

**AN ETHICAL EVALUATION OF AWARENESS AND ATTITUDES REGARDING  
THE USE AND DISPOSAL OF PLASTIC BAGS IN LUSAKA URBAN.**

**By**

**NTAWUGASHIRA JEAN BOSCO**

A Dissertation Submitted to the University of Zambia in Partial Fulfillment of  
the Requirements of the Degree of Master of Arts in Applied Ethics

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## ABSTRACT

The aim of the study was to make an ethical evaluation of the awareness and attitudes regarding the use and disposal of plastic bags in Lusaka urban. The research questions were as follows: (i) What is the situation in Lusaka urban regarding the disposal of plastic bags? (ii) How aware are the shoppers, manufacturers of plastics, supermarkets and grocery stores managers and street vendors about the disposal of plastic bags in Lusaka urban? (iii) How responsible are the shoppers, manufacturers of plastics, supermarkets and grocery stores managers and street vendors with regard to the disposal of plastic bags in Lusaka urban? This was an exploratory study research design involving qualitative methodology with an ethical component. The methods used involved primary and secondary data. The primary data were collected through interviews, focus group discussions and observations while secondary data were collected from relevant literature at the University of Zambia main library, the department of philosophy, the Zambia Environmental Management Agency library, and relevant books, journals and the internet. Convenience sampling was used with regard to the 60 shoppers interviewed and purposive sampling was used to obtain relevant information from various institutions and people. Lusaka City has an estimated population of 2,200,000. The targeted population (excluding focus group discussions) was 85 people selected from various backgrounds and parts of Lusaka. In addition, information was sought from focus group discussions with people from Small Christian Communities. The ethical theoretical framework involved the Land Ethic and Environmental Virtue Ethics.

Plastic bags are manufactured in large quantity in Lusaka and they present a big problem to the environment in Lusaka urban. As they are used and reused, they end up in the solid waste stream making plastic waste a major challenge regarding solid waste management in Lusaka. They have also reduced the aesthetic value of the environment in many parts of Lusaka. Lusaka City Council has a systematic way of collecting waste in general and of disposing it, but it needs cooperation from the community to succeed in this challenging task. There is unfortunately no national law regarding littering, only a by-law of the Lusaka City Council. Consequently, poor awareness among the general public about the destructive effects of plastics on the natural and human environment in addition to a careless and irresponsible attitude towards caring for the environment are sources of environmental degradation in Lusaka urban.

The Land Ethic, with its emphasis on the fact that humans are an inseparable component of the natural environment, was availed of to evaluate the perceptions and attitudes of the general public regarding waste disposal on the environment. Environmental Virtue Ethics was also availed of to evaluate whether people had a responsible attitude to waste disposal. The findings of the study revealed that whereas shoppers had some knowledge about the disposal of plastic wastes, they tended to place the responsibility of disposing of these wastes on the Lusaka City Council without undertaking personal responsibility for their own behaviour in throwing away plastic waste indiscriminately. Furthermore, they felt that the government was at fault in not having a mandatory policy with respect to the disposal of waste. Manufacturers of plastics and supermarket companies and grocery stores were more concerned about the financial success of their businesses rather than about the threat to the natural environment. However, they expressed a willingness to comply with a mandatory government policy regarding the use of plastic bags and bottles if one were laid down.

Arising from an ethical evaluation of the findings, the government should ban plastic bags and either introduce biodegradable materials or reintroduce paper bags. The attitude and behaviour of manufacturers, companies and consumers regarding the use and disposal of plastic bags in particular also needs to change. In particular, ZEMA needs to intensify its efforts to sensitise the general public with regard to the destructive effects of plastic materials on the environment not only through a law but also through formal and informal education.

## DEDICATION

To all my parents, relatives and friends.

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## LIST OF ACRONYMS

EAC: E African Commu

FGD: Focus Group Discussion

LCC: Lusaka City Council

PVC: Polyvinylchloride

SOE: State of Environment

UNEP: United Nations Environmental Programme

WMU: Waste Management Unit

ZEMA: Zambia Environmental Management Agency



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## CHAPTER 1: INTRODUCTION

### 1.0 Background

Plastics in general have been useful from the time they were introduced because they made work and life easy on account of their weight and convenience. Plastics are cost-effective, light, easy to use, more durable, more weather friendly and possible to use even for wet market products like fresh fish. Plastics require less energy to manufacture and recycle; they are reusable and take up less space in landfill. However, as time went by, some plastic materials have posed a problem to the environment, especially disposable ones such as plastic bags and plastic bottles.

Plastics in general have effects on human health when burnt because they have chemicals such as vinyl chloride and benzene that release harmful fumes that damage cells in the lung lining thereby increasing the risk of emphysema and cancer. Disposable plastics in the environment become a hazard to all life in water and on land. Fish, birds, marine mammals, reptiles, and other animals can become entangled in discarded plastics, and sustain injuries from ingested plastics.<sup>1</sup>

The threat of plastic bags to the environment is not only related to ending up in a landfill, but also to the resources needed to produce, transport and recycle them as well as the emissions resulting from these processes. Plastic bags present a problem to environment not only in terms of polluting it, but also that their manufacture presents a challenge in form of depletion of non-renewable energy sources, as significant amounts of petroleum are used. Plastic bags are also well known for their interference in ecosystems and the part they play in flood events where they clog pipes and drains.

It has been noted that “from cell phones and computers to bicycle helmets and hospital IV bags, plastic has moulded society in many ways that make life easier and safer. But the synthetic material also has left harmful imprints on the environment and perhaps human health according to a new compilation of articles authored by more than 60 scientists from around the world.”<sup>2</sup> Uncontrolled dumping and burning of wastes including plastic materials affects the beauty of the city and causes air pollution which is in turn a health hazard. Plastic is so resilient that even burying it deep in the soil does not keep it from negatively impacting the environment. Placing plastics in a landfill may simply be storing

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<sup>1</sup>Dangers of plastic bags. <http://www.environmentalissues.com>. Accessed on November 13, 2013.

<sup>2</sup>The environmental toll of plastics. <http://www.environmentalhealthnews.org/>. Accessed on June 14, 2013.

a problem for the future as plastic chemicals often sink into nearby land contaminating ground water. In addition, the production of plastics involves a major use of fossil fuels (ibid.).

Countries such as Rwanda, Mali, Mauritania, Bangladesh, and China have completely banned the use of plastic bags; other countries such as Ireland, Israel, Canada, Botswana, Kenya, Tanzania, South Africa, and Taiwan are gradually reducing the use of plastic bags because they destroy the environment. In some countries, laws have been enacted against those who will not comply. So far, Africa is the leading continent in the global crackdown on plastic bags.<sup>3</sup> However, the reduction in the use of plastic bags is not the most important policy for developed countries because their main purpose is saving energy or solving the shortage of landfill areas.<sup>4</sup>

In Zambia today, plastic bags have gained an increasing popularity among consumers and retailers because of their convenience. They are widely used by consumers to carry all sorts of goods ranging from food stuffs to clothes bought from streets, markets, shops, butcheries and malls. However, while these plastic bags ease the carrying of light goods, their disposal becomes a problem. Used plastic bags are lying almost everywhere in Lusaka and they pose a danger to the environment ranging from flooding the city by blocking drainages and pipes to polluting the air when they are burnt in an open area.

It should be noted that there is a difference between littering and dumping. People who litter represent a variety of social economic backgrounds. Unintentional littering can result from unsecured vehicle loads and overflowing trash containers and dumpsters. Illegal dumps are found in isolated locations in various areas of Lusaka. Like litterers, illegal dumpers come from all walks of life. Often these individuals are looking to avoid paying trash disposal costs or are unaware of how to properly dispose of items. Most dumpsites contain the following: household trash, plastic materials, appliances, bulky items, construction debris, and other woody materials. The acceptable way to dispose of all solid waste, including plastic waste, is to take it to a designated site. In view of this background, this study seeks to achieve an increase in awareness about the destructive effects of the careless and irresponsible disposal of plastic wastes and hopefully contribute to the Keep Lusaka Clean campaign.

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<sup>3</sup> Could 2013 spell the end of plastic bags? <http://www.france24.com>. Accessed on 13 June 2013.

<sup>4</sup> Dangers of Plastic Bag. <http://premiumwritingservice.com/>. Accessed on 18 June 2013.

### **1.1 Statement of the problem**

Lusaka urban is littered by plastics almost everywhere and these end up in drainages. The effect on the environment was experienced during the last rainy season. Some areas such as Misisi and John Laing compounds experienced floods and there was a threat of the breakout of diseases such as diarrhoea and cholera. There is little or no ethical consideration as to how these plastic wastes are disposed of. Although the Zambia Environmental Management Agency (ZEMA) has already started sensitising the public through the media about the negative environmental effects of using plastic bags in particular, the problem still remains.

Unfortunately, there is no law at present to ban the use of plastics in Zambia although there is an Environmental Management Act (Act No.12 of 2011). This Act, in its Section 58, Division 4 on Waste Management, refers to the extended producer responsibility and suggests a reduction in the thickness of plastics in Zambia which do not protect the environment. Nevertheless, the city looks unclean with plastics scattered almost everywhere. For instance, despite environmental awareness about plastic bags, big companies such as Pick and Pay, Shoprite and Spar supermarkets are still using plastic bags as carrier bags for their products. This study, therefore, makes an ethical evaluation of awareness and responsibility among the general public, manufacturers, companies and grocery store managers in Lusaka urban with regard to the use and disposal of plastic bags in particular. There is a gap of knowledge about ethical issues regarding awareness and attitudes of the general public on the disposal of plastic wastes in Lusaka urban. It is the goal of this study to fill this gap.

### **1.2 Aim of the Research**

The main aim of this study was to make an ethical evaluation of awareness and attitudes regarding the use and disposal of plastic bags on the environment with a specific focus on Lusaka urban.

### **1.3 Research Objectives**

- i. To find out the situation in Lusaka urban regarding the disposal of plastic bags.
- ii. To investigate the awareness of shoppers, manufacturers of plastics, supermarket and grocery store managers and street vendors in Lusaka urban regarding the use and disposal of plastic bags.



- iii. To find out what kind of ethical responsibility is present among shoppers, manufacturers, supermarket and grocery store managers and street vendors in Lusaka urban regarding the use and disposal of plastic bags.

