

**ASSESSING CUSTOMER ATTITUDES TOWARDS ZERO WASTE SHOPPING**

**IN**

**NELSON MANDELA BAY**

by

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and

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**DECLARATION**

I, Megan Amy Brokensha and I, Storm Brandon Watson, declare that “Assessing customer attitudes towards zero waste shopping in Nelson Mandela Bay” is our own work, that all sources used or quoted have been identified and acknowledged by means of complete referencing, and that this study was not previously submitted by either one of us for a degree at another university.

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## ABSTRACT

South Africa is far behind developed nations when it comes to efficient waste management. Despite growing concerns for the natural environment and overall public health, waste levels in South Africa remain alarmingly high. It is clear that government alone can no longer deal with the issue of waste generation and the efficient management of waste. It is thus imperative that the private sector and individuals start assisting government in reducing waste levels. A solution that has been suggested to overcome the rising levels of waste in South Africa is the practice of zero waste shopping. However, limited research, particularly in Nelson Mandela Bay, has been conducted concerning consumer attitudes towards this concept. It is vital to understand whether consumers would adopt zero waste practices, and if so, how.

The purpose and primary objective of this study is to assess consumer attitudes towards zero waste shopping in Nelson Mandela Bay. In order to achieve this objective and many other secondary and methodological objectives, a quantitative research approach has been followed. A sample of 150 consumers within Nelson Mandela Bay was selected for the study through the use of convenience sampling. The measuring instrument, a structured self-administered questionnaire, was distributed to respondents within the designated population. Furthermore, the questionnaire assessed respondents' general perceptions regarding waste management and environmental sustainability as well as respondents' perceptions and practices regarding zero waste shopping.

The data obtained from the empirical study has been analysed through the use of descriptive statistics and reliability testing. The analysis of the data revealed that most consumers within Nelson Mandela Bay are aware of the negative impact that waste generation has on the environment and overall public health. Moreover, it was also found that respondents are aware of the concept of zero waste as well as its basic principles. However, despite the fact that respondents are knowledgeable about zero waste, it is clear that they do not engage in many zero waste shopping practices, while some do not even engage in any practices at all. The most significant finding with regards to zero waste shopping revealed that respondents are most likely to only partake in zero waste shopping practices if it is convenient and does not require much effort. Therefore, any zero waste shopping practice that is deemed to be inconvenient or perceived as troublesome will not be undertaken by respondents. The study thus illustrates that a significant shift in consumer attitudes and habits is needed in order for zero waste shopping to be adopted successfully.

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## CHAPTER ONE

### INTRODUCTION AND SCOPE OF THE STUDY

#### 1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

In any modern society, waste is the ultimate symbol of inefficiency and represents a total misallocation of resources (Zaman & Lehmann, 2013:123). In fact, waste generation is one of the greatest challenges facing society (Hou, Al-Tabbaa, Guthrie & Watanabe, 2012:2494). According to The World Bank (2018), by the year 2050, global waste will increase by 70 percent if action is not taken. Furthermore, over the next 30 years, global waste is expected to increase to 3.4 billion tonnes (The World Bank, 2018). In South Africa alone, an estimated one kilogram of waste is generated per day by each resident (Kaza, Yao, Bhada-Tata & Van Woerden, 2018:19). Therefore, it is important to reduce the levels of waste generation globally (Zaman & Lehmann, 2013:123).

According to Babayemi and Dauda (2009:83), waste is defined as a product of human activities which is regarded as being useless. The South African Waste Information Centre (2016) elaborates, explaining that waste is any substance, object or material that is unwanted and discarded, regardless of whether it can be reused, recycled or recovered. Waste can be classified into various categories, such as domestic waste, building waste, inert waste, business waste and hazardous waste (South African Waste Information Centre, 2016). Song, Li and Zeng (2015:199) assert that waste generation has excelled due to a continuous increase in the global population, booming economies, overall rise in community living standards and rapid urbanisation. Ferrara and Missios (2012:710) add that higher incomes and increased purchases of material goods are major contributors to waste generation across the globe.

In order to slow waste generation and prevent the depletion of global resources, a concept of sustainable consumption and living is required (Song *et al.*, 2015:199). The conceptualisation of zero waste is the most visionary idea for addressing global waste issues (Cole, Osmani, Quddus, Wheatley & Kay, 2014:65). According to Song *et al.* (2015:199), simply put, zero waste is a philosophy that supports the redesign of all resources' life cycles so that these resources can be reused. Zaman and Lehmann (2011:177) state that zero waste involves designing and managing materials, products and processes in such a way as to avoid and eliminate all waste, thus conserving and recovering every resource from waste streams. Cole

*et al.* (2014:64) add that the zero waste concept requires a significant behavioural change from customers, businesses and governments alike. Benefits of adopting the notion of zero waste range from the support of local, regional farmers to higher transparency along the supply chain and thus, better informed customers (Beitzen-Heineke, Balta-Ozkan & Reefke, 2017:1528).

In developing countries, waste and the management thereof are a major challenge due to the constant generation of waste and the burden posed on municipal budgets because of the high cost of waste management (Guerrero, Maas & Hogland, 2013:220). Despite this, many developing nations are seeking to address the waste issue with increasing urgency (Al-Khatib, Monou, Zahra, Shaheen & Kassinos, 2010:1131). Some of these countries are looking towards the zero waste hierarchy for guidance on how to reduce overall waste. According to the Zero Waste International Alliance (2015), the zero waste hierarchy provides guidance on how to achieve zero waste by describing a progression of policies and strategies, from highest to lowest use of materials, that supports the zero waste ideal. However, municipalities of developing nations face challenges in the adoption of zero waste such as lack of organisation, shortage of financial resources, inadequate support from businesses and consumers, and complexity (Guerrero *et al.*, 2013:220).

With regards to waste management and embracing the idea of zero waste, South Africa is said to be 20 to 30 years behind Europe and other developed nations (Godfrey & Oelofse, 2017:1). This is largely because approximately 90 percent of waste generated within South Africa is still being sent to landfills for disposal, with only the remaining 10 percent being reused or recycled (Stats SA, 2018). However, not everything is doom and gloom for South Africa as the number of people choosing to live a low waste or zero waste lifestyle is slowly on the rise. The zero waste concept has gained popularity in some of South Africa's largest urban cities, such as Cape Town, Johannesburg and Durban (Black, 2017). Several popular grocery chains in South Africa, like Food Lovers Market and Woolworths, are also embracing the zero waste concept (Black, 2015). Although South Africa has started its zero waste journey, Godfrey and Oelofse (2017:1) state that South Africa can still learn a lot from what other countries have implemented in terms of policy and technology and use this to improve.

This study will investigate the attitudes and perceptions that customers have with regards to zero waste and zero waste shopping in particular. This chapter will cover topics such as the problem statement, research objectives, definitions of key concepts, a brief literature overview,

research design and methodology, scope and demarcation of the study, contribution of the study, structure of the study, and finally, time frame of the study.

## **1.2 PROBLEM STATEMENT**

Dubihlela and Ngxukumeshe (2016:171) state that South African consumers have begun to realise the importance of environmental issues and the ensuing health problems that come with these issues. They have thus progressively become more open to solving issues regarding environmental protection and have also become sensitive to the use of environmentally friendly products, which has given rise to the debate of zero waste shopping. Dubihlela and Ngxukumeshe (2016:164) state that although organisations are being recognised for their efforts towards environmental sustainability (in terms of redesigning their products by ensuring that they are renewable, recyclable, reusable, ozone friendly and bio-degradable) limited research has been done on how consumer attitudes impact the concept of zero waste shopping in the South African context. It is thus important to investigate customer attitudes towards zero waste shopping in an attempt to understand how consumers currently perceive the concept of zero waste and how they are, or are not, working towards practising zero waste shopping. Furthermore, an investigation into consumer attitudes towards zero waste shopping could also assist firms in conceptualising how they should adapt their product offerings to encourage consumers to become environmentally conscious while simultaneously having their needs satisfied.

Matete (2009:6) indicates that the South African Department of Environmental Affairs and Tourism (DEAT) introduced the concepts of a waste hierarchy into environmental legislation in order to address the issue of unsustainable waste management systems in the country. Matete (2009:7) further explains that the legislation imposed by the DEAT has made progress in addressing the environmental issues associated with waste disposal by landfill. However, the legislation has made no significant contribution to the elimination of waste generation by households as it does not target waste generation by consumers explicitly (Matete, 2009:7). This is a major cause for concern as the GreenCape Market Intelligence Report (2018:1) specifies that in 2016, South Africa produced a total of 111 million tonnes of waste of which 75 percent was landfilled and 59 percent handled by local municipal waste management systems, thus highlighting the fact that South African consumers need to change their view on waste management.

There is a lack of research to assess customer attitudes towards zero waste shopping in NMB and it is thus not clear what the attitudes of customers residing in NMB are towards zero waste shopping. The GreenCape Market Intelligence Report (2018:13) indicates that the cost of landfill disposal in NMB is the eighth most expensive in the country, amounting to a total 117 rand per tonne of waste, excluding value-added tax. These statistics indicate the importance of investigating how consumer attitudes influence their perceptions of zero waste shopping. A study of this nature could assist in recommending to firms on how they can adapt their product or service offerings to enhance environmental sustainability and assist in educating consumers on waste management practices.

### **1.3 RESEARCH OBJECTIVES AND QUESTIONS**

In this section, the purpose of the study as well as the objectives that this study aims to achieve will be discussed. The objectives of this study include the primary objective, secondary objectives and methodological objectives. Research questions will also be listed.

#### **1.3.1 PRIMARY RESEARCH OBJECTIVE**

The primary objective of this study is to determine customer attitudes towards zero waste shopping in NMB.

#### **1.3.2 SECONDARY RESEARCH OBJECTIVES**

In order to achieve the primary objective, the following secondary objectives need to be addressed:

- SO<sup>1</sup>: To investigate how zero waste management is practised in NMB.
- SO<sup>2</sup>: To identify the factors that influence customers' attitudes towards zero waste shopping.
- SO<sup>3</sup>: To investigate the benefits of zero waste shopping for all stakeholders involved.
- SO<sup>4</sup>: To empirically assess the level of awareness and practices of individuals towards zero waste shopping.
- SO<sup>5</sup>: To provide firms with effective guidelines on how to adopt zero waste management as a business philosophy in their supply chain.

#### **1.3.3 METHODOLOGICAL RESEARCH OBJECTIVES**

In order to achieve the primary and secondary objectives, the following methodological objectives have been identified:

MO<sup>1</sup>: To undertake a theoretical investigation of customers' attitudes towards zero waste shopping.

MO<sup>2</sup>: To determine the appropriate research methodology to address the identified research problem and research objectives.

MO<sup>3</sup>: To develop an appropriate measuring instrument that will be used to conduct the study's empirical investigation.

MO<sup>4</sup>: To source primary data from a pre-determined sample of consumers in NMB.

MO<sup>5</sup>: To provide conclusions and recommendations to consumers and firms based on the findings of this research.

#### 1.3.4 RESEARCH QUESTIONS

- What are consumers' attitudes towards zero waste shopping?
- What are practices implemented by firms to promote zero waste shopping?
- What are potential obstacles to zero waste shopping?
- What are the benefits associated with zero waste shopping?
- What additional measures can organisations and individuals themselves take to promote zero waste shopping?

### 1.4 DEFINITIONS OF KEY CONCEPTS

With the study focusing on the nature of customer attitudes towards zero waste shopping, clear definitions of key terms related to the study will follow.

#### 1.4.1 WASTE

According to the South African Waste Information Centre (2016), waste is any object or material that is unwanted, abandoned, disposed or discarded of by the holder thereof, regardless of whether the object or material can be reused or recycled. Oelofse and Godfrey (2008:244) concur, stating that waste is any material, liquid, solid or gas that is unvalued, unwanted and thus, discarded. Furthermore, waste can be categorised as solid, liquid, organic, agricultural, recyclable or bio-medical (Duggal, 2017). For the purpose of this study, waste is regarded as any material or object, no matter its nature, which people dispose of, regardless of whether it can be recycled or reused.

#### 1.4.2 ZERO WASTE

Zero waste is an ideology that strives to encourage the creation of goods that are designed in such a way that they can be recycled or repurposed (Alfred, 2016:6). As set out by Song *et al.* (2015:199), zero waste entails redesigning a product's entire life cycle to ensure that it can be recycled and avoid landfills. In addition to this, zero waste seeks to create a circular economy in which unwanted materials avoid landfill disposal and instead become the raw materials for new products (Alfred, 2016:6).

#### 1.4.3 ZERO WASTE SHOPPING

Good (2015) explains that zero waste shopping is concerned with the elimination of all unnecessary waste during an individual's shopping trip. Pujol-Mazzini (2017) adds that zero waste shopping is ultimately a form of waste prevention practiced by consumers. Therefore, zero waste shopping is the ultimate form of sustainable shopping (Good, 2015).

#### 1.4.4 ZERO WASTE MANAGEMENT

According to Madubula and Makinta (2014:204), zero waste management strategies are put in place to minimise waste generation, maximise waste reuse and recycling, as well as ensure the environmentally safe disposal of waste. Additionally, zero waste management entails the treatment of waste to make it less hazardous or harmful to the environment and seeks to avoid landfill disposal at all costs (Oelofse & Godfrey, 2008:242).

#### 1.4.5 RECYCLING

Recycling has become an important form of waste reduction as the costs of the disposal of waste are on the rise and the space for landfills is decreasing (Al-Salem, Lettieri & Baeyens, 2009:2626). According to Banerjee (2015:53), recycling can be defined as the process whereby one aims to prevent the waste of potentially useful resources by recovering, reprocessing and converting discarded consumer products that would have ultimately ended up in landfill sites into potentially useful resources.

#### 1.4.6 REUSING

Mohanty (2011:2) simply defines reusing as the repeated use of an item. Reusing is a term closely linked with recycling and stems from the assumption that materials that flow through our lives can be regarded as resourceful rather than refuse (Abdul-Rahman, 2014:3).

#### 1.4.7 GREEN SUPPLY CHAIN MANAGEMENT

Supply chain management encompasses the planning and management of all activities related to the flow and transformation of goods from raw materials through to the end user. These activities include sourcing, procurement, logistics management and conversion (Badenhorst-Weiss, Cilliers, Dlamini & Ambe, 2018:5; Rao, 2002:633). Green supply chain management is successfully implemented when organisations integrate ideas related to environmental management, such as zero waste, life cycle assessment, collaboration with suppliers for green product designs and employee empowerment, into their supply chain (Rao, 2002:632).

#### 1.4.8 CUSTOMER ATTITUDES

According to Khandelwal and Bajpai (2013:86) customer attitudes can be defined as the tendency of customers to respond to a situation in a consistent manner, whether it be positive or negative. For the purpose of this study, customer attitudes will be regarded as the composite of a consumer's behavioural intentions towards the topic of zero waste shopping as outlined by Perner (2018).

### 1.5 LITERATURE REVIEW

The following section will provide a brief overview of some topics covered in the study's literature review.

#### 1.5.1 THE CONCEPT OF ZERO WASTE

Strategies employed by both businesses and consumers who wish to be more environmentally friendly must have the principal aim of waste prevention (Bautista-Lazo & Short, 2013:144). The avoidance of waste or the prevention thereof is a better alternative to attempting to eliminate waste that already exists (Bautista-Lazo & Short, 2013:141). According to Lehmann (2011:158), waste avoidance must be given the ultimate priority for those wanting to reduce their carbon footprint, followed by recycling, reusing and then only landfilling or incineration. An approach that has been suggested as a means of achieving waste avoidance or prevention, thus addressing the concerns of increased global waste, is the concept of zero waste (Phillips, Tudor, Bird & Bates, 2011:335).

As set out by Veleva, Bodkin and Todorova (2017:518), zero waste can be defined as an approach of waste avoidance achieved through recapturing resources from waste streams, reducing overall consumption and reconsidering products' life cycles. Phillips *et al.* (2011:336) add that zero waste exemplifies the ultimate aim of reducing society's impact on

the environment and thus seeks to avoid waste generation at all costs. The concept of zero waste supports the development of a circular economy in which used and unwanted materials become the raw materials for a new product instead of being disposed of in landfills or incinerators (Alfred, 2016:6).

The issue of waste generation has been a problem for years but in recent years the idea of zero waste has emerged as a promising way to look at waste in a new light (Lehmann, 2011:157; Zaman, 2014:683). Instead of having the traditional outlook on waste as something that must be disposed of, the zero waste concept has led to the identification of waste as a valuable resource (Lehmann, 2011:157). Waste must consequently be recovered, gathered, sorted, managed and developed (Zaman, 2014:683).

The key to a successful zero waste strategy is a change in behaviour and lifestyles as well as a shift in attitudes to reduce overall consumption (Lehmann, 2011:165). Phillips *et al.* (2011:335) adds to this, stating that a major key success factor is diligent planning and the utilisation of a range of skills relevant to waste avoidance. Additionally, the reduction of wasteful consumption and the changing of attitudes and behaviour also assist in the implementation of zero waste. A zero waste hierarchy has been created to indicate best practice with regards to zero waste and indicates the worst use of materials to the best use of materials (Zero Waste International Alliance, 2015). Therefore, implementing the zero waste concept is about recognising the true cost of waste with the ideal of having nothing to salvage (Bautista-Lazo & Short, 2013:142).

A way in which individual consumers have made zero waste a part of their daily routines is through zero waste shopping. According to Guarany (2018), zero waste shopping entails the elimination of plastic in the form of packaging, the purchase of products that are sourced locally and purchasing only what is needed in order to prevent unnecessary waste. Individuals engaging in zero waste practices also seek to purchase products that have been made out of waste and are durable alternatives to typical disposable products (Pujol-Mazzini, 2017).

### 1.5.2 BENEFITS AND CHALLENGES OF ZERO WASTE SHOPPING

The consumption of resources over the last few decades have increased dramatically (Singh, Laurenti, Sinha & Frostell, 2014:800). This increase in resource consumption can be attributed to increased globalisation, urbanisation, rapid economic growth and a growing global population, which in turn, has resulted in substantial amounts of waste (Singh *et al.*, 2014:800). Gutberlet (2016:55) adds that waste has come about from ongoing human activities in the

pursuit of unlimited economic growth. More recently, waste has been recognised as a global issue that has had alarming effects on our environment (Singh *et al.*, 2014:800). According to Bandara and Hettiaratchi (2010:108), waste has led to countless environmental and social issues.

Pietzsch, Riberio and de Medeiros (2017:327) identify financial benefits, environmental benefits and benefits to the community as the three most important benefits of zero waste shopping. Abdullahi (2017) states that zero waste shopping results in financial and economic benefits as less waste is generated through the shopping process and thus less is spent on the disposal of waste. Lehmann (2011:165) explains that another financial benefit is obtained through the more efficient use of resources, as resources are made to last much longer than what they currently do.

Zero waste shopping also results in benefits for the environment such as the reduction of waste and its negative impact on the natural environment, reduction in resource extraction and decreased levels of energy consumption (Gutberlet, 2016:55). In fact, zero waste, if implemented properly, avoids waste generation in the first place (Lehmann, 2011:164).

The third major benefit of zero waste is associated with communities at large. Individuals within a community who change their lifestyles and consumption patterns to be in line with the zero waste concept have the ability to influence others to commit to the zero waste movement (Pietzsch *et al.*, 2017:327). Moreover, practising a zero waste lifestyle significantly reduces the risk to overall public health (Bandara & Hettiaratchi, 2010:109).

Although there are many benefits associated with the zero waste movement and zero waste shopping, there are, however, challenges as well. The most important challenge that will have to be overcome is the resistance by individuals to change their behaviour (Pietzsch *et al.*, 2017:328). Lehmann (2011:165) explains that many consumers only think about consumption in the short term which only adds to their resistance to behavioural change. Individuals need to change their old habits and form new ones by understanding that their behaviour today will affect future generations to come (Gutberlet, 2016:60).

### 1.5.3 CUSTOMER ATTITUDES TOWARDS ZERO WASTE SHOPPING AND THE THEORY OF PLANNED BEHAVIOUR

Customer attitudes can be defined as a combination of an individual's beliefs, feelings and behavioural intentions toward a concept or idea (Akroush & Al-beDei, 2015:1355). Measuring

and analysing human behaviour has forever been a complex dilemma for various academics to conceptualise (Ajzen, 1991:179). There are various factors that affect a customer's attitudes towards the concept of zero waste shopping and to further explore the influence of these factors, a theoretical framework for systematically identifying the determinants of zero waste management behaviour is required (Tonglet, Phillips & Read, 2004:197). The most applicable theoretical framework that can serve as a basis for analysing customer attitudes towards zero waste shopping can be provided by making use of the theory of planned behaviour, developed by Icek Ajzen in 1985.

The theory of planned behaviour has been used by various academics since its inception in 1985 and is found to be well supported by empirical evidence. Furthermore, the theory hypothesises that consumer behaviour can be accurately predicted by assessing the individual's attitudes towards the behaviour, subjective norms and perceived behavioural control (Ajzen 1991:179).

Most importantly, the theory of planned behaviour can be used to thoroughly examine the aspects that influence behavioural choices in relation to zero waste shopping. This theory relies on the assumption that individuals behave rationally, in the sense that they consider the implications of their actions when making various purchasing decisions. This theory has been successfully applied to a range of diverse areas such as leisure choice, investment decisions and has even been linked to studies on dishonest actions. (Tonglet *et al.*, 2004:197).

The reason why it of utmost importance to establish a framework for determining consumer behaviour is that in recent years it can be noted that organisations have put in a considerable amount of effort in reducing their negative effects on the environment by integrating environmental sustainability into their overall strategic mission (Dubihlela & Ngxukumeshe, 2016:164). However, there is a lack of literature on understanding how consumers behave when making purchases regarding products that incorporate environmental sustainability in relation to factors such as quality, price and effort on the behalf of the consumer and has thus made it difficult to systematically identify the behaviours of individual customers (Dubihlela & Ngxukumeshe, 2016:164; Tonglet *et al.*, 2004:197).

By correctly applying the theory of planned behaviour, firms can modify their various business approaches, such as marketing and production, to entice consumers to be more environmentally conscious and willing to adopt the concept of zero waste shopping to a larger scale, thus making

the sustainability efforts of the firm more of a distinctive competence rather than merely a philanthropic activity that serves only as a positive public relations activity.

#### 1.5.4 SUPPLY CHAIN AND WASTE MANAGEMENT STRATEGIES

The traditional supply chain can be defined as the integrated manufacturing process wherein raw materials are converted into final consumer goods and then delivered to end users. Supply chain management can thus be conceptualised as the planning and management of all activities directly and indirectly involved in this process (Badenhorst-Weiss *et al.*, 2018:5; Benita, 1999:336).

Firms have been pressured by various legislation and consumer groups regarding their efforts relating to minimising waste and how they aim to reduce and improve the negative ecological impacts that firms have caused over the past few decades (Ojo, Mbohwa & Akinlabi, 2013:315). As a result of these pressures, firms have adopted what academics term “green supply chain management” and is defined by Badenhorst-Weiss *et al.* (2018:105) as the integration of environmental thinking into supply chain management activities.

Large and Thomsen (2011:177) indicate that there are various methods and strategies firms can use to integrate environmental thinking into their supply chain, including:

- Procuring packaging material that can more easily be reused and recycled.
- Partaking in the research and design phase of products and making valuable suggestions for alternative sources of supply.
- Collaborating with upstream and downstream members of the supply chain, enticing them to commit to waste reduction goals.
- Selecting and evaluating suppliers based on their environmental performance.

Other strategies identified by Badenhorst-Weiss *et al.* (2018:165) could consist of implementing inventory management systems, redesigning materials flow activities, and/or implementing quality control systems.

The most well-known and widely used quality control system today is that of Total Quality Management (TQM). Various literature sources suggest that firms need to integrate TQM into their supply chain (Chang, 2009:82; Fernandes, Sampaio & Carvalho, 2014:773; Talib, Rahman & Qureshi, 2010:268). TQM is more than a system but a management philosophy that can be implemented throughout the entire supply chain and has shown evidence that the adoption thereof can improve business performance, customer satisfaction and employee

motivation (Fernandes *et al.*, 2014:775). The successful implementation of TQM in the firm's supply chain can ensure that all participants, including consumers, are aware and actively participate in the sustainability goals of the firm.

## **1.6 RESEARCH DESIGN AND METHODOLOGY**

The research design and methodology consist of the research paradigm, research approach, population, sample, data collection, questionnaire design, pilot study, data analysis, and reliability and validity of the measuring instrument. Each element of the research design and methodology will be briefly defined. A more detailed illustration of the research design and methodology will be outlined in Chapter Three of this study.

### **1.6.1 RESEARCH DESIGN**

Research design is a plan used to guide a research process by mapping out how a study will progress from its purpose and objectives to its outcomes (Abutabenjeh & Jaradat, 2018:238). Furthermore, Bhat (2019) explains that research design is a framework of research methods and techniques that are chosen by the researcher to combine various elements of research in a logical manner so that an outcome can be obtained for the research problem. Selecting the appropriate research design is the most important decision made in the research process (Abutabenjeh & Jaradat, 2018:237).

