

**The study of Waste Management Practices within households in
Khakhanwa Village, Thulamela Municipality**

BY

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DECLARATION

I Mabadahanye Vhonani hereby declare that this dissertation titled “**The study of waste management practices within households in Khakhanwa village, Thulamela municipality**” hereby submitted to the University of Venda, School of Health Sciences, has not been submitted before for any degree or examination at this or any other university; and that it is my own work in design and execution and that all materials contained herein have been duly acknowledged.

.....

Mabadahanye V

.....

Date

DEDICATION

This work is dedicated to my courageous mother, Mrs Mabadahanye T.J. and my two lovely children, Fhumulani and Nduvhokhae Munyai.

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I would like to thank the almighty God for the wisdom and strength he gave me throughout my lifetime.

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ABSTRACT

The sanitary state of an area is largely influenced by waste handling practices of the residents and measures in place for safe waste evacuation and disposal. Despite strategies that the municipality and local communities have put in place; namely, collection of wastes in one central spot in some villages, littering of all types of wastes is still on the increase in many rural areas.

The focus of this study was on common refuse generated at Khakhanwa Village, different waste management practices and the knowledge of villagers on the impact of poor refuse management. The study was carried out using the quantitative, descriptive methodology. A total population of 312 households participated. Data was collected using a structured questionnaire and ethical aspects were taken into consideration. Data was analysed descriptively using SPSS version 22.0. It is presented using graphs, tables and pie chart.

The findings show that the respondents satisfactorily showed understanding of waste management and the impact of poor waste management. Due to lack of waste services, the majority of the residents resort to storing wastes within their homes, burning it and disposing of it in open dumping sites as major waste management practices. The most familiar wastes in Khakhanwa village are decomposable wastes, napkins and plastics. These findings call for strengthened waste services in rural areas and more waste education amongst all villagers. Policies on waste management need to be put in motion. Communities need to be equipped with the knowledge of reducing, reusing and recycling for the purpose of limiting wastes. Finally school curricula should be adjusted such that they inform learners about waste management from early ages.

Key words: Waste management, waste disposal, practices, household waste.

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LIST OF ACRONYMS

CBD- Central Business District

IDP- Individual Development Plan

MEC- Member of Executive Council

NWMS- National Waste Management Strategy

SPSS- Statistical Package for Social Sciences

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CHAPTER 1: INTRODUCTION

1.1. Introduction

In South Africa and the world today, waste management has reached disturbing levels and countries are struggling to deal with wastes. The background of the study will elaborate on the challenges of waste management in different countries and South Africa in particular. The problem statement, study rationale, significance of the study, study objectives and the definitions of terms will also be included.

1.2. Background of the study

Waste management remains one of the major challenges faced by developing countries. The sanitary state of an area is largely influenced by the waste handling practices of the residents and measures in place for safe waste evacuation and disposal (Modebe, Onyeonoro, Ezeama, Ogbuagu and Agam, 2009). The problem of solid waste is a universal one as waste exists in every society. However, waste management problems only appear more serious in developing economies because of poor management framework. The quantity and type of waste generated depends upon the function which a city performs, its economic status and the level of technological development (Ukpong and Udofia, 2011).

In ancient times, waste disposal did not pose a significant problem. This was because the population was small and the land available to receive waste materials was abundant. Waste-related problems started when humans began to congregate in larger communities (Doru and Smaranda, 2010). The challenge becomes greater for developing nations as there should be a balance between economic and social development and environmental performance. Therefore, it is vital to optimize domestic waste management processes and improve their enactments (Ayoub, Musharavati and Gabbar, 2014). Abin (2012) argues that the problem of solid wastes is drawing the attention of people due to the garbage that lies uncollected besides streets, dustbins and grounds that impose a threat to the environment and risk to public health.

A study conducted by Nirgude, Naik, Prasad and Nagaraj(2014) in South India, revealed that the non-availability of dust bins, irregular visits of municipal vans for household waste collection and lack of knowledge regarding importance of segregation of waste, were the principal problems in the practice of solid waste disposal by urban slum families. In Pakistan,

poor solid waste management practices, lack of funds and irresponsible behaviour of dwellers reflect the worst scenario in the country. Due to diverse living practices in the same town, management authorities cannot provide uniform solid waste management system (Naem and Nasi, 2012).