#### **1.4 Research Questions**

- i. What is the situation in Lusaka urban regarding the disposal of plastic bags?
- ii. How aware are shoppers, manufacturers of plastics, supermarket and grocery store managers and street vendors in Lusaka urban regarding the use and disposal of plastic bags.
- iii. How responsible are shoppers, manufacturers, supermarket and grocery store managers and street vendors in Lusaka urban with regard to the disposal of plastic bags?

#### **1.5 Theoretical Framework**

The Land Ethic and Environmental Virtue Ethics have been used to guide the collection of data and to make an ethical evaluation of the findings. The Land Ethic emphasises that as “members and citizens” of the biotic community, humans are an inseparable component of the natural environment. In this case, Lusaka urban residents are obliged to act responsibly towards the environment. Environmental Virtue Ethics emphasises the need people to cultivate in themselves the environmental virtues such as care and respect for the natural environment.

#### **1.6 Design, Methodology and Methods**

The research involved an exploratory case study design using qualitative methodology with an ethical component. The methods involved primary and secondary data. The primary data involved observations, in-depth interviews and Focus Group Discussions. Secondary data involved materials obtained from relevant literature at the University of Zambia main library, the department of philosophy, and from books, journals and other relevant materials at Zambia Environmental Management Agency library and internet.

#### **1.7 Ethical issues**

At the beginning of each interview, participants were informed about the purpose of the study. Consent was obtained from each participant to be a part of the study. The participants were assured that the information they would give would remain confidential and that their identities would remain anonymous. They were informed that they were

free not to participate in the study if they were not comfortable to disclose some information.

### **1.8 Significance of the study**

Although some studies have been carried out with respect to poor waste management in the disposal of plastics (Rana, 2010), nevertheless, ethical issues regarding the awareness and responsible attitudes of shoppers and other relevant persons on the environment in Zambia, and in particular in Lusaka urban, have not been studied. This study, therefore, is intended to close this gap by contributing knowledge concerning the awareness and responsibility of various actors in Lusaka urban regarding the use and disposal of plastic bags in particular. The outcome of this study will hopefully increase awareness about the destructive effects of the careless and irresponsible disposal of plastic wastes and hopefully contribute to the Keep Lusaka Clean campaign.

### **1.9 Delimitations**

The scope of the research was limited to acquiring knowledge concerning awareness and attitudes of shoppers, manufacturers, supermarket and grocery store managers and street vendors in Lusaka urban with respect to the use and disposal of plastic bags in particular. Although plastic bottles and other plastic materials raise similar problems with respect to the degradation of the environment, this study focused mainly on plastic bags.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.0 Introduction**

This chapter reviews some studies which were done on the effects of some disposable plastic materials on the environment, namely, available literature from various sources, mainly books, journals, newspapers and internet. It is divided into the following parts: plastic materials and the natural environment in general; the impact of disposable plastic materials on the environment; management of disposable plastic wastes; the situation in some countries outside Africa; the situation in some African countries; and the situation in Zambia regarding plastic waste.

### **2.1 Plastic waste and the natural environment in general**

According to United Nations Environmental Programme, every year a large amount of plastic debris enters the oceans and scientists are concerned about the impact of small plastic fragments on the environment. The role of these plastics as a vector for carrying chemicals in the ocean is as yet poorly understood, but it is a potential threat to ecosystems and human health (UNEP, 2011: 21).

Some scientists are increasingly concerned about the potential impact of toxic compounds released from plastic debris on the natural environment. Despite international efforts to curb the flow of plastic debris, this debris continues to accumulate and it is affecting the marine environment (ibid.). At the same time, in various parts of the world, the fishing industry is being affected by plastics entering the nets, and the tourism industry is also being affected by plastics which are being washed up on beaches. Both industries are being affected economically (ibid.).

Polyethylene bags are commonly used in Africa to provide safe drinking water, but they often end up in water bodies due to lack of waste disposal facilities (Barnes et al., 2009). However, some measures have been taken to address the issue of these disposable plastic materials on the international level. "Discharge of plastics and other litter from ships and offshore structures are addressed under the international law, but the implementation and the enforcement are often inadequate" (UNEP, 2009: 21).

### **2.2 Impact of disposable plastic waste on the environment**

The natural environment can be damaged by some disposable plastic materials due to littering. According to Narayan, plastic packaging waste forms a significant part of solid waste and has caused increasing environmental concerns (Narayan, 1994).

In the context of fishing this can have effects on biodiversity through physical damage by ingestion and entanglement in the ghost nets. A recent study of planktivorous fish from the northern pacific found an average of 2.1 plastic items per fish (Boerger et al., 2010). Furthermore, the ingestion of plastics mistaken for sea food is well documented in seabirds, sea turtles and marine mammals and this can be fatal (Jacobsen et al., 2010). Sometimes sea turtles mistake plastic bags for jelly fish. The particles of plastics when ingested may cause an obstruction or damage the gut lining (Astudillo, 2009). A large number of marine species is known to be harmed and/or killed by plastic debris, which could jeopardize their survival, especially since many are already endangered by other forms of anthropogenic activities (Derraik, 2002).

Most plastics are designed and manufactured to resist environmental degradations, including biodegradations (Albertson and Huang, 1995:1). However, disposable plastic materials accumulate, they cause environmental pollution which can be manifested in different ways such as in the deterioration of natural beauty, in death and entanglement of marine animals, and in blockage of sewerage systems of cities and towns in developing countries which in turn creates bad smells and favourable habitats for mosquitoes (Asgedom, 2012: 86). The accumulation of disposable plastic materials reduces the infiltration of water in soil and it affects the aeration of agriculture soils which in turn results in the reduction of productivities of such fields (ibid.) Most used plastic bags end up in landfills, and this not only leads to impractical use of land resources. They also do not degrade easily because they take between 400 and 1000 years to break down. They are reduced to smaller particles that contaminate water and soil.

In many poor and developing countries, plastic bags are mostly used to carry food items. Plastic water bottles are used as storage for different beverages of local or traditional brews, water, cooking oil, milk, honey and petroleum products such as benzene and kerosene. This practice can cause serious health problems due to some carcinogenic agents and cross contamination by microorganisms (Cliver, 2006).

Plastics are useful to society because of their convenience and because they enable future technological and medical advances<sup>5</sup>. However, there are concerns about their usage and disposal such as the leaching of chemicals from plastic products and the potential for plastics to transfer chemicals to wildlife and humans. The most important concern is that the current usage of disposable plastic materials is not sustainable. “Given our declining

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<sup>5</sup>Plastics, the environment and human health: current consensus and future trends. <http://www.plastics.environment> and human health.htm. Accessed on November 12, 2013).

reserves of fuels, and finite capacity of disposal of waste to landfill, this linear use of hydrocarbons, via packaging and other short-lived applications of plastic, is simply not sustainable” (ibid.).

The sustainability of a practice or of a society is basically its capacity to be practiced or maintained indefinitely. The practice of ongoing use of disposable and petrochemical based plastic materials cannot lead to sustainable development which was defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Attfield, 2003: 128).

### **2.3. Management of disposable plastic waste**

Albertson and Huang (1995) state that plastics increased because they are more economical than metals, woods, and glasses in terms of the manufacturing cost and the amount of energy and water required. However, discarded packaging is also a very obvious source of litter, posing a major waste management challenge (Barnes et al., 2009). This makes plastic waste management an urgent problem needing environmentally compatible and friendly solutions, both short and long term, as soon as possible.

Increasing volumes of plastic materials are manufactured for various uses. The disposal of used plastic materials has become a serious problem. Unlike natural plastics, most petrochemical based plastics cannot be assimilated by microorganisms. Natural plastics are called bioplastics which are based on renewable resources. The most familiar bioplastics are made from natural materials such as maize, starch or potatoes. Some bioplastics look virtually indistinguishable from traditional petrochemical plastics. Today, not only wrapping material can be made from carbohydrates (plant material), but in general bioplastics have a broad application as for instance, in medicine where stitches need not be taken out anymore after surgery because they just dissolve (Spielthener, 2012:10). Unlike traditional plastics, bioplastics generally do not produce an increase in carbon dioxide gas when they break down. Another good thing about bioplastics is that they are biodegradable; they decay into natural materials that blend harmlessly with soil. Burying disposable plastic materials in the landfill is storing a big problem for the future.<sup>6</sup> The management of plastic wastes especially plastic bags should be managed through reducing on their usage, reusing them, recycling them or introducing alternative to petroleum based plastics. The alternative could be the biodegradable plastic bags. The other option is to completely replace plastic bags with paper bags.

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<sup>6</sup>Dangers of plastics. <http://www.environmenthealthnews.org>. Accessed on October 9, 2013.

The total management of plastic wastes requires complementary combinations of biodegradation, incineration and recycling. Biodegradation is the most desirable although it requires intensive research and development before it becomes practical (Albertson and Huang, 1995). In view of the increase in the quantity of plastic waste generated, there is public concern over its effects on the environment. Plastic packaging waste is a particularly visible problem and it is clear that there is no single, simple solution to waste management of these plastic materials (ibid.).

The disposal of packaging materials is particularly significant in view of the recent focus on waste generation and management as important environmental aspects of society today (Thompson et al., 2009). This problem was acknowledged several years ago by a segment of the plastic industry, and attempts were made to come up with environmentally degradable plastics which, once used, would harmlessly degrade and return to nature. These biodegradable plastics were anticipated and promoted as a total solution to the problem of waste management (ibid.). It seems this process was abandoned during the course of time.

#### **2.4 Some countries outside Africa banning some disposable plastic waste**

According to the World Health Organisation, a clean beach is one of the most important characteristics sought by visitors (Bartram and Rees, 2000). This may be one of the reasons a number of countries around the world decided to get rid of plastic waste. The countries cited in this work used different measures and steps to reduce and remove plastic waste from their environments. It is surprising that it costs more money to recycle plastic bags than to manufacture them. Consequently, used plastic bags are not being recycled, but are dumped in the environment. And when dumped in landfills, they are blown around everywhere including in oceans, rivers and lakes.<sup>7</sup> When plastic bags remain for a long time in the natural environment, they break down into smaller more toxic petro-polymers. This process is called photodegradation and it leads to the contamination of soil and waterways. In the end, microscopic particles enter the food chain. Other steps may involve abiotic (thermal, photo) and biotic processes to degrade the polymer, under suitable conditions, to a low-molecular weight species. However, the resultant breakdown fragments must be completely used by micro-organisms; otherwise there is a potential for environmental and health consequences (Narayan, 2006). Therefore, the use of cloth bags is highly recommended (ibid.).