### **1.6.2 RESEARCH PARADIGM**

According to Antwi and Kasim (2015:218), a research paradigm is a pattern, structure and framework used to organise ideas, values and assumptions. There are several research paradigms that exist, some are of a qualitative nature while others are of a quantitative nature (Davies & Fisher, 2018:21).

Qualitative research entails the collection of information on various variables over a period of time in order to gain insights into a particular research problem. Qualitative research does not produce results that have been found through statistical procedures. On the other hand, quantitative research seeks to explain a situation using numerical data that has been analysed through statistical methods. (Yilmaz, 2013:311).

Antwi and Kasim (2015:218) explain that an interpretive paradigm is used when conducting qualitative research as it is characterised by observation and interpretation, thus collecting information about situations, then interpreting the information to make meaningful deductions.

Conducting quantitative research will require researchers to make use of a positivist paradigm which is experimental in nature and tests theories using numerical data (Davies & Fisher, 2018:21).

This study will make use of a quantitative research methodology and therefore use a positivist research paradigm. The quantitative research methodology will consist of assessing the attitudes and practices of customers in the NMB area with regards to zero waste shopping.

### 1.6.3 RESEARCH APPROACH

As set out by Chetty (2016), a research approach is a plan and strategy for research that consists of the steps that need to be taken in the collection, analysis and interpretation of data and information gathered throughout the research process. Moreover, the research approach can be divided into two categories, namely: data collection which can be qualitative or quantitative; and data analysis which can be exploratory or descriptive (Chetty, 2016).

Exploratory research and data analysis are a primary avenue of qualitative research and aim to provide a better understanding of something, often done through the use of focus groups and open-ended response surveys (McNiell, 2019). Alternatively, descriptive research attempts to describe, explain or validate characteristics or behaviour of individuals (McNiell, 2018). Therefore, descriptive research is concerned with describing what exists (Posinasetti, 2014) and is often conducted with the use of quantitative surveys and observations (McNiell, 2018).

This study will therefore make use of a descriptive research approach and analysis to acquire the relevant data that will assist researchers in determining the attitudes and practices of consumers towards zero waste shopping in NMB.

### 1.6.4 POPULATION

In research, the term “population” refers to all items or people in the category of what is being researched (Denscombe, 2014:21). In this study, the research population will consist of all consumers in NMB. However, the researchers are unable to access every single consumer in NMB and therefore a sample will be selected from the population.

### 1.6.5 SAMPLE

A sample is a subset of the research population and the process of selecting a sample is referred to as “sampling” (Taherdoost, 2016:20). There are two types of sampling, namely probability sampling and non-probability sampling (Singh, 2018). Probability sampling implies that every

single person within the population stands an equal chance of being selected as part of the sample (Cherry, 2018). The types of probability sampling include simple random sampling, stratified random sampling, and cluster sampling (Adwok, 2015:96). On the other hand, non-probability sampling involves the selection of participants in such a way that each individual within the population will not have an equal chance of being selected for the sample group (Singh, 2018). The types of non-probability sampling include convenience sampling, purposive sampling, quota sampling, and snowball sampling (Cherry, 2018).

This study will make use of non-probability sampling and, more specifically, convenience sampling as individuals will be selected purely based on their availability and willingness to participate. Furthermore, the sample size of this study will consist of 150 consumers who reside in NMB.

#### 1.6.6 DATA COLLECTION

To address all research objectives set out for this study, the research will be divided into two categories, namely primary and secondary research.

Primary research entails the collection of data for the specific research problem at hand (Hox & Boeijie, 2005:593). As explained in section 1.6.2, this study will be quantitative in nature. A large sample will be required, resulting in the use of a survey whereby a structured questionnaire will be used to collect data. This data will in turn be statistically analysed and interpreted to solve the research problem posed. Therefore, the self-administered questionnaire handed to several NMB residents will be the source of primary data for this study.

Secondary research is data that was originally collected for a different purpose and is reused for another research problem (Hox & Boeijie, 2005:593). Sources of secondary data can range from annual reports, journal articles and government publications to reputable internet sources (Struwig & Stead, 2013:82). For this study, secondary research will be obtained by accessing the library facilities at Nelson Mandela University (NMU) in addition to a number of databases such as Emerald, Jstor, Sage and ResearchGate just to name a few.

#### 1.6.7 RESEARCH MEASURING INSTRUMENT: QUESTIONNAIRE DESIGN

The items contained within this study's measuring instrument, namely the questionnaire, will be sourced from existing measuring instruments which have been used in similar research to the study that will be conducted. The questionnaire will also be developed based on the

literature review conducted. The reliability and validity of the measuring instrument referred to will be confirmed.

The questionnaire administered to respondents will require them to evaluate their responses using a five point Likert scale as well as a dichotomous scale. The questionnaire will be accompanied by a cover letter highlighting the research topic, objectives of the research study, promise confidentiality and, finally, provide instructions for the completion of the questionnaire. Furthermore, the questionnaire will be developed according to the requirements of the study and consist of four sections:

- Section A will determine respondents' general perceptions regarding waste management and environmental sustainability.
- Section B will investigate consumers' general attitudes towards zero waste shopping.
- Section C of the questionnaire will investigate practices of individuals regarding zero waste.
- Section D will focus on the biographical information of respondents.

#### 1.6.8 PILOT STUDY

According to Arain, Campbell, Cooper and Lancaster (2010:1) a pilot study is a small, preliminary study conducted to help the design and test the feasibility of a study that will be used on a larger scale. In this research study, a pilot study will first be conducted by distributing questionnaires among 10 potential respondents. This is done to determine whether the questionnaire is adequate to be used on a larger scale.

#### 1.6.9 DATA ANALYSIS

Sridhar (2018) explains that data analysis is the process of evaluating data collected using analytical and statistical tools. This is done to discover useful information and aids in the formulation of conclusions and future recommendations (Sridhar, 2018). For the purpose of the study to be conducted, the primary data collected from the administered questionnaires will be captured using Microsoft Excel. Data will then be analysed using Statistica, a statistical and analytical computer programme. Furthermore, the data analysis techniques used within this study will be descriptive, analysing the mean, median, mode and standard deviation of the data collected.

#### 1.6.10 VALIDITY AND RELIABILITY OF THE MEASURING INSTRUMENT

Validity in the context of a research study can be described as the accuracy with which the findings reflect the data (Noble & Smith, 2015:2). Drost (2011:106) states that reliability is the extent to which a measuring instrument is repeatable when different people perform the measurements under different conditions. Validity and reliability will be ensured in this study by making use of a pilot study as well as consulting numerous experts for their opinions and basing it on the literature review to be conducted.

More specifically, face and content validity will be considered. Face validity is concerned with whether the measuring instrument appears valid to respondents and is thus designed to meet the specified objectives of the study (Krabbe, 2017:115). Therefore, the questionnaire will indicate the objectives of the study to respondents and will only seek to obtain the necessary information. On the other hand, content validity questions whether the measuring instrument is really measuring what it is intended to measure (Brod, Tesler & Christensen, 2009:1263). This will be ensured by referring to the literature review conducted as well as academic experts when constructing the questionnaire.

Cronbach's alpha coefficient will be used as an objective measure of the study's reliability. Tavakol and Dennick (2011:53) explain that Cronbach's alpha coefficient provides a measure of the internal consistency of a test or scale and is expressed as a number between zero and one. Measuring internal consistency is important because it defines the extent to which items in the measuring instrument measure the same concept and is therefore linked to the inter-relatedness of the items within the measuring instrument (Tavakol & Dennick, 2011:53).

### 1.7 ETHICS

In accordance with NMU's policies, this study will be conducted in an ethical manner. In order to ensure that the study will comply with all of the institution's ethical requirements, an Ethics Form E will be obtained from the Department of Business Management. Measures will also be taken to ensure that the contributions of respondents will be kept confidential and this will be communicated to respondents on the cover letter of the measuring instrument. Respondents will also be made aware that they have no obligation to take place in the study and that they have the right to withdraw their contributions during any time of the study.

## **1.8 SCOPE AND DEMARCATION OF THE STUDY**

As set out in the introduction and background to this study as well as the problem statement, it is evident that the rate at which waste is generated and the way in which it is subsequently handled is not acceptable or sustainable anymore. However, it has also been explained that the adoption of zero waste shopping by consumers can significantly reverse this problem and thus have a positive impact on the environment at large. Consumers' attitudes regarding zero waste shopping will essentially determine its rate of adoption and ensuing success.

Given the importance of consumers' attitudes towards zero waste shopping, this study will focus primarily on the attitudes and practices of consumers with regards to zero waste shopping in NMB. As it is most convenient for the researchers, the empirical study will be targeted at consumers from the NMB area in South Africa, which includes Port Elizabeth, Despatch and Uitenhage. Furthermore, the demographic information pertaining to respondents is limited to age, education, gender, occupation and living area. The empirical study will assess customers' attitudes towards and practices of zero waste shopping.

## **1.9 CONTRIBUTION OF THE STUDY**

Since preceding research has primarily focused on how firms integrate sustainability and promote environmentally friendly practices, the body of knowledge pertaining to attitudes of customers towards zero waste shopping is largely unexplored (Dubihlela & Ngxukumeshe, 2016:164; Tonglet *et al.*, 2004:197). This study aims to add value and expand on the limited body of knowledge that currently exists regarding customer attitudes towards zero waste shopping. Given the fact that consumers play an enormous role in creating overall environmental sustainability, this study offers great potential to organisations to integrate consumer behaviour into their sustainably strategies to improve its effectiveness. Furthermore, this study aims to provide greater insight into how firms can redesign their supply chains to ensure sustainability is practised by both its upstream and downstream members.

## **1.10 STRUCTURE OF THE STUDY**

This section will identify what each chapter of the study will entail. The structure of the study will be divided into five chapters as follows:

- Chapter One is the introductory chapter of this study and thus provides a detailed introduction and background of the topic under investigation. This is followed by a problem statement and several research objectives. Moreover, a list of research

questions has been posed and thereafter, the proposed research design and methodology. Finally, the demarcation of the study, the division of chapters and the time frame of the study is set out.

- Chapter Two will provide a literature review of the topic at hand. This literature review will include an overview of the zero waste concept and the history of zero waste shopping and waste management. Furthermore, it will include theory on planned behaviour, the concept of a circular economy, benefits and challenges of zero waste shopping, zero waste shopping practices, consumers' attitudes towards zero waste shopping, and the adoption of zero waste shopping in South Africa. Finally, the literature review will focus on supply chain and waste management strategies.
- Chapter Three will focus on the research design and methodology to be implemented in this study. It will elaborate on the sample of this study, data collection and data analysis.
- Chapter Four will provide the empirical results of this study. The research findings and outcomes relating to reliability and validity will also be presented.
- Chapter Five will conclude the study, firstly providing a brief overview of the preceding chapters. It will, based on the findings of the literature review and the empirical investigation, draw conclusions on the study. This will be followed with recommendations for, contributions to and limitations of the study.

### 1.11 STUDY TIME FRAME

The study will follow the time frame set out in Table 1.1.

**Table 1.1: Time frame of the study**

Activity	Date
Development of the research proposal	8 April 2019
Ethical clearance for the study	15 April 2019
Literature review	6 May 2019
Proposed research design	27 May 2019
Development of questionnaire	1 June 2019
Collection of empirical data	18 June 2019
Analysis of empirical data	5 August 2019
Conclusion and recommendations of results	9 September 2019
Submission of the final study	28 October 2019

This time frame will guide the researchers and assist with time management of the study.

## **1.12 CHAPTER SUMMARY**

This chapter puts forth an overview of the proposed study to be conducted. An introduction to the topic has been provided, which identifies the need for conducting a study on consumer attitudes towards zero waste shopping in NMB. Waste generation is increasing at an alarming rate and is consequently having devastating effects on the environment. Consumers play a major role in adding to the amount of waste generated, as most engage in a take-make-consume-dispose mentality. Therefore, in this regard, it is necessary to investigate how consumers feel about zero waste shopping, a waste mitigating measure that has the potential to not just dramatically reduce the amount of waste, but potentially eliminate it all in one.

The study will be guided by the primary objective as well as secondary and methodological objectives that have been proposed. Moreover, the research design and methodology has briefly been discussed, comprising of the research paradigm and approach to be used as well as the population and sample of the study. Additionally, methods of data collection and the study's research instrument have also been elaborated on.

This chapter concludes with an outlined structure of the chapters to come. Furthermore, a time frame of the study has also been provided.

The next chapter, Chapter Two, will provide a detailed literature review that will cover a number of matters associated with the study's topic.

## **CHAPTER TWO**

### **A THEORETICAL OVERVIEW OF ZERO WASTE AND ZERO WASTE SHOPPING**

#### **2.1 INTRODUCTION**

The preceding chapter (Chapter One) provided a detailed introduction to the background of the study. The chapter highlighted the significance of effective waste management systems and itemised the importance of changing consumer perspectives regarding waste in order to address the issue of waste generation in South Africa.

The primary objective of this study is to determine customer attitudes towards zero waste shopping in NMB. In order to achieve the primary objectives, various secondary objectives need to be addressed, as outlined by Chapter One. These secondary objectives will thus be addressed in this chapter.

The issue of waste generation has been an age-old dilemma. However, with the emergence of the topic of zero waste and zero waste management, academics and researchers have been given a promising outlook on waste (Lehmann, 2011:157). Models and frameworks such as the circular economy, the zero waste hierarchy and the theory of planned behaviour are some of the most popular amongst academics and as such need to be integrated into the discussion of zero waste shopping. There are various models and frameworks that act as a base for firms to build and create their waste management systems, thus enabling them to do their part in mitigating waste from landfills and ensuring that their products are ecologically friendly at every stage of its life cycle.

In South Africa, waste management systems and facilities have always been two to three decades behind those of developed nations (Godfrey & Oelofse, 2017:1). These inefficient waste management systems and facilities are compounded by various drivers of waste generation in South Africa, including increases in the population, urbanisation, income levels, globalisation and economic growth as outlined by the Department of Environmental Affairs (2018:6).

The topic of zero waste management would not be complete without making sufficient reference to the issue of food waste. As noted by Nahman and De Lange (2013:2494), 50 percent of all food produced for human consumption, including both pre- and post-consumer production, is wasted throughout the entire food supply chain. This is a major cause for concern

as food consumption is the type of domestic waste with the largest environmental impact (Wieser, 2014:1).

## **2.2 THE CONCEPT OF ZERO WASTE**

Strategies employed by both businesses and consumers who wish to be more environmentally friendly must have the principal aim of waste prevention (Bautista-Lazo & Short, 2013:144). The avoidance of waste or the prevention thereof is a better alternative to attempting to eliminate waste that already exists (Bautista-Lazo & Short, 2013:141). According to Lehmann (2011:158), waste avoidance must be given the ultimate priority for those wanting to reduce their carbon footprint, followed by recycling, reusing and then only landfilling or incineration. An approach that has been suggested as a means of achieving waste avoidance or prevention, thus addressing the concerns of increased global waste, is the concept of zero waste (Phillips *et al.*, 2011:335).

As set out by Veleva *et al.* (2017:518), zero waste can be defined as an approach of waste avoidance achieved through recapturing resources from waste streams, reducing overall consumption and reconsidering products' life cycles. Phillips *et al.* (2011:336) add that zero waste exemplifies the ultimate aim of reducing society's impact on the environment and thus seeks to avoid waste generation at all costs through recovering value from and conserving existing resources. The concept of zero waste supports the development of a circular economy in which used and unwanted materials become the raw materials for a new product instead of being disposed of in landfills or incinerators (Alfred, 2016:6). Therefore, the ultimate goal of the zero waste concept is to avoid unnecessary generation of waste and ensure the reuse or recycling of all waste that is produced (Phillips *et al.*, 2011:337).

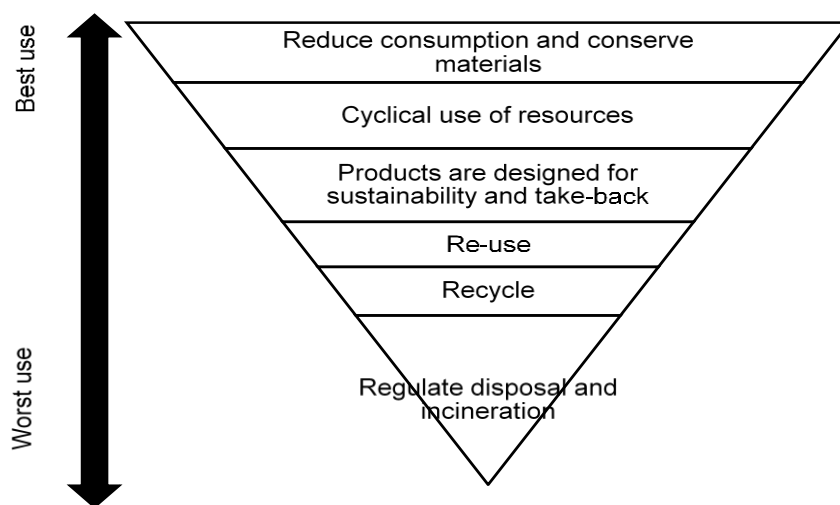
The issue of waste generation has been a problem for ages but in recent years the idea of zero waste has emerged as a promising way to look at waste in a new light (Lehmann, 2011:157; Zaman, 2014:683). Instead of having the traditional outlook on waste as something that must be disposed of, the zero waste concept has led to the identification of waste as a valuable resource (Lehmann, 2011:157). Waste must consequently be recovered, gathered, sorted, managed and developed. Moreover, Zaman (2014:683) explains that the practice of zero waste ensures that products that are discarded can be recovered and easily reused and repaired, therefore extending the product's lifespan. Hence the zero waste concept eliminates the end-of-life phase of most products and ensures that resources are used in the best way possible with a minimal environmental impact (Zaman, 2014:683).

The key to a successful zero waste strategy is a change in behaviour and lifestyles as well as a shift in attitudes to reduce overall consumption (Lehmann, 2011:165). Phillips *et al.* (2011:335) continues, stating that a major key success factor is diligent planning and the utilisation of a range of skills relevant to waste avoidance. Adherence with the pillars of zero waste will also ensure successful implementation of the concept. According to Alfred (2016:24) the pillars of zero waste include:

- committing to zero waste by setting targets that provide accountability and a way of measuring success;
- accessing tools that help the reduction, reuse and recycling of materials;
- introducing educational programmes about zero waste at all levels of schooling; and
- partnering with others and continuing to learn.

These keys to success and zero waste pillars can aid in the implementation of zero waste. Lehmann (2011:155) states that the simplest way to implement zero waste in one's everyday life is by avoiding the creation of waste in the first place. Additionally, the reduction of wasteful consumption and the changing of attitudes and behaviour also assist in the implementation of zero waste. A zero waste hierarchy, as depicted in Figure 2.1, has been created to indicate best practice with regards to zero waste and indicates the worst use of materials to the best use of materials (Zero Waste International Alliance, 2015). Therefore, implementing the zero waste concept is about recognising the true cost of waste with the ideal of having nothing to salvage (Bautista-Lazo & Short, 2013:142).

**Figure 2.1 The zero waste hierarchy**



(Source: Zero Waste International Alliance, 2015)

A way in which individual consumers have made zero waste as a part of their daily routines is through zero waste shopping. According to Guarany (2018), zero waste shopping entails the elimination of plastic in the form of packaging, the purchase of products that are sourced locally, and purchasing only what is needed in order to prevent unnecessary waste. Zero waste shoppers come prepared on their shopping trips with alternate and reusable packaging options such as mason jars, glass containers, material shopping bags and paper bags (Good, 2015). Individuals engaging in zero waste practices also seek to purchase products that have been made out of waste and are durable alternatives to typical disposable products (Pujol-Mazzini, 2017).

A zero waste lifestyle embraces minimalism and rejects the use of disposable items (Martinko, 2014). According to Ergil (2019), it is most important for zero waste shoppers to refuse single-use items such as plastic bags, takeaway containers and juice cartons. Furthermore, Ergil (2019) stresses that shoppers should strive to reuse any plastic goods that they already own before purchasing other products to use as containers or carriers. Martinko (2014) states that shoppers should take these reusable containers and carriers with them when out shopping in order to further avoid any more single-use items which would create more waste. According to Veronese (2019) other zero waste practices include buying in bulk, choosing items that make use of plastic-free packaging, purchasing directly from suppliers, and continuously striving to use sustainable alternatives instead of products that cannot be reused over time.

### **2.3 THE HISTORY OF ZERO WASTE AND ZERO WASTE SHOPPING**

Waste has been one of the most analysed issues since the dawn of the twentieth century (Bautista-Lazo & Short, 2013:142). Even Henry Ford, the prolific founder of the automobile manufacturer named after him, weighed in on the issue of waste and the adoption of zero waste in the early 1900s (Bautista-Lazo & Short, 2013:142). According to Levinson (2014), Henry Ford proposed an idea of zero waste, stating that an ideal situation would be one in which there is nothing left to salvage, thus eliminating all waste. However, it is clear that this idea has not materialised as limits on how much waste can be dealt with, locally and globally, are rapidly being reached (Mauch, 2016:5). Mauch (2016:5) further explains that the environmental impact of waste cannot be ignored any longer and thus a call for the reduction in or elimination of waste, through the practice of zero waste, is increasing significantly.

Paul Palmer, a chemist from Yale in the United States, first coined the term zero waste in the 1970s when he started a company that marketed waste products identified as reusable (The

Zero Waste Institute, 2019). This environmental movement, including the concept of the three Rs (reuse, reduce, recycle) spread to Europe in the late 1970s (Reike, Vermeulen & Witjes, 2018:248). In the 1980s, Taiichi Ohno, the father of Toyota's successful production system, looked to build on Henry Ford's thoughts on zero waste and developed the lean production process, a manufacturing process that emphasises the elimination of waste (Bautista-Lazo & Short, 2013:142). Furthermore, the 1980s also saw a growing global trend of recycling by both individuals and businesses (Reike *et al.*, 2018:248).

According to Connet (2013:1), it became clear in the 1990s that it is possible for individuals globally to reduce their consumption levels, recycle more and for manufacturers to design products with zero waste in mind. Reike *et al.* (2018:249) add that the 1990s saw more preventative measures being taken to reduce levels of waste and that concepts such as living a zero waste lifestyle and product life cycle thinking began to emerge. This was spurred by published reports on global warming and the devastating effect thereof, statistics on greenhouse gas emissions, and loss of biodiversity just to name a few (Reike *et al.*, 2018:249).

The 2000s saw the environmental movement of zero waste spread rapidly around the globe, with more individuals and businesses adopting the concept in their everyday activities (Connet, 2013:1). Many sustainable manufacturers began finding ways to design as much waste as possible out of the manufacturing process as well as their products while consumers began to recognise the negative effects of waste on the environment around them (Lehmann, 2010:28). Moreover, in 2008, Bea Johnson decided on adopting a zero waste lifestyle and since then has become a pioneer for the concept of zero waste, with many attributing her efforts to the initiation of the global zero waste lifestyle movement (Zero Waste Home, 2015). Connet (2013:1) explains that, as a culmination of these milestones over the decades, many communities, individuals and businesses are looking to eliminate waste from their daily activities entirely as early as 2020.

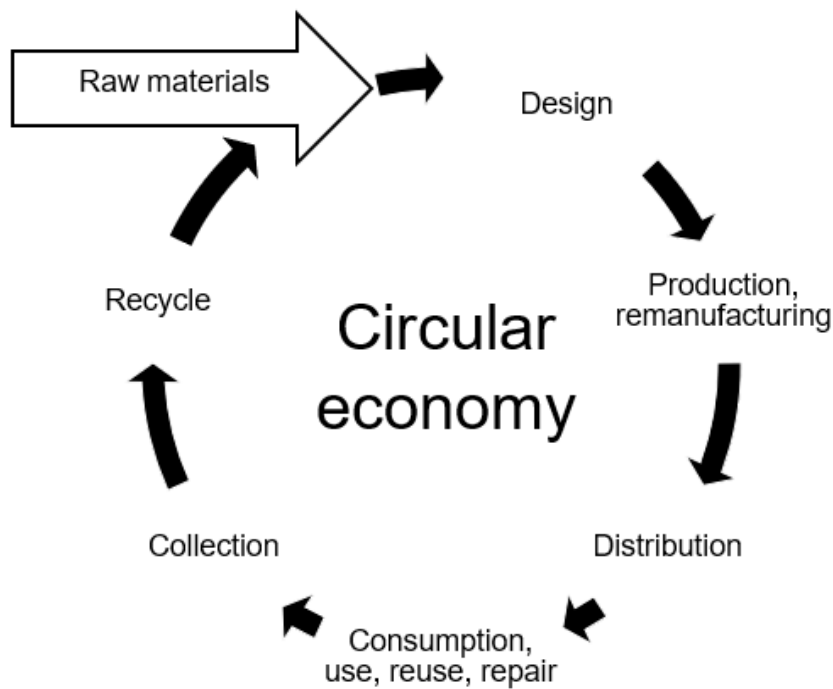
As the number of people choosing to live zero waste lives has increased, so has the number of stores to accommodate these lifestyles. The first zero waste store ever to open is Original Unverpackt, translated to Original Unpackaged, which opened in Berlin, Germany (Ruggeri, 2016). The founder of the store, Milena Glimbovski, opened it in 2014 and thereafter has published a book on how to live a zero waste lifestyle (Original Unverpackt, 2019). Original Unverpackt and other zero waste stores enable zero waste by allowing customers to purchase exactly how much of a product they need, thus reducing waste in the customer's home

(Ruggeri, 2016). Furthermore, customers are encouraged to bring their own refillable containers and reusable shopping bags when purchasing a range of products, from fresh produce to cosmetics (Ocampo, 2019). A number of zero waste stores have opened all over the world and are located in cities such as London, Berlin, Vienna, Barcelona and Pulau Ujong (McCarthy, 2019). In South Africa, shoppers can find zero waste stores in Cape Town, Durban and Johannesburg (Brinkley, 2018).