Today the most important subject that affects and worries mankind is the issue concerning waste management (Kumar and Nandini, 2013). Georges (2015) found that in Cameroon like many other African countries, waste management is poorly practiced. In Nigeria, Uncollected wastes have contributed to flooding, breeding of insects and rodents and the spread of diseases such as malaria, typhoid and fever. According to Fakere, Fadairo and Oriye (2012), the problem of waste generation, handling and disposal has reached a disturbing level in Nigerian urban centres. This is because of the huge volume of waste generated in the cities on a daily basis, which calls for proper handling in order to protect the environment and the population. Domestic waste constitutes the highest percentage of waste generated in Akure, Nigeria.

The situation in several other South-Western Nigerian cities also shows that the percentage of domestic wastes is considerably high, compared to wastes from other sources (Fakere et al, 2012). Boadi and Kuitunen (2005) conducted a study in Ghana and found that the majority of households store solid waste in their homes and a small percentage store their wastes outside their homes. Wastes that are stored inside the home are usually associated with the abundance of house flies in the home and kitchens. As a result, many children suffered from diarrhoea. Many households that store their wastes at home do so in open containers and plastic, which makes the households unhygienic.

Xotole, Xali and Barchiesi (2001), argue that lack of household refuse collection symbolises inequality in South Africa. This is because whites-only suburbs are always kept clean while most black townships and rural areas residents are left with no choice but to dump their refuse in open spaces and unsealed communal skips. Kamara (2006) also found that waste collection coverage in South African cities is generally highest in the 'urban core' and lowest in the scattered settlement. The government shows strong commitment to domestic waste management, but in certain instances, such as the case of plastic bags, it is clear that there is a need for an institutional strengthening of waste management, to enhance a strong implementation capacity.

Limpopo, Mpumalanga and Eastern Cape are the three provinces of South Africa that were listed to have a low percentage of households refuse removal of less than 44% in 2012. On

the other hand, Gauteng and Western Cape were the provinces with the highest percentage of refuse removal of over 90% (Statistics South Africa, 2012). This may be a manifestation of what Kamara (2006) mentioned above, since Limpopo and Mpumalanga are the most rural areas, with some scattered settlements; on the other hand, Gauteng and Western Cape are most urbanised and developed. This means that in South Africa urbanised areas receive better refuse removal services than rural areas. It may be of interest to consider and compare the availability of infrastructure such as roads that may hinder the delivery of service.

The South African Local Government Association (2014) has singled out refuse removal and sewage collection and disposal as some of the basic human needs. However, the National Waste Management Strategy of South Africa (2011) confirmed that waste management in South Africa has various challenges due to rapid economic growth and historical waste services backlog. In 2007 only 61% of South African households were receiving household waste collection services, with the services skewed in favour of the urban residents. On the other hand, low income rural areas remained disadvantaged. It has also been observed that inadequate waste management services lead to unpleasant living conditions and unhealthy environment.

The Individual Development Plan (IDP) (2013/2014) of Thulamela Municipality has indicated that the Thulamela Municipality has to perform responsibilities on noise pollution, refuse removal, refuse dumps and solid wastes. Waste management was listed as one of the priority areas and the corresponding goal was to clean areas to create licenced landfill sites. In this plan it was left blank under “free basic waste removal”. This indicates a lack of waste management prioritization in the Thulamela Municipality. This is because waste management in rural areas is not being followed adequately, with more than 400 villages not receiving waste removal services. A few transfer stations have been mentioned. It has also been indicated that in urban areas collection is done every day, although in Thohoyandou Block P East and West collection is only done once a week, on Tuesdays. The Thulamela Municipality has one licensed landfill site at Muledane –Tswinga area and an unlicensed one at Malamulele. The Thulamela Municipality collects wastes from proclaimed areas once a week and every day in the Central Business District (CBD’s) of Thohoyandou and Malamulele.

1.3 Problem statement

Despite the efforts made by government to control refuse, most rural areas in the Thulamela Municipality still have a problem with refuse management. For example, most households dispose their refuse within their homes. The storage of wastes at home makes the homes unhygienic. Some villagers dump their refuse in open spaces along the road, and close to water sources, thus polluting land and rivers. Such refuse is comprised of tins, plastics, used diapers, and abandoned goods. This practice is associated with the presence of flies within the home. Flies carry germs that cause communicable diseases. In addition, disposal sites carry along rodents, insects and other vermin, which could transmit diseases such as typhoid fever, dysentery, diarrhoea, cholera, yaws, and other diseases (Sarker, Sarker, Islam and Sharmin, 2012). Now that the responsibility of proper domestic waste management lies within the household, the concern is that it is not clear if the members of the household know how to carry out this responsibility safely. In light of this, it was clear that there was a need to study waste management within households in Khakhanwa Village of Thulamela Municipality, South Africa.