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<sup>7</sup>Dangers of plastic bags. <http://www.premiumwritingservice.com/>. Accessed on June 17, 2013.

Rolf Halden, a researcher at Arizona State University has been following the chemical trail of plastics, quantifying their impact on human health and the environment. In a new overview appearing in the journal *Reviews on Environmental Health*, Halden details the risks and societal rewards of plastics and describes the strategies to mitigate their negative impacts through reconsideration of plastic composition, use and disposal.<sup>8</sup>

Plastics are the fastest growing component of waste and some of this waste reaches disposal sites, but much of it litters the landscape (Unnithan, 1998). There is a need for a second plastic revolution. The first one brought us the age of plastics, changing human society and enabling the birth and explosive growth of many industries. But the materials used to make plastics were not carefully chosen and now we encounter adverse consequences in widespread environmental pollution and unnecessary human exposure to harmful substances. Future smart plastics will be equally versatile but also non-toxic, biodegradable and made from renewable resources (ibid.).

In Ireland, plastic bag waste was of serious concern as it made up most of the visible litter in the rural environment (University College Dublin, 2003). Plastic bags released in the environment easily travel long distances and often attach themselves to hedges and trees. This unsightly scene becomes more prominent during winter when deciduous trees shed their leaves (ibid.). In 1997, the Irish government published a Statement of Intent on the use of environmental taxation which recognised the benefits of using economic instruments in achieving environmental objectives. Consequently, the plastic bag levy was introduced in March 2002 as a direct result of this Statement (Patel, 2004). A levy of Euro 0.15 was placed on all plastic bags including biodegradable bags targeting shoppers at point of sale (ibid.). In the European Union, Ireland is leading among the countries that are taxing plastic bags as a measure to discourage consumers from harming the environment.<sup>9</sup> Plastic manufacturers in the European Union are pushing for a ban on the disposal of plastics in landfills, arguing that Europe needs tougher recycling requirements to stop an important raw material being thrown away. Bulgaria, Cyprus, Finland, France, Greece and Malta all recycle less than 20 per cent of plastics, while the Czech Republic, Estonia, Germany, Ireland, the Netherlands and Sweden recycle between 30 to 40 per cent of their plastics. As mentioned earlier plastic bag eradication or reduction is not the most

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<sup>8</sup>Health and environment: A closer look at plastics. <http://www.plasticsinenvironment.com>. Accessed on June 17, 2013.

<sup>9</sup> Dangers of plastic bags. <http://www.phaseoutoflightweight-plastic-bags.htm>. Accessed on November 12, 2013.

important policy for these developed countries because their main purpose is saving energy or solving the problem of the shortage of landfill areas (ibid.).

In Asia, a strict ban was introduced in Bangladesh in 2002 after the occurrence of floods from 1988 to 1998 that submerged two-thirds of the country in water (ibid.). The cause was from littered plastic bags. A total plastic bag ban on ultra-thin plastic bags and a fee on plastic bags were introduced in China on June 1, 2008. This came into effect because of the problems with sewerage and general waste.

Hong Kong forbids retailers from giving plastic bags under a certain thickness and for distributing them for free. The use of plastic bags dropped 90 per cent after the introduction of a levy. In 2002, India banned the production of plastic bags below 20 micrometre in thickness to prevent plastic bags from clogging the municipal drainage systems and to prevent the sacred cows of India from ingesting plastic bags as they confuse them with food. However, the enforcement of this policy remains a problem. Malaysia enforces taxes on plastic bags on every Saturday since 2011 in the state of Selangor (ibid.).

## **2.5 Some African countries banning plastic waste**

Several African countries namely Mauritania, Mali, Rwanda, Tanzania, Ethiopia and Somalia have banned the use of petrochemical based plastic bags. The production and use of plastic bags became a criminal offence in both Mauritania and Mali on December 31, 2012, making Africa the leading continent in the global crackdown on plastic bags. South Africa and Kenya have already banned ultra-thin plastic bags, while Ivory Coast has become the latest African country to ban the production and use of plastic bags.<sup>10</sup>

### **2.5.1 Rwanda**

According to the *News Times*, the Director of United Nations Environmental Programme (UNEP), Achim Steiner, confirmed that Rwanda has successfully banned the use of plastic bags.<sup>11</sup> To achieve this, the Rwanda Environmental Management Authority massively sensitised Rwandan people, especially traders, on the danger of using plastic bags. Even people in rural areas know that anyone using plastic bags is breaking the law on environmental protection (ibid.).

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<sup>10</sup>Plastic Bags. <http://www.france24.com>. Accessed on June 17, 2013.

<sup>11</sup>Man held in Rwanda over smuggled polythene bags. <http://www.newstimes.co.rw>. Accessed on June 17, 2013.



In an article in *Sunday Times*, of April 1<sup>st</sup>, 2013, a man was detained by the police in Rwanda after being caught smuggling a shipment of polythene bags into the country, as they are considered to be an environmental hazard by the Rwandan government. In the laws of Rwanda, article 433 of the Penal Code stipulates that “any person who sells polythene without authorization shall be liable to a fine of Rwf 10,000 to 300,000, and the penalty is doubled in case of recidivism.” The police paraded the suspect during the occasion community work so that other citizens would be reminded of consequences of getting involved in such illegal business.<sup>12</sup>

Rwanda’s strict plastic bag legislation serves as a strong message to potential bag sellers and reminds its citizens of the environmental dangers that disposable plastic bags represent. There is a strong stand against the presence of plastic bags in the environment and anyone arriving in Rwanda is ordered to surrender plastic bags and have them confiscated by authority at the airport and borders. However, this environmental decision poses a challenge for Rwanda because certain businesses have suffered as a result of the law because the alternative to plastic bags is paper which is both more expensive and less durable.

### **2.5.2 Tanzania**

Tanzania belongs to the East African Community (EAC) and this Community passed a Polythene Materials Control Bill in 2011 in the East African Legislative Assembly. The government of Tanzania has decided to ban the use of plastic bags in order to protect the environment as the prevalence of plastic bags was endangering the lives of creatures on land and in the water bodies.<sup>13</sup> The reason advanced by the government was that it had observed the adverse impacts they had on the environment. Being non-biodegradable, the plastic bag wastes were damaging the soil and hence posing a serious challenge to agricultural activities. Furthermore, the burning of plastics causes air pollution.<sup>14</sup> Manufacturers and shops that would go against the ban would face the wrath of the law. Whereas plastic bags of 100 micrometre thickness are allowed, the ban refers to the disposable plastic bags that are used to carry products from shops and markets to homes.

### **2.5.3 Ethiopia**

In Ethiopia, some studies revealed that plastic bags are causing severe environmental pollution to human and animal health in urban and rural areas of the country (Bjerkli,

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<sup>12</sup>ibid.

<sup>13</sup>Plastics and environment. <http://www.allafrica.com>. Accessed on November 14,2013

<sup>14</sup> ibid.

2005). Besides the toxicity effects of plastic bags, the overflowing of water is also a common problem during the rainy season as a result of the blockages of drainages (Asgedom, 2012).

#### **2.5.4 Southern Africa**

In Southern Africa, litter has not received much attention in the region, although it is a growing problem as economic development increases the amount of packaging and plastics.

Litter degrades slowly or not at all, and pieces of litter can entangle or be swallowed by birds, fish and other wildlife. Throughout Southern Africa, there are reports of increased littering (SOE, 2000: 245). Lake Kariba for example on the Zambia-Zimbabwe border is a victim of litter, mainly plastic bags and beer cans dropped by fishermen and visitors (ibid.). Open burning of municipal and industrial wastes at dumps releases a complex mix of contaminants into the air together with smoke and particulates. Although the health effects are unknown in southern Africa, in other parts of the world burning dumps have been found to produce dioxins, one of the deadliest chemicals (ibid.).

#### **2.5.5 South Africa**

The South African government has enacted legislation that bans the thin plastic bags that are given out to consumers by supermarkets and shopkeepers. All shops are now required to provide, at a cost, thicker, more durable plastic bags that are environmentally friendly. However, this legislation poses a challenge because of the loss of jobs in the plastic industry and also because of the extra cost for the poor for thick plastic bags.<sup>15</sup>

### **2.6 The situation in Zambia regarding plastic waste**

Disposable plastic materials are scattered widely due to poor waste management practices although it has not attracted much attention. Although the careless disposal of plastic waste poses a great threat to the environment in Zambia, little or nothing seems to be done to redeem the situation despite the fact that the Environmental Management Act (2011), in section 54 subsection (1) states that a person shall not collect, transport, sort, recover, treat, store, dispose of, or otherwise manage waste in a manner that results in an adverse effect, or creates a significant risk of an adverse effect occurring.

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<sup>15</sup>South Africa bans plastic bags. <http://www.stratek.co.com>. Accessed on November 13, 2013.

According to a report in the Sunday Times of Zambia on the 10<sup>th</sup> November, 2013,<sup>16</sup> continuing to use plastic products in Zambia is poisoning our environment to such an extent that all the good things we get from it will gradually diminish thereby posing a great threat to future generations. It stated that that plastic in water bodies actually decomposes as it is exposed to the rain and sun and other environmental conditions. Polystyrene begins to decompose within one year, releasing components that are detectable in the parts-per-million range (ibid.). Plastics usually do not break down in an animal's body after being eaten. However, the substances released from decomposing plastic are absorbed and could have an adverse effect. Chemicals found in plastics such as BPA and PS oligomer are a source of concern because they can disrupt the functioning of hormones in animals and can seriously affect the reproductive systems, which can lead to extinction of many animal species (ibid.). There is no clear and deliberate policy coupled with community participation in environmental management in particular focusing on the disposing of plastic waste.