## **2.4 CIRCULAR ECONOMY AND ZERO WASTE**

A linear economy is one in which natural resources are essentially converted into waste (Murray, Skene & Haynes, 2017:371). According to Andrews (2015:305), the linear economy can be traced back to the Industrial Revolution in the eighteenth century, where a take-make-use-dispose model of consumption started to take shape. Today, the linear economy and energy flow model is still the economic system of choice for many countries (Korhonen, Honkasalo & Seppala, 2018:37). However, the linear economy is unsustainable and must be replaced with an alternative economic model (Andrews, 2015:309). A viable alternative is the circular economy, which is an approach that aims to design waste out of products, thus keeping resources in use for as long as possible and enabling more value to be extracted from these resources (Esposito, 2019; Domenech, 2014). Therefore, the circular economy model is an economically viable way to reuse products and other materials continuously, thus promoting zero waste (Bocken, de Pauw, Bakker & van der Grinten, 2016:308).

There is an urgent need to transition from a wasteful, linear economy to a more sustainable system such as the circular economy model as environmental problems, caused by our excessive consumption rates and waste, are threatening earth's natural resources (Geissdoerfer, Savaget, Bocken & Hultink, 2017:757). Ghisellini, Cialani and Ulgiati (2015:2) agree, stating that the circular economy will lead to a more sustainable society and encourage the prevention and elimination of waste. Esposito (2019) explains that a circular economy is based on a number of principles, namely designing waste out of the production process, optimising resources, and continuously evaluating and improving the circular process.

**Figure 2.2: The circular economy**

(Source: European Commission, 2014:5)

A circular economy balances economic growth and development with the protection of the environment and earth's natural resources (Murray *et al.*, 2017:373). Bonviu (2014:85) adds that the circular economy entails the end of a throwaway society and instead creates a society in which production and consumer behaviour shifts to a reuse and recycle approach. According to Veleva *et al.* (2017:518), a circular economy is concerned with the elimination of waste in the manufacturing process as well as designing products that can be reused or repurposed into new products indefinitely. Furthermore, a circular economy also seeks to change the behaviour of individuals to make them adapt to living zero waste lifestyles (Veleva *et al.*, 2017:518). Nonetheless, in order for a circular economy to work, it is necessary that all environmental, technological, economic and social aspects of the economy are considered (Ghisellini *et al.*, 2015:2). Winans, Kendall and Deng (2017:830) add that appropriate governmental policy instruments will contribute significantly to the success of a circular economy.

The implementation of a circular economy has a number of benefits, most notably for the environment (Korhonen *et al.*, 2018:40). The greatest benefit of a circular economy is its ability to reduce risk to the supply of natural resources (Andrews, 2015:310). Ghisellini *et al.* (2015:2) explain the importance of this, stating that the reduction of resource use leads to a greener economy and has a positive impact on the wellbeing of society as a whole. According to

Domenech (2014), the implementation of a circular economy will also create new business opportunities and revenue streams. Other benefits of a circular economy include reduced use of virgin materials, creation of new markets, decrease in emissions as well as emissions control costs, increased investment in business, and increased sense of community within society (Korhonen *et al.*, 2018:40). However, a considerable barrier to the successful implementation of a circular economy is a lack of understanding and knowledge of the concept as well as the dramatic change in processes and behaviour that it represents (Andrews, 2015:310). Another issue that will have to be addressed is the quality of materials and products if a circular economy is to be implemented, as materials will have to be able to be reused over and over again (Winans *et al.*, 2017:830). Despite these challenges, many are warming to the idea of a circular economy, with countries such as China, Japan, the United Kingdom, Sweden, Finland, the Netherlands and Canada working to implement the concept (Bocken *et al.*, 2016:308).

## **2.5 WASTE MANAGEMENT IN SOUTH AFRICA**

It is regularly said that South Africa is two to three decades behind the United States of America, Europe and other developed nations regarding waste management and the changeover from landfilling to reducing, recycling and reusing (Godfrey & Oelofse, 2017:1). As a result of a rising population and economic development in South Africa and the increasing rates of urbanisation within the country, waste generation has increased dramatically, which consequently requires the formation and application of effective waste management programmes and strategies (Irwan, Basari, Watanabe & Abushammala, 2013:22). The Council for Scientific and Industrial Research (2009:7) states that South Africa's sustainable commitment has forever been aimed at the wider economic and social challenges of a developing and unequal society whilst protecting its precious environmental resources.

### **2.5.1 DRIVERS OF WASTE**

Waste related issues that stem from consumer consumption is directly related to the increase in waste generation and landfill disposal in the country. There are various drivers of waste generation in South Africa, as outlined by the Department of Environmental Affairs (2018:6), and include population growth, economic growth, income levels, urbanisation and globalisation.

Population growth can be seen as one of the core drivers of waste generation in South Africa. An increase in population results in an increase in consumption which ultimately leads to an increase in waste generation (Omolulu & Lawal, 2013:84). It has been shown that the South

African population increased by more than three million people between the years 2013 and 2017, with Gauteng being the most densely populated province in the country, and as a result, also the province with the greatest amount of general waste generation (Department of Environmental Affairs, 2018:6).

Another key driver of waste generation in South Africa is the growth of its economy. The growth of the economy has an impact on waste generation either directly through an increase in manufacturing or indirectly through higher incomes which result in increased consumption (Greyson, 2007:1383). South Africa's gross domestic product (GDP), which is an indication of the monetary value of goods and services produced in a given period, increased from R3.54 trillion in 2012 to R4.65 trillion in 2017, indicating that production and manufacturing has increased in the country due to an increase in demand and as such has resulted in increases in waste generation due to an increase in consumption (Department of Environmental Affairs, 2018:8).

Income is an additional driver of waste generation in South Africa. Irwan *et al.* (2013:22) state that there is a strong association between income levels, standards of living and waste generation. This is true for South Africa as domestic waste generation varies amongst the various income groups with waste generation per capita being the highest for the high-income groups of the country (Department of Environmental Affairs, 2018:10).

Urbanisation is linked to economic development and can therefore be seen as a key driver of waste generation, more specifically solid waste generation (Department of Environmental Affairs, 2018:12). Solid waste generation is generally considered to be more of an urban issue as waste generation rates tend to be much higher in urban areas (Berg, 2012). The reason for this is that residents in urban areas are generally wealthier individuals who purchase more store-bought goods and make less use of reusing and recycling practices than residents in rural areas because their financial position makes it more appealing for them to just purchase another product (Irwan *et al.*, 2013:22).

According to Achankeng (2003:1), another key driving force of waste generation in South Africa is globalisation as the country has experienced an increase in the trade of recyclable waste, particularly paper and plastics. There are numerous benefits associated with the "globalisation of waste" such as the fact that the trade for recyclable waste can be seen as a win-win situation for both the exporting country and the importing country, as the exporting country can get rid of their waste in a sustainable manner while the importing country can

benefit from importing cheaper raw materials which can be used to improve their local economies (Department of Environmental Affairs, 2018:13). However, globalisation is fuelling the already extraordinary urban growth phenomenon being faced by South Africa and as such adds more waste related issues faced by the already inefficient waste management systems of the country (Achankeng, 2003:2).

### 2.5.2 STATE OF WASTE MANAGEMENT

As stated, waste generation in South Africa is driven by its increasing population, economic growth and rate of urbanisation. Statistics released by the Department of Environmental Affairs state that in 2017, South Africa generated 54.2 million tonnes of general waste. It was indicated that of the 54.2 million tonnes of general waste, 56% of waste was regarded as organic waste, 9% as municipal waste, 8% as construction and demolition waste, 7% as commercial and industrial waste, and the remaining 20% regarded as other forms of waste such as glass, paper, plastic and metals. (Department of Environmental Affairs, 2018:20).

The state of a country's waste management can be identified by its importing and exporting of waste materials (Achankeng, 2003:1). In 2017, South Africa imported 137 490 tonnes of general waste which accounted for less than one percent of the total waste generated in that year. South Africa exported 258 557 tonnes of general waste in 2017, which also amounts to less than one percent of the total waste generated in that year (Department of Environmental Affairs, 2018:21). Due to insufficient waste management practices it comes as no surprise that South Africa has such low import and export statistics of waste materials.

Waste collection services in South Africa is regulated and outlined by the National Domestic Waste Collection Standards. The main objective of these standards is to ensure that all households in South Africa have, where possible, effective and regular waste collection services (Department of Environmental Affairs, 2018:45). In 2016, approximately 59 percent of South African households had their waste collected by a local authority, service provider or community member (Stats SA, 2018). In addition to providing waste collection services, municipalities are pressured to encourage initiatives that support waste management at the source and have the duty to educate households on effective waste management strategies to improve community involvement in waste reduction to landfill sites (Department of Environmental Affairs, 2018:45).

The most crucial point in the waste management chain is the point at which waste is recycled, treated, recovered, reused, incinerated or disposed of to a landfill site (Dlamini, 2016:23). In

2018, South Africa had 2 475 licenced waste management facilities across the country. These facilities perform various waste management activities, the most common activity being the disposal of waste on land, followed by the treatment and storage of waste. Less common waste management activities practised by these facilities are waste incineration and composting services. Oelofse and Godfrey (2008) state that waste management facilities in South Africa can be regarded as sufficient in terms of facilities offered, but insufficient in terms of its service delivery as it was found that 20 percent of landfill facilities were recognised as non-compliant with regards to management and operations. These non-compliances were mostly related to insufficient training of staff members, insufficient budget, lack of appropriate safety equipment and poor access to service areas (Oelofse & Godfrey, 2008).

Legislation is attempting to improve the current state of waste management in South Africa. South Africa's legal framework on waste management is one of the most advanced on the African continent (Nkosi, 2014:9). These legislations are aimed at promoting and enforcing waste management practices. The National Environmental Management Waste Act (NEM:WA) was the first waste legislation published in South Africa, and since then a flood of regulations followed which aims at controlling the waste sector in an effort to mitigate the ecological and human health impacts related to insufficient waste management practices. Godfrey and Oelofse (2017:7) state that the various legislations aimed at improving the state of waste management in the country have in fact had an adverse effect. It was found that these legislations resulted in major constraints to waste management as recycling and recovery activities have become very difficult to implement without triggering additional extensive legislative requirements, as such waste minimisation practices have become less attractive and resulted in sub-par attempts from firms to contribute to the goal of zero waste.

As stated by Pasang, Moore and Sitorius (2007:1936), the waste management issue in South Africa is not primarily related to financial and technical aspects, but rather related to vision, commitment and policy initiatives such as long-term planning, revenue collection, level of stakeholder involvement, sharing disposal facilities and, most importantly, transparency in decision making.

### 2.5.3 IMPACT OF WASTE

The increase in waste generation and the fact that 90 percent of waste generated ultimately ends up in a landfill site has resulted in various ecological issues. The increase in waste has impacted the quality of South Africa's air and land most significantly (Department of

Environmental Affairs, 2018:37). Landfill sites have been identified as the largest contributors to greenhouse gas emissions (Singh, Anunay, Rohit, Shivangi & Vipul, 2016:1). The Department of Environmental Affairs (2018:38) states that South African landfill sites produce an estimated 43 million cubic metres of methane gas per year, which is equivalent to 595 550 tonnes of carbon dioxide. Additionally, these landfill sites result in a nuisance to surrounding areas and suburbs due to the fact that it not only produces toxic gasses but also produces highly unpleasant odours which places further hindrances to property development, giving rise to numerous other impacts (Singh *et al.*, 2016:1).

Mahler (2007:1) asserts that land contamination has been identified as another major impact of inefficient waste management and has been worsened by the present industrial and commercial activities and incompetent treatment and disposal of waste. In South Africa, asbestos, cadmium, dioxin, lead and mercury are the most common chemicals of major public concern that result from inadequate waste storage, treatment and disposal. As a result of land contamination, land use is negatively impacted in South Africa as the major health risks associated with landfill sites have resulted in surrounding areas not being able to suffice as residential, commercial or institutional areas (Department of Environmental Affairs, 2018:67).

#### 2.5.4 RESPONSE TO WASTE-RELATED CHALLENGES

Over the past 20 years, South Africa's legislation has changed dramatically in an attempt to shape the waste industry of the country. Godfrey and Oelofse (2017:7) state that there are more than 41 national acts that have been implemented to have a direct or indirect influence on waste management in South Africa. These acts have been further augmented by provincial and municipal waste legislation such as municipal by-laws. The Department of Environmental Affairs (2018:9) explains that legislations regarding waste management are derived from the country's constitution and these legislations aim to:

- prevent pollution and environmental deprivation;
- encourage preservation; and
- secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The NEM:WA, which was derived from the National Environmental Management Act 1998, was the first comprehensive act to regulate waste management in a proactive way in South Africa. There were however some ambiguities surrounding the act and as such The National

Environmental Management: Waste Amendment Act (NEM:WAA) came into effect on 2 June 2014 in order to rectify the shortcomings of the NEM:WA. This amendment includes a comprehensive definition of waste and a definite end of waste status by opening up more opportunities for the recycling market.

There are various fiscal responses implemented by the government to combat the waste epidemic in South Africa. It can be noted that financial incentives and disincentives related to waste management are the most effective method of reducing waste and improving waste management (World Wide Fund, 2017). Fiscal drivers in South Africa include:

- the National Pricing Strategy for Waste Management (NPSWM), which is a legal requirement of the NEM:WAA and provides the basis for setting of waste management charges in South Africa. The main aim of the NPSWM is to address the pervasive under-pricing of waste management as under-pricing creates the wrong motivations for effective waste management;
- the plastic bag levy, which is a levy charged on disposable plastic bags in attempt to change conscious consumerism of plastic bags;
- the tyre levy, which is a tariff charged at R2.30 per kilogram per tyre and is reserved for recycling; and
- the proposed landfill tax, which is still under consideration by the Department of Environmental Affairs. This tax is aimed at discouraging landfilling as a means of waste disposal.

In South Africa, various well-organised waste management projects have been unsuccessful as they have failed to incorporate the effect of the informal sector in their waste management planning (Fakir, 2009:37). The informal waste sector is a key contributor to waste management, especially regarding landfill diversion and recycling (Oelofse & Strydom, 2010). The South African situation is expected to be in line with that of other emerging economies in the sense that it has a well-developed waste management sector side-by-side with informal collection and scavenging (Godfrey & Oelofse, 2017:1). The waste sector will be more reliant on informal waste collection, which is currently already being handled by informal pickers and house-to-house collectors who can derive any sort of income or material from waste, than on the highly industrialised and capital-intensive operations in developed economies. The informal sector has low fixed capital costs and operates under the radar of the tax system. However, trends in

South Africa may be changing as the economics of recycling improves and there is growth in the market for recycling material collection which may well become more formalised (Fakir, 2009:37).

## **2.6 GENERAL OVERVIEW OF FOOD WASTE**

Food waste is directly linked to the topic of zero waste shopping, and as such will be further elaborated on.

### **2.6.1 FOOD WASTE GLOBALLY**

The world produces enough calories every year to feed everyone on earth a mostly vegetarian diet, however, due to the complexities, inadequacies and incongruities in the food system, millions of people worldwide are starving. The issue of food waste is important with regards to the discussion of zero waste, specifically zero waste shopping, due to the fact that the demand for food is growing at an exponential rate. If current production and consumption remains unchanged, food production is estimated to grow by as much as 70 percent in order to feed nine billion people globally by 2050. This increase in food production would require an increase of 120 million hectares of arable land for crop production in developing countries, which could be a major contributor to the current waste epidemic. (World Wide Fund, 2017).

For the purpose of this study, food waste will be defined as the loss of nutritious edible materials intended for human consumption, arising at any point in the food supply chain (Parfitt, Barthel & McNaughton, 2010:3065). Food wastage occurs at all stages of the food life cycle, starting from harvesting, through to manufacturing and distributing, and lastly, at consumption (Sjölund, 2017:35). Globally, it is estimated that food waste throughout the food supply chain (including both pre- and post-consumer food waste) amounts to 50 percent of all food that is produced for human consumption (Nahman & De Lange, 2013:2494). Literature conducted on the topic of food waste has indicated that this is, to a large extent, preventable (Marangon, Tempesta, Troiano & Vecchiato, 2014:201).

Parfitt *et al.* (2010:3067) indicate that food waste is primarily caused by large scale urbanisation that has accelerated food demand and expansion of the agricultural sector, dietary changeovers to more differentiated and resource-intensive foods, and globalisation and global trade that drive the increase of processed goods, supermarkets and international competition to local markets.

Food consumption is the type of domestic consumption with the largest environmental impact (Wieser, 2014:1). It can thus be found that fostering change towards more sustainable food consumption is a key for reducing environmental pressures. Nahman and De Lange (2013:2494) state that food waste is problematic from a social and environmental perspective for various reasons. From a social perspective, a huge portion of discarded food is still edible, implying that it could have been used to feed those in need if it were better distributed. According to Marangon *et al.* (2014:201), additional social impacts arising from food waste is related to the fact that it contributes to an increase in food prices, making it less accessible for the bottom of the pyramid consumers and as a result increases the already high number of undernourished individuals worldwide. From an environmental perspective, the disposal of food waste (even inedible food waste) to a landfill site or by incineration implies the loss of a potentially valuable resource that could have been used in various other processes such as energy generation or for composting purposes (Wieser, 2014:3). Additionally, the disposal of food waste contributes to the already decreasing quality of the natural environment due to the greenhouse gasses generated from it (Marangon *et al.*, 2014:201).

The significant economic and environmental losses from food waste are compounded by the fact that 800 million people still suffer from hunger globally, while 1.9 billion adults are overweight or obese (World Health Organisation, 2018). These disturbing figures highlight that a third of the global population are characterised as malnourished, underfed and famished, negatively impacting productivity, economic growth and additionally resulting in increases of nutrition-related diseases, morbidity and mortality (World Wide Fund, 2017).

## 2.6.2 FOOD WASTE IN SOUTH AFRICA

South Africa produces approximately 31 tonnes of food per year, of this, 10 tonnes or 33% is lost on a yearly basis (Department of Environmental Affairs, 2018:25). As stated by Notten, Bole-Rentel and Rambaran (2014:10), the majority of the food losses or wastage in South Africa occurs at the agricultural-harvest stage (50%), followed by processing and packaging (25%), distribution and retail (20%), and at consumer level (5%). Furthermore, Nahman and De Lange (2013:2496) indicate that the total cost of edible food waste throughout the value chain in South Africa amounts to R61.5 billion per annum, which is equivalent to two percent of the country's annual GDP. Of the R61.5 billion, approximately R6 billion arises at the consumer or household level. Nahman and De Lange (2013:2496) further assert that these costs

include the costs of wasted edible food that could have been used to feed the hungry, valued according to weighted market prices for income specific food baskets.

Due to various environmental legislations in South Africa, the perception is that the food industry is strongly regulated. However, South Africa does not have any legislation directly regulating food waste. This results in usable food products being condemned, due to the fact that there are no regulations in place for the disposal management of these products. Given the environmental, social and economic cost of disposing food, the legal responsibilities of waste disposal would suggest that the holistic role of the government at all levels is crucial for planning, employing, encouraging and monitoring the mitigation and diversion of food loss from landfill sites. (World Wide Fund, 2017).

A study conducted in South Africa found that the weight of food waste as a percentage of the total weight of domestic waste collected at different households were found to be 27% in low income areas, 13% in middle income areas, and 17% in high income areas (Oelofse & Godfrey, 2008). This is interesting as literature conducted on waste management has found that high income households generate the most waste. Low income groups, however, have higher rates of food waste driven by the fact that they have insufficient facilities such as refrigerators or freezers to keep food fresh (Nahman & De Lange, 2013:2151).

Food waste has serious environmental implications. In South Africa, the major wastages related to food waste from an environmental perspective are related to energy and water. South Africa wastes enough energy every year from producing foods that are never consumed to power the City of Johannesburg for roughly 16 consecutive weeks. Additionally, the water wasted every year by producing food that is never consumed is estimated to be enough to fill over 600 000 Olympic swimming pools. These statistics are of major concern given the fact that farming, which amounts for 50 percent of total food waste throughout the food supply chain, alarmingly consumes 62 percent of the country's freshwater supply at the same time that it is ranked the thirtieth driest country in the world. (World Wide Fund, 2017).

It can confidently be stated that the level of food loss and waste in South Africa is unsustainable and unnecessary (Notten *et al.*, 2014:12). Food waste in South Africa negatively impacts the competitiveness of the food industry as it puts a damper on the sector's growth and employment potential. Additionally, it is a waste of valuable resources which, as the effects of global warming increases, could negatively affect the competence of the country's food industry to adapt to changes (World Wide Fund, 2017). Moreover, effectively reducing food loss and

waste is an opportunity to improve the unpleasurable statistics of significant portions of the South African population related to malnutrition and mortality caused by food loss and waste (Oxford, 2018).

Parfitt *et al.* (2010:3079) state that if food production is to keep up with the growing demand, many absurdities, inadequacies and problematic practices in production and consumption would need to be resolved. Critical levers in the transition to a just and sustainable food system are the identification and resolution of food waste drivers and the shifting of food consumption patterns (World Wide Fund, 2017).

## **2.7 CUSTOMER ATTITUDES TOWARDS ZERO WASTE SHOPPING AND THE THEORY OF PLANNED BEHAVIOUR**

Customer attitudes can be defined as a combination of an individual's beliefs, feelings and behavioural intentions toward a concept or idea (Akroush & Al-beDei, 2015:1355). Measuring and analysing human behaviour has always been a complex dilemma for various academics to conceptualise (Ajzen, 1991:179). There are various factors that affect a customer's attitudes towards the concept of zero waste shopping, and in order to further explore the influence of these factors, a theoretical framework for systematically identifying the determinants of zero waste management behaviour is required (Tonglet *et al.*, 2004:197). The most applicable theoretical framework that can serve as a basis for analysing customers' attitudes towards zero waste shopping can be provided by making use of the theory of planned behaviour, developed by Icek Ajzen in 1985.

The theory of planned behaviour has been used by various academics since its inception in 1985 and is found to be well supported by empirical evidence. The theory hypothesises that consumer behaviour can be accurately predicted by assessing the individuals' attitudes towards the behaviour; subjective norms and perceived behavioural control. (Ajzen, 1991:179).

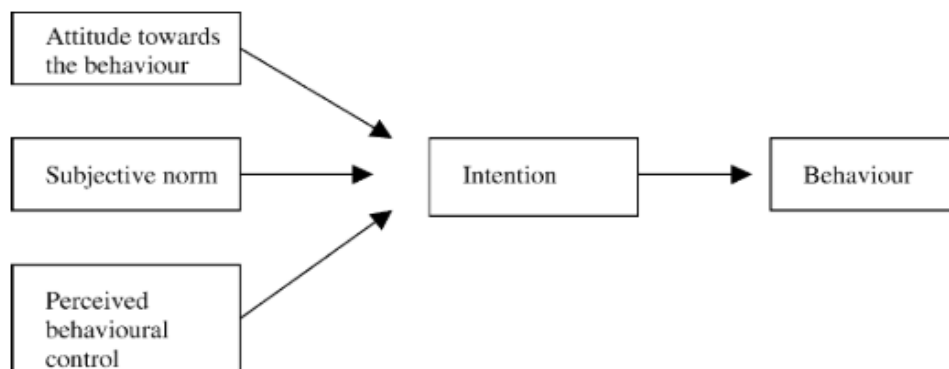
The reason why it of utmost importance to establish a framework for determining consumer behaviour is that in recent years it can be noted that organisations have put in a considerable amount of effort in reducing their negative effects on the environment by integrating environmental sustainability into their overall strategic mission (Dubihlela & Ngxukumeshe, 2016:164). However, there is a lack of literature on understanding how consumers behave when making purchases regarding products that incorporate environmental sustainability in relation to factors such as quality, price and effort from the part of the consumer and has thus made it

difficult to systematically identify the behaviours of individual customers (Dubihlela & Ngxukumeshe, 2016:164; Tonglet *et al.*, 2004:197).

The theory of planned behaviour can be used to thoroughly examine the aspects that influence behavioural choices in relation to zero waste shopping. This theory relies on the assumption that individuals behave rationally, in the sense that they consider the implications of their actions when making various purchasing decisions. This theory has been successfully applied to a range of diverse areas such as leisure choice, investment decisions and has even been linked to studies on dishonest actions. (Tonglet *et al.*, 2004:197).

Figure 2.3 is a visual representation of the theory of planned behaviour. According to the theory, the most proximal determinant of an individual's behaviour is his or her intentions to engage in the behaviour. In turn, "behavioural intentions are predicted by three main components, namely attitudes towards the behaviour; subjective norms; and perceived behavioural control" (Ajzen, 1991:182).