1.4. Rationale for the study

Studies have been conducted in South Africa and abroad on refuse and waste management. The majority of these studies have focused on key areas such as environmental and health impact of household waste, as well as waste handling and environmental education on waste in urban areas. However, no known study has focused on a description of refuse management practices and knowledge within households at Khakhanwa Village in particular.

1.5. Significance of the study

This study may identify knowledge gaps on refuse management practices within households for future studies. The municipal sector may be able to single out the gaps on refuse waste management that have not been previously considered. Policy developers may also have a further lead on pending issues on waste management that still need policy developments and/or amendments.

1.6. Purpose of the study

The study aims to describe the household refuse management practices in Khakhanwa Village of Thulamela Municipality, South Africa.

1.7. Objectives of the study

- To identify the common types of domestic wastes generated in Khakhanwa Village.
- To describe household waste management practices.
- To assess knowledge on the impact of poor waste management.

1.8. Definition of terms

- **Waste**- any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered (National Environmental Management: Waste Amendment Act, 2014)
- **Household**- A household is a group of persons who live together and provide themselves jointly with food and/or other essentials for living, or a single person who lives alone (National Environmental Management: Waste act, 2008).
- **Household waste**- means waste, excluding hazardous waste that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes which include garden and park wastes, municipal wastes and food wastes (National Environmental Management: Waste Amendment Act, 2014). The word household waste will be used interchangeably with refuse and domestic waste.
- **Waste management**- implies management and systematic monitoring of recollection activities, the selection and actual collection, transport, treatment, recovery, disposal, and storage of wastes (Mihaela, 2011).

- **Waste management practices-** for the purpose of this study, waste management practices refer to those regular activities on waste management that are considered normal.
- **Impact-** for the purpose of this study, impact refers to those negative effects of poor waste management.

1.9. Arrangement of chapters

Chapter 2: Literature review- chapter two provides the legislations on waste management in South Africa, the knowledge and awareness of people on waste management and their practices. It also presents the safe practices of waste management as well as the impact of poor waste management.

Chapter 3: Research Methodology- This chapter describes the overview of the quantitative method employed in this study, together with the designs and sampling methods. Data collection methods and ethics allied thereof are also discussed.

Chapter 4: Results- this chapter gives the results of the findings of the study and these are presented in tables and graphs.

Chapter 5: Discussion of findings- the results of the study are discussed in relation to the literature in chapter two.

Chapter 6: Conclusion and recommendations- the conclusions of the study are presented as well as the recommendations based on the findings of the study.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

In order to provide a background of this study, this chapter reviewed literature on waste management. The literature includes the legislation that governs wastes in South Africa and the statistics on waste removal. Furthermore, awareness and knowledge on waste management and practices of waste management within households are discussed. In addition, acceptable and safe practices of domestic waste management and the impact of poor waste management are reviewed. The chapter again illustrates possible control strategies for waste management.

2.2. Legislations governing waste management in South Africa

2.2.1. The Constitution of South Africa

The South African Constitution 108 of 1996 stipulates that everyone has the right to an environment that is not harmful to their health or wellbeing and to have the environment protected in order to benefit the current and future generations. The constitution further stipulates that this can be reached through legislative and other measures to prevent pollution and ecological degradation, promote conservation and secure ecological sustainable development (The Constitution of South Africa, 1999).

2.2.2. National Environmental Management: Waste Act 59 of 2008

This Act stipulates that the local municipality has to deliver waste, management services, including waste removal, waste storage and waste disposal that is accessible to the whole community and adheres to national norms and standards. The population of the community should be known, as well as the number of people in need of waste services and the number of people already receiving waste management services. At the national level the minister should delegate an officer responsible for waste management in the national government to do so. At provincial level a Member of Executive Council (MEC) should appoint an officer responsible for coordinating waste management in the province. This act stipulates that there are priority wastes. There are those wastes that are believed to be a potential threat to human health, wellbeing, or the environment. Priority wastes ought to be managed and,

where possible methods of minimising, storage, reuse, recycling and recovering treatment and disposal should be considered (National Environmental Management: Waste Act, 2008).