### **2.6.1 The situation in Lusaka**

In Lusaka, disposable plastic materials, especially plastic bags, were introduced for packaging after the coming of Shoprite supermarkets in the 1990s. Later on, plastic bottles for water and for a variety of drinks came in huge numbers because they were hygienic and available at the market. The number of plastic bags and bottles has been steadily increasing over the years and are mostly used by the retailers and consumers on a daily basis because of their lower cost, lighter weight and handiness. Some of these plastic bags and bottles are reused by some communities for packaging vegetables and local beverages for consumers and before being finally disposed of in the environment. Before the coming of Shoprite supermarkets, grocery shop owners were using paper bags for packaging their products. These paper bags were locally manufactured by companies such as Zambezi Paper Mill Ltd situated in Buseko area. However, with the appearance of plastic bags on the market, paper bags have largely disappeared. Zambia Environmental Management Agency (ZEMA) in conjunction with Lusaka City Council encourages community participation to prevent the damage that disposable plastic materials can do to the environment and also to enhance the benefits that result from this waste in terms of job creation.

Lusaka City Council has a law which was promulgated in 2004 although it is not a national law. It is called a by-law of Lusaka city Council. It is binding only for Lusaka

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<sup>16</sup> Wildlife Society, Copperbelt University.

City and can be enforced by Council Police only. Consequently, to ensure compliance, the Waste Management Unit of Lusaka City Council encourages waste collection companies to employ the residents of the very zones where garbage is collected and is working hard to make sure that these plastics are collected and disposed of well. This also encourages community participation in the protection of the environment by keeping it clean.

In view of the fact that little or no study has been carried out with respect to disposable plastic materials in Zambia, this research intends to contribute to closing this gap by making an ethical evaluation of the kind of awareness and responsibility that exists among the general public, manufacturers of plastics, managers of supermarkets and grocery shops and street vendors in Lusaka urban with respect to this problem.

## **CHAPTER 3: THEORETICAL FRAMEWORK**

### **3.0 Introduction**

This chapter discusses the theories that were used in the study, namely, the Land Ethic and Environmental Virtue Ethics. Environmental Virtue Ethics has emphasised the need for the development of environmental virtues such as care and respect for the natural environment. These are habits of care that result in the corresponding virtues when repeated on numerous occasions.

### **3.1 The Land Ethic**

The Land Ethic stipulates that humans need to begin thinking of themselves as part of a wider community, which includes not only all living things but also all the members of the ecological system, including water, soil and air (Olen and Barry, 2002: 535). Aldo Leopold, the founder of the Land Ethic, says that the individual is a member of a community of independent parts. To think of ourselves in this way is to reject the view that we are masters of nature and that nature is there to be exploited by us. It is to think of ourselves as members of a team, living and working harmoniously with our teammates (ibid.).

Leopold gives the following definition of an environmental ethic: “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” (in Wenz, 2001: 157). It focuses on a non-anthropocentric ethic. It is neither human centred, nor is it individualistic. What is to be considered as morally fundamental is not the good of individual members of the biotic community, but the good of the community itself. Hence Leopold writes: “The land ethic simply enlarges the boundaries of the community to include soils, waters, plants and animals, or collectively: the land” (in Keller, ed., 2010: 194). The Land Ethic is a holistic ethic, that is, we have duties not just to individuals but to the biotic community. The source of the Land Ethic is ecology which is the science of interrelationships among organisms and their environment. Given a full understanding of the interdependence of plant and animal life, soil, air and water, we should come to think of the biotic community like a vast collective organism with its own morally important interests (Olen and Barry, 2002).

The key concept that Leopold introduces is that of conservation. Conservation is a state of harmony between people and the holistic environment. The ideal practice of this theory would be that every person would have an obligation to land over and above personal

interest. It should be noted, however, that although the Land Ethic is not human centred as such, this does not necessarily mean that humans are of less importance than the natural environment. The point is that by recognizing ourselves as members of ecological community, we become aware of our dependence on the natural environment as our life-support system for our own wellbeing. Hence, the more we acknowledge our necessary interaction with the natural environment, the more we ourselves benefit. The Land Ethic cannot prevent the alteration, management and use of natural resources, but it affirms their right to continued existence especially in their natural state. It tries to change the role of a human being as a conqueror of the land-community to a plain member and a citizen of it. It implies respect for fellow members, and also respect for the community as such.

In this study, the Land Ethic will guide in the collection and analysis of relevant data with regard to the awareness and responsibility of involved persons concerning the harmful effects of the use and disposal of plastic waste on the natural environment. As members of the Lusaka urban ecosystem (although precise boundaries cannot be defined), all humans manufacturing, using, distributing or disposing of plastic bags bear a duty of responsibility to the environment which they inhabit.

### **3.2 Environmental Virtue Ethics**

“Traditional” virtue ethics focus on the character traits or virtuous habits that people should have towards one another. “Environmental” virtue ethics, on the other hand, according to Sandler (in Keller ed., 2010), is an extension of traditional virtue ethics that focuses on the responsibility of humans to the natural environment in which they live. It places emphasis on the kind of person that one ought to be, the kind of virtues one ought to have in relation to the environment. Given the seriousness of our environmental crises and the challenges these pose to human societies, the need for environmental virtue is all the more crucial. Many people today want to live a good life in relationship to nature and the environment, and environmental virtue ethics help us to understand what that means. Environmental leaders need strength of character grounded in virtue to sustain them over a lifetime of service in urging others to care for the environment as well.

Environmental virtue ethics then is simply ethics as it pertains to human-environment interactions and relationships. In the words of Sandler: “So an adequate environmental ethic likewise requires not only an ethic of action - one that provides guidance regarding what we ought and ought not to do to the environment - but also an ethic of character – one that provides guidance on what attitudes and dispositions we ought and ought not to

have regarding the environment” (ibid.: 252). Many environmental philosophers have argued that a proper naturalistic understanding of human beings will locate them not only socially but also ecologically as members of the broader biotic community. Concern for ethical matters outside of ourselves is important, but we can be more persuasive if we can blend this with considerations of personal and community character.

Environmental virtue ethics strives for excellence of character in a human being which would include dispositions to maintain and promote the well-being of the larger ecological community. Environmental virtues such as care, cleanliness, and appreciation of beauty are the proper dispositions or character traits for human beings to have regarding their interactions and relationships with the environment. The environmentally virtuous person is disposed to respond, both emotionally and through action, to the environment and to non-human individuals (whether inanimate, living, or conscious) that populate it in an excellent or fine way (ibid.: 253). Contemporary environmental virtue ethics thus marks a shift away from individuals performing heroic acts, and instead proposes a relational consciousness of a broader conception of the common good. It appeals to the development of environmentally conscious characters, but in community.

In this study, Environmental Virtue Ethics will help to reinforce the Land Ethic by guiding the researcher in focusing on the awareness and attitudes of relevant people and institutions towards care of the natural environment in the context of disposable plastic waste.

## **CHAPTER 4: METHODOLOGY AND METHODS**

### **4.0 Introduction**

The study under consideration was an ethical evaluation of awareness and attitudes towards the use and disposing of disposable plastic materials, especially plastic bags, on the environment in Zambia with a focus on Lusaka urban. This chapter identifies the location of the study and the design, methodology and methods used to carry out the study.

### **4.1 Location of study**

As mentioned above, the study involved seven multinational supermarkets, namely, Pick and Pay (Woodlands), Spar supermarkets (Crossroads and Chilenje), Shoprite (Chilenje, Cairo road and Manda Hill) and Melisa supermarket (Kabulonga). It also included five grocery shops (two in Chilenje, two in Kanyama and one in Garden compound), two plastic manufacturing companies (ZALCO Ltd, Dahua Enterprises Ltd), five street vendors and three Small Christian Communities (Kanyama, Mutendere and Garden).

Figure 4.1: Map of Lusaka indicating locations of places where research data collected.

Source: Drawn by Researcher

Figure 4.1: Map of Lusaka indicating locations of places where research data was collected.

Source: Drawn by researcher



## **4.2 Methodology and Methods**

The research was an exploratory case study design involving qualitative methodology. The methods used for primary data collection were observation, in-depth interviews and focus group discussions. Secondary data involved relevant literature from the University of Zambia main library, the department of philosophy, books, journals, newspapers from ZEMA library and internet.

### **4.2.1 Observation**

Observation by the researcher provided information about the actual behaviour of people towards the environment. Direct observation was useful because some behaviour involves habitual routines of which people are hardly aware (Kombo, 2009: 96). This allowed the researcher to put behaviour in context and thereby understand it better. The researcher sought to preserve the natural form of social behaviour with no manipulation (Black, 1976: 331). He visited some illegal dumping sites, took part in the garbage collection process and visited the official dumping site.

### **4.2.2 In-depth interviews**

The researcher visited seven multinational supermarkets, namely, Pick and Pay (Woodlands), Spar supermarkets (Crossroads and Chilenje), Shoprite (Chilenje, Cairo road and Manda Hill) and Melisa supermarket (Kabulonga). These seven supermarkets were selected because they heavily use plastic bags for packaging and where they come from there is a restriction on the use of plastic bags. These supermarkets are also in different parts of Lusaka and they are frequented by people from various parts of Lusaka. Key personnel were interviewed in each institution. Five grocery shops (two in Chilenje, two in Kanyama and one in Garden compound) were visited and five grocery shop owners were interviewed. Two plastic manufacturing companies were visited and two managers were interviewed. Two health workers, a medical doctor and a clinical officer were also interviewed. In addition, five street vendors were interviewed in the Lusaka central business district and shoppers from various parts of the city. The researcher also visited Zambia Environmental Management Agency (ZEMA) and interviewed senior Information and Documentation personnel. Two health institutions (UTH and Chilenje Clinic) and two of the plastic manufacturing companies, namely, ZALCO Ltd and Dahua Enterprises Ltd were also visited. Finally, two Lusaka City Council officials from Waste Management Unity (under the Public Health Department) were also interviewed and these two officials facilitated the researcher to visit Chunga landfill for observing the final stage

of disposing the waste in Lusaka urban. In sum, then, apart from the numbers involved in Focus Group Discussions, a total of 85 persons were interviewed ( Table 4.1).