**Figure 2.3: The theory of planned behaviour**



(Source: Adapted from Greaves, Zibarras & Stride, 2013:110)

Attitudes towards behaviour refers to the overall positive or negative evaluation of performing the behaviour (Fielding, McDonald & Louis, 2008:319). Furthermore, the attitudes towards the behaviour is determined by the sum of the expected outcomes and is weighted by an evaluation of the desirability of the outcome (Kalafatis, Pollard, East, Tsogas & Pollard, 1999:444). Subjective norms are based on an individual's perception of whether other people in their lives would want them to perform the behaviour, whereas perceived behavioural control reflects the extent to which individuals perceive the behaviour to be under their volitional control (Fielding *et al.*, 2008:319).

As a general rule, “the more favourable the attitude and subjective norm with respect to engaging in the behaviour, and the greater the perceived control, the more likely it is that a person will form an intention to perform the behaviour in question” (Ajzen, 2015:125). In other words, if an individual has a positive attitude towards a certain behaviour, if there is enough peer-pressure, and if they have faith in themselves to perform the behaviour, then their intention to perform that behaviour ought to be strong (in this case the behaviour refers to the adoption of zero waste shopping practices). Thus, if firms can induce an appropriate change of the three determinants of intention as stipulated, they can ultimately increase the likelihood of an individual performing a specific behaviour (Ioannou, Zampetakis & Lasaridi, 2013:2035).

The theory of planned behaviour allows for the incorporation of additional variables, provided that “these variables make a significant contribution to the explanation of behaviour provided by the model” (Ajzen, 1991:189). For the purpose of this study the additional variables of moral norm and situational factors will be incorporated. Moral norm can be defined as an individual’s personal beliefs about the moral correctness or incorrectness of performing a specific behaviour (Tonglet *et al.*, 2004:198). Situational factors such as inconvenience, the amount of effort involved, storage space, and access to zero waste shopping organisations are likely to influence behaviour (Davies, Foxall & Pallister, 2002:41). These variables proved to have significant relevance to the behavioural changes of individuals regarding the topic of recycling (Tonglet *et al.*, 2004:198), which is relative to the topic of zero waste shopping and as such proves to be relevant to this study.

By correctly applying the theory of planned behaviour, firms can modify their various business approaches such as marketing and production to entice consumers to be more environmentally conscious and more willing to adopt the concept of zero waste shopping to a larger scale, thus making the sustainability efforts of the firm more of a distinctive competence rather than merely a philanthropic activity that serves only as a positive public relations activity.

## **2.8 SUPPLY CHAIN AND WASTE MANAGEMENT STRATEGIES**

Green, Inman, Sower and Zelbst (2018:26) state that “manufacturing organisations must respond to changes in the demands of both immediate and ultimate customers. As these customers begin to demand eco-friendly products and services that are produced by processes that do not damage the environment, manufacturing organisations must modify operations to reflect these new customer demands.”

The traditional supply chain can be defined as the integrated manufacturing process wherein raw materials are converted into final consumer goods and then delivered to end users. Supply chain management can thus be conceptualised as the planning and management of all activities directly and indirectly involved in this process. (Badenhorst-Weiss *et al.*, 2018:5; Benita, 1999:336).

Firms have been pressured by various legislation and consumer groups regarding their efforts relating to minimising waste and how they aim to reduce and improve the negative ecological impacts that firms have caused over the past few decades (Ojo *et al.*, 2013:315). As a result of these pressures, firms have adopted what academics term “green supply chain management” and is defined by Badenhorst-Weiss *et al.* (2018:105) as the integration of environmental thinking into supply chain management activities. Green supply chain management activities include product design, production processes, material sourcing and selection, delivery of goods to final consumers, as well as the end of life management of products after their useful life (Botha, Badenhorst-Weiss, Bihma, Chodukufa, Cohen, Cronje, Eccles, Grobler, Le Roux, Rudansky-Kloppers, Strydom, Van Wyk and Young, 2016:286). Srivastava (2007:53) explains that green supply chain management involves addressing the influence and relationships between supply chain management and the natural environment.

Large and Thomsen (2011:177) indicate that there are various methods and strategies firms can use to integrate environmental thinking into their supply chain, including:

- procuring packaging material that can more easily be reused and recycled;
- partaking in the research and design phase of products and making valuable suggestions to alternative sources of supply;
- collaborating with upstream and downstream members of the supply chain, thus enticing them to commit to waste reduction goals; and
- selecting and evaluating suppliers based on their environmental performance.

Firms can gain a competitive advantage over their competitors by redesigning their supply chain to integrate environmental thinking (Badenhorst-Weiss *et al.*, 2018:165). Gajendrum (2017:3) states that literature related to the topic of green supply chain management, with specific focus on zero waste management, concludes that successful green supply chain management requires firms to integrate the activities of green purchasing, green design,

product life cycle assessment and reverse logistics in the formulation and implementation of their supply chain.

### 2.8.1 GREEN PURCHASING

Green purchasing can broadly be defined as the selection of goods and services based on their environmental performance (Chin & Malik, 2015:1). Green purchasing can be conceptualised as the selection and procurement of goods and services that prove to have minimal or no deteriorating environmental impacts throughout its entire life cycle, starting from manufacturing to distribution, consumption and, finally, disposal (Dubey, Bag, Ali & Venkatesh, 2013:189; Mafini & Loury-Okoumba, 2018:3). Moreover, according to Gajendrum (2017:4), green purchasing assists in improving the overall environmental awareness of consumers.

### 2.8.2 GREEN DESIGN

Green design can simply be defined as the process of designing goods and services that are ecologically compatible (Gajendrum, 2017:3; Srivastava, 2007:58). Firms have realised that a strong environmental reputation is vital for their success in the long run, as such most organisations are incorporating significant ecological improvements during their product and service development (Gajendrum, 2017:3).

As per Ilgin and Gupta (2010:563), green design should be seen as synonymous with “Environmentally Conscious Manufacturing and Product Recovery (ECMPRO)”. ECMPRO involves incorporating environmental reasoning into new product development including design, material choice, manufacturing procedures and the conveyance of the item to consumers alongside the end-of-life management of the item after its useful life (Ilgin & Gupta, 2010:563).

Therefore, the rationale of green product design is to design and develop goods and services that have minimal adverse effects on the environment by integrating environmental thinking throughout the product’s life cycle.

### 2.8.3 PRODUCT LIFE CYCLE ASSESSMENT

The most well-developed tool to measure the environmental impact of a product’s design is the product life cycle assessment (Ilgin & Gupta, 2010:566). Life cycle assessment or analysis is a method used to calculate and evaluate the ecological impact of a product through its life cycle

surrounding all aspects related to extraction and processing of raw materials, manufacturing, transportation and distribution, usage, remanufacturing, recycling, and final disposal (Department of Environmental Affairs and Tourism, 2004:2; Jensen, Hoffman, Møller & Schmidt, 1997:8).

The results obtained from undertaking a life cycle assessment can be used by the firm as a framework for formulating a list of best practices in the design and production of goods and services to ensure that there is minimal to zero environmental damage (Gajendrum, 2017:4; Jensen *et al.*, 1997:8).

#### 2.8.4 REVERSE LOGISTICS

Reverse logistics is the activity directly related to the minimisation of waste as it focuses on controlling backward flows of raw materials. Reverse logistics is defined as moving goods from their place of use, back to their place of manufacturing for reprocessing, refilling, repairs or recycling and, as a last resort, disposal (Gajendrum, 2017:4). Botha *et al.* (2016:292) indicate that reverse logistics aids in the removal of waste from landfills and additionally forces organisations to consider different disposal options in terms of their impact on the environment.

Reverse logistics becomes relevant when end-users decide that the product in question has reached the end of its life and that these product returns now need to be managed in an effective and cost-efficient manner (Botha *et al.*, 2016:292; Rubio & Parra, 2014:1). There are various activities in the reverse logistics process starting from product collection, inspection, separation and sorting, recovery and, most importantly for the purpose of this, study disposition (Kaynak, Kocoglu & Akgun, 2014:439).

There are various disposition options firms can undertake, each depending on the product life cycle stage at which the product was returned. These disposition options include:

- **Redistribution:** Redistributing is distributing reusable products to potential markets of future users (Botha *et al.*, 2016:294).
- **Reconditioning:** Reconditioning involves restoring the product to a good condition through repairs or restoration (Kaynak *et al.*, 2014:439).
- **Donation:** Organisations may choose to give returned products to humanitarian or philanthropic organisations without receiving any compensation for it (Botha *et al.*, 2016:295).

- Disposal: Disposal is required for products that cannot be reused for technical or cost reasons. Firms need to ensure that they make use of environmentally friendly disposal methods to mitigate ecological risks arising from the product's disposal (Srivastava, 2007:61).

Note that these options are not an exhaustive list of disposition options available to firms but are sufficient for the purpose of this study. It can be concluded that firms need to ensure that an effective and efficient reverse logistics management system is in place as Kaynak *et al.* (2014:339) state that there is potential for improved customer satisfaction, decreased resource investment levels, and reductions in storage and distribution costs.

## **2.9 BENEFITS AND CHALLENGES OF ZERO WASTE SHOPPING**

The consumption of resources over the last few decades have increased dramatically (Singh *et al.*, 2014:800). This increase in resource consumption can be attributed to increased globalisation, urbanisation, rapid economic growth and a growing global population, which in turn, has resulted in substantial amounts of waste (Singh *et al.*, 2014:800). Gutberlet (2016:55) adds that waste has come about from ongoing human activities in the pursuit of achieving unlimited economic growth. More recently, waste has been recognised as a global issue that has had alarming effects on our environment (Singh *et al.*, 2014:800). According to Bandara and Hettiaratchi (2010:108), waste has led to countless environmental and social issues. It is thus evident that globally, environments and societies at large will benefit from a concept like zero waste shopping as the amount of waste, and the impacts thereof, will be substantially reduced.

Pietzsch *et al.* (2017:327) identify financial benefits, environmental benefits and benefits to the community as the three most important benefits of zero waste and zero waste shopping. Pietzsch *et al.* (2017:327) state that zero waste shopping results in financial and economic benefits as less waste is generated through the shopping process and thus less is spent on the disposal of waste. Lehmann (2011:165) explains that another financial benefit is obtained through the more efficient use of resources, as resources are made to last much longer than what they currently do. Therefore, the efficient use of resources means that the zero waste shopper will buy less of these resources in the long run, thus saving money (Cohen, 2016).

Zero waste shopping also results in benefits for our environment such as the reduction of waste and its negative impact on the natural environment, reduction in resource extraction and decreased levels of energy consumption (Pietzsch *et al.*, 2017:327). In fact, zero waste, if

implemented properly, avoids waste generation in the first place (Lehmann, 2011:164). Matete and Trois (2008:1487) state that a major advantage that zero waste shopping presents for the natural environment is the reduction in the amount of waste put into landfills or incinerated. This, in turn, reduces the emission of harmful gasses and pollutants that come with landfilling or the incineration of waste (Bandara & Hettiaratchi, 2010:108).

According to Pietzsch *et al.* (2017:327), the third major benefit of zero waste is associated with communities at large. Individuals within a community who change their lifestyles and consumption patterns to be in line with the zero waste concept have the ability to influence others to commit to the zero waste movement (Pietzsch *et al.*, 2017:327). Moreover, practising a zero waste lifestyle significantly reduces the risk to overall public health (Bandara & Hettiaratchi, 2010:109).

A number of other benefits of zero waste shopping have also been identified. Gutberlet (2016:56) asserts that the zero waste movement has helped to shift individuals' perspectives on waste, viewing it as a resource that can be transformed rather than something that is completely obsolete. Furthermore, Menikpura, Sang-Arun and Bengtsson (2013:41) explain that there is a considerable reduction in the emission of greenhouse gasses (a leading cause of global warming) as a result of zero waste. Jones (2018) states that zero waste practices also help to protect marine life and wildlife as well as conserve the natural environment.

Although there are many benefits associated with the zero waste movement and zero waste shopping, there are, however, challenges as well. The most important challenge that will have to be overcome is the resistance by individuals to change their behaviour (Pietzsch *et al.*, 2017:328). Lehmann (2011:165) explains that many consumers only think about consumption in the short term which only adds to their resistance to behavioural change. Individuals need to change their old habits and form new ones by understanding that their behaviour today will affect future generations to come (Gutberlet, 2016:60).

Another challenge of zero waste shopping is the fact that many people are still unaware of the concept itself (Luthra, Kumar, Kumar & Haleem, 2011:236). This could be due to a severe lack of governmental support of the zero waste idea as well as a lack of education at all schooling levels about what is good for the environment (Brown, 2016; Luthra *et al.*, 2011:236). Therefore, it is clear that the government, educational institutions, businesses and individuals must work together to ensure the success of the zero waste movement.

## **2.10 ZERO WASTE SHOPPING IN SOUTH AFRICA: A CASE STUDY**

Zero waste shopping is a relatively new concept to South African consumers and there are limited options available for consumers to choose from regarding zero waste stores. However, the global awareness and seriousness of plastic pollution and the need to reduce or eliminate single-use plastics has reached Cape Town as consumers are demanding change (Two Oceans Aquarium, 2019). There has since been a surge in local stores and grocers that make for a completely plastic-free shopping experience. The most successful local grocers and stores in doing so include Shop Zero, Nude Foods, Low Impact Living, and Faithfull To Nature. These stores provide both South African consumers and firms with efficient and effective waste management and zero waste shopping experiences.

Shop Zero has integrated sustainability education into its product offering, as they aim to educate their consumers on how to live a zero waste lifestyle. The store focuses on introducing consumers to the topic of zero waste shopping by advising consumers on alternatives to plastic and also stocking a range of sustainable gifts, potentially acting as a catalyst for the promotion of sustainable living.

Nude Foods is the first South African plastic-free grocery store. Nude Foods offer consumers a variety of grocery store choices ranging from fruits and vegetables to soaps and bodywashes. Nude Foods requires consumers to bring their own containers for their purchases, therefore mitigating the pollution and waste caused by single-use plastics and encouraging consumers to reuse their packaging in a more sustainable manner.

Low Impact Living is similar to Shop Zero in the sense that education is at the core of its business model. The zero waste store is used for various talks, workshops and groups that aim to ignite and nurture the art of sustainable living to consumers. These workshops range from eco-housekeeping to holistic nanny training and everything in between.

Faithful To Nature is similar to the other zero waste stores, however, they are an online-based sustainability products provider. They stock a large number of sustainable products that consumers can purchase online, making sustainable living an easier practice for consumers around South Africa to adopt.

As evident from these zero waste stores, sustainable zero waste shopping is an attainable goal for both South African consumers and organisations. It can be noted that the predominant theme of these stores is that of consumer education, thus, if South African firms aim to mitigate

the negative ecological impacts of their products, they need to integrate the education of consumers as part of their core business activities. (Two Oceans Aquarium, 2019).

## **2.11 CHAPTER SUMMARY**

The main objective of this chapter was to provide a compressive literature review of the various topics relevant to zero waste management and zero waste shopping, in order to aid in the achievement of the primary goal of this research.

This chapter discussed the concepts of zero waste management and expanded on the history of the topic with further emphasis on zero waste shopping. The circular economy was discussed and proved to be a viable alternative to a linear economy, as the model aims to design waste out of products and as such keeps resources in use for as long as possible. Models such as these are necessary, especially in the South African context, as it was found that waste generation has rapidly increased in the country. This increase in waste generation compounded with the fact that the country has insufficient and ineffective waste management facilities and systems, proves to be of major concern to the state of the country's economy and environment. It was noted that fiscal and legislative pressures on firms and individuals would be the most effective manner to mitigate the impact of waste on the country. Evident from the literature was the negative ecological impact of food waste both globally and in the South African context. The seriousness of food waste has not been realised in South Africa as there is no single legislation directly aimed at the regulation of food waste in the country, this proves to be of major concern, as the cost of food waste amounts to roughly R61.5 billion per annum.

Moreover, the literature review revealed that change is necessary to mitigate the impact of waste both globally and in South Africa. The most effective and efficient way to achieve this goal is through changing consumer attitudes towards waste. The theory of planned behaviour acts as a framework to build and create sustainability strategies aimed at changing consumer attitudes regarding zero waste specifically. Consumer education also proved to be a catalyst in the promotion of sustainable living, as South African consumers appear to be ignorant to waste management practices, especially regarding sustainable shopping practices. Thus, it is crucial that firms and government institutions need to adopt a holistic view on waste management, specifically focusing on consumer education and consumer awareness related to waste and waste management.

The chapter to follow, Chapter Three, will provide the reader with the research design and methodology to be followed in order to obtain and analyse the information required to conduct the study.

## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 INTRODUCTION**

In Chapter Two, a general overview of zero waste and associated topics has been discussed. A detailed introduction to and history of zero waste was provided. Moreover, a number of elements of zero waste was elaborated on, such as supply chain and waste management strategies, the circular economy, and waste management in South Africa. Customer attitudes towards zero waste shopping and the theory of planned behaviour were also explored in detail. Furthermore, the benefits and challenges of zero waste shopping and a case study of zero waste shopping in South Africa was also provided.

This chapter will provide further information and detail regarding the research design and methodology to be followed by this study. Chapter Three will begin with an outline of the study's research design, which will delineate the research paradigm, research approach and research method to be used in this study.

A research design is an arrangement of the elements of research used to determine what evidence and information needs to be gathered and from where, as well as how to interpret this information to obtain answers to the initial research questions (Saunders, Lewis & Thornhill, 2019:157). Creswell (2007:5) further explains that a research design is a logical sequence that couples a study's empirical investigation to its research questions and its conclusions. Selecting the appropriate research design is the most important decision made in the research process (Abutabenjeh & Jaradat, 2018:237).

Data collection and the various methods thereof will also be discussed in terms of the population and sample of this study, as well as the sampling technique that is to be used. Thereafter, the research instrument used in this study will be elaborated on, including the ethical considerations taken into account during the development and distribution thereof. The way in which the data collected from the research instrument will be analysed as well as the validity and reliability of the self-administered questionnaire will also be discussed. This chapter will then conclude with a summary, covering the main topics within this chapter.

### **3.2 RESEARCH PARADIGM**

According to Wahyuni (2012:69), a research paradigm is defined as a set of ideas and assumptions about how the world is perceived and thus serves as a framework for guiding the behaviour of researchers. Willis (2007:33) adds that a research paradigm can also be a world view or belief system that will guide research and practices within a particular field of study. Moreover, a research paradigm will influence the way in which knowledge is studied and interpreted, and more importantly, sets out the intent, motivation and expected outcomes of the study at hand (Mackenzie & Knipe, 2006:2). There are several research paradigms that exist, some of a qualitative nature while others are of a quantitative nature (Davies & Fisher, 2018:21). According to Struwig and Stead (2013:64), the main research paradigms are the positivist paradigm and the interpretivist paradigm.

A positivist paradigm adopts a scientific approach to research and seeks to enhance the knowledge surrounding a particular set of parameters and the relationship among them (Antwi & Kasim, 2015:218). Mackenzie and Knipe (2006:2) assert that a positivist paradigm is used to reflect which causes will most likely determine an effect or outcome. Moreover, according to Davies and Fisher (2018:21), this research paradigm is experimental in nature and tests theories using numerical data. Taylor and Medina (2011:2) agree, stating that the positivist paradigm utilises quantitative methodology to probe, affirm and predict certain patterns of behaviour.

An interpretivist paradigm is the other main type of research paradigm utilised by researchers for their studies. This paradigm seeks to understand “the world of human experience” and suggests that reality is a social construct (Mackenzie & Knipe, 2006:3). Wahyuni (2012:71) explains that this may be because researchers who make use of the interpretivist paradigm recognise that individuals’ varied backgrounds, perceptions and experiences contribute to the construction of reality that exists through interacting with one another. To understand this construct, researchers using the interpretivist paradigm will conduct qualitative research as it is characterised by observation and interpretation, thus collecting information about situations, then interpreting the information to make meaningful deductions (Antwi & Kasim, 2015:218).

This study will adopt a positivist research paradigm as data will be collected to attain the study’s primary objective of determining customer attitudes towards zero waste shopping in NMB.

### **3.3 RESEARCH APPROACH**

A research approach is a blueprint that sets out the plans and procedures for the researcher to go about doing their research (Creswell, 2014:31). Determining the research approach can include selecting different research methods and techniques, choosing data collection tools, processing and interpreting data, and finally, presenting solutions to the research problem (Grover, 2015:1). According to Creswell (2014:32), there are three major research approaches, including qualitative research (which is of an exploratory nature), quantitative research (which is of a descriptive nature), and a mixed-method which incorporates both qualitative and quantitative research approaches.

A qualitative research approach entails the collection of information on various variables over a period of time in order to gain insights into a particular research problem, however, it does not produce results that have been found through statistical procedures (Yilmaz, 2013:311). According to Szyjka (2012:111), researchers making use of a qualitative research approach attempt to understand a social phenomenon through contextualising, understanding and interpreting participants' perspectives of a particular situation. This research approach provides insights into research questions and can later be used for potential quantitative research once the problem is understood (DeFranzo, 2011). Moreover, a qualitative research approach is of an exploratory nature, as it aims to gain an understanding of how and why a behaviour or phenomenon occurs (McLeod, 2017). Rossiter (2017) further explains that exploratory research is more flexible than its counterpart as it is able to address more open-ended questions in exploring new knowledge of a topic. Qualitative data collection methods typically include focus groups, observations, participation and individual interviews (DeFranzo, 2011).

An alternative research approach that can be used is a quantitative research approach. This research approach seeks to explain a situation using numerical data that has been analysed through statistical methods (Yilmaz, 2013:311). Moreover, the data collected employing this approach can be used to quantify individuals' behaviours, attitudes, opinions and other variables (DeFranzo, 2011). Therefore, a researcher utilising a quantitative research approach will seek to establish a general law of behaviour across different settings and use the research conducted to support or reject a pre-determined theory (McLeod, 2017). A quantitative research approach is of a descriptive nature, as it is designed to answer specific research questions that are concerned with describing what currently exists (Posinasetti, 2014). Quantitative data collection methods include surveys, questionnaires and observations

(McLeod, 2017). Various differences between qualitative and quantitative research approaches are outlined in Table 3.1.

**Table 3.1: Differences between a qualitative approach and a quantitative approach**

Qualitative research approach	Quantitative research approach
Describes a problem from the point of view of those experiencing it and is thus more subjective.	Provides observed outcomes (as interpreted by researchers) of a test regarding a problem and is thus more objective.
Aims to explore ideas used in ongoing processes.	Aims to examine a cause and effect relationship among variables.
Utilises non-structured techniques such as group discussions and interviews.	Utilises structured techniques such as questionnaires and surveys.
Not likely to use statistical tests.	Statistical tests are used for data analysis.
Text-based.	Numbers-based.
The end result is an initial understanding of a behaviour or phenomenon.	The end result recommends a final course of action.

(Source: Surbhi, 2018).

A quantitative research approach that is of a descriptive nature will be used in this study as the data will be collected through the use of a self-administered questionnaire where answers to research questions will be expressed in numbers. Moreover, the data will be analysed with the use of statistical tests and then used to examine the attitudes that consumers in NMB have towards zero waste shopping.

### 3.4 POPULATION AND SAMPLE

In research, the term “population” refers to all items or people in the category of what is being researched (Denscombe, 2014:21). Surbhi (2017) explains that a population represents all people, units, objects or anything else that is capable of having a certain property or common characteristics. On the other hand, a sample is a subset of the research population and the process of selecting a sample is referred to as “sampling” (Singh, 2018). Therefore, a sample is a part of the population that is selected to represent the entire population for participation in a study (Surbhi, 2017).

For the purpose of this study, the research population will consist of all the consumers in NMB, however, the researchers are unable to access every single consumer in NMB and therefore a sample will be selected from the population. The sample to be considered in undertaking this study will consist of 150 consumers who reside in NMB.

### 3.4.1 SAMPLING TECHNIQUES

Struwig and Stead (2013:116) assert that among the various ways of sampling there are two main sampling techniques, namely non-probability sampling and probability sampling. Non-probability sampling results in the probability that a subject being selected for the study is unknown and therefore leads to selection bias (Acharya, Prakash & Nigam, 2013:332). Types of non-probability sampling include convenience sampling, quota sampling and snowball sampling (Cherry, 2018). Convenience samples are selected on the basis of availability (Singh, 2018); quota sampling ensures the selection of a sample that has a certain characteristic that the researcher desires (Acharya *et al.*, 2013:332); and snowball sampling is a technique that allows researchers to select additional respondents using information from initial respondents (Struwig & Stead, 2013:118).

On the other hand, probability sampling implies that every single person within the population stands an equal chance of being selected as part of the sample (Cherry, 2018). Probability sampling includes simple random sampling, stratified random sampling and systematic random sampling (Foley, 2018). According to Foley (2018), simple random sampling entails the creation of a master list of the population and then the random selection of subjects from the list. Cherry (2018) explains that stratified random sampling involves separating the population into groups and taking a random sample from each group. Lastly, a systematic random sample is one in which a random starting point is selected and then every  $n^{\text{th}}$  item in the sample from there on is selected (Acharya *et al.*, 2013:331).