This Act further stipulates that a holder of waste must take reasonable measures to:

- avoid the generation of waste and where such generation cannot be avoided, to minimize the toxicity and amounts of waste that are generated;
- reduce, re-use, recycle and recover waste;
- where waste must be disposed of, workers should ensure that the waste is treated and disposed of in an environmentally sound manner;
- manage the waste in such a manner that it does not endanger the health or the environment or cause a nuisance through noise, odor or visual impacts;
- prevent the waste from being used for an unauthorized purpose

2.2.3. National Domestic Waste Collection Standards, 2011

This is a regulation formulated as a requirement in the National Environmental Management: Waste Act 59 of 2008. It was formulated to protect the environment and to ensure the health safety of all people. It has been indicated that waste services should be governed by equity, affordability and availability, practicality and community participation. This regulation states that the municipalities are responsible for collecting wastes from all households and where the distance is a barrier, onsite disposal should be an alternative solution (National domestic waste collection standards, 2011).

The municipalities also have the responsibility of educating people on waste and wastes handling, how to separate wastes within their households and recycling. Each household must be provided with a bin/ receptacle to ensure that waste is safe and does not leak; animals cannot enter, bins do not corrode and protect health and environment. These standards indicate that recyclable wastes should be collected once every two weeks and non-recyclable wastes should be collected once a week. It is further stipulated that the communal collection points must be collected as soon as they are reported to be full or within 24 hours of being reported as full (National Domestic Waste Collection Standards, 2011).

2.3 South African statistics on waste management

Zurbrugg (2003) has indicated that there are large differences in solid wastes produced in rural and in urban areas. The proper disposal of household waste and refuse is important to maintain environmental hygiene. Figure 2.1 shows that the percentage of refuse removal services provided by municipalities throughout the country was notably higher in the largely urbanized provinces of Gauteng (90,9%) and Western Cape (90,8%), but lower in the more rural Eastern Cape (43,2%), Mpumalanga (39,2%) and Limpopo (20,8%). Nationally, the percentage of households whose refuse was removed by the municipality increased from 58,3% to 64% between 2002 and 2012 (Statistics South Africa, 2012).