Table 4.1: Distribution of persons interviewed

<b>Institution</b>	<b>Location</b>	<b>Position</b>	<b>Number</b>
Shoprite	Manda Hill	General Manager	1
	Chilenje	Manager	1
	Cairo Road	Manager	1
Pick and Pay	Woodlands	Manager	1
Spar Supermarket	Crossroads	Manager	1
Melissa Supermarket	Kabulonga	Manager	1
Lusaka City Council	Along Indep. Avenue	Public Health Officer	2
ZEMA	Church Road	Snr. Info & Doc. Officer	1
Health Institutions	UTH, Chilenje Clinic	Medical Doctor	1
		Clinical Officer	1
ZALCO Ltd	Industrial area	Manager	1
Dahua Enterprises Ltd	Chinika	Manager	1
Grocery Shops	Chilenje	Shop owners	2
	Kanyama		2
	Garden		1
Manufacturers	Industrial area	Managers	2
Street Vendors	City Centre		5
Individual Shoppers	Various parts of the City		60
<b>Total</b>			<b>85</b>

Source: Researcher's compilation of interviews

### 4.2.3 Focus Group Discussions (FGDs)

This method was used to collect qualitative information to reveal perceptions, views, feelings and attitudes of the participants about the effects of disposable plastic waste on the environment in Lusaka urban. The FGDs involved three Small Christian Communities in Mutendere, Garden and Kanyama compounds respectively. A Small Christian Community (SCC) is a group of people staying in one area with different careers, gender, age, social and economic backgrounds who come together at a certain time to meet for faith reasons. This group was selected because its members meet at a certain time and in a designated place. It is easy to approach them because of their cooperation and understanding. Although FGDs should be between seven to ten members, the numbers involved were based on convenience and availability as shown in the Table 4.2.

Table 4.2: FGDs with Small Christian Communities

<b>Institution</b>	<b>Location</b>	<b>Position</b>	<b>Number</b>
Small Christian Communities	Kanyama	Mixed Careers	28
	Mutendere	Mixed Careers	26
	Garden	Mixed Careers	24
<b>Total</b>			<b>78</b>

### 4.2.4 Sampling Techniques

Sampling is “the process of selecting a portion of the population to represent the entire population” (Locke et al., 2009: 64). It is also referred to as the procedure a researcher uses to gather people, places or things to study (Kombo et al., 2009: 77). A population is a group of individuals, objects or items from which samples are taken for measurement. It also refers to an entire group of persons or elements that have at least one thing in common (Kombo et al., 2009). Lusaka City has an estimated population of 2,200,000. The total population targeted was 163 (60 individual shoppers, 25 key informants and 78 involved in FGDs with Small Christian Communities as shown in Tables 4.1 and 4.2). The 60 individual shoppers were chosen at the different supermarkets on the basis of convenience sampling. The 25 key informants were purposefully selected with respect to their relevance to the topic of disposable plastic bags in particular. The 78 persons involved in the group discussions from the Small Christian Communities were selected on

the basis of convenience sampling as these groups were comprised of different members of their communities involving mixed careers.

#### **4.2.5 Data Analysis**

Data analysis with regard to awareness and responsibility of relevant persons was carried out with reference to the Land Ethic and Environmental Virtue Ethics. Common themes were identified with respect to the frequency with which they occurred in the interviews, and the ethical theories were applied with reference to these common themes.

## CHAPTER 5: FINDINGS AND DISCUSSION

### 5.0 Introduction

This chapter will discuss and analyse the findings of the study with reference to the research questions. Guided by the Land Ethic and Environmental Virtue Ethics, the responses in interviews and FDGs will be analysed with respect to common themes emerging and the presence or absence of ethical responsibility that they reflected.

### 5.1 The situation regarding the disposal of plastic waste in Lusaka urban

This section will respond to the first research question. The Waste Management Unit (WMU) under the Public Health Department at Lusaka City Council (LCC) revealed that there are two kinds of waste, namely, liquid and solid waste. Disposable plastic materials fall under solid waste. The LCC does not make any particular distinction between types of solid waste. All solid waste including plastic materials generated in Lusaka city is discarded to the waste stream ( Figure 5.1).



Figure 5.1: Garbage at Lusaka City Market during dry season.  
Source: Field data (15th October, 2013)

The system of waste stream involves two categories, namely, residential and non-residential. Under the residential category, people are encouraged to store waste in bin liners while those in the non-residential category (commercial houses, institutions, churches, schools, etc.) are encouraged to store waste in wheel-bins of different volume capacity (100, 120, or 220 litres) because the population density is high.

There are also two kinds of waste collection, door to door collection and communal collection. Door to door collection is called primary collection and it is carried out by

Community Based Enterprises (CBEs) from individual homes to a central place. Containers and skip bins are placed in these central places of high density population. When these containers and skip bins are full, they are taken by hook lift trucks and skip trucks to the dump site called a landfill or sanitary fill. The dump site is a created depression of about 50 square metres using heavy moving equipment. It is engineered with an electronic weigh bridge in order to estimate the quantity and the matching price to be paid to the LCC. The LCC is expected to collect all the waste in Lusaka on account of the resources which it has at its disposal (Figure 5.2).



Figure 5.2: Garbage collection by Lusaka City Council  
Source: Field data (20<sup>th</sup> May, 2014)

In compounds, the LCC has engaged community based enterprises while in other residential areas and central business districts, it has entered into contracts with garbage collecting companies. A major problem, however, is the unwillingness of people to pay for the system to render a waste collection service efficient. This is a poor attitude that has been developed by some residents because they expect the LCC to collect the garbage where it has been dumped. This poor attitude may be a result of lack of environmental appreciation and irresponsibility. When people illegally dump waste at undesigned places, the same people go and complain to their councillors (democratically elected by themselves) who in turn blame the waste management unit.

According to LCC Waste Management Unit, plastic bottles and single-used plastic bags represent a huge threat to the environment in Lusaka urban. The threat is not only related to the volume of the waste but also to the resources needed for its disposal and also the possible emissions from its burning. As revealed in the literature review, plastics are very

well known for the part they play in flood events; they block pipes and drainages. Once pipes and drainages are blocked, humans are also affected. Sometimes plastic bags are used to conceal human excreta and are thrown in undesignated places, attracting flies and producing a very bad smell affecting the whole surrounding. It is common to find countless plastic materials in the drainages and along the streets of residential compounds. These can pose a serious threat to human health and the natural environment.

The researcher observed during the rainy season that plastic bags contribute much to the flooding in Lusaka. When it rains, water cannot easily flow in the drainages prompting residents to manually remove these plastic materials in order to save their homes from flooding ( Figure 5.3). This is in line with what was mentioned in the reviewed literature that when plastic materials accumulate, they cause environmental pollution which can be manifested in different ways such as in the deterioration of the beauty of the natural scenery, and in the blockage of sewage systems of cities and towns in developing countries (Asgedom, 2012: 86).



Figure 5.3: A child tries to remove plastics in drainage in garden Compound  
Source: Field data (11<sup>th</sup> January, 2014)

Disposable plastic materials are heavily used in all kinds of businesses starting from the streets to the supermarkets. Buying a fruit on the street involves a plastic bag to package it and the more items one buys from different places and individuals, the more plastics one receives. These plastic bags find themselves back on the streets or undesignated dumping places. Plastic bottles, on the other hand, can be retuned for deposit to the recycling companies. There is also a considerable production of single-use plastic cups which are being used in public drinking places in middle and low income communities in Lusaka urban. Plastic bottles, however, are not manufactured in Lusaka but are imported in a

compressed form. Plastic bags are given by the retailers to their customers because they are cheap, lightweight, convenient and hygienic as a means of carrying goods.

There are many industries in Lusaka that are manufacturing only light plastic bags. These light plastic materials come in different sizes and shapes according to the needs and use of consumers ( Figure 5.4). For instance, there are plastic materials designed for packaging a variety of products ranging from foodstuff to clothing. Companies like Polythene Products Zambia Ltd, Polycor Ltd and Dahua Enterprises Ltd, all situated in industrial and Chinika areas, manufacture hundreds of tons of plastic materials every month.



Figure 5.4: Showroom at a plastic bag manufacturing company in Chinika area.  
Source: Field data (2nd May, 2014)

Plastic recycling is the process of recovering scraps of waste plastic and reprocessing the material into useful products, sometimes completely different in form from their original state. The manager of Dahua Enterprises Ltd noted that they alone manufacture ten tonnes of plastic bags per month. These plastic products are meant to target the wider market, the whole Zambia consumer community. He further noted that there is a boom of plastic material production in Zambia, mainly polyethylene and polyvinylchloride. A discussion with the same manager concerning these plastic bags revealed that they are of the photo-degradable type and not the bio-degradable type. It also emerged that the additives used in these plastic bags are compatible with recycling operations of conventional plastics. On film thickness, the manager claimed that the ones being produced are 20-25 microns.

There are a number of recycling companies in Lusaka although the researcher only managed to visit one called Central Recycling Co Ltd, also known as ZALCO Ltd which is known to recycle plastic materials ( Figure 5.5). The manager informed the researcher



that his company recycles old battery casings into new batteries. Other plastic materials are recycled into pellets which are later sold to other companies such as LAMASAT and KAZUMA for manufacturing conduit pipes, polyvinylchloride (PVC) pipes and water tanks. However, the manager of ZALCO Ltd noted that the market for these pellets is very limited, which means they only recycle a limited quantity of plastic materials. He emphasised that the problem which this company is facing is the non-availability of end users of their final products. Although ZALCO Ltd and Polythene Products Zambia, for instance, are able to recycle plastic bottles into plastic chairs and tables, they cannot afford to do this because the cost of production is very high in Zambia. For this reason, water companies prefer to import empty plastic bottles cheaply.



Figure 5.5: Plastic materials ready to be taken for recycling  
Source: Field data (20th May, 2014)

A Chinese company called H.Y Investments is currently setting up a plastic recycling plant in Lusaka and it expects to produce 100 tons of recycled plastics per month. Meanwhile, some small and medium entrepreneurs have started capitalizing on this venture by collecting used plastic materials at no cost. The researcher observed this practice at Chunga dumping site where plastic materials are collected and sorted out for sale to various recycling companies that manufacture chairs, cups, plates, conduit pipes and plastic sheets used in construction ( Figure 5.6). This venture can help to reduce the amount of plastic materials in the environment.

Compared to other materials such as metal and glass products, plastic polymers require greater processing to be recycled. When different types of plastics are melted together, they tend to separate like oil and water and form different layers. The phase boundaries

cause structural weakness in the resulting material. Furthermore, it is difficult to sort out plastics according to their chemical composition before recycling.