This study will make use of non-probability sampling and, more specifically, convenience sampling. Individuals will therefore be selected purely based on their availability and willingness to participate. Furthermore, the use of convenience sampling will allow the study to commence in a timely, cost effective manner. As mentioned, the sample size of this study will consist of 150 consumers who reside in NMB.

## 3.5 DATA COLLECTION

The research objectives of this study necessitate the collection of secondary and primary data. This section will describe the secondary and primary data to be collected for this study.

### 3.5.1 SECONDARY DATA COLLECTION

Struwig and Stead (2013:82) state that secondary data refers to data that already exists and is available from sources other than the current research study. Therefore, secondary data can be

described as data that has been collected by someone other than the user and is thus already available and has most likely been analysed by someone else (Choudhary, 2017). Hox and Boeijie (2005:593) add that secondary data has originally been collected for a specific purpose and is reused for another research problem. Sources of secondary data can range from annual reports, journal articles and government publications to reputable internet sources (Struwig & Stead, 2013:82).

The secondary data for this study has been collected by conducting an extensive literature review on the topic of zero waste and zero waste shopping in order to identify what customers' general attitudes are towards the concept of zero waste shopping. Moreover, the secondary data used to conduct the literature review has been obtained by consulting the library database of NMU which has provided access to a number of online databases such as EBSCOhost, Emerald and SpringerLink. In addition to this, textbooks, newspaper articles and reputable websites have been referred to.

### 3.5.2 PRIMARY DATA COLLECTION

According to Hox and Boeijie (2005:593), primary data collection calls for the collection of data for the specific research problem at hand. Consequently, primary data is obtained directly from first hand sources and may be done by means of observations, experimentations, questionnaires or surveys (Choudhary, 2017). Additionally, Struwig and Stead (2013:89) assert that interviews, focus groups and the internet can be used to collect primary data.

Due to the quantitative nature of this study, primary data will be collected through the use of a survey whereby a structured questionnaire will be administered to respondents. This data will in turn be statistically analysed and interpreted to address the research problem proposed. Therefore, the self-administered questionnaire handed to several NMB residents will be the main source of primary data for this study.

### 3.6 RESEARCH MEASURING INSTRUMENT: QUESTIONNAIRE

There are various research instruments that can be used in quantitative research, the most common of these being questionnaires and interviews (Struwig & Stead, 2013:89). For the purpose of this study, the most applicable research instrument will be that of a self-administered questionnaire. As stipulated, a quantitative research approach that is of a descriptive nature will be used in this study as the data will be collected through the use of a self-administered questionnaire where answers to research questions will be expressed in numbers.

Wilkinson and Birmingham (2003:7) state that questionnaires are the most preferred instrument of data collection as it provides researchers with a cheap and effective way of collecting large amounts of data in an organised and manageable form. Wilkinson and Birmingham (2003:8) further state that while questionnaires can be very detailed, covering many subjects or issues, they can also be very simple and focus on one important area.

The items contained within this study's measuring instrument, namely the questionnaire, will be sourced from existing measuring instruments which have been used in similar research to the study to be conducted. The questionnaire will also be based on existing literature cited in the literature review.

The questionnaire will be accompanied by a cover letter and comprise of four sections. The cover letter that will accompany the questionnaire will highlight the purpose of the study, elaborate on the objectives of the research and include a promise of confidentiality. Furthermore, instructions on how to complete the questionnaire will be provided to the respondents at the beginning of each new section, which should eliminate ambiguity and improve the effectiveness and reliability of the questionnaire.

The questionnaire will comprise of four sections, namely:

- Section A: General perceptions regarding waste management and environmental sustainability using a five-point Likert-type ordinal scale;
- Section B: General perceptions regarding zero waste shopping using a five-point Likert-type ordinal scale;
- Section C: Investigate practices regarding zero waste shopping using a dichotomous scale;
- Section D: Biographical information of respondents using a category scale.

To ensure maximum efficiency and effectiveness of the questionnaire, careful consideration will go into the creation and development thereof. The content of the questions will only ask what is necessary in relation to the purpose and objective of the study and comprise of questions that the respondents will be able and willing to answer. The wording of the questions will be thoroughly examined to ensure that it is understandable to the respondents, that it does not influence respondents to answer in a certain way, and to ensure that only one question is being asked at a time. The order of the questions will be arranged in such a way as to elicit respondent's motivation to complete the questionnaire.

### **3.7 PILOT STUDY**

Zikmund, Babin, Carr and Griffon (2010:65) state that a pilot study can be defined as a small-scale research project that collects data from respondents parallel to those that will be used in the actual study. For the purpose of this study, a pilot study will be conducted by dispersing 10 self-administered questionnaires amongst 10 potential respondents to determine whether the questionnaire is logical and competent enough to be used for the actual study. As with the actual study, the pilot study will make use of convenience sampling to gather respondents' answers. The pilot questionnaire will include additional questions to get respondents' impressions of the questionnaire itself. Respondents of the pilot study will also be given the opportunity to critique and comment on the questionnaire. The critique and comments from the pilot study will be used to improve and make changes in the questionnaire where legitimate concerns were noted.

### **3.8 ETHICAL CONSIDERATIONS**

In accordance with NMU's policies, this study will be conducted in an ethical manner. This study will comply with all regulations and requirements stipulated by the institution. In order to ensure that the study will fulfil all of the institution's ethical requirements, an ethics form E will be completed and passed on to the ethics department, under the supervision of the study leader. Measures will also be taken to ensure that the contributions of respondents will be kept confidential and this will be clearly communicated to respondents on the cover letter of the measuring instrument. Respondents will also be made aware that they have no obligation to take place in the study and that they have the right to withdraw their contributions at any time during the study.

### **3.9 DATA ANALYSIS**

Sridhar (2018) explains that data analysis is the process of evaluating data collected using analytical and statistical tools. This is done to discover useful information and aids in the formulation of conclusions and future recommendations (Sridhar, 2018). Struwig and Stead (2013:156) state that the first step in quantitative data analysis is to convert raw data into a "list of required information". In this process raw data is converted into meaningful information that can be interpreted and studied.

For the purpose of the study to be conducted, the primary data collected from the administered questionnaires will be captured using Microsoft Excel. Data will then be analysed using

Statistica, a statistical and analytical computer programme. The study will make use of descriptive statistics in analysing data.

Descriptive statistics provide statistical summaries of data (Struwig & Stead, 2013:165). The purpose of these statistics is to provide an overall, coherent and straightforward picture of a large amount of data. Kenton (2018) explains that descriptive statistics aids in summarising data in such a way that meaningful information might be observed, such as patterns emerging from the analysed data. The primary data analysis techniques used within this study will be descriptive in nature, analysing the mean, median, mode and standard deviation of the data collected as well as examining frequency distributions.

These statistical findings will be used to compare and interpret the data collected and analysed from the questionnaires. From this, interpretations, comparisons and plausible conclusions can be drawn for the primary research of this study.

### **3.10 VALIDITY AND RELIABILITY OF THE MEASURING INSTRUMENT**

Validity in the context of a research study can be described as the accuracy with which the findings reflect the data (Noble & Smith, 2015:35). Drost (2011:106) states that reliability is the extent to which a measuring instrument is repeatable when different people perform the measurements under different conditions. Face and content validity will be ensured in this study by making use of a pilot study as well as consulting numerous experts for their opinions and basing it on the literature review conducted. Face validity is concerned with whether the measuring instrument appears valid to respondents and is thus designed to meet the specified objectives of the study (Krabbe, 2017:115). Therefore, the questionnaire will indicate the objectives of the study to respondents and will only seek to obtain the necessary information. On the other hand, content validity questions whether the measuring instrument is really measuring what it is intended to measure (Krabbe, 2017:115). This will be ensured by referring to the literature review conducted as well as academic experts when constructing the questionnaire.

Cronbach's alpha coefficient will be used as an objective measure of the study's reliability. Tavakol and Dennick (2011:53), explain that Cronbach's alpha coefficient provides a measure of the internal consistency of a test or scale and is expressed as a number between zero and one. Measuring internal consistency is important because it defines the extent to which items in the measuring instrument measure the same concept and is therefore linked to the inter-relatedness of the items within the measuring instrument (Tavakol & Dennick, 2011:53).

### 3.11 CHAPTER SUMMARY

The primary objective of this chapter is to provide a comprehensive analysis of the research methodology to be used in the study. This chapter highlighted the importance of an appropriate research design. It was set out in this chapter that the study will adopt a positivist research paradigm and as such, a quantitative research approach that is of a descriptive nature as the data will be collected through the use of a self-administered questionnaire where answers to research questions will be expressed in numbers.

The research objectives of this study require the collection of both primary and secondary data. Secondary data, data that already exists and is available from sources other than the current study, has been gathered from a range of annual reports, journal articles, reputable websites and government publications. The primary data, data for the specific research problem at hand, will be obtained directly from respondents and will be sourced by means of a self-administered questionnaire completed by several NMB consumers.

The research population of this study will consist of all the consumers in NMB, however, due to researchers lacking the personal capacity to access the entire population, it was found sufficient to select a sample of 150 consumers who reside in NMB. This study will make use of non-probability sampling, more specifically, convenience sampling as it would provide the researchers with the timeliest and most cost-effective means of reaching respondents.

The research instrument used in the study as stipulated in section 3.6 is by means of a self-administered questionnaire. The items contained within the questionnaire will be sourced from existing instruments which have been used in similar research studies to that of the study to be conducted. The items will also be based on literature cited in the literature review of this study.

A pilot study will be conducted by having 10 potential respondents complete the questionnaire and then give them the opportunity to analyse and critique it. Legitimate concerns highlighted by the respondents will be assessed and corrective action will be taken.

The data obtained from the actual research study that will consist of 150 consumers who reside in NMB will be analysed by means of Microsoft Excel and Statistica. Descriptive statistics will be used to analyse and report on the data converted to meaningful information. By making use of descriptive statistics, valuable and reliable conclusions can be drawn from the data collected.

The following chapter (Chapter Four) of this study will provide the reader with the results of the empirical study.

## **CHAPTER FOUR**

### **EMPIRICAL RESULTS**

#### **4.1 INTRODUCTION**

The preceding chapters have dealt with and focused on a theoretical overview of zero waste and zero waste shopping as well as the research methodology conducted for this study. Chapter Three provided a detailed account of the research design and methodology undertaken. The chapter elaborated on the study's research paradigm, research approach and research method. Moreover, an overview of the study's population, sample and sampling technique used were given. Data collection methods (secondary and primary) as well as the measuring instrument used to collect primary data was also discussed. In addition to this, the way in which data is to be analysed for this study was provided, wherein descriptive statistics was specifically mentioned. The ethical considerations undertaken to complete this study as well as the validity and reliability of the measuring instrument was also elaborated on. Thereafter, the chapter ended in a short summary of its contents.

This chapter will focus on the results of the empirical investigation undertaken concerning customer attitudes towards zero waste shopping in NMB. Firstly, a layout of the research instrument used will be presented. Thereafter, an analysis of the data will be given, where descriptive statistics and frequencies will describe the results and subsequently be examined. Following this, the validity and reliability of the measuring instrument will be discussed, referring specifically to face and content validity as well as Cronbach's alpha coefficient. Lastly, the biographical data of respondents will be elaborated on. The chapter will then conclude with a summary.

#### **4.2 LAYOUT OF THE MEASURING INSTRUMENT**

The measuring instrument, from here on referred to as the questionnaire, made use of a particular structure in that it comprises of four sections. Table 4.1 sets out the layout of the questionnaire.

**Table 4.1: Layout of the measuring instrument**

Section	Topic / Factors	Statement coding
A	General perceptions regarding waste management and environmental sustainability	PERCEP1-PERCEP10
B	Perceptions regarding zero waste shopping	
	Knowledge of zero waste	ZERO1-ZERO5
	Food waste	FOOD1-FOOD5
	Attitudes towards zero waste	ATT1-ATT5
	Impact of waste	IMPACT1-IMPACT5
	Challenges of zero waste	CHALL1-CHALL5
	Benefits of zero waste	BEN1-BEN5
C	Practices regarding zero waste shopping	PRAC1-PRAC15
D	Biographical data	GENDER1-GENDER2
		ETHNICITY1-ETHNICITY5
		AGE1-AGE6
		QUALI1-QUALI6
		EMPLOY1-EMPLOY8
		SHOPPING1-SHOPPING6
		RESIDENCE1-RESIDENCE6
		HIERARCHY1-HIERARCHY4
		ZERO1-ZERO10

As depicted in Table 4.1, Section A of the questionnaire was set out to investigate respondents' general perceptions regarding waste management and environmental sustainability while Section B examined respondents' perceptions regarding zero waste shopping. Section A and Section B make use of a five-point Likert scale in the questionnaire, however, for discussion purposes in this chapter, response categories on the five-point Likert scale for the various statements within these sections were categorised as follows: responses from 1 to 2.333 were categorised as *disagree*; 2.333 to 3.667 categorised as *neutral*; and 3.667 to 5.00 were categorised as *agree*. Thereafter, Section C assessed zero waste shopping practices that respondents regularly undertake. Lastly, Section D provided the biographical data of respondents.

### 4.3 RESULTS OF THE EMPIRICAL INVESTIGATION

This section will make use of descriptive statistics to organise, describe, analyse and interpret the data obtained through the administration of the research questionnaire. Descriptive statistics aid in describing and understanding certain features of a data set (Kenton, 2018). Narkhede (2018) adds that descriptive statistics summarises and organises data so that it can be understood more clearly. Beintema and Casper (2018:38) agree, stating that descriptive

statistics are best used to organise and describe a large data set. Moreover, descriptive statistics can be categorised in two different ways, namely measures of central tendency and measures of variability or spread (Narkhede, 2018).

Measures of central tendency outline the centre position of the distribution of a particular data set and does so with the use of the data's mean, median and/or mode (Tiemann, 2010:12). On the other hand, measures of variability or spread analyses how spread out the distribution of a data set is and includes standard deviation (Kenton, 2018).

#### 4.3.1 BIOGRAPHICAL INFORMATION

The biographical information collected from the sample of 150 NMB residents is presented in Table 4.2. This table includes the respondents' gender, ethnicity, age in years, highest qualification, employment status, frequency of shopping and place of residence.

**Table 4.2: Summary of biographical information of respondents**

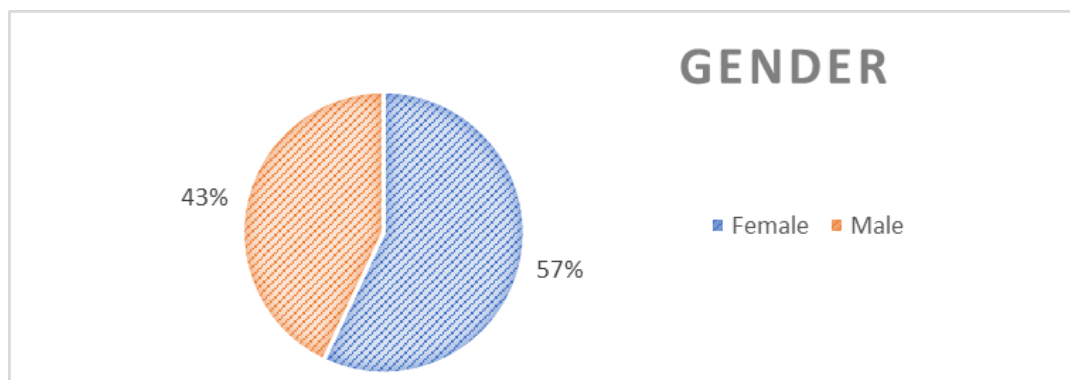
Biographical section	Categories	Frequency	Percentage (%)
<b>Gender</b>	Female	86	57
	Male	64	43
<b>Ethnicity</b>	African	34	23
	Coloured	30	20
	Indian and Asian	11	7
	White	75	50
<b>Age in years</b>	16 – 20 years	3	2
	21 – 30 years	67	45
	31 – 40 years	27	18
	41 – 50 years	28	19
	51 – 60 years	19	13
	61 years and above	6	4
<b>Highest qualification</b>	Grade 11 and lower	15	10
	Grade 12	32	21
	National diploma or certificate	38	25
	Bachelor's degree	41	27
	Postgraduate degree or diploma	24	16
<b>Employment status</b>	Student	27	18
	Unemployed	5	3
	Retired	4	3
	Self-employed	13	9
	Employed full-time	92	61
	Employed part-time	8	5
	Unable to work	1	1

Biographical section	Categories	Frequency	Percentage (%)
<b>Frequency of shopping</b>	Once a month	18	12
	Twice a month	9	6
	Three times a month	15	10
	Once a week	61	41
	Every second day	33	22
	Every day	14	9
<b>Place of residence</b>	House	86	57
	Townhouse	23	15
	Flat or apartment	34	23
	Non-urban area	7	5
<b>The three R's of the waste hierarchy</b>	Reduce the amount of waste that is produced	85	57
	Reuse products through finding new use for it or donating it	101	67
	Recycling materials from normal waste	62	41
	None of the above	17	11
<b>Zero waste shopping products: When consumers are most likely to produce zero waste purchasing certain products</b>	Fruit	93	62
	Vegetables	86	57
	Meat	61	41
	Cheese	48	32
	Grains	41	27
	Personal care and beauty products	46	31
	Cleaning products and materials	59	39
	Stationery and office supplies	45	30
	Packaging materials (e.g. plastic bags)	96	64
	Other	5	3

#### 4.3.1.1 Gender

Out of all respondents interviewed, the majority were male (57%) while the remaining were female (43%). Figure 4.1 illustrates the gender distribution of the respondents.

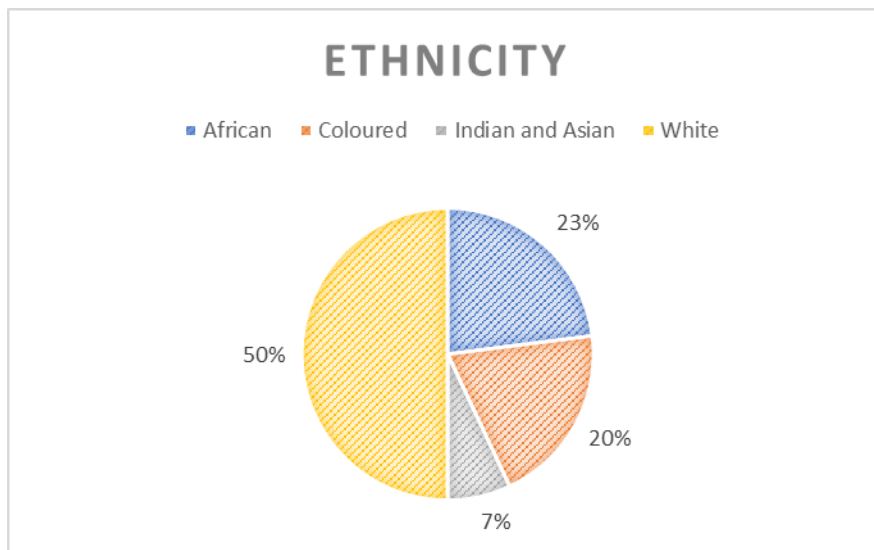
**Figure 4.1: Gender of respondents**



#### 4.3.1.2 Ethnicity

Most respondents who took part in the study were white, representing 50% of the total sample. This was followed by African, Coloured, and Indian and Asian ethnic groups representing 23%, 20%, and 7% of the sample respectively. Half of the sample size is represented by one ethnic group as a result of the use of convenience sampling. Figure 4.2 depicts the ethnic groups involved in the study.

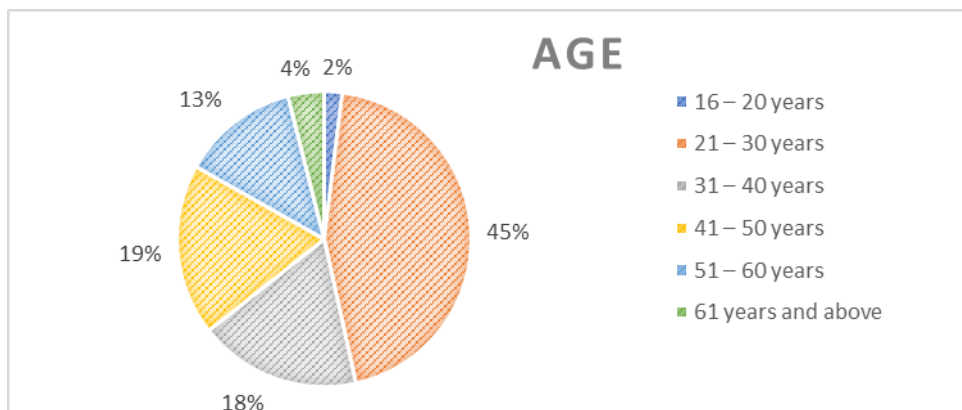
**Figure 4.2: Ethnicity of respondents**



#### 4.3.1.3 Age

Figure 4.3 shows the various age groups of the respondents involved in the study. The age group representing the majority of the respondents is 21 to 30 years (45%). This is followed by 41 to 50 years (19%), 31 to 40 years (18%), 51 to 60 years (13%), 61 years and above (4%), and lastly, 16 to 20 years (2%).

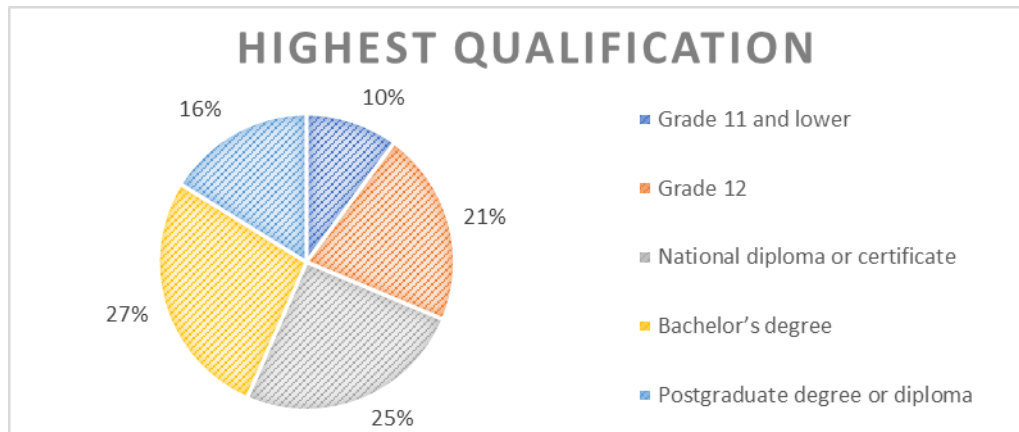
**Figure 4.3: Age of respondents**



#### 4.3.1.4 Highest qualification

The majority of respondents in this study have obtained a bachelor's degree (27%), while 25% have obtained a national diploma or certificate. Other qualifications obtained by respondents include grade 12 (21%), a postgraduate degree or diploma (16%) and grade 11 and lower (10%). Figure 4.4 represents the highest qualifications held by respondents.

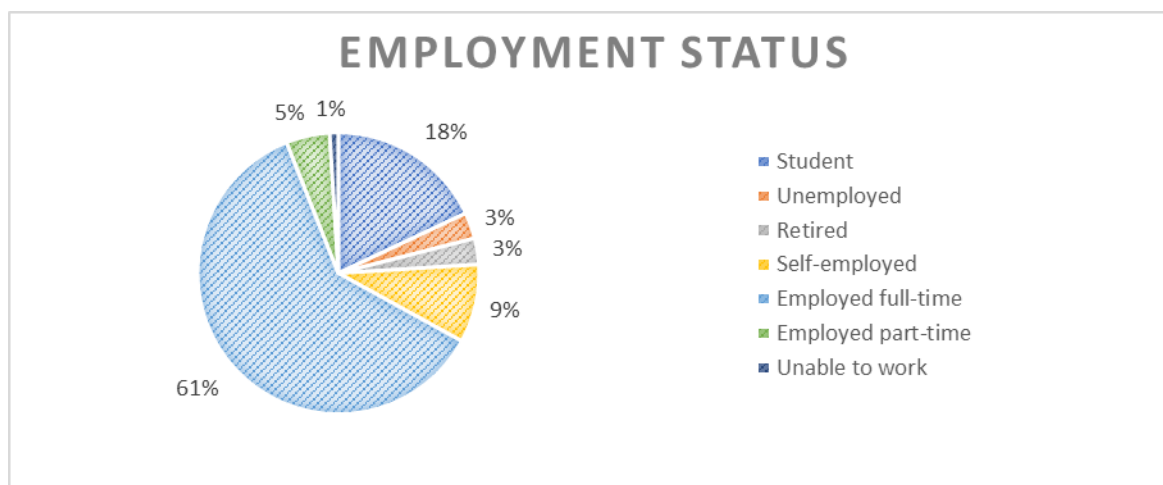
**Figure 4.4: Education of respondents**



#### 4.3.1.5 Employment status

A total of 61% of respondents are currently employed full-time, whereas 18% of the respondents are students. Furthermore, 9% of respondents are self-employed, 5% are employed part-time, 3% are unemployed, 3% are retired and 1% are unable to work. Respondents' employment status is a key biographical factor in this study, as literature highlights that economic status is a key driver of waste generation in South Africa (Irwan *et al.*, 2013:22). Figure 4.5 illustrates the employment status of respondents

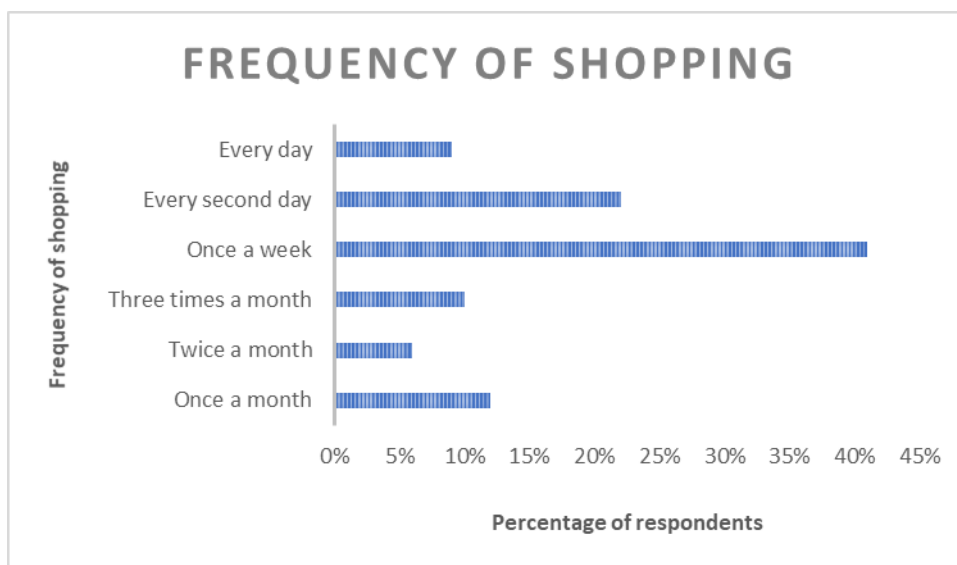
**Figure 4.5: Employment status of respondents**



#### 4.3.1.6 Frequency of shopping

The frequency of respondents' shopping was measured as literature indicates that an increase in the frequency of shopping leads to an increase in the consumption of goods, potentially resulting in larger amounts of waste generation (Greyson, 2007:1383). The majority of respondents engage in shopping activities once a week (41%). This is followed by consumers engaging in shopping activities every second day (22%), once a month (12%), three times a month (10%), every day (9%), and lastly, twice a month (6%). Figure 4.6 shows the frequency with which respondents engage in shopping activities.