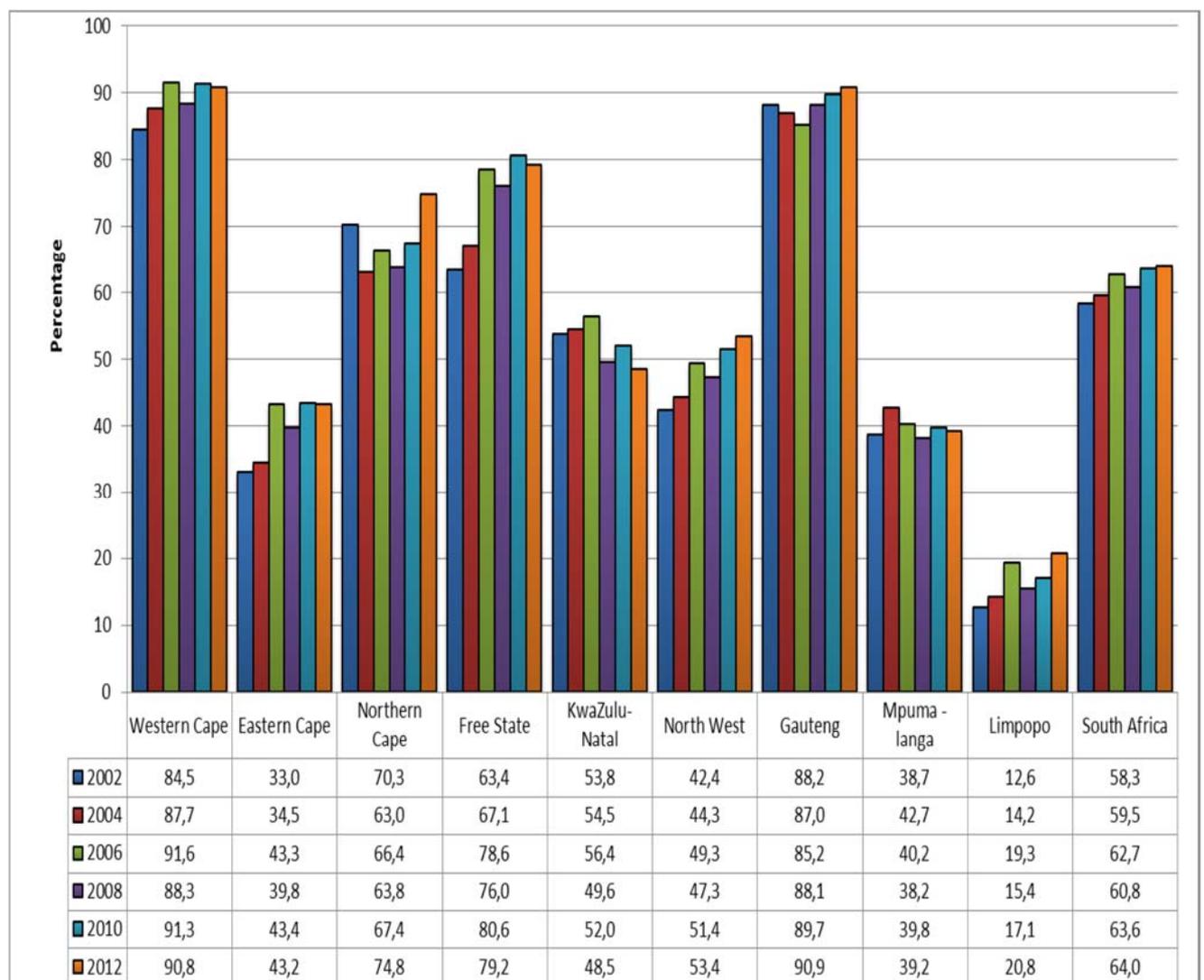


Figure 2.1: Percentage of households whose refuse is removed by the municipality by province, years 2002–2012

2.4. Knowledge and awareness of waste management

Abin (2012) argues that in day to day life, many people, especially women, are unaware of proper waste disposal practices and their harmful impact on human health and environment. Women play a key role in housekeeping and disposing of domestic wastes. In most households, the responsibility of waste handling and management is left to women and girls. Waste handling extremely touches the lives of women, especially in some developing and underdeveloped countries and areas. Women are often responsible for collecting wastes in their households and moving these to community transfer areas. This is may be because they are in daily contact with wastes in their households and because women tend to be the most marginalised groups in many societies (United Nations Environmental Programme, 2009).

According to Saidon (2013), the factors that influence knowledge include formal education. Formal education influences the public's reaction towards waste management. It was concluded in the study on educational returns on the environment that formal education has an indirect influence through improved understanding on the practice of the public on waste management. It was further indicated that reaching a secondary education level had an indirect influence on waste separation. Formal education has a direct and significant influence on one's understanding of waste separation and management. Arora and Agarwal (2011) have also indicated that the practice of waste management is affected by level of education and stream of education among 300 university students that were studied. In this sample, 54% were classified as possessing low knowledge and 46% had medium level of education on waste management. It was concluded that the majority of students had unsatisfactory knowledge regarding waste management and it was recommended that knowledge on waste management has to be improved in order to protect the environment from waste hazards.

Jatau (2013) indicated that sufficient knowledge on waste management may help people protect themselves from infections such as malaria, diarrhoea, typhoid fever, cholera and hepatitis. In addition, adequate knowledge on the impact of poor waste management and disposal may influence people to adopt positive waste management practices, which in turn can promote personal hygiene. Fakere, Fadairo and Oriye (2012) add that knowledge of the sources of waste and type in an area is required in order to design and operate appropriate solid waste management systems.

2.5. Practices of waste management within households

Arora and Agwaral (2011) have indicated that civilisation and globalisation have affected our lifestyle and daily activities. Nowadays more and more disposable goods are manufactured for onetime use. However, most households have no waste separation practices and people must be taught how to deal with solid waste in their homes, schools and work places. It has been found that 37% of respondents practice waste management in their households, while 63% did not (Sarker, Sarker, Islam and Sharmin, 2012). Banga (2011) conducted a study in Zambia on 468 households and found that 59.4% of the households separate their wastes within their households. Some households separate their wastes because they want them to be disposed of efficiently while some want to make manure from the separated wastes. Broken bottles are often thrown in pit latrines. Separated wastes include bottles, plastic bags, banana and potato peelings. Plastic bags are usually burnt. Refuse paper is not usually thrown away. Instead it is used for making fire and sometimes used for sanitary purposes.

Boadi and Kuitunen (2005) conducted a study in Ghana and found that the majority of households store solid wastes in their homes while a small percentage store their wastes outside their homes. Wastes that are stored inside the home are usually associated with house flies in the home and kitchens. As a result, many children were found with diarrhoea. Many households that store their wastes at home do so in open containers and plastic which makes the household unhygienic. In addition, municipal solid waste is dumped in open areas along roadsides (Naem and Nasir, 2012). In a study conducted in India by Nirgude, Naik, Prasad and Nagaraj (2014) among 127 households, the dumping of waste outside the homes was preferred by the majority (66.1%) of the families. Only 38.8 % of families reported that a municipal vehicle collected their solid waste. The most common problems for waste disposal reported were non- availability of dust bins (84.5%) and municipal vans (22.6%) for regular collection of solid waste.