Figure 5.6: Sorting out of plastic materials for recycling at Chunga dumping site.  
Source: Field data (20<sup>th</sup> May, 2014)

The managers of Pick and Pay, Shoprite and Spar supermarkets noted that they have all entered into contracts with other companies that deal in garbage collection. Every morning, waste collection companies come to collect the waste generated by these supermarkets including discarded disposable plastic materials. It is then the responsibility of these waste collection companies to dispose of the plastic materials. Whereas some companies collect plastic materials for purposes of recycling, others take these plastic materials to Chunga dumping site.

Grocery shop owners said that most of them registered for fee paying garbage collection. These shop owners collect all paper and plastic waste and keep them waiting for the day of garbage collection. This practice is in accordance with the business regulation of the LCC through its health desk. Any business that does not meet the hygienic standards set by the LCC may face closure. These shop owners are aware that conducting business in an untidy environment will not bring customers, hence, a loss of business. One of the managers of a recycling company which also collects garbage told the researcher that his company recycles plastic bags into pellets which are later sold to other companies that manufacture conduit pipes and water tanks.

As can be seen from the above, the fact that plastic bags are manufactured in Lusaka and that their availability and use is widespread in supermarkets and grocery stores poses a serious threat to the environment. From the literature review, it is clear that plastics can have detrimental effects on the natural as well as the human environment and, in view of the accumulation of uncollected waste in various parts of Lusaka, the threat remains a very real one. Whereas plastic bags are only one indicator of the threat posed by plastics on a much wider scale, they nevertheless remain a major contributor to the deterioration of the environment unless some form of reliable substitutes become available.

## **5.2 Awareness and responsibility of diverse sectors of society.**

What follows are the data collected with respect to the general awareness (or lack of it) of different sectors of society in Lusaka urban regarding the littering and dumping of plastic waste on the one hand (the second research question), and the responsibility or lack of it for such behaviour on the other hand (the third research question). Those interviewed by the researcher can be seen in Table 4.1 on page 20 above. Responses to the questions asked can be seen in Table 5.1 below. The understanding that nearly all of those interviewed had of the meaning of the term “environment” was that it referred to the ‘general’ natural surroundings in Lusaka. However, the street vendors tended to think of it in more restrictive terms as referring to their ‘immediate’ surroundings.

### **5.2.1 Care of disposable plastic waste**

All of the shoppers interviewed (100%) stated that they care about the disposal of plastic waste in the environment. A strong majority (95%) furthermore made it clear that they were aware of the fact that plastics cause problems to the environment. This was confirmed by the overall response from all of the FDGs. Both medical officers, who were interviewed, said that plastic waste is a hazard to human health especially when it is burnt in the open air confirming the literature review that plastic waste are a potential threat to the natural environment and to human health. According to the interviewed medical officers, burning plastics in an open air is not a healthy practice because their fume is harmful to the lungs once inhaled and it can also lead to a cancer disease.

Table 5.1: Responses of shoppers to questions on garbage disposal

TOTAL SAMPLE = 60	YES	NO
Do you care about the disposal of plastic waste in the environment?	60 (100%)	0 (0%)
Are you aware that plastic waste causes problems to the environment?	57 (95%)	3 (5%)
Have you any knowledge about the manufacturing of plastic bags in Zambia?	36 (60%)	24 (40%)
Are there advantages in using plastic bags and bottles?	51 (85%)	9 (15%)
Are there disadvantages in using plastic bags and bottles?	45 (75%)	15 (25%)
Do you think that the Lusaka City Council is responsible for managing plastic waste?	45 (75%)	15 (25%)
Do you think that there should be a mandatory policy in Zambia concerning the disposal of plastic waste?	45 (75%)	15 (25%)

### 5.2.2 Manufacture of plastic bags in Zambia

Regarding the knowledge that interviewees had of the manufacturing of plastic bags in Zambia, all managers and shop owners had full information although only two out of five street vendors had such information. Responses from the FGDs were less certain. The majority of shoppers interviewed (60%) said that they were aware that plastic bags were being manufactured in Lusaka in large quantities. They knew also the companies that are involved the manufacturing of these plastic bags within Lusaka. It is perhaps significant that 24 shoppers (40%) were not aware of this.

### 5.2.3 Advantages of plastic bags

Regarding the advantages of using plastic bags and bottles, 85% answered that plastic bags are very convenient and practical for shopping. The other 15%, however, while acknowledging the advantages, also felt that plastic bags do harm to the environment. In the case of plastic bottles, whereas they agreed that they were hygienically convenient for water and beverage consumption at places of work or on a journey, they felt that problems arose after using these plastic materials when they were thrown away. The dominant feeling from the FDGs was that plastic materials were making the city dirty and cause flooding in many areas through blocking drainages.

#### **5.2.4 Disadvantages of plastic bags**

When asked about the disadvantages of using plastic bags and bottles, 75% felt that there were disadvantages, despite the advantages of using them. The disadvantages of using plastic bags were related to the unsightly look of some areas of the city caused by dumping and the blocking of drainages during the rainy season. Observation by the researcher on the blocking of drainages by plastics confirmed this. It is also clearly supported by the literature review that points out that such waste can become carcinogenic to humans, a breeding ground for pathogenic organisms, the possible spread of infectious diseases, in addition to a loss of aesthetic beauty to the environment. In particular, they recognised that some areas in Mutendere, Garden, and Chilenje compounds looked unsightly. Nevertheless, although most shoppers acknowledged that plastic materials are non-biodegradable and are harmful to the environment, they felt that it was justified to use them for practical convenience and for financial reasons.

#### **5.2.5 Responsibility of LCC**

Lusaka City Council has a huge responsibility in the management of plastic wastes. It has placed containers and skipbins in some central places of high density population. Once they are full, they are taken to a land fill in Chunga. A majority of shoppers (75%) stated that they dumped plastics together with other waste at a garbage collection point designated by the LCC as they believed that the LCC had the responsibility of managing waste disposal. However, they expressed ignorance as to what happened to these plastic materials after they had been collected by the garbage collectors and they did not seem to be concerned. Some shoppers said that they burned these plastics in their backyards while others buried them in the landfill.

#### **5.2.6 A mandatory policy**

All interviewees (100%) answered positively to the question as to whether there should be a mandatory policy in Zambia concerning the disposal of plastic wastes. It is perhaps significant that none of those interviewed seemed to take personal responsibility for littering and the careful disposal of waste.

### **5.3 Discussion**

Whereas those interviewed did express a feeling of care for the environment and were aware of disadvantages in the use of plastic bags and bottles, there was a general feeling that shoppers felt justified in using plastic materials for reasons of practicality, finances and convenience. The feeling of 75% of shoppers was that it was the duty of the LCC rather than their duty to take care of the proper disposal of plastic waste, especially in

view of market levies collected from traders. However, the other 15% (25 shoppers) did acknowledge some responsibility for their individual behaviour regarding the disposal of plastic waste. Nevertheless, they did not give any indication that they were putting into practice this responsibility although they acknowledged knowing about the officially designated dump sites in Lusaka. They were more inclined to transfer responsibility to the LCC. This kind of response, however, is not very convincing as the LCC had already put at their disposal bins for collecting waste which they would then transport to the landfill. Although shoppers did acknowledge that the LCC was making efforts to improve the situation regarding the dumping of waste, nevertheless, focusing on the LCC as having the sole responsibility for disposing of plastic waste seems to have been a way of shirking their own responsibility. The overall thrust of the responses is that shoppers wanted a clean Lusaka without the unsightly appearance of heaps of rubbish but did not feel that it was their responsibility to take steps to bring this about.

The senior information and documentation officer at ZEMA mentioned that the government encourages communities to report illegal dumping so that, working with the authorities, they can build a sustainable environment and a caring society. He said that the illegal dumping of waste is not necessary because dumping sites have been established within the city and these are managed by independent contractors. Furthermore, he emphasised that LCC is engaging plastic manufacturing companies and waste management disposal companies in creating plastic recycling programmes that will allow residents to conveniently dispose of all sorts of plastic materials without burning or burying them in their backyards. He noted that people in general were not cooperating in the proper disposing of their garbage. Indeed, he emphasised that indiscriminate littering and dumping of rubbish and waste is a form of environmental vandalism. He said that it pollutes the environment (water ways, streets, parks and reserves, etc.), detracts from the appearance and image of the city, and imposes unnecessary costs on the city.

The managers of both Dahua Enterprises Ltd and ZALCO Ltd said that the production of plastics was good business because it provided employment opportunities for many young people who were jobless. They also said that they had a very wide consumer community because almost all companies needed these plastic materials to package their final products. In other words, the financial benefits of their businesses took precedence over any responsibility for caring for the natural environment.

The unanimous support for a mandatory policy concerning the disposal of plastic waste seems to reflect an awareness that the government is not implementing the Environmental

Management Act of 2011 which was already in place. Furthermore, whereas there was strong support for the “Keep Lusaka Clean” campaign, the feeling was that it would not succeed adequately without some mandatory public policy. One of the policies that was mentioned by supermarket managers, especially Shoprite and Pick and Pay, was the imposition of a plastic levy. Funds raised from such a levy could be separately earmarked for environmental causes, for example: (i) developing collection and recycling facilities for post-consumer plastic waste; (ii) public awareness campaigns on responsible disposal; and (iii) to cover the clean-up cost of highly littered areas.

All the managers in the six supermarkets said that their companies have no policy regarding the disposal of plastic waste. Four of them cited the policy that banned the famous “Utujilijili” (liquor which was sold in small sachets) and how it succeeded. However, at present, they (and the grocery shop owners) were afraid of losing business if they did not provide plastic bags to customers. On the other hand, they were willing to support a government policy that might be laid down, whether it be taxing plastic bags, returning plastic bottles for sale, or imposing a total ban and the re-introduction of paper bags for packaging.

The LCC had put in place facilities that were designed to make it as convenient as possible for residents to practice responsible waste management. It had entered into contracts with garbage collecting companies such as Conquest Ltd to collect garbage in various parts of the city. The LCC had also acquired trucks which helped in collecting the garbage on a daily basis. This promoted waste collection by individuals or companies. Through the Waste Management Unit of LCC, the government encouraged residents to dump plastic materials in designated places and to develop good habits of responsible waste management. However, despite these facilities, some residents of Lusaka continued to throw litter anyhow and anywhere. The researcher observed that in some places where the garbage had been collected, more garbage was found heaped at the same spot the following morning ( Figure 5.7).