**Figure 4.6: Respondents' frequency of shopping**

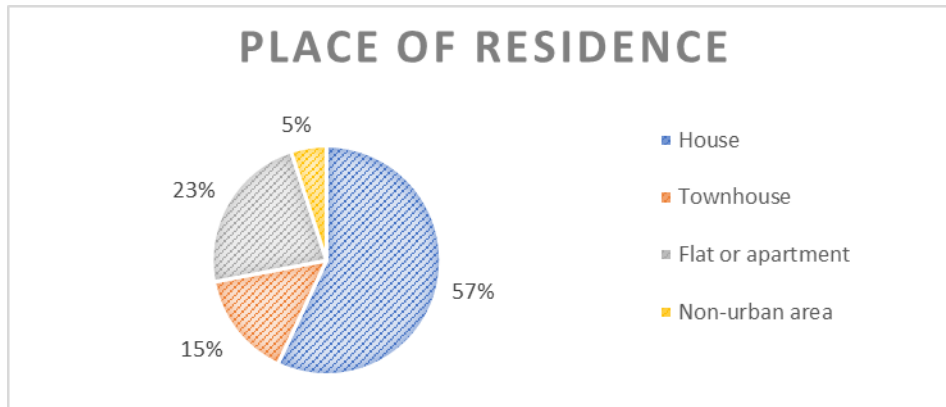


#### 4.3.1.7 Place of residence

Figure 4.7 displays the respondents' place of residence. According to Berg (2012), solid waste generation is generally considered to be more of an urban issue as waste generation rates tend to be higher in urban areas. Therefore, respondents' place of residence may have an impact on their levels of waste generation. The majority of respondents within this study live in a house (57%), followed by a flat or apartment (23%), townhouse (15%), and non-urban areas (5%). Moreover, it is important to note that respondents who reside in houses dispose of their municipal solid waste on their own, either by leaving their garbage bags outside of their houses to be collected by garbage trucks on a weekly or monthly basis, or by physically taking their waste to accredited refuse sites. On the other hand, respondents who live in townhouses, apartments or flats dispose of their waste at a communal waste collection point within their

complex. Thus, the place of residence has an impact on how respondents dispose of their waste and impacts their waste management.

**Figure 4.7: Respondents' place of residence**



#### 4.3.1.8 The three R's of the waste hierarchy

In this section, respondents selected elements of the waste hierarchy which they engage in in their daily lives and were thus able to select more than one option. A total of 57% of respondents indicated that they attempt to reduce the amount of waste that they produce, while 67% of respondents state that they reuse products by finding new ways to use it or instead donate it. Moreover, 41% assert that they recycle materials and 11% of respondents admit to not engaging in any of these practices. Figure 4.8 illustrates which of the three R's of the waste hierarchy respondents undertake.

**Figure 4.8: The waste hierarchy**



#### 4.3.1.9 Zero waste shopping products

Respondents were tasked with indicating which products they would most likely produce zero waste when making their purchasing decisions and were thus able to select more than one option. Figure 4.9 shows the results obtained. It was discovered that respondents feel as if they produce zero waste when purchasing the following products:

- Packaging materials such plastic bags (64%).
- Fruit (62%).
- Vegetables (57%).
- Meat (41%).
- Cleaning products and materials (39%).
- Cheese (32%).
- Personal care and beauty products (31%).
- Stationery and office supplies (30%).
- Grains (27%).
- Others such as clothes, medicine and baking goods (3%).

From the results obtained, it is evident that the most popular product that respondents produce zero waste with when purchasing is packaging materials (64%). For example, many respondents take their own shopping bags with when shopping instead of buying new bags with each purchase. Moreover, fruit (62%) and vegetables (57%) follow packaging materials closely as products that respondents generate zero waste with when purchasing. On the other hand, products that are least popular with regards to respondents engaging in zero waste with when shopping include other items such as clothing, baking goods and medicine.

**Figure 4.9: Zero waste shopping products**



#### 4.3.2 GENERAL PERCEPTIONS REGARDING WASTE MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY

Table 4.3 illustrates descriptive statistics relating to general perceptions regarding waste management and environmental sustainability, indicating the mean, standard deviation and percentage of responses. Note that response categories on the five-point Likert scale for the various statements in the questionnaire were categorised as follows: responses from 1 to 2.333 as *disagree*; 2.333 to 3.667 as *neutral*; and 3.667 to 5.00 as *agree*.

**Table 4.3: Descriptive statistics relating to general perceptions regarding waste management and environmental sustainability**

Statement	Mean	Standard deviation	Responses (%)		
			Disagree	Neutral	Agree
PERCEP1	3.5	1.04	19	21	59
PERCEP2	3.67	0.94	14	20	66
PERCEP3	3.85	0.96	8	22	70
PERCEP4	3.31	1.11	25	27	47
PERCEP5	3.33	1.09	23	29	48
PERCEP6	4.19	0.91	8	7	85
PERCEP7	3.57	1.13	19	22	59
PERCEP8	3.05	1.09	33	30	37
PERCEP9	3.48	1.06	2	23	57
PERCEP10	4.08	0.97	7	17	76
<b>OVERALL</b>	<b>3.28</b>	<b>0.94</b>	<b>17.6</b>	<b>22</b>	<b>61</b>

According to the overall mean of 3.28 and standard deviation of 0.94, respondents were indifferent to perceptions regarding waste management and environmental sustainability, as the mean score lies between 2.333 and 3.8667. The standard deviation of 0.94 indicates that there is a low dispersion of scores around the mean, and from this it can be concluded that the majority of respondents are indifferent to perceptions concerning waste management and environmental sustainability.

PERCEP6 was the most notable outlier in this analysis, with the highest mean score of 4.19, lowest standard deviation of 0.91 and highest percentage (85%) of respondents agreeing to the

statement. Therefore, it appears that respondents are of the opinion that improper waste management can lead to a number of environmental problems. This indicates that respondents are aware of the dangers that improper waste management pose on the natural environment. Moreover, PERCEP10 was another significant outlier as it scored a mean of 4.08. Therefore, it can be deduced that respondents are knowledgeable that their actions, positive or negative, will have an impact on the environment.

Results indicate that PERCEP8, relating to respondents informing others about proper waste management practices, scored the lowest mean of 3.05 as well as the highest percentage of respondents disagreeing (33%) or feeling indifferent (30%) to this particular statement. This indicates that although respondents are aware that their actions may affect the environment, they still do not deem it necessary to inform others on how to practice proper waste management.

#### 4.3.3 PERCEPTIONS REGARDING ZERO WASTE SHOPPING

Table 4.4 displays respondents' general perceptions regarding zero waste shopping and shows the mean, median, mode and standard deviation of responses for this section. Furthermore, specific topics relating to respondents' perceptions will be discussed, namely *knowledge of zero waste shopping* (KNOW1 to KNOW5), *food waste* (FOOD1 to FOOD5), *attitudes towards zero waste shopping* (ATT1 to ATT5), *impact* (IMPACT1 to IMPACT5), *challenges* (CHALL1 to CHALL5) and *benefits* (BEN1 to BEN5) *of zero waste shopping*. The five-point Likert scale used in the questionnaire has been reduced to three response categories, with responses from 1 to 2.333 categorised as *disagree*, 2.333 to 3.667 categorised as *neutral*, and 3.667 to 5.00 categorised as *agree*.

**Table 4.4: Descriptive statistics of perceptions regarding zero waste shopping**

Statement code	Mean	Median	Mode	Standard deviation
KNOW1	3.53	4	4	1.16
KNOW2	3.75	4	4	1.07
KNOW3	3.29	3	4	1.08
KNOW4	3.54	4	4	1.03
KNOW5	3.38	3	4	1.06
<b>Overall scores for <i>knowledge of zero waste</i></b>	<b>3.50</b>	<b>3</b>	<b>4</b>	<b>1.08</b>

Statement code	Mean	Median	Mode	Standard deviation
FOOD1	4.24	4	5	0.87
FOOD2	3.82	4	4	0.95
FOOD3	4.09	4	4	0.89
FOOD4	3.78	4	4	0.90
FOOD5	3.74	4	4	0.83
<b>Overall scores for <i>food waste</i></b>	<b>3.93</b>	<b>4</b>	<b>4</b>	<b>0.89</b>
ATT1	4.15	4	4	0.89
ATT2	3.51	4	4	1.07
ATT3	2.91	3	3	1.15
ATT4	3.13	3	4	1.21
ATT5	3.60	4	4	0.93
<b>Overall scores for <i>attitudes towards zero waste shopping</i></b>	<b>3.46</b>	<b>3.60</b>	<b>4</b>	<b>1.05</b>
IMPACT1	3.67	4	4	0.95
IMPACT2	3.97	4	4	0.85
IMPACT3	3.89	4	4	0.90
IMPACT4	4.10	4	4	0.98
IMPACT5	4.16	4	4	0.83
<b>Overall scores for <i>impact of waste</i></b>	<b>3.96</b>	<b>4</b>	<b>4</b>	<b>0.90</b>
CHALL1	3.99	4	4	0.82
CHALL2	4.05	4	4	0.83
CHALL3	4.13	4	4	0.84
CHALL4	4.12	4	4	0.86
CHALL5	4.08	4	4	0.90
<b>Overall scores for <i>challenges of zero waste</i></b>	<b>4.07</b>	<b>4</b>	<b>4</b>	<b>0.85</b>
BEN1	3.79	4	4	0.95
BEN2	3.88	4	4	0.81
BEN3	3.88	4	4	0.90
BEN4	4.01	4	4	0.86
BEN5	3.79	4	4	0.98

Statement code	Mean	Median	Mode	Standard deviation
Overall scores for <i>benefits of zero waste</i>	3.87	4	4	0.90
OVERALL	3.8	4	4	0.95

Each of the five factors regarding respondents' perceptions of zero waste shopping will be discussed.

#### 4.3.3.1 Knowledge of zero waste

Statements KNOW1 to KNOW5 relate to respondents' overall *knowledge of zero waste* and thus examines whether respondents are familiar with the concept of zero waste and what it entails. These statements produced an overall mean score of 3.50 and standard deviation of 1.08. Table 4.5 summarises the statistics for *knowledge of zero waste*.

**Table 4.5: Descriptive statistics: Knowledge of zero waste**

Mean	Median	Mode	Standard Deviation
3.50	3	4	1.08

According to the mean score obtained of 3.50, the majority of respondents are indifferent to having basic knowledge of what zero waste is and what it entails. Moreover, the standard deviation of 1.08 indicates that there is a large dispersion of scores around the mean.

Statement KNOW2 recorded the highest mean for this factor, with a mean score of 3.75. This indicates that respondents agree with the basic principles of zero waste such as waste avoidance, reuse, recycling and reduction of waste generation. In contrast, KNOW3, which relates to respondents' knowledge of how to implement zero waste in their daily lives, reported the lowest mean score of 3.29. This indicates that although most respondents are knowledgeable of zero waste, they are not particularly driven to implement zero waste in their daily lives.

#### 4.3.3.2 Food waste

The *food waste* factor relates to consumers' food consumption patterns as well as the amount of edible food that is discarded by individuals and the negative impact that this has on the environment. Statements FOOD1 to FOOD5 thus measured respondents' insights into *food waste*. This factor resulted in an overall mean score of 3.93 and a standard deviation of 0.89 which indicates a low dispersion of scores around the mean. Furthermore, these results indicate

that respondents agree to the fact that there is excessive food waste within our economy and that it has a negative effect on the environment. Table 4.6 sets out the statistics for the factors regarding *food waste*.

**Table 4.6: Descriptive statistics: Food waste**

Mean	Median	Mode	Standard Deviation
3.93	4	4	0.89

Overall, all statements regarding food waste reported a mean score of no less than 3.74, indicating that respondents agree to most statements related to *food waste*. Statement FOOD1 is worth noting as it was the statement which scored the highest overall mean and mode of 4.24 and 5 respectively, as shown in Table 4.4. Therefore, these scores are evidence that the majority of respondents feel strongly about the fact that the cost of wasted edible food could alternatively be used to feed the hungry. Statement FOOD3 also indicated an above average mean score of 4.09, suggesting that respondents are aware of the major losses that are incurred due to food waste. It can thus be deduced that respondents are aware of and educated about the impact of food waste on the environment.

#### 4.3.3.3 Attitudes towards zero waste

*Attitudes towards zero waste* can be positive or negative as consumers will have varying opinions on whether zero waste will have a significantly positive effect on the environment or whether it is even possible to live a zero waste lifestyle. Five statements, ATT1 to ATT5 were used to test respondents' *attitudes towards zero waste*. The overall mean score for respondents' *attitudes towards zero waste* was recorded as 3.46 while the standard deviation recorded was 1.05. The mean score of 3.46 specifies that the majority of respondents have a neutral attitude towards the concept of zero waste. The standard deviation of 1.05 indicates that there is great dispersion around the mean score. Table 4.7 displays statistics relating to respondents' *attitudes towards zero waste*.

**Table 4.7: Descriptive statistics: Attitudes towards zero waste**

Mean	Median	Mode	Standard Deviation
3.46	3.60	4	1.05

As stipulated in Table 4.4, ATT1 showcased the highest mean score of 4.15 and lowest standard deviation of 0.89 for all statements regarding respondents' attitudes towards zero waste. This indicates that the majority of respondents agree that implementing zero waste will have a

significantly positive effect on the environment. It should be noted that in contrast to the results recorded for ATT1, the majority of respondents were indifferent about stating whether they are already practicing zero waste in their daily lives, as ATT3 scored the lowest mean of 2.91.

#### 4.3.3.4 Impact of waste

The *impact of waste* factor is concerned with the effects that respondents' waste generation and disposal have on the environment. Statements IMPACT1 to IMPACT5 measure respondents' knowledge of the impact that waste has on the environment and their overall health. The mean score reported for this factor was 3.96, indicating that respondents agree that waste has an impact on their personal well-being and surrounding environment. Additionally, a mode of 4 and a standard deviation of 0.90 was reported. The standard deviation of 0.90 indicates that there is a low dispersion of scores around the mean. Table 4.8 summarises the statistics for the *impact of waste* factor.

**Table 4.8: Descriptive statistics: Impact of waste**

Mean	Median	Mode	Standard Deviation
3.96	4	4	0.90

Table 4.4 indicates that IMPACT5 and IMPACT4 scored the highest means for this factor with 4.16 and 4.10 respectively, signifying that respondents are aware of the impact that waste has on the natural environment (IMPACT5) and their personal health (IMPACT4). The lowest mean score recorded for this factor is 3.67 for IMPACT1 regarding respondents' consciousness about their own actions and how this may result in the generation of waste. Therefore, it can be concluded that respondents take note of what impact general waste has on the environment but are somewhat oblivious to how their own waste generation may adversely impact the environment.

#### 4.3.3.5 Challenges of zero waste

*Challenges of zero waste* include individuals' resistance to behavioural change, lack of knowledge of zero waste as well as an absence of environmental education at school level. Statements assessing respondents' views on the *challenges of zero waste* (CHALL1 to CHALL5) had the highest overall mean score among all factors within Section B of the questionnaire. The mean score of 4.07 indicates that respondents mostly agree to the various challenges posed by the implementation of zero waste. The standard deviation of 0.85

highlights the fact that the data recorded for this factor is homogenous. Table 4.9 displays statistics relating to the *challenges of zero waste*.

**Table 4.9: Descriptive statistics: Challenges of zero waste**

Mean	Median	Mode	Standard Deviation
4.07	4	4	0.85

All statements within this factor reported mean scores higher than 3.99, as depicted in Table 4.4, indicating that the majority of respondents agree to most of the statements concerning this factor. These statements are related to how various groups (individuals, schools and the government) influence zero waste management. From the results obtained by these statements it can be concluded that the main challenge of zero waste is that, within the NMB area, generally individuals, government and schools appear to be uninterested about the efficient management of waste and subsequent implementation of waste management practices such as zero waste shopping.

#### 4.3.3.6 Benefits of zero waste

The *benefits of zero waste* factor presents numerous advantages of engaging in zero waste shopping, such as a reduction in the emission of harmful greenhouse gasses, as well as a number of financial and economic benefits that result from zero waste shopping. Five statements (BEN1 to BEN5), used to measure the respondents perceived benefits of zero waste, recorded an overall mean score of 3.87 and standard deviation of 0.90. These statements examine respondents' overall perceptions of the various benefits that zero waste could pose. Furthermore, the mean score stipulates that the majority of respondents agree that zero waste may result in a number of benefits. The standard deviation of 0.90 indicates that there is a low dispersion of scores around the mean. Table 4.10 shows the statistics for the *benefits of zero waste* factor.

**Table 4.10: Descriptive statistics: Benefits of zero waste**

Mean	Median	Mode	Standard Deviation
3.87	4	4	0.90

Upon investigating the various statements, it was found that the most significant benefit of zero waste, according to respondents, is the fact that it significantly reduces the hazard to overall public health (BEN4 with a mean score of 4.01). Moreover, BEN2 and BEN3 reported the same mean scores of 3.88, indicating that respondents agree that zero waste can have a positive

effect on the natural environment by reducing the extraction of natural resources and aid in the efficient allocation thereof.

#### 4.3.4 PRACTICES REGARDING ZERO WASTE SHOPPING

Ten statements (PRAC1 to PRAC10) were used to investigate what general practices, if any, respondents undertake in their daily lives with regards to zero waste shopping. Table 4.11 summarises the frequency of respondents, in percentage format, of the various zero waste shopping practices they undertake on a regular basis.

**Table 4.11: Descriptive statistics relating to respondents' zero waste shopping practices**

Statement		Frequency of responses %		
		Always	Sometimes	Never
Statement code	Key words			
PRAC1	Reuse shopping bags	27	47	25
PRAC2	Avoid single-use plastics	14	59	27
PRAC3	Reduce packaging waste	27	49	23
PRAC4	Purchase environmentally friendly products	12	62	26
PRAC5	Use own containers as packaging	8	37	55
PRAC6	Avoid harmful cleaning chemicals	11	29	59
PRAC7	Make use of recycling facilities	16	45	39
PRAC8	Reuse items as much as possible	50	41	9
PRAC9	Use alternatives to disposable items	33	49	17
PRAC10	Creative reuse of items to avoid disposal	40	45	15
PRAC11	Pass items on for continued use	59	37	4
PRAC12	Use recycled materials	13	32	55
PRAC13	Search for second-hand items	23	51	26
PRAC14	Reuse food leftovers	53	38	9
PRAC15	Have a compost heap	11	23	66
<b>OVERALL</b>		<b>27</b>	<b>43</b>	<b>30</b>

PRAC11 stood out positively amongst all other zero waste shopping practices as it recorded the highest number of respondents indicating that they always engage in this practice (59%), while also recording the lowest number of respondents indicating that they never engage in this practice (4%). Therefore, it can be deduced that most respondents strive to continuously reuse items, such as clothing. This is supported by results obtained from PRAC14 which states that

53% of respondents always reuse leftover food in order to avoid food waste as well as PRAC8 which reports that 50% of respondents always use items as much as they are able to before disposing of them. From these statements, it can be concluded that residents in NMB regularly reuse items, more specifically food and clothing, as these are seen as necessities and not something that should be discarded of.

PRAC5, PRAC6, PRAC12 and PRAC15 were the main practices the majority of respondents indicate they never engage in. The common thread among these practices relate to the fact that it takes personal commitment, action and initiative from respondents in order to engage in these practices. For example, 59% of respondents state that they never make their own cleaning materials (PRAC6) while 55% of respondents specify that they never make handmade gifts from recycled materials (PRAC12). Furthermore, the practice (PRAC15) that most respondents never undertake (66% of respondents) is having their own compost heap at home to aid in the proper disposal of inedible food waste.

PRAC4 was the practice that the majority of respondents admit to only sometimes engaging in (62%). From this result it can be concluded that respondents only purchase products that are environmentally friendly when it is convenient for them and thus do not particularly go out of their way to purchase these products. This is supported by the results obtained for PRAC1, PRAC2, PRAC3, PRAC7, PRAC9, PRAC10 and PRAC13. All of these practices have a similar theme in that they relate to the ease with which respondents are able to undertake them. If it is convenient and requires minimal effort on the part of the respondent, then they will engage in the practice, however, if the practice requires any more effort than normal then respondents will be discouraged from participating in the practice.

#### **4.4 RESULTS OF THE VALIDITY OF THE MEASURING INSTRUMENT**

According to Bolarinwa (2015:195), the validity of a measuring instrument examines the degree to which the instrument measures what it claims to measure. The questionnaire used to complete this study has been deemed valid through face and content validity. Supplementary validity measures such as an exploratory factor analysis has been deemed unnecessary, as this study does not test a hypothesised model. Bolarinwa (2015:196) states that face validity is demonstrated when an expert on the particular research subject at hand reviews the measuring instrument and comes to the conclusion that it measures the correct characteristics associated with the research. The questionnaire used in this study was examined and deemed acceptable

by a research supervisor and expert in the field of waste management, thus ensuring face validity of the questionnaire.

Content validity reflects whether the items within the measuring instrument cover the entire content of the construct that it was designed to measure (Korb, 2012). Drost (2011:118) adds that content validity can be assessed by covering a variety of items within a questionnaire and asking the opinions of others to see whether they understand what the measuring instrument is trying to achieve. In this study, content validity has been ensured by referring to an extensive literature review of the topic at hand to develop the questionnaire. In addition to this, a pilot study was conducted in order to find out whether respondents understood the questionnaire and considered it to be logical and competent to be used for the actual study conducted.

#### **4.5 RESULTS OF THE RELIABILITY OF THE MEASURING INSTRUMENT**

Shuttleworth (2009) states that reliability tests the consistency of the measuring instrument and whether the same results will be obtained over a variety of conditions. Korb (2012) states that there is a strong link between validity and reliability, as an instrument must be reliable in order to be valid.

In order to assess the reliability of the questionnaire used in this study, Cronbach's alpha coefficient was used. According to Hair, Black, Babin and Anderson (2014:123), Cronbach's alpha coefficient is the most widely used measure of reliability. Furthermore, the lower limit for Cronbach's alpha coefficient that is generally agreed upon is 0.70 yet can be lowered to 0.60 for exploratory research (Hair *et al.*, 2014:123).

##### **4.5.1 GENERAL PERCEPTIONS REGARDING WASTE MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY**

Ten statements (PERCEP1 to PERCEP10) were used to derive respondents' general perceptions regarding waste management and environmental sustainability. Table 4.12 lists these statements.