Boadi and Kuitunen (2005) noted that home collection of solids wastes is limited to medium and low wealth household. As a result, the poor dispose their wastes in open spaces, drains and water bodies. Some residents burn their wastes. The haphazard disposal, burring and burning of solid wastes is a potential health risk through pollution. In most rural areas there is still a serious problem of waste disposal. As shown in Figure 2.2 below, captured by the researcher, wastes are dumped in open spaces along the road. The disposed wastes include tins, plastics, used diapers, and abandoned goods. Also in Figure 2.3, which was

taken at Tshikonelo Village by the researcher, the wastes are dumped near a valley which is used as a source of water during the rainy season. When water is scarce, the water is used for household activities such as washing, bathing and watering plants, including vegetables.



Figure 2.2. Waste dumped in an open space at Tshikonelo Village, Thulamela Municipality



Figure2.3.Waste dumped near a periodical water source.

In Vhembe District and Thulamela Municipality in particular, some waste removal projects have been initiated. For example, disposable napkins are collected in one place and the municipality collects them once every week. A few people, mostly women organise themselves and volunteer to manage a designated area. Sometimes they even collect the used diapers from households. Figure 2.4 shows the structure that is used for accumulation of disposable napkins. They are easily accessed by pets and the health of surrounding villagers is compromised. Figure 2.5 shows a picture of wastes that were abandoned for more than three weeks without collection. It is a rural area; it reached a point where pets dragged the wastes to the surrounding households and people who passed by inhaled the bad smell.



Figure 2.4. The structure used for collection of napkins



Figure 2.5. An abandoned site with disposed napkins

2.6 Acceptable and safe practices of domestic waste management

Waste is stored at points of generation before collection. One of the key issues facing storage facilities is keeping it neat and tidy. When refuse is stored at home, even for a short period of time, it is capable of attracting flies. Refuse must always be stored in a container with a tight fitting lid, in a plastic to avoid flies and smells. The refuse container should be kept away from direct sun. In addition, the refuse should also be kept away from animal reach. The container also has to be emptied at most times and not allowed to overflow. The refuse container should always be washed with water and soap. Equitable waste collection services must be provided to all households within the jurisdiction of the municipality. In areas where travelling distances and the resulting costs may render regular waste collection services impractical, the municipality, through its by-laws, must allow for more feasible alternative ways of waste handling, such as on-site disposal (National Environmental Management: Waste Act, 2008).

The municipality must provide an enabling environment for households to recycle domestic waste. Only vehicles that are appropriate for waste collection should be utilized. Each household should have separate containers for biodegradable and non-biodegradable wastes. Also, the solid waste collection personnel should provide a shift in the garbage collection and disposal schedule by type of waste in order to practice segregation at the disposal site (Ultra and Ultra, 2013).

Waste collection vehicles should not be used for anything other than collecting waste. These vehicles should always be cleaned for health purposes and wastes should always be covered. Waste collection frequency of less than once a week is a health hazard in the South African climatic conditions or due to hot weather. To avoid health hazards all waste collection workers must get regular check-ups to ensure their wellbeing. In addition, they should wear appropriate personal protective equipment/clothing and get on-going training on health and safety issues. Collection of domestic wastes should also create job opportunities for the local community (National Environmental Management: Waste Act, 2008)

Between 20 and 80 percent of solid waste in African cities is disposed of by dumping it in open spaces, water bodies, and surface drains as a result of inadequate infrastructure (Kamara, 2006). No person may burn waste except at an authorised incinerator operated by the municipality; or a place designated by the municipality for such purpose (Makhado Municipality Draft Environmental Waste Management by- Laws (n.d). A refuse disposal facility or dump is normally used by rural communities who do not have access to a landfill site. The site must be identified in consultation with the local health officer. A refuse pit should be placed at least 20 metres away from the kitchen. It should also not be placed above drainage pipes that may carry water to households or surface water because toxins can contaminate the water. Children and pets should not be allowed near the refuse pits because this may pose serious health risks them (Ukpong and Udophia, 2011).