Despite these efforts by the government, however, 75% of the shoppers interviewed felt that the government should impose and enforce a mandatory policy with regard to the disposal of plastic waste and that plastic bags should be completely banned and paper bags re-introduced. This idea also emerged strongly from the FGDs. Other suggestions were to tax plastic bags and sell them at the counter. Supermarket managers suggested selling them at the counter as is the practice in many other countries.



Figure 5.7: Observed illegal dumping in Woodlands near St. Mary's Girls School  
Source: Field data (15th May, 2014)

However, most of the shoppers felt that it is the cheapness of plastic bags that has led to careless disposal in many areas of the city. For instance, during his research, the researcher observed that take-away consumerism is common place in Lusaka. A number of food items such as French fries that can be taken away are usually wrapped in flimsy plastic bags. Although all of these plastic bags end up in the environment, neither the supplier nor the consumer is made to pay for the external costs in terms of garbage collection. The researcher observed that some Lusaka residents have a habit of dumping waste at undesignated places during the night to avoid being caught by the LCC ( Figure 5.7). He also observed people just throwing plastic bags and bottles after consuming the products which were contained therein.

Those who suggested putting a high tax on plastic bags had in mind that if plastic bags became expensive, people would stop buying them. They felt that if multinational supermarkets taxed plastic bags at the counter without a national policy, other business entities may not comply and customers may do their shopping where these plastics were given out free. Four out of five of the street vendors said that selling plastic bags on the streets was not very profitable for them although it did give them some little income. With regard to the recycling of plastic materials, especially bottles, there was a strong feeling that they should be returned to suppliers for a fee for recycling as a way of creating jobs.



The researcher observed at a dumping site that there was a practice of sorting out plastic materials for sale to recycling companies (Figure 5.6).

#### **5.4 Summary of discussion**

There seems to be fairly widespread concern about the harm that plastic waste can do to the environment. On the other hand, while shoppers and others care for the environment, they do not seem to translate this into concrete action with regard to littering and dumping of plastic bags in particular. They feel rather that this is the responsibility of the LCC due to market levies collected from traders.

Most of those interviewed feel that it is up to the government to make a law banning the use of plastic bags and to enforce it accordingly. There should also be a clear government policy regarding the disposal of plastic waste. Supermarket managers would be willing to obey such a policy. Manufacturers or producers for their part felt that, currently, they were just following business rules and abiding by regulations laid down by the government.

Despite the disapproval of people who litter and dump waste anyhow, nevertheless, many felt that their actions were justified for the following reasons: (i) there was no law or enforced policy to prevent it; (ii) there was a lack of bins in public places; (iii) plastic bags were very practical and convenient to use; (iv) plastic bags were very inexpensive; (v) an opportunity for jobs was created for women cleaning around Lusaka. Furthermore, for manufacturers and street vendors, plastic bags were a source of income.

#### **5.5 Ethical evaluation**

##### **5.5.1 The Land Ethic**

Aldo Leopold noted in the Land Ethic that humans should consider themselves as “members and citizens” of the biotic community. In other words, human beings should not consider themselves as being outside of the natural environment in which they reside. They are a part of that environment and they are interacting with all other elements in that environment.

Human beings are therefore held responsible for the waste that they dispose of because certain kinds of waste, and in this case plastic waste in particular, has a negative effect on the overall environment or ecosystem. Consequently, all of those living and moving in the natural environment, that is, supermarket and grocery store owners, street vendors, shoppers, and manufacturers of plastics - in addition to the LCC - should recognise their

common responsibility to care for the environment to which they belong. The environmental ethical guideline that Leopold gives for the Land Ethic is that a decision is ethically right when it preserves “the integrity, stability and beauty” of the natural environment. Certain kinds of human actions do have negative consequences for the integrity and stability of the natural environment whether people are aware of it or not. The literature on plastic waste has made specific reference to the pollution of the air from burnt plastics and to the clogging of drainages. Such effects not only tend to pollute the non-human environment but also affect human beings living in such an environment. There is thus a threat to the wellbeing of both the natural and human environment by those who dump and burn plastics in their backyards.

It should also be noted that the natural environment does not only contribute to human health and wellbeing but that it has a value of its own which should be respected for its aesthetic beauty. The indiscriminate dumping of waste (Figures 5.1, 5.2 and 5.7) destroys the beauty of the natural environment of Lusaka.

Because of the human capacity for ethical awareness and responsibility, human beings have a duty, according to the Land Ethic, to behave in such a way as to preserve the “integrity, stability and beauty” of the environment which they inhabit. The indiscriminate and careless dumping of plastic waste displays a lack of awareness of the negative effects involved or a lack of responsibility for their actions – or perhaps a lack of both.

### **5.5.2 Environmental Virtue Ethics**

What emerges from the interviews with different sectors of society in Lusaka is that there seems to be a lack of environmental virtues with respect to care for the environment. Hence, to cope with this environmental challenge, people need to cultivate in themselves the virtues that will help them to care for the environment. Moral virtues are habits that are acquired by repetition of the same kind of action (Mackinnon, 2012: 125). As mentioned earlier, whereas traditional virtue ethics emphasises the character traits or virtuous habits that people should have towards one another, environmental virtue ethics emphasise the kind of virtues we ought to have in relation to the environment. Such virtues are, for example, care, cleanliness and appreciation of beauty as good character traits for human beings regarding our relationship with the environment. It should be noted, however, that it is not sufficient for the possession of a virtue that one “feels” a sense of care or considers that one “ought” to do something. It is necessary that awareness

and desire be translated into responsible action in most cases if the virtue is to be truly present.

In the study under consideration, the occurrence of littering and indiscriminate dumping in Lusaka reveals a lack of environmental virtues. Repeated actions of care for the environment would very likely result in the virtue of caring for the environment in an effective manner. The person who has acquired the virtue of caring is more inclined to care about other people and other things in practice than the person who does not have the virtue. From the findings of this study, it is clear that while the residents of Lusaka in general do have a “sense” of caring for the wellbeing of the environment, they do not have the virtuous habit of taking active responsibility for disposing well of waste; there is rather in many cases the vicious habit of throwing waste anywhere. The habit of caring for the environment by disposing of plastic materials in a responsible way is clearly lacking based on observation. Such an irresponsible manner of behaving may be due either to a lack of environmental education or to a lack of moral responsibility towards the environment -- or both. The net effect, however, is that the required environmental virtue has not been developed in those who use and dispose of plastics so carelessly. Manufacturers of plastics, supermarkets, grocery stores and street vendors are clearly more focused on the economic value of generating greater profit than in caring for the environment. Shoppers find it more practical and convenient to take advantage of the plastic bags and bottles that are put at their disposal at a more economic price. In the end, the more immediate financial benefits of daily living take precedence over the more long term benefits to the environment.

## **CHAPTER 6: CONCLUSION AND RECOMMENDATIONS**

### **6.0 Introduction**

The aim of this study was to make an ethical evaluation of the awareness (perceptions) and attitudes (responsibility) of the general public in Lusaka urban with regard to the disposing of plastic waste, and plastic bags in particular. This was a case study design involving qualitative methodology with an ethical component. The ethical evaluation of the study used the Land Ethic and Environmental Virtue Ethics.

### **6.1 Conclusion**

Plastic bags are manufactured in large quantities in Lusaka and they pose a serious threat to the environment in the long term even though perhaps not so immediately evident. The literature review bears witness to this fact. Furthermore, plastics are among the fastest growing components of waste. On the one hand, plastic bags have been found to be more practical, more convenient and less expensive than paper bags for consumers with the result that they are widely used. They are also of financial benefit to manufacturers, supermarkets, grocery stores and street vendors. On the other hand, plastics account for a relatively high percentage of the municipal solid waste and for a sizable litter stream. There is evidence to support the fact that plastic bags block sewerages and deface the beauty of some parts of Lusaka. The use of plastic bags has become part of a throwaway culture of consumerism contributing to the degradation of the natural environment.

The findings of the study revealed that whereas shoppers had some knowledge about the disposal of plastic wastes, and felt that the LCC was doing a certain amount to control the problem of illegal dumping of waste, they tended largely to feel that the LCC was not doing enough. Consequently, they placed the responsibility of disposing of these wastes largely on the LCC without undertaking personal or communal responsibility for their own behaviour in throwing away plastic waste indiscriminately. Furthermore, they felt that the government was at fault in not having a mandatory policy enforced with respect to the disposal of waste. The three FGDs revealed a similar attitude. Manufacturers of plastics, supermarket companies and grocery stores seemed to be more concerned about the financial success of their businesses than about the threat to the natural environment. However, they expressed a willingness to comply with a mandatory government policy regarding the use of plastic bags and bottles if one were laid down. At present, however,

there is no national law regarding littering, although there is a by-law of the LCC and a campaign has been started to keep Lusaka clean.

The Land Ethic has emphasised that as “members and citizens” of the biotic community, humans are an inseparable component of the natural environment. In this case, the human inhabitants of Lusaka urban are obliged to act responsibly towards the environment. The irresponsible behaviour of humans with regard to the use and disposal of plastic bags can have a destructive effect on the environment and, in turn, on human health whether we are aware of it or not. An ethically right action, according to the Land Ethic, is one that encourages the “integrity, stability and beauty” of the natural environment whereas the irresponsible discarding of plastic bags is seen to contravene this principle. Consequently, the Land Ethic rejects the attitude of carelessly throwing away plastic bags by failing to express an awareness of the value of the natural environment and of the harm being done to it by such behaviour.

The theory of Environmental Virtue Ethics has emphasised the need for the development of environmental virtues such as care and respect for the natural environment. These are habits of care that result in the corresponding virtues when repeated on numerous occasions. Based on the interviews carried out in this study, the attitudes of those interviewed towards the natural environment manifests a lack of care for our natural surroundings. Whereas this may be due in some cases to a lack of knowledge or awareness regarding the harm that can be done to the environment through the irresponsible disposal of plastic waste, and plastic bags in particular, there is evidence to suggest that it is also due to the lack of the virtue of environmental care which is more than just a sense of caring but involves the responsible actions that should result from this virtue on most occasions.