**Table 4.12: Reliability results of general perceptions regarding waste management and environmental sustainability**

<b>Cronbach's alpha: 0.89</b>			
<b>Statement code</b>	<b>Statement</b>	<b>Item total correlation</b>	<b>Cronbach's alpha if deleted</b>
PERCEP1	I actively make an effort to manage the amount of waste that I produce.	0.67	0.89

Cronbach's alpha: 0.89			
Statement code	Statement	Item total correlation	Cronbach's alpha if deleted
PERCEP2	I strive to limit my impact on the environment as far as possible.	0.69	0.89
PERCEP3	I have a significant concern for protecting the environment.	0.69	0.89
PERCEP4	I consider the environment by purchasing environmentally friendly products.	0.75	0.88
PERCEP5	I have strong personal environmental values that impact my recycling behaviour.	0.77	0.88
PERCEP6	I am of the opinion that improper waste management can lead to various environmental problems.	0.51	0.90
PERCEP7	I am informed of how household waste can be managed effectively.	0.57	0.90
PERCEP8	I try to inform others about proper waste management practices.	0.71	0.89
PERCEP9	I have access to or knowledge and experience of waste management.	0.61	0.89
PERCEP10	I can have a positive effect on the environment by engaging in recycling practices.	0.52	0.90

As shown in Table 4.12, Section A of the questionnaire which concerns respondents' general perceptions regarding waste management and environmental sustainability proved to be sufficiently reliable as these statements together obtained a Cronbach's alpha coefficient of 0.89, which is above the lower limit of 0.70 as suggested by Hair *et al.* (2014:123). Therefore, the data obtained can be considered as reliable.

#### 4.5.2 PERCEPTIONS REGARDING ZERO WASTE SHOPPING

Factors within Section B of the questionnaire were tested for reliability by obtaining a Cronbach's alpha coefficient for each of the factors.

##### 4.5.2.1 Reliability results of knowledge of zero waste

A total of five statements were used to measure respondents' *knowledge of zero waste* (KNOW1 to KNOW5). These statements are listed in Table 4.13.

**Table 4.13: Reliability results of knowledge of zero waste**

Cronbach's alpha: 0.83			
Statement code	Statement	Item total correlation	Cronbach's alpha if deleted
KNOW1	I have heard of the concept of zero waste before.	0.56	0.82
KNOW2	I am aware of the basic principles of zero waste (e.g. waste avoidance, reuse, recycling and reduction of waste).	0.65	0.79
KNOW3	I know how to implement zero waste in my daily life.	0.73	0.76
KNOW4	I strive for a change in behaviour and lifestyle to reduce overall consumption.	0.62	0.80
KNOW5	I have the principal aim of waste prevention.	0.58	0.81

As evident from Table 4.13, *knowledge of zero waste* obtained a Cronbach's alpha coefficient of 0.83 and is therefore sufficient evidence of reliability for this factor as it is above the lower limit of 0.70 as suggested by Hair *et al.* (2014:123). This ensures that the data obtained can be considered reliable.

#### 4.5.2.2 Reliability results of food waste

In order to measure respondents' knowledge of *food waste* and the impact that it may have on the environment (FOOD1 to FOOD5), a total of five statements were used. These statements are listed in Table 4.14.

**Table 4.14: Reliability results of food waste**

Cronbach's alpha: 0.80			
Statement code	Statement	Item total correlation	Cronbach's alpha if deleted
FOOD1	I believe that the costs of wasted edible food could be used to feed the hungry.	0.43	0.80
FOOD2	I am of the opinion that the food industry in South Africa is not strongly regulated as there is limited legislation regarding food waste disposal.	0.71	0.71
FOOD3	I believe that producing food that is never consumed leads to major energy and water losses.	0.65	0.73
FOOD4	I am concerned that food waste negatively affects the competitiveness of the food industry by hampering growth and employment potential.	0.57	0.76
FOOD5	I believe that shifting food consumption patterns contribute to food waste disposal.	0.52	0.77

The factor for *food waste* returned a Cronbach's alpha coefficient of 0.80, as shown in Table 4.14. Therefore, there is sufficient evidence of reliability for this factor as it is above the lower limit of 0.70 as suggested by Hair *et al.* (2014:123). Therefore, the data obtained can be considered reliable.

#### 4.5.2.3 Reliability results of attitudes towards zero waste

The *attitudes towards zero waste* factor made use of five statements (ATT1 to ATT5). These statements are listed in Table 4.15.

**Table 4.15: Reliability results of attitudes towards zero waste**

Cronbach's alpha: 0.82			
Statement code	Statement	Item total correlation	Cronbach's alpha if deleted
ATT1	I believe that implementing zero waste will have a significantly positive effect on the environment.	0.44	0.83
ATT2	I am of the opinion that it is possible to live a zero waste lifestyle.	0.61	0.79
ATT3	I already practice zero waste in my daily life.	0.68	0.77
ATT4	I encourage others to embrace a zero waste lifestyle.	0.68	0.77
ATT5	I believe that embracing zero waste is regarded as a moral obligation.	0.67	0.77

Table 4.15 indicates that a Cronbach's alpha coefficient of 0.82 was obtained for *attitudes towards zero waste*. This factor is therefore proved sufficiently reliable as the Cronbach's alpha coefficient is above the lower limit of 0.70 as suggested by Hair *et al.* (2014:123).

#### 4.5.2.4 Reliability results of impact of zero waste

A total of five statements were used to measure respondents' knowledge of the *impact of zero waste* on the environment (IMPACT1 to IMPACT5). These statements are listed in Table 4.16.

**Table 4.16: Reliability results of the impact of zero waste**

Cronbach's alpha: 0.80			
Statement code	Statement	Item total correlation	Cronbach's alpha if deleted
IMPACT1	I am conscious about the impact that my daily life has on the generation and/or disposal of waste.	0.48	0.79

Cronbach's alpha: 0.80			
Statement code	Statement	Item total correlation	Cronbach's alpha if deleted
IMPACT2	I am aware that landfilling and the burning of waste are major contributors to greenhouse gas emissions.	0.59	0.76
IMPACT3	I am aware that food waste has a harmful effect on the natural environment.	0.66	0.74
IMPACT4	I am aware that inefficient waste management poses serious health issues.	0.62	0.75
IMPACT5	I am aware that waste disposal leads to land contamination.	0.57	0.76

As evident from Table 4.16, *impact of zero waste* obtained a Cronbach's alpha coefficient of 0.80 and is therefore sufficient evidence of reliability for this factor as it is above the lower limit of 0.70 as suggested by Hair *et al.* (2014:123). This ensures that the data obtained can be considered reliable.

#### 4.5.2.5 Reliability results of challenges of zero waste

Respondents' perceptions of the *challenges of zero waste* (CHALL1 to CHALL5) were measured by a total of five statements. These statements are listed in Table 4.17.

**Table 4.17: Reliability results of challenges of zero waste**

Cronbach's alpha: 0.76			
Statement code	Statement	Item total correlation	Cronbach's alpha if deleted
CHALL1	I believe that many individuals need to overcome their resistance to behavioural change.	0.58	0.70
CHALL2	I realise that individuals need to change their old habits by understanding that their behaviour could affect future generations.	0.56	0.71
CHALL3	I am of the opinion that many individuals are unaware of the zero waste concept.	0.44	0.75
CHALL4	I believe that there is a lack of governmental support for nurturing a zero waste lifestyle.	0.56	0.71
CHALL5	I am of the opinion that there is a lack of environmental education at school level.	0.52	0.73

The *challenges of zero waste* factor obtained a Cronbach's alpha coefficient of 0.76 and is therefore sufficient evidence of reliability for this factor as it is above the lower limit of 0.70 as suggested by Hair *et al.* (2014:123). This ensures that the data obtained can be considered reliable.

#### 4.5.2.6 Reliability results of benefits of zero waste

To measure respondents' perceptions of the *benefits of zero waste* (BEN1 to BEN5), a total of five statements were used. These statements are listed in Table 4.18.

**Table 4.18: Reliability results of benefits of zero waste**

Cronbach's alpha: 0.83			
Statement code	Statement	Item total correlation	Cronbach's alpha if deleted
BEN1	I believe that zero waste shopping results in financial and economic benefits as less waste is generated through the shopping process.	0.61	0.80
BEN2	I am convinced that through zero waste shopping resources are used more efficiently as they are made to last longer.	0.71	0.78
BEN3	I am of the opinion that zero waste shopping benefits the natural environment through the reduction in resource extraction.	0.65	0.79
BEN4	I believe that practicing a zero waste lifestyle significantly reduces the risk of overall public health.	0.64	0.79
BEN5	I know that there is considerable reduction in the emission of greenhouse gasses as a result of zero waste shopping.	0.55	0.82

As shown in table 4.18, *benefits of zero waste* obtained a Cronbach's alpha coefficient of 0.83 and is therefore sufficient evidence of reliability for this factor as it is above the lower limit of 0.70 as suggested by Hair *et al.* (2014:123). This ensures that the data obtained can be considered reliable.

## 4.6 CHAPTER SUMMARY

The objective of this chapter was to state, analyse and discuss the results obtained from the measuring instrument, the administered questionnaire, to achieve the primary objective of this research study which is to assess customer attitudes towards zero waste shopping in the NMB area.

This chapter started by summarising the biographical information (Section D of the questionnaire) of the respondents, these results were tabulated and discussed in section 4.3.1. This discussion was followed by an analysis of the general perceptions regarding waste management and environmental sustainability (Section A of the questionnaire), where the results proved that respondents' general perceptions regarding waste management and

environmental sustainability were mostly neutral to positive. Thereafter, customer perceptions regarding zero waste shopping (Section B of the questionnaire) was stated and showcased the various factors that influence customer perceptions and attitudes. The results of this section showed that challenges of zero waste was the factor that proved to be a key influencer among respondents. Moreover, various practices of zero waste shopping (Section C of the questionnaire) were also listed. Practices regarding the reuse of a product proved to be the most popular among NMB residents, while practices that require more effort than normal were not as popular. Furthermore, the validity and reliability of the measuring instrument was tested using face and content validity as well as Cronbach's alpha coefficient to assess reliability. All six factors in Section B of the questionnaire proved to be reliable when tested.

The following chapter (Chapter Five) will provide an overall summary, conclusion and recommendations of this research study.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 INTRODUCTION**

Chapter Four of this study put forth the layout of the measuring instrument used to conduct the empirical investigation. The chapter also discussed the validity and reliability of the measuring instrument. Most importantly, Chapter Four presented the empirical results obtained from the investigation carried out.

This chapter is the final chapter of the study and will provide an encapsulated overview of the complete study. More specifically, this chapter will summarise the main research objectives of the study, as well as all preceding chapters of the study. Furthermore, a brief summary of the study's research design and methodology will be presented. The main findings of the literature review as well as the empirical investigation will also be given. Moreover, recommendations for future research will be noted, along with the shortcomings of this study. The chapter will conclude with the researchers' self-reflection.

#### **5.2 OVERVIEW OF THE STUDY**

The purpose of this study was to determine customer attitudes towards zero waste shopping in NMB. The study has been conducted through the use of an extensive literature review and the administration of a measuring instrument used to collect and subsequently interpret data from consumers within NMB. Though this investigation, it has been possible to make interpretations as to what customers' attitudes are towards the concept of zero waste and zero waste shopping, as well as what practices they put in place in order to implement this in their daily lives.

##### **5.2.1 RESEARCH OBJECTIVES**

The purpose and primary objective of this study was to determine customer attitudes towards zero waste shopping in NMB. In order for the primary objective to be addressed, various secondary objectives were set, including:

- SO<sup>1</sup>: To investigate how zero waste management is practised in NMB.
- SO<sup>2</sup>: To identify the factors that influence customers' attitudes towards zero waste shopping.
- SO<sup>3</sup>: To investigate the benefits of zero waste shopping for all stakeholders involved.

SO<sup>4</sup>: To empirically assess the level of awareness and practices of individuals towards zero waste shopping.

SO<sup>5</sup>: To provide firms with effective guidelines on how to adopt zero waste management as a business philosophy in their supply chain.

In order to achieve the stated primary and secondary objectives, the following methodological objectives were identified:

MO<sup>1</sup>: To undertake a theoretical investigation of customers' attitudes towards zero waste shopping.

MO<sup>2</sup>: To determine the appropriate research methodology to address the identified research problem and research objectives.

MO<sup>3</sup>: To develop an appropriate measuring instrument that will be used to conduct the study's empirical investigation.

MO<sup>4</sup>: To source primary data from a pre-determined sample of consumers in NMB.

MO<sup>5</sup>: To provide conclusions and recommendations to consumers and firms based on the findings of this research.

## 5.2.2 SUMMARY OF CHAPTERS

This research study has been structured into five chapters, each serving a specific purpose. A brief summary of what each chapter entails will follow.

- Chapter One provided an introduction and background to the study. Moreover, a problem statement indicating the necessity for the study to be completed was presented, followed by the research objectives of this study. Thereafter, a number of key concepts were clarified, and a brief literature overview was given. The research design and methodology were outlined, where numerous aspects concerning the framework of methods and techniques used to complete the research for this study were mentioned. In addition to this, ethics, the scope and demarcation of the study, contribution and structure of the study, as well as the study time frame was discussed.
- Chapter Two provided a theoretical overview of zero waste and zero waste shopping. In this chapter, the concept of zero waste and zero waste shopping as well as the history thereof was discussed. Furthermore, reference was made specifically to waste management in South Africa, with a particular focus on food waste. Supply chain and waste management strategies were also discussed. The chapter concluded with an examination of customer attitudes towards zero waste and the theory of planned

behaviour, the benefits and challenges of zero waste shopping, and a case study of zero waste shopping in South Africa.

- Chapter Three gave a detailed account of the study's research design and methodology. The purpose of this chapter was to provide an understanding of how the quantitative study was to be conducted. An overview of the research paradigm and research approach used was given. Furthermore, the population and sample of the study was elaborated on. Data collection, the research measuring instrument, ethical considerations, data analysis and, finally, the validity and reliability of the measuring instrument were discussed at length.
- Chapter Four presented the empirical results of the study. First, the layout of the measuring instrument, the questionnaire, was provided. Thereafter, the data obtained from the administration of the measuring instrument was presented and interpreted. This included a discussion on respondents' general perceptions regarding waste management and environmental sustainability; perceptions regarding zero waste shopping; and practices regarding zero waste shopping. Moreover, biographical data of respondents was given. The validity and reliability of the measuring instrument was also discussed.
- This chapter (Chapter Five) concludes the study by providing the main findings of the literature review and the empirical investigation. In addition to this, various recommendations are presented. The chapter will conclude with an explanation on the shortcomings of this research, a discussion of future research, and a self-reflection.

### **5.3 RESEARCH DESIGN AND METHODOLOGY**

According to Saunders *et al.* (2019:157), a research design is the organisation of certain research elements in order to determine what evidence, information and data is needed to be gathered, as well as how it needs to be interpreted, in order to execute the research objectives of a study. Firstly, it was determined that this study would make use of a positivist research paradigm, as a quantitative research approach was taken to fulfil requirements of the research objectives. In order to conduct the quantitative research, a population and sample was identified. The research population of this study was identified as all consumers within the NMB area. The sample taken from this population was then narrowed down to 150 consumers residing within NMB. It was determined that researchers would use non-probability convenience sampling to conduct the study.

The research design and methodology also discussed the data collection methods used within this study. Specific reference was made to secondary and primary data collection. Secondary data was collected by conducting an extensive literature review on the topic at hand, while primary data was collected by administering the research instrument to the identified sample of this study.

A questionnaire was deemed necessary as the research instrument of this study and was thus discussed at length with regards to its layout and validity and reliability. It was determined that the questionnaire would comprise of four sections:

- Section A: General perceptions regarding waste management and environmental sustainability;
- Section B: Consumer perceptions regarding zero waste shopping;
- Section C: Practices regarding zero waste shopping; and
- Section D: Biographical data of respondents.

The validity and reliability of the questionnaire would be ensured through face and content validity, as well as the use of Cronbach's alpha coefficient as a statistical measure of reliability. Moreover, ethical considerations concerning the administration of the measuring instrument were put forth. Lastly, the analysis of the data obtained from the administered questionnaires was discussed. It was determined that data would be analysed by means of descriptive statistics, thus analysing data in terms of the mean, median, mode, standard deviation and frequency distributions.

## **5.4 MAIN FINDINGS FROM THE LITERATURE REVIEW**

Chapter Two of this study provided a theoretical overview of zero waste and zero waste shopping. A number of topics related to zero waste, zero waste shopping and waste management, with specific reference to South Africa, was discussed. The main findings from this literature review will follow.

### **5.4.1 THE CONCEPT AND HISTORY OF ZERO WASTE AND ZERO WASTE SHOPPING**

According to Bautista-Lazo and Short (2013:142), waste has been one of the most analysed issues since the start of the 1900s. However, the term zero waste was first coined by Paul Palmer in the 1970s as he marketed waste products to businesses to reuse (The Zero Waste Institute, 2019). In more recent times, advocates of the zero waste lifestyle have emerged and

a number of zero waste shops have opened, with a small number of them in South Africa (Zero Waste Home, 2015; Ruggeri, 2016; Brinkley, 2018). According to Phillips *et al.* (2011:335), zero waste is an approach which has been suggested as a means of achieving waste avoidance or prevention. However, despite recent developments and trends with regards to the implementation of zero waste, there are still increasing global concerns about levels of waste generation, particularly in developing nations such as South Africa where there is not much attention given to the sustainable management of waste (Ferronato & Torretta, 2019:1). Therefore, Lehmann (2011:157) suggests the use of zero waste to eliminate the traditional outlook on waste as something that should be disposed of and rather encourage people to recognise waste as a valuable resource.

#### 5.4.2 WASTE MANAGEMENT IN SOUTH AFRICA

South Africa is evidently far behind developed nations with regards to waste management and the shift from simply landfilling waste, to reducing, recycling and reusing waste (Godfrey & Oelofse, 2017:1). The Department of Environmental Affairs (2018:6) states that there are various drivers of waste generation in South Africa, including population growth, economic growth, income levels, urbanisation, and globalisation. Furthermore, Singh *et al.* (2016:1) state that the high levels of waste have led to devastating impacts on the natural environment. Therefore, to tackle the country's issue of waste generation, more than 41 national acts have been implemented to have a direct or indirect influence on waste generation and management in South Africa (Godfrey & Oelofse, 2017:7). In addition to this, there are a number of licensed waste management facilities across the country that perform various waste management activities (Dlamini, 2016:23). However, Oelofse and Strydom (2010) suggest that the informal sector also be incorporated into the management of waste in South Africa, indicating that informal pickers and house-to-house waste collectors are able to contribute significantly to the country's management of waste.

#### 5.4.3 GENERAL OVERVIEW OF FOOD WASTE

Food waste is described as the loss of nutritious edible materials that are intended for human consumption and can occur at any point in the food supply chain (Parfitt *et al.*, 2010:3065). In this study, emphasis has been placed on food waste as consumers are largely responsible for the generation thereof. In South Africa, approximately one third of the food produced within the country each year becomes food waste, with consumers being responsible for five percent of this waste (Department of Environmental Affairs, 2018:25). Although there is such a large

amount of food wasted each year, Marangon *et al.* (2014:201) assert that food waste is, to a large extent, preventable and that it is thus necessary for consumer attitudes to change towards fostering sustainable food consumption. Notten *et al.* (2014:12) agree, stating that the level of food waste in South Africa is unsustainable and unnecessary. The World Wide Fund (2017) advocates the identification and resolution of food waste drivers, as well as shifting of food consumption patterns to assist in the reduction of the levels of food waste.

#### 5.4.4 CUSTOMER ATTITUDES TOWARDS ZERO WASTE SHOPPING AND THE THEORY OF PLANNED BEHAVIOUR

Akroush and Al-beDei (2015:1355) describe customer attitudes as a combination of individuals' beliefs, feelings and behavioural intentions toward a particular concept or idea. In order to identify and explore various factors that influence customer attitudes towards zero waste shopping, a theoretical framework, Icek Ajzen's theory of planned behaviour, was proposed (Tonglet *et al.*, 2004:197). According to Ajzen (1991:179), the theory of planned behaviour hypothesises that consumer behaviour can be predicted by assessing individuals' attitudes towards the behaviour, subjective norms, and perceived behavioural control. Fielding *et al.* (2008:319) state that an individual's attitude towards a behaviour can be positive or negative and is determined by the sum of the expected outcomes perceived by the individual, weighted by an evaluation of the desirability of these perceived outcomes. Moreover, subjective norms are based on the perception of whether other people in an individual's life would want them to perform such a behaviour, while perceived behavioural control reflects the extent to which an individual perceives the behaviour to be under their self-imposed control (Fielding *et al.*, 2008:319). For this study, additional variables of moral norm and situational factors have been incorporated into Ajzen's theory of planned behaviour. Moral norm refers to an individual's personal beliefs about the moral correctness or incorrectness of performing a specific behaviour (Tonglet *et al.*, 2004:198). Furthermore, situational factors such as inconvenience, access to zero waste shops and the amount of effort involved are likely to influence consumer attitudes and behaviour (Davies *et al.*, 2002:41). Therefore, it has been determined that these various factors have been proved significantly relevant to the attitudes and behaviours of consumers towards the concept of zero waste and zero waste shopping.

#### 5.4.5 BENEFITS AND CHALLENGES OF ZERO WASTE SHOPPING

It is clear that the adoption and implementation of zero waste and zero waste shopping will result in benefits for the natural environment (Matete & Trois, 2008:1487). According to

Pietzsch *et al.* (2017:327), the three most significant benefits of zero waste shopping are financial benefits, environmental benefits and benefits to the community as a whole. Financial benefits of zero waste shopping refer to the efficient use of resources, as resources are purchased with zero waste in mind and are made to last much longer than what they currently do (Lehmann, 2011:165). Zero waste avoids waste generation in the first place and thus reduces the amount of waste put into landfills or incinerated, which in turn reduces the emission of harmful pollutants and gasses (Bandara & Hettiaratchi, 2010:108). Moreover, zero waste can have a significant benefit to communities at large, reducing their risk to overall public health (Bandara & Hettiaratchi, 2010:108). However, there are also a number of challenges associated with zero waste and zero waste shopping. Pietzsch *et al.* (2017:328) identify the resistance by individuals to change their behaviour as the most pressing challenge of zero waste shopping. Luthra *et al.* (2011:236) state that another challenge of zero waste shopping could be the mere fact that many people are still unaware of the concept itself. However, Gutberlet (2016:60) states that in order for most challenges associated with zero waste shopping to be overcome, it is important for individuals to change their old habits and form new ones by understanding how their actions today will affect future generations.

## **5.5 MAIN FINDINGS AND CONCLUSIONS FROM THE EMPIRICAL INVESTIGATION**

Chapter Four of this study presented and interpreted the data obtained from the administration of the measuring instrument. Data relating to respondents' general perceptions regarding waste management and environmental sustainability; perceptions regarding zero waste shopping; and practices regarding zero waste shopping were identified and presented. Moreover, biographical data of respondents were also obtained. A summary of the main findings of the empirical investigation will follow.

### **5.5.1 FINDINGS REGARDING WASTE MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY**

Section A of the measuring instrument was used to assess the general perceptions of respondents regarding waste management and environmental sustainability. The overall mean score was 3.28, which lies between the interval of 2.33 and 3.8667, indicating that respondents are indifferent to perceptions regarding waste management and environmental sustainability. A standard deviation of 0.94 was recorded which indicates that there is a low dispersion of data

around the mean score. It was thus concluded that respondents have a neutral stance with regards to perceptions regarding waste management and environmental sustainability.

Based on the analysis of the results obtained from the questionnaire regarding Section A, it was found that although respondents are aware and agree to the fact that various environmental problems arise as a result of improper waste management (PERCEP6), they do not deem it necessary to inform others on how to practice proper and efficient waste management (PERCEP8). This finding highlights the realisation of how little concern society has for the environment, it is thus clear that their lack of efficient waste management does not stem from ignorance but rather from blatant disregard for the natural and ecological environment.

## 5.5.2 FINDINGS REGARDING ZERO WASTE SHOPPING PERSPECTIVES

The measuring instrument was used to obtain data related to respondents' perceptions regarding zero waste shopping. Specific topics relating to respondents' perceptions were measured, including knowledge of zero waste shopping; food waste; attitudes towards zero waste shopping; the impact of waste; and the challenges and benefits of zero waste.

### 5.5.2.1 Knowledge of zero waste shopping

Concerning respondent's knowledge of zero waste shopping, a mean score of 3.50 was recorded, thus producing a neutral response from respondents indicating that they are indifferent to having basic knowledge of what zero waste is and what it entails. This factor has a large standard deviation which demonstrates a large dispersion of data around the mean. It was therefore deduced from the results obtained for this factor that the majority of respondents have knowledge of zero waste shopping as illustrated by the mode of 4. Upon analysis of each individual statement relating to respondents' knowledge of zero waste shopping, it was found that although respondents agree with the basic principles of zero waste such as waste avoidance, reuse, recycling and reduction of waste generation, they lack knowledge with regards to the efficient implementation thereof.

### 5.5.2.2 Food waste

Results pertaining to food waste showcased that respondents agreed that there is excessive food waste within our economy and that it has a negative effect on the environment. Statements measuring respondents' perceptions regarding food waste scored an overall mean of 3.93 and a standard deviation of 0.89. Respondents had strong feelings relating to the fact that the cost of wasted edible food could alternatively be used to feed the hungry. Overall, it was concluded

that respondents are aware and knowledgeable about food waste and the subsequent impact thereof.