2.7. The impact of poor waste management

Illegal dumping is considered one of the most common problems in South Africa. This is because illegal dumping of wastes affects both big and small municipalities and this practice impacts negatively on the environment and health of people Godfrey and Oelofse (2009). According to Ukpong and Udophia (2011), waste management problems only appear more serious in developing economies because of poor management framework. In addition, Godfrey and Oelofse (2009) have indicated that waste has direct and indirect impact on the human, ecosystem health, including contamination of surface and ground water. It has been

further indicated that methane emissions from wastes contribute an estimated 2% of the greenhouse gas emissions profile of South Africa. Environmental hygiene plays an important role in the prevention of diseases. For example, it impacts on the natural environment and the preservation of important natural water assets such as water sources (Statistics South Africa, 2012).

The above has been supported by Mihaela (2011), who stated that waste generation and disposal cause the loss to our natural resources. Arora and Agarwal (2011) indicated that there are risks associated with unhealthy disposals of wastes. Their study showed that the majority of respondents had unsatisfactory knowledge and inadequate practices on waste management. Inadequate solid waste facilities result in indiscriminate burning and burying of solid waste. There is an association between waste burning and the incidence of respiratory health symptoms among adults. According to Fakere et al (2012), improper disposal of solid waste poses serious danger to the handlers and the people living around the wastes as disposal sites carry along rodents, insects and other vermin, which could transmit diseases such as typhoid fever, dysentery, diarrhoea, cholera, yaws, and other diseases. Haphazard waste disposal is a serious threat to the immediate environment because it leaves the environment dirty and polluted, thus posing a danger to the health of the inhabitants. Such inadequate waste disposal creates serious environmental problems that affect the health of humans and animals and cause serious economic and other welfare losses (Sarker et al, 2012).

When residents dispose wastes close to residences, the organisms associated with such refuse can act as degradation agents. This will make the residential environment to be of poor quality; hence, the buildings will require renovation or maintenance more frequently. The quality of man's environment is an integral contributor to the overall quality of families and individuals' quality of life (Fakere et al,2012) When waste disposal sites are in close proximity to residential structures, such environment is adversely affected as organisms that thrive in such dirty places are also agents of disease outbreak. Therefore, the aim of shelter as a place where people live and play in a hygienic manner is defeated when the stench from the nearby dump sites is a constant menace. In addition, these dumping sites can contaminate ground water, which in turn affects the purity of the water fetched from wells. Hence, if residents of a city are devoid of access to portable water, it will take its toll on their health. This is a precarious situation and it adversely affects the residential environment (Fakere et al, 2012).

Agwu (2012) reported that poor sanitation, such as decaying or non-existent sewage system and toilets, fuels the spread of diseases such as cholera and basic illnesses like diarrhoea, which kill a child every 21 seconds. The hardest hit by poor sanitation are the rural poor and residents of slum areas in fast-growing cities, mostly in Africa and Asia. However these impacts are not confined merely to the disposal site. On the contrary, they pervade the area surrounding the site and wherever wastes are generated, spread, or accumulated. Unless an organic waste is appropriately managed, its adverse impact will continue until it has fully decomposed or otherwise stabilised. Uncontrolled or poorly managed intermediate decomposition products can contaminate air, water, and soil resources.

Achankeng (2003) observed that African countries face a challenge of health and environmental problems resulting from municipal solid wastes management. Uncollected and illegally dumped wastes endanger human and animal health and result in environmental degradation. Fakere et al (2012) have indicated that different refuse disposal methods impact on the environment differently. Burning of refuse emits carbon dioxide, reduces air quality and highly contributes to global warming. Landfills contribute to air pollution, soil degradation, and contamination of ground water, promotes breeding grounds for rodents and increases prevalence of diseases like cholera, typhoid and malaria.

According to Naem and Nasir (2012) open dumps of waste are creating serious negative impacts on environment in Taxila city. Many negative impacts have been observed in the area due to open dumping of solid waste. Heavy winds spreads dust and filth from the open dumps to living areas and toxic gaseous emissions are continuously exposed to the atmosphere. Dumped solid wastes at final disposal site were burnt and creating drastic air pollution. The most obvious environmental damage caused by municipal solid wastes is aesthetic, the ugliness of street litter and degradation of the urban environment and the beauty of the city. More serious, however, and often unrecognized, is the transfer of pollution to water, ground water (Tsega and Reddy, 2013).

Table 2.1 below shows the environmental impacts of waste management methods. The methods that have been assessed are burning, controlled tipping and landfills (Fakere et al, 2012).