Laws can help in the promotion of environmental virtues. The cross-section of public attitudes indicated the desire for a mandatory policy with regard to waste disposal in Zambia. A combination of legislation and the enhancement of ecological consciousness through both formal and informal education is likely to be the best way to lessen such an environmental problem. The general public has the responsibility of ensuring that they change their attitude towards the disposal of plastic waste. Education is a very powerful tool to address the issue of plastic wastes, especially when it is discussed in schools. Children not only can change habits with relative ease but they are also able to take their awareness into their families and into the wider community thereby working as catalysts for change. A first step in developing environmental virtues, therefore, is to generate a

strong awareness of the problem and greater respect for the natural environment. Informal education through the mass media can also be a powerful means for promoting responsible environmental behaviour.

## **6.2 Recommendations**

Arising from the findings of the study, there is a manifest need for a change in awareness and attitudes towards the use and disposal of plastic waste in general and with respect to plastic bags in particular. Environmental sanity could be achieved through the introduction of a levy on each plastic bag sold (except re-usable). To achieve this goal, the levy could be transferable (by law) to the consumer. In this way, it would be possible to bring about a change in consumer behaviour towards rational use and re-use of plastic bags. The levy could be collected from plastic manufacturers and importers. This would be necessary because direct collection from customers would be problematic as a sizable percentage of businesses are informal and most do not use the receipt system. A levy system has been successfully used in Ireland and in South Africa. The funds raised from a levy on plastics could be used for research and the development of alternative materials such as paper and cloth bags. Re-use could be facilitated by the availability of durable bags other than plastics, for example, traditional baskets. In addition, however, and even more importantly, the general public needs to be sensitised to the harm being done to the environment through the development of virtuous habits of caring for the environment. The formal (schools) and informal (newspapers, TV, etc.) media of education would have an important role to play in helping to develop such habits.

In view of the above, the following recommendations are accordingly made:

1. The government should enact a law that bans the use of plastic bags by introducing biodegradable materials or reintroducing paper bags. It should also put in place and enforce a mandatory policy with regard to littering in the streets in order to strengthen the Keep Lusaka Clean campaign and generate environmental virtues in shoppers and others.
2. ZEMA needs to intensify its efforts to increase the awareness of the general public through formal and informal education about the importance of generating greater respect for the natural environment and the key role that humans play in protecting and developing it.

3. Manufacturers, supermarkets and grocery store owners need to be held responsible for their behaviour with regard to the distribution and disposal of plastic waste, and of plastic bags in particular.

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## **APPENDICES**

### **Appendix I: Interview schedule for shoppers**

**The University of Zambia**

**School of Humanities and Social Sciences**

**Department of Philosophy and Applied Ethics**

Dear Respondent, I am Ntawugashira Jean Bosco, an MA student at the University of Zambia. As per academic requirement, I am conducting a study on awareness and attitudes towards disposable plastic materials on the environment in Lusaka urban.

You have been selected to participate in this study about awareness and attitudes towards disposable plastic waste on the environment in Lusaka Urban. The study is purely an academic exercise. Therefore, be assured that the information provided will be treated with utmost confidentiality. We thank you most sincerely for your corporation.

1. Do you care about the disposal of plastic waste in the environment?
2. Are you aware that plastic waste causes problems to the environment?
3. In your opinion, do plastic producing companies and the government take seriously their responsibilities towards plastic waste management in Lusaka?
4. Have you any knowledge about the manufacturing of plastic bags in Zambia?
5. Can you mention officially recognised sites in Lusaka urban where the disposal of plastic waste takes place?
6. Are there advantages in using plastic bags and bottles?
7. Are there disadvantages in using plastic bags and bottles?
8. Does your company have a policy regarding plastic waste?
9. If “no”, why not?
10. If “yes”, what does the policy state?
11. Do you think that the Lusaka City Council is responsible for managing plastic waste?
12. Do you think that there should be a mandatory policy in Zambia concerning the disposal of plastic waste?
13. Do you think it should be the responsibility of LCC to take care of plastic waste management?

**THANK YOU FOR YOUR TIME**

## **Appendix II: Interview schedule for supermarket and grocery store managers.**

**The University of Zambia**

**School of Humanities and Social Sciences**

**Department of Philosophy and Applied Ethics**

Dear Respondent, I am Ntawugashira Jean Bosco, an MA student at the University of Zambia. As per academic requirement, I am conducting a study on awareness and attitudes towards disposable plastic materials on the environment in Lusaka urban.

You have been selected to participate in the study. The study is purely an academic exercise. Therefore, be assured that the information provided will be treated with utmost confidentiality. I thank you most sincerely for your corporation.

1. Do you care about the disposal of plastic waste in the environment?
2. Are you aware that plastic waste causes problems to the environment?
3. In your opinion, do plastic producing companies and the government take seriously their responsibilities towards plastic waste management in Lusaka?
4. Have you any knowledge about the manufacturing of plastic bags in Zambia?
5. Can you mention officially recognised sites in Lusaka urban where the disposal of plastic waste takes place?
6. Are there advantages in using plastic bags and bottles?
7. Are there disadvantages in using plastic bags and bottles?
8. Does your company have a policy regarding plastic waste?
9. If “no”, why not?
10. If “yes”, what does the policy state?
11. Do you think that the Lusaka City Council is responsible for managing plastic waste?
12. Do you think that there should be a mandatory policy in Zambia concerning the disposal of plastic waste?

**THANK YOU FOR YOUR TIME**

## **Appendix III: Semi-structured interview question guide for street vendors**

### **INTRODUCTION**

1. Researcher's self-introduction.
2. Researcher informs interviewees of the purpose of the interview.
3. Researcher requests consent of interviewees.
4. Researcher assures interviewees of confidentiality and anonymity.
5. Researcher informs interviewees that their participation will not be used to disadvantage them in any way.

### **QUESTION GUIDE**

1. What do you understand by "environment"?
2. Why do people like using plastic bags and bottles?
3. What do you think can be the effects of these plastic materials on the environment?
4. What is your experience regarding these plastic bags and bottles in your home?
5. What problems do you encounter after using plastic bags and bottles?
6. What are some of the advantages of these plastic materials?
7. What are the disadvantages found in using plastic bags and bottles?
8. What should the government do about the disposal of plastic materials in regard to the environment?

## **Appendix IV: Interview schedule for LCC officials**

### **The University of Zambia**

#### **School of Humanities and Social Sciences**

#### **Department of Philosophy and Applied Ethics**

Dear Respondent, I am Ntawugashira Jean Bosco, an MA student at the University of Zambia. As per academic requirement, I am conducting a study on awareness and attitudes towards disposable plastic waste on the environment in Lusaka urban.

You have been selected to participate in the study. The study is purely an academic exercise. Therefore, be assured that the information provided will be treated with utmost confidentiality. We thank you most sincerely for your corporation.

1. Do you care about the disposal of plastic waste in the environment?
2. Are you aware that plastic waste causes problems to the environment?
3. In your opinion, do plastic producing companies and the government take seriously their responsibilities towards plastic waste management in Lusaka?
4. Have you any knowledge about the manufacturing of plastic bags in Zambia?
5. Can you mention officially recognised sites in Lusaka urban where the disposal of plastic waste takes place?
6. Are there advantages in using plastic bags and bottles?
7. Are there disadvantages in using plastic bags and bottles?
8. Does your company have a policy regarding plastic waste?
9. If “no”, why not?
10. If “yes”, what does the policy state?
11. Do you think that the Lusaka City Council is responsible for managing plastic waste?
12. Do you think that there should be a mandatory policy in Zambia concerning the disposal of plastic waste?
13. Do you think it should be the responsibility of LCC to take care of plastic waste management?

**THANK YOU FOR YOUR TIME**

## **Appendix V: Interview schedule for plastic manufacturers**

**The University of Zambia**

**School of Humanities and Social Sciences**

**Department of Philosophy and Applied Ethics**

Dear Respondent, I am Ntawugashira Jean Bosco, an MA student at the University of Zambia. As per academic requirement, I am conducting a study on awareness and attitudes towards disposable plastic materials on the environment in Lusaka Urban.

You have been selected to participate in the study. The study is purely an academic exercise. Therefore, be assured that the information provided will be treated with utmost confidentiality. We thank you most sincerely for your corporation.

1. Do you care about the disposal of plastic waste in the environment?
2. Are you aware that plastic waste causes problems to the environment?
3. In your opinion, do plastic producing companies and the government take seriously their responsibilities towards plastic waste management in Lusaka?
4. Have you any knowledge about the manufacturing of plastic bags in Zambia?
5. Can you mention officially recognised sites in Lusaka urban where the disposal of plastic waste takes place?
6. Are there advantages in using plastic bags and bottles?
7. Are there disadvantages in using plastic bags and bottles?
8. Does your company have a policy regarding plastic waste?
9. If “no”, why not?
10. If “yes”, what does the policy state?
11. Do you think that the Lusaka City Council is responsible for managing plastic waste?
12. Do you think that there should be a mandatory policy in Zambia concerning the disposal of plastic waste?
13. Do you think it should be the responsibility of LCC to take care of plastic waste management?

**THANK YOU FOR YOUR TIME**



## **Appendix VI: Interview schedule for ZEMA official**

**The University of Zambia**

**School of Humanities and Social Sciences**

**Department of Philosophy and Applied Ethics**

Dear Respondent, I am Ntawugashira Jean Bosco, an MA student at the University of Zambia. As per academic requirement, I am conducting a study on awareness and attitudes towards disposable plastic waste on the environment in Lusaka urban.

You have been selected to participate in the study. The study is purely an academic exercise. Therefore, be assured that the information provided will be treated with utmost confidentiality. We thank you most sincerely for your corporation.

1. Do you care about the disposal of plastic waste in the environment?
2. To what extent are plastic bags being manufactured in Zambia?
3. How seriously does ZEMA take its responsibilities towards plastic waste management in Lusaka?
4. Do you think that people in Lusaka care about the disposal of plastic waste in the environment?
5. Can you mention officially recognised sites in Lusaka urban where the disposal of plastic waste takes place?
6. Are there advantages in using plastic bags and bottles?
7. Are there disadvantages in using plastic bags and bottles?
8. Does ZEMA have a policy regarding plastic waste?
9. If “no”, why not?
10. If “yes”, what does the policy state?
11. Do you think that the Lusaka City Council is responsible for managing plastic waste?
12. Do you think that there should be a mandatory policy in Zambia concerning the disposal of plastic waste?
13. Do you think it should be the responsibility of LCC to take care of plastic waste management?

**THANK YOU FOR YOUR TIME**