix IX: In-depth interview schedule: Resident Engineer

- (i) What role do you play in waste management on the Great East Road campus?
- (ii) Do you have any guidelines or policy to follow on waste management?
- (iii) Do you have a budget for waste management?
- (iv) Do you have any improvement plans for the future?
- (v) What kind of support do you receive from Central Administration?
- (vi) What is the sanitary situation on the Great East Road campus in relation to the environment?
- (vii) What are you doing about it?
- (viii) What problems do you see?

Appendix X: In-depth interview schedule: University of Zambia Students Hall (Hostels)

Representatives

- (i) What do you understand by waste management?
- (ii) How do you dispose of your waste or garbage?
- (iii) Do you always use the bin(s)?
- (iv) If yes, why?
- (v) If no, why not?
- (vi) Are you aware of any guidelines or policies on waste management for the University of Zambia?
- (vii) If yes, what sorts of guidelines or policy are there?
- (viii) If no, what issues should be covered by such guidelines or policy?
- (ix) Do you think waste management is a priority in the university structure?
- (x) What are the general attitudes of students towards waste management?
- (xi) What are views about waste management on campus?
- (xii) What are your suggestions on making improvements on waste management at the university?
- (xiii) Where do you get information from about waste management on campus?
- (xiv) How do you assess the attitude of staff and students on waste management?
- (xv) What do you think about institutions involved in waste management on campus, that is, Lusaka City Council, garbage collector, ZEMA, cleaning contractors, and so on?
- (xvi) How do you think waste management could be improved on the Great East Road campus of the University of Zambia?

**Appendix XI: In-depth interview schedule: UNZA Central Stores and UNZA Mechanical
Workshop**

- (i) What kind of waste do you produce?
- (ii) How do you dispose of your waste?
- (iii) Does the waste you produce cause any health problem(s) to the university community?
- (iv) Do you have any general views on waste management on the Great East Road campus?
- (v) What problems do you see?

Appendix XII: Focus Group Discussion questions: University of Zambia Students

- (i) What do you understand by waste management?
- (ii) How do you dispose of your waste or garbage?
- (iii) Do you always use the bin(s)?
- (iv) If yes, why?
- (v) If no, why not?
- (vi) Are you aware of any guidelines or policies on waste management for the University of Zambia?
- (vii) If yes, what sorts of guidelines or policy are there?
- (viii) If no, what issues should be covered by such guidelines or policy?
- (ix) Do you think waste management is a priority in the university structure?
- (x) What are the general attitudes of students towards waste management?
- (xi) What are your views about waste management on campus?
- (xii) What are your suggestions on making improvements on waste management at the university?
- (xiii) Where do you get information from about waste management on campus?
- (xiv) How do you assess the attitude of staff and students on waste management?
- (xv) What do you think about institutions involved in waste management on campus, that is, Lusaka City Council, garbage collector, ZEMA, cleaning contractors, and so on?
- (xvi) How do you think waste management could be improved on the Great East Road campus of the University of Zambia?

Appendix XIII: Focus Group Discussion questions: University of Zambia Cleaners

- (i) What do you understand by waste management?
- (ii) How do you dispose of waste or garbage?
- (iii) Do you always use the bin(s)?
- (iv) Where do you dispose of the waste in the bins?
- (v) Do you have any guidelines or policy from the university administration for you to follow in waste management?
- (vi) If yes, what sorts of guidelines or policy are there?
- (vii) If no, what issues should be covered by such guidelines or policy?
- (viii) Do you think waste management is a priority in the university structure?
- (ix) What are the general attitudes of students towards waste management?
- (x) What are your views about waste management on campus?
- (xi) What are your suggestions on making improvements on waste management at the university?
- (xii) How do you assess the attitude of staff and students on waste management?
- (xiii) What do you think about institutions involved in waste management on campus, that is, Lusaka City Council, garbage collector, ZEMA, cleaning contractors, and so on?
- (xiv) How do you think waste management could be improved on the Great East Road campus of the University of Zambia?

Appendix XIV: Keep UNZA Clean Committee terms of reference

- 1) The Committee shall be under the office of the Registrar of the University of Zambia.
- 2) The Committee shall sensitise and mobilise the University of Zambia Academic and Non-Academic staff on the need for maintenance of a clean and green environment.
- 3) The Committee shall engage UNZASU, Council of Hall Representatives, Student Associations and Clubs to change the mindset of students towards the maintenance of a clean University of Zambia environment.
- 4) The Committee shall mobilise resources from Schools, Departments, Directorates and Units to contribute towards sourcing of tools and consumables for use in the cleaning exercise.
- 5) The Committee shall mobilise other stakeholders within and outside the university to partner in the keep UNZA clean activities.
- 6) The Committee shall liaise with the Department of Horticulture for technical and operational guidance.

Appendix XV: Letter to Zambia Daily Mail (29th August, 2012)

UNZA litter needs cleaning

Dear Editor,

Having walked around most of the UNZA campus recently, I was appalled at the amount of rubbish and litter lying around the campus. There were large numbers of both formal and informal dumps scattered around with rubbish just blowing about without being contained; and added to this was general litter everywhere especially fast food containers presumably dropped by students.

I guess money is tight but the extent of this problem is a poor reflection on both the administration who have failed to manage the situation and littering students who have contributed to the mess. Manpower should not be a problem to address the situation as there are many general workers and the students themselves who could be mobilised, but the administration needs to develop a sustainable plan to clear up the immediate mess and then to manage it thereafter.

Since this institution houses the cream of the academia in Zambia, one would think they might be able to put their heads together to come up with a lasting solution that would work.

Ken Cummins.