#### 5.5.2.3 Attitudes towards zero waste

Statements used to determine respondents' attitudes towards zero waste recorded an overall mean of 3.46 and a standard deviation of 1.05. These results indicate that the majority of respondents have a neutral attitude towards the concept of zero waste. It should be noted, however, that although respondents have a neutral attitude towards zero waste, the majority have strong feelings about the possible positive effects it can have on the environment. Moreover, despite the strong positive feeling respondents appear to have about waste management, they indicate that they are impartial about the fact that they already implement it in their daily lives.

#### 5.5.2.4 Impact of waste

The impact of waste factor showed that respondents are knowledgeable of the impact that waste has on the environment and on their overall personal health as the factor scored a mean of 3.96 and a standard deviation of 0.90. Factors relating to respondents' awareness of the impact that waste has on the environment and their personal health point out that they are aware of the impact of waste but are indifferent with regards to how their own actions may result in the impact that waste has on the environment.

#### 5.5.2.5 Challenges of zero waste

Challenges of zero waste proved to be the factor that recorded the highest overall mean score of 4.07, indicating that the majority of respondents agree that there are various challenges related to the successful implementation of zero waste. Furthermore, the standard deviation of 0.85 indicates that there is low dispersion of data around the mean score. The major challenge that affects the successful implementation of zero waste within the NMB area is that, generally, individuals, government and schools appear to be uninterested about the efficient management of waste and subsequent implementation of waste management practices such as zero waste shopping.

#### 5.5.2.6 Benefits of zero waste

The benefits of zero waste factor recorded a mean score of 3.87 and a standard deviation of 0.90. These results displayed that respondents are aware of the various benefits that zero waste

could pose. It was noted that the most significant benefit of zero waste, according to respondents, is the fact that it reduces the hazard to overall public health. It was also noted that respondents agree to the fact that zero waste can have a positive effect on the natural environment by reducing the extraction of natural resources, thus aiding in the efficient allocation thereof.

All factors that were used to measure respondents' perceptions regarding zero waste shopping had a similar theme in the sense that for all of the factors, respondents were aware and knowledgeable about the effects of waste and the management thereof, whether it be positive or negative, but lacked in the implementation of this. Overall, it can be deduced that consumers within NMB have strong opinions about waste management and do not necessarily lack knowledge regarding the adverse effects that an absence of waste management could have on the environment. However, these consumers do not exhibit any significant efforts to aid in the implementation of crucial waste management practices such as zero waste shopping.

### 5.5.3 FINDINGS REGARDING ZERO WASTE SHOPPING PRACTICES

A total of 15 statements were used to investigate what general practices, if any, respondents undertake in their daily lives that relate to zero waste shopping. Upon investigation of the results obtained from the questionnaire and the analysis and interpretation thereof in Chapter Four of this study, it was found that the majority of respondents strive to continuously reuse items, such as clothing and left-over food to avoid unnecessary waste generation. Half of the respondents also agreed that they always use items as many times as they are able to before discarding of them. On the other end of the spectrum, respondents were reluctant to engage in practices that required personal commitment, action and initiative on their part. Therefore, it was concluded that if a practice is convenient and requires minimal effort on the part of the respondent, then they will engage in the practice, but if the practice requires any more effort than normal then respondents will be reluctant to participate in the practice.

### 5.5.4 FINDINGS REGARDING BIOGRAPHICAL DATA

Section D of the measuring instrument was used to obtain information regarding the biographical data of respondents. The biographical information collected from the 150 NMB consumers indicate that 57% of respondents were male whilst the remaining 43% were female. The majority of the respondents in the study were white (50%) followed by African, Coloured and Indian and Asian ethnic groups representing 23%, 20% and 7% of the sample respectively. The age group representing the majority of the respondents were 21 to 31 years (45%) followed

by 41 to 50 years (19%), 31 to 40 years (18%), 51 to 60 years (13%), 61 and above (4%) and lastly, 16 to 20 years (2%). In terms of education, the majority of respondents have obtained a bachelor's degree (27%), while 25% have obtained a national diploma or certificate. Other qualifications obtained by respondents include grade 12 (21%), a postgraduate degree or diploma (16%) and grade 11 or lower (10%). Moreover, 61% of respondents indicate that they are employed full time, whereas 18% of the respondents indicate that they are students. Furthermore, 9% of respondents are self-employed, 5% are employed part time, 3% are unemployed, 3% are retired and 1% are unable to work. Regarding the respondents' place of residence, the majority of respondents involved in the study live in a house (57%), followed by a flat or apartment (23%), townhouse (15%) and non-urban areas (5%).

Section D of the questionnaire also measured the purchasing behaviour of the respondents and it was found that the majority of respondents engage in shopping activities once a week (41%), followed by consumers engaging in shopping activities every second day (22%), once a month (12%), three times a month (10%), every day (9%), and twice a month (6%). Additionally, it was found that, regarding the three R's of the waste hierarchy, 57% of respondents indicate that they attempt to reduce the amount of waste that they produce, while 67% of respondents state that they attempt to reuse products by finding new ways to use it or instead donate it. Furthermore, 41% of respondents state that they recycle materials and 11% of respondents admit to not engaging in any of the aforementioned practices. The most noteworthy zero waste shopping products respondents produce zero waste with when shopping include packaging materials such as plastic bags (64%), fruit (62%), meat (41%) and cleaning products and materials (39%).

#### 5.5.5 THE LINK BETWEEN THE THEORETICAL FINDINGS AND THE EMPIRICAL INVESTIGATION

The most notable and relevant link between the theoretical findings and the empirical investigation relate to the theory of planned behaviour which states that situational factors such as inconvenience, access to zero waste shops and the amount of effort involved are likely to influence consumer attitudes and behaviour. It is evident from the empirical investigation that respondents' general perceptions regarding zero waste management and environmental sustainability, perceptions regarding zero waste shopping and practices regarding zero waste shopping were all dependent on the perceived convenience of the practice or action itself. Therefore, it was found that if a practice or action related to zero waste management or zero

waste shopping was deemed too inconvenient or required a more than normal amount of effort on the part of the respondent, then they would be resistant to participate in the practice or action.

## **5.6 RECOMMENDATIONS**

Recommendations relating to general perceptions regarding waste management and environmental suitability, perceptions regarding zero waste shopping, and zero waste shopping practices will follow.

### **5.6.1 RECOMMENDATIONS REGARDING GENERAL PERCEPTIONS OF WASTE MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY**

Given the findings of this study is recommended that:

- Consumers need to actively make an effort to manage the amount of waste that they produce and strive to limit their adverse impact that they have on the environment.
- Consumers should be more concerned for protecting the environment and can do so by considering purchasing environmentally friendly products.
- Consumers need to be educated on the impact that improper waste management can have on the environment and how they can effectively manage their own household waste.
- Consumers need to be more willing and open to inform others about proper waste management practices.

These recommendations above are not an exhaustive list but are sufficient for the purpose of this study. Moreover, these recommendations are based on the main findings obtained from the primary and secondary research done during this study.

### **5.6.2 RECOMMENDATIONS REGARDING PERCEPTIONS OF ZERO WASTE SHOPPING**

Given the findings of this study, consumers need to adapt their perceptions regarding zero waste shopping with specific attention to their knowledge about zero waste, food waste, their attitudes towards zero waste, the impact of waste, the challenges posed by zero waste and the benefits of zero waste. Specific recommendations pertaining to perceptions regarding zero waste shopping are tabulated in Table 5.1.

**Table 5.1: Recommendations on perceptions regarding zero waste shopping**

<b>Knowledge of zero waste</b>
<ul style="list-style-type: none"> <li>• Consumers need to be educated on the basic principles of zero waste and how to implement zero waste in their daily lives.</li> </ul>
<ul style="list-style-type: none"> <li>• Consumers need to shift their mindset to strive for a change in behaviour and lifestyle to reduce overall consumption.</li> </ul>
<ul style="list-style-type: none"> <li>• Consumers should adopt the principle aim of waste prevention.</li> </ul>
<b>Food waste</b>
<ul style="list-style-type: none"> <li>• Recommendations relating to food waste include the importance of government regulation pertaining to the correct disposal of both edible and non-edible food waste, as a rise in concern from the government will have a large effect on the food waste crisis in the country.</li> </ul>
<b>Attitudes towards zero waste</b>
<ul style="list-style-type: none"> <li>• Consumers need a shift in mindset to positively affect their attitudes towards zero waste.</li> </ul>
<ul style="list-style-type: none"> <li>• Consumers need to practice zero waste in their daily lives and encourage others to embrace the zero waste lifestyle.</li> </ul>
<ul style="list-style-type: none"> <li>• Consumers need to regard zero waste as a moral obligation.</li> </ul>
<b>Impacts of zero waste</b>
<ul style="list-style-type: none"> <li>• Consumers are to be made aware of the various impacts of waste on the environment.</li> </ul>
<ul style="list-style-type: none"> <li>• Consumers should become educated on the various adverse effects that inefficient waste management could pose on the environment.</li> </ul>
<b>Challenges of zero waste</b>
<ul style="list-style-type: none"> <li>• Consumers need to overcome their resistance to behavioural change.</li> </ul>
<ul style="list-style-type: none"> <li>• Consumers need to realise the need to change their existing habits by understanding that their behaviours could affect future generations.</li> </ul>
<ul style="list-style-type: none"> <li>• There should be more support for waste management from individuals, schools and the government.</li> </ul>
<b>Benefits of zero waste</b>
<ul style="list-style-type: none"> <li>• Consumers should be educated on the various financial and health benefits associated with zero waste.</li> </ul>
<ul style="list-style-type: none"> <li>• Consumers need to be taught that through zero waste shopping, resources can be used more efficiently as they are made to last longer.</li> </ul>

Table 5.1 thus outlines recommendations with regards to particular factors that influence consumer perceptions of zero waste shopping.

### 5.6.3 RECOMMENDATIONS REGARDING ZERO WASTE SHOPPING PRACTICES

It is recommended that consumers can actively participate in zero waste shopping by engaging in the following zero waste shopping practices:

- Take your own reusable bags with when shopping.
- Avoid purchasing items that consist of single-use plastic.
- Purchase items in bulk or as refills in order to reduce packing waste.

- Take your own plastic or glass containers with to shops to use when purchasing groceries such as milk, meat, cheese and grains.
- Make your own cleaning materials or purchase natural cleaning materials that are free from harmful chemicals.
- Make a habit of taking recyclable goods to recycling facilities.
- Use and reuse items as much as possible before disposing of it.
- Welcome any types of alternatives to disposal such as swapping paper towels for washable non-paper towels.
- Find ways to reuse an item for something other than what it was originally designed or intended for.
- Pass items on to others for continued reuse.
- Make handmade gifts from recycled material.
- Look for second-hand items before purchasing new ones.
- Reuse leftover food to avoid food waste.
- Create a compost heap at home for the correct discarding of inedible food.

These practices are not an exhaustive list of zero waste shopping practices but are sufficient for the purpose of this study. It is thus recommended that consumers use a combination of knowledge and creativity to find new and innovative ways to engage in zero waste shopping practices.

## **5.7 SHORTCOMINGS OF THE RESEARCH**

As per Price and Murnan (2004:66), all research studies will have limitations which are characteristics of the study's research design or methodology that have influenced the interpretation of the research findings. Hence, this study also has various limitations which are important to consider when interpreting the study as a whole.

The most significant limitation of this study is that it was conducted solely within the NMB area in the Eastern Cape, one of nine provinces in South Africa. Therefore, the study cannot be considered as a true reflection of all areas in South Africa, particularly smaller towns and rural areas. Moreover, the case study on zero waste shopping included in the literature overview focused on various zero waste shops across South Africa, as there is a lack of literature on zero waste shopping in NMB.

For the empirical investigation conducted, researchers made use of convenience sampling to select respondents. This resulted in a sample that was somewhat biased, as 57% of the sample

were female, while 50% were of the same ethnic group. Moreover, it is important to note that the study examined respondents' perceptions concerning zero waste shopping. Therefore, there is no definite way to verify data obtained from respondents as researchers have taken the word of participants as true.

An additional limitation of this study relates to the time constraints within which the study had to be completed. This study was completed over the course of eight months to be submitted in partial fulfilment of the requirements of a Bachelor of Commerce Honours degree in business management. Therefore, the study was not completed in isolation during this time frame as researchers partook in other academic activities necessary to complete their degrees.

## **5.8 FUTURE RESEARCH**

Future research into customer attitudes towards zero waste shopping is necessary. Moreover, this research should be expanded into other regions in South Africa, including urban and rural areas. This should be done in order to obtain a more general insight into customer attitudes towards zero waste shopping, thus helping researchers understand what behaviours, positive or negative, customers will engage in with regards to zero waste shopping.

Research conducted in the future should also include additional factors that may influence customer attitudes towards zero waste shopping. This will allow researchers to be able to identify these factors and determine what level of influence they may have on consumers' attitudes towards zero waste shopping, as well as whether these influences can change. Additional research could also be done to identify how the topic of zero waste management and zero waste shopping differ from industry to industry. Moreover, future research could possibly include comparative studies based on the differences in attitudes of respondents from different demographics. Most importantly, future research should focus on what type of zero waste practices consumers engage in and why.

## **5.9 SELF-REFLECTION**

The researchers involved in this project have gained an immense amount of knowledge throughout the process of completing this study. A great deal of literature research had to be done in order to truly understand the concept of zero waste and zero waste shopping, as well as the various factors that go hand-in-hand with this topic. Moreover, the study's empirical investigation has led to the researchers gaining experience and expertise in the development of a research instrument, the collection of primary data, and the analysis and statistical

interpretation thereof. In light of the completion of this study, it is clear that the researchers have gained many skills through each step in the research process, thus aiding in any other future research that they may take part in.

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**ANNEXURE A: COPY OF THE QUESTIONNAIRE COVERING LETTER AND  
QUESTIONNAIRE**



Nelson Mandela University, South Campus

Department of Business Management

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July – August 2019

Dear Sir or Madam

**ASSESSING CUSTOMER ATTITUDES TOWARDS ZERO WASTE SHOPPING IN  
NELSON MANDELA BAY**

It is hereby confirmed that Ms M Brokensha and Mr S Watson are registered honours students in the Department of Business Management at Nelson Mandela University. These students are busy conducting a research project, as part of their treatise, investigating perceptions regarding customer attitudes towards zero waste shopping in Nelson Mandela Bay.

It would be appreciated if you could assist the students in the completion of a short questionnaire regarding the afore-mentioned topic. Please note that the information provided will be treated as strictly confidential and will be used for research purposes only. No individual results will be published. We trust that you will find this in order, and we thank you for your time and effort in completing this questionnaire.

Kind regards

A handwritten signature in blue ink, appearing to read "E. Smith".

Professor EE Smith  
Research coordinator

A handwritten signature in black ink, appearing to read "M Brokensha".

A handwritten signature in black ink, appearing to read "S Watson".

Ms M Brokensha & Mr S Watson  
Honours research students

## QUESTIONNAIRE

Please indicate by means of a cross (X) your answer to the statements in the following sections.

### SECTION A

#### GENERAL PERCEPTIONS REGARDING WASTE MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY

<b>AS A CONSUMER...</b>		<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>
1	I actively make an effort to manage the amount of waste that I produce.	1	2	3	4	5
2	I strive to limit my impact on the environment as far as possible.	1	2	3	4	5
3	I have a significant concern for protecting the environment.	1	2	3	4	5
4	I consider the environment by purchasing environmentally friendly products.	1	2	3	4	5
5	I have strong personal environmental values that impact my recycling behaviour.	1	2	3	4	5
6	I am of the opinion that improper waste management can lead to various environmental problems.	1	2	3	4	5
7	I am informed of how household waste can be managed effectively.	1	2	3	4	5
8	I try to inform others about proper waste management practices.	1	2	3	4	5
9	I have access to or knowledge and experience of waste management.	1	2	3	4	5
10	I can have a positive effect on the environment by engaging in recycling practices.	1	2	3	4	5

## SECTION B

## PERCEPTIONS REGARDING ZERO WASTE SHOPPING

AS A CONSUMER ...		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	I have heard of the concept of zero waste before.	1	2	3	4	5
2	I am aware of the basic principles of zero waste (e.g. waste avoidance, reuse, recycling and reduction of waste).	1	2	3	4	5
3	I know how to implement zero waste in my daily life.	1	2	3	4	5
4	I strive for a change in behaviour and lifestyle to reduce overall consumption.	1	2	3	4	5
5	I have the principal aim of waste prevention.	1	2	3	4	5
6	I believe that the costs of wasted edible food could be used to feed the hungry.	1	2	3	4	5
7	I am of the opinion that the food industry in South Africa is not strongly regulated as there is limited legislation regarding food waste disposal.	1	2	3	4	5
8	I believe that producing food that is never consumed leads to major energy and water losses.	1	2	3	4	5
9	I am concerned that food waste negatively affects the competitiveness of the food industry by hampering growth and employment potential.	1	2	3	4	5
10	I believe that shifting food consumption patterns contribute to food waste disposal.	1	2	3	4	5
11	I believe that implementing zero waste will have a significantly positive effect on the environment.	1	2	3	4	5
12	I am of the opinion that it is possible to live a zero waste lifestyle.	1	2	3	4	5
13	I already practice zero waste in my daily life.	1	2	3	4	5
14	I encourage others to embrace a zero waste lifestyle.	1	2	3	4	5
15	I believe that embracing zero waste is regarded as a moral obligation.	1	2	3	4	5

AS A CONSUMER ...		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
16	I am conscious about the impact that my daily life has on the generation and/or disposal of waste.	1	2	3	4	5
17	I am aware that landfilling and the burning of waste are major contributors to greenhouse gas emissions.	1	2	3	4	5
18	I am aware that food waste has a harmful effect on the natural environment.	1	2	3	4	5
19	I am aware that inefficient waste management poses serious health issues.	1	2	3	4	5
20	I am aware that waste disposal leads to land contamination.	1	2	3	4	5
21	I believe that many individuals need to overcome their resistance to behavioural change.	1	2	3	4	5
22	I realise that individuals need to change their old habits by understanding that their behaviour could affect future generations.	1	2	3	4	5
23	I am of the opinion that many individuals are unaware of the zero waste concept.	1	2	3	4	5
24	I believe that there is a lack of governmental support for nurturing a zero waste lifestyle.	1	2	3	4	5
25	I am of the opinion that there is a lack of environmental education at school level.	1	2	3	4	5
26	I believe that zero waste shopping results in financial and economic benefits as less waste is generated through the shopping process.	1	2	3	4	5
27	I am convinced that through zero waste shopping, resources are used more efficiently as they are made to last longer.	1	2	3	4	5
28	I am of the opinion that zero waste shopping benefits the natural environment through the reduction in resource extraction.	1	2	3	4	5
29	I believe that practicing a zero waste lifestyle significantly reduces the risk of overall public health.	1	2	3	4	5
30	I know that there is considerable reduction in the emission of greenhouse gasses as a result of zero waste shopping.	1	2	3	4	5

## SECTION C

## PRACTICES REGARDING ZERO WASTE SHOPPING

AS A CONSUMER ...		Always	Sometimes	Never
1	I take my own reusable bags with when shopping.	1	2	3
2	I avoid purchasing items that consist of single-use plastic.	1	2	3
3	I purchase items in bulk or as refills in order to reduce packaging waste.	1	2	3
4	I only purchase products that are environmentally friendly.	1	2	3
5	I take my own plastic or glass containers with to the shops to use when purchasing groceries such as meat, milk, cheese, grains, etc.	1	2	3
6	I make my own cleaning materials or purchase natural cleaning alternatives in order to avoid harmful chemicals.	1	2	3
7	I make a habit of taking recyclable goods to recycling facilities (e.g. glass, paper, plastic, cardboard).	1	2	3
8	I use and reuse an item as much as I can before disposing of it.	1	2	3
9	I welcome any type of alternatives to disposals such as swapping paper towels for washable non-paper towels.	1	2	3
10	I find ways to reuse an item for something other than its originally intended purpose.	1	2	3
11	I pass items on to others for continued reuse (e.g. clothing).	1	2	3
12	I make handmade gifts from recycled material.	1	2	3
13	I look for second-hand items before purchasing new.	1	2	3
14	I reuse leftovers to avoid food waste.	1	2	3
15	I have my own compost heap at home.	1	2	3

**SECTION D****BIOGRAPHICAL DATA**

Please indicate with a cross (X) in the appropriate block.

**1. Gender**

Female	1
Male	2

**2. Ethnicity**

Group	African	Coloured	Indian	White	Other
Response	1	2	3	4	5

**3. Age in years**

16 – 20 years	1
21 – 30 years	2
31 – 40 years	3
41 – 50 years	4
51 – 60 years	5
60 years and above	6

**4. Highest qualification**

Grade 11 and lower	1
Grade 12	2
National diploma or certificate	3
Bachelor's degree	4
Postgraduate degree or diploma	5
Other (please specify)	6

**5. Employment status**

Student	1	Employed full-time	5
Unemployed	2	Employed part-time	6
Retired	3	Unable to work	7
Self-employed	4	Other	8

6. **Frequency of shopping**

Once a month	1
Twice a month	2
Three times a month	3
Once a week	4
Every second day	5
Every day	6

7. **Place of residence**

House	1
Townhouse	2
Flat or apartment	3
Farm, estate or plot	4
Informal settlement	5
Other (please specify)	6

8. **The three R's of waste hierarchy**

I engage in the following activities or practices:	
<b>Reduce</b> amount of waste that is produced (e.g. multipurpose or multi-use of items).	1
<b>Reuse</b> of products through finding new use for it or donating it.	2
<b>Recycling</b> of materials from normal waste (e.g. glass).	3
None of the above	4

9. **Zero waste shopping products**

I am most likely to practice zero waste when purchasing the following types of products:			
Fruit	1	Personal care and beauty products	6
Vegetables	2	Cleaning products and materials	7
Meat	3	Stationery and office supplies	8
Cheese	4	Packaging materials (e.g. plastic bags)	9
Grains	5	Other (please specify)	10

**Thank you for completing this questionnaire**

**ANNEXURE B: ETHICAL CLEARANCE FORM****FACULTY OF BUSINESS AND ECONOMIC SCIENCES****ETHICS CLEARANCE FOR TREATISES / DISSERTATIONS / THESES**

Instructions:

- Should be completed by study leader and student
- Must be signed off by student, study leader and HoD
- *Please note that by following this Proforma ethics route, the study will NOT be allocated an ethics clearance number*

**FACULTY: Business and Economic Sciences****SCHOOL / DEPARTMENT: Department of Business Management**

I, Professor EE Smith, the study leader for Miss MA Brokensha (216034973) and Mr SB Watson (216058546) a candidate for the degree of Business Management Honours with a treatise entitled "Assessing customer attitudes towards zero waste shopping in Nelson Mandela Bay", considered the following ethics criteria (*please tick the appropriate block*):

		YES	NO
1.	Is there any risk of harm, embarrassment or offence, however slight or temporary, to the participant, third parties or to the communities at large?		X
2.	Is the study based on a research population defined as 'vulnerable' in terms of age, physical characteristics and/or disease status?		X
2.1.	Are the subjects/participants/respondents of your study:		X
2.1.1	Children under the age of 18?		X
2.1.2	NMU staff?		X
2.1.3	NMU students?		X
2.1.4	A sample from an institution (e.g. hospital/school)?		X
2.1.5	Handicapped (e.g. mentally or physically)?		X
3.	Does the data that will be collected require consent of an institutional authority for this study? (An institutional authority refers to an organisation that is established by government to protect vulnerable people?)		X
3.1	Are you intending to access participant data from an existing, stored repository (e.g. school, institutional or university records)?		X
4.	Will the participant's privacy, anonymity or confidentiality be compromised?		X
4.1	Are you administering a questionnaire/survey that:		X
4.1.1	Collects sensitive/identifiable data from participants?		X
4.1.2	Does not guarantee the anonymity of the participant?		X
4.1.3	Does not guarantee the confidentiality of the participant and the data?		X

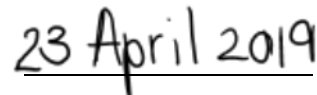
4.1.4	Will offer an incentive to respondents to participate, i.e. a lucky draw or any other prize?		X
4.1.5	Will create doubt whether sample control measures are in place?		X
4.1.6	Will be distributed electronically via email (and requesting an email response)?		X
	Note: <ul style="list-style-type: none"> <li>• If your questionnaire DOES NOT request respondents' identification, is distributed electronically and you request respondents to return it manually (print out and deliver/mail); AND respondent anonymity can be guaranteed, your answer will be NO.</li> <li>• If your questionnaire DOES NOT request respondents' identification, is distributed via an email link and works through a web response system (e.g. the university survey system); AND respondent anonymity can be guaranteed, your answer will be NO.</li> </ul>		X
5.	Do you wish to publish an article from this study and submit to an accredited Journal?		

*Please note that if **ANY** of the questions above have been answered in the affirmative (**YES**) the student will need to complete the full ethics clearance form (REC-H application) and submit it with the relevant documentation to the Faculty RECH (Ethics) representative.*

and hereby certify that the student has given his/her research ethical consideration and full ethics approval is not required.



SUPERVISOR



DATE



HEAD OF DEPARTMENT



STUDENTS



**ANNEXURE C: TURNITIN REPORT**

Submitted on 7 October 2019

**Brokensha & Watson - Treatise 2019 - Turnitin**

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**ORIGINALITY REPORT**

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**10%**

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**1****Submitted to Nelson Mandela Metropolitan  
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