Table 2.1. Environmental Impacts of Waste Management Methods

S/N	Refuse Disposal Method	Environmental Impacts
1	Burning	-Co2 emission -Reduce air quality -Contributes to global warming
2	Controlled Tipping	-No negative impact -Cleaner residential environment
3	Landfills	-Air pollution -Soil degradation -Contamination of ground water -Constitutes breeding grounds for rodents and other harmful creatures -Contributes to prevalence of diseases such as; cholera, typhoid, malaria, dysentery, etc

2.8 Possible control strategies for waste management

There are many forms of potential approaches that can be followed to deal with domestic waste management. These include reducing the amount of waste production through consumption reduction, waste separation from source in addition to waste processing. However, the effect of these methods will remain limited until they are integrated in a complete waste management system (Ayoub, Mushavarati, and Gabbar, 2014). Fakere et al (2012) have provided the following recommendations, which were directed to the government of Nigeria in 2012: Governments should be alive to their responsibilities of making basic amenities that would enable families and individuals to have access and maintain a good healthy environment. Residential neighbourhoods should be provided with properly designed waste disposal points in order to protect the environment from pollution. Also, the existing laws and regulations guiding environmental sanitation and health should be reviewed and enforced with stiffer actions in order to make them more effective. More attention should be given to waste disposal management through adequate funding.

Godfrey and Oelofse (2009) have indicated that municipalities responsible for waste management face greater challenges of providing quality services. They believe it is a municipality's responsibility to provide waste management services, as stipulated in South African Constitution. It is further indicated that municipalities are faced with four major challenges with regard to waste management; namely, financial management, equipment management, labour (staff) management and institutional behaviour.

According to Godfrey and Oelofse (2009), municipalities must shift their funds from focusing on clean-up campaigns and focus more on preventative strategies. These include providing waste bins and using open spaces that could be used for illegal dumping for projects that are beneficial to the community. The community will take ownership of such projects and such projects may include parks and play-grounds, community gardens and car washes that could also help in generating income and creating employment. There are currently skills shortages in the waste management sector. The skills shortage, combined with the high turnover of workers within municipalities, provides further challenges to sustainable waste management (Godfrey and Oelofse, 2009).

Likewise, Ukpong and Udophia (2011) have recommended that improved funding of waste management unit and provision of appropriate waste collection and disposal equipment should be undertaken. Manpower training without improved funding would amount to nothing because it is improved funding that will enable the unit to procure the right equipment, such as till trucks, towing locomotives, tracked mechanical shovels and mechanical excavators etc. Establishing a data base of waste generation in the city is necessary for the proper planning of waste collection and disposal and in deciding the type and capacity of waste management equipment to procure.

2.9. Summary

Waste management is a challenge to many countries. Waste management services are usually directed to high and medium class people than the poor. Although the National Environmental Management: Waste Act, 2008 reveals much on waste management services, rural areas still receive the least services and some receive none at all in South Africa. Lack of education is mostly related to poor knowledge and poor practice of waste management. Poor waste management practices such as storing wastes within the home if often associated with poor health. Lack of proper waste management also poses risk to natural resources and the environment as a whole.

CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

This chapter presents the research design and methodology which were used to conduct this study. The chapter also outlines the study design and study setting. Furthermore the study population and the sampling methods used are discussed. Other essential aspects that have been addressed in this chapter are research ethics, data collection methods and instrument development. Data management and analysis will also be covered.

3.2. The study design

According to Bless, Higson-Smith and Kagee (2006), research design is a set of procedures that guide the researcher in the process of verifying a particular hypothesis and excluding all possible hypotheses and allow the researcher to draw conclusions about the relationship between variables. This study has adopted a quantitative cross-sectional, descriptive design. Quantitative design has been described by Rubin and Babbie (2010), as a method which emphasizes precise objective and generalizable findings. The quantitative study design was chosen to identify and assess the waste management practices in Khakhanwa Village.

3.3. The study setting

The study was conducted in Thulamela Municipality, Vhembe District of Limpopo Province in South Africa. Thulamela Municipality is one of the four municipalities in Vhembe District with a population of 618,462, 136,982 households and 68.81% poverty rate (Vhembe District Municipality Profile, 2011). Thulamela is comprised of 40 wards (Thulamela Municipality IDP Review, 2013/2014). The study has been conducted at Khakhanwa Village (ward 18) outside Thohoyandou with 377 households (Census, 2011). Tshivenda is the general language spoken in Khakhanwa village. The picture below shows where Khakhanwa Village is located in the Thulamela Municipality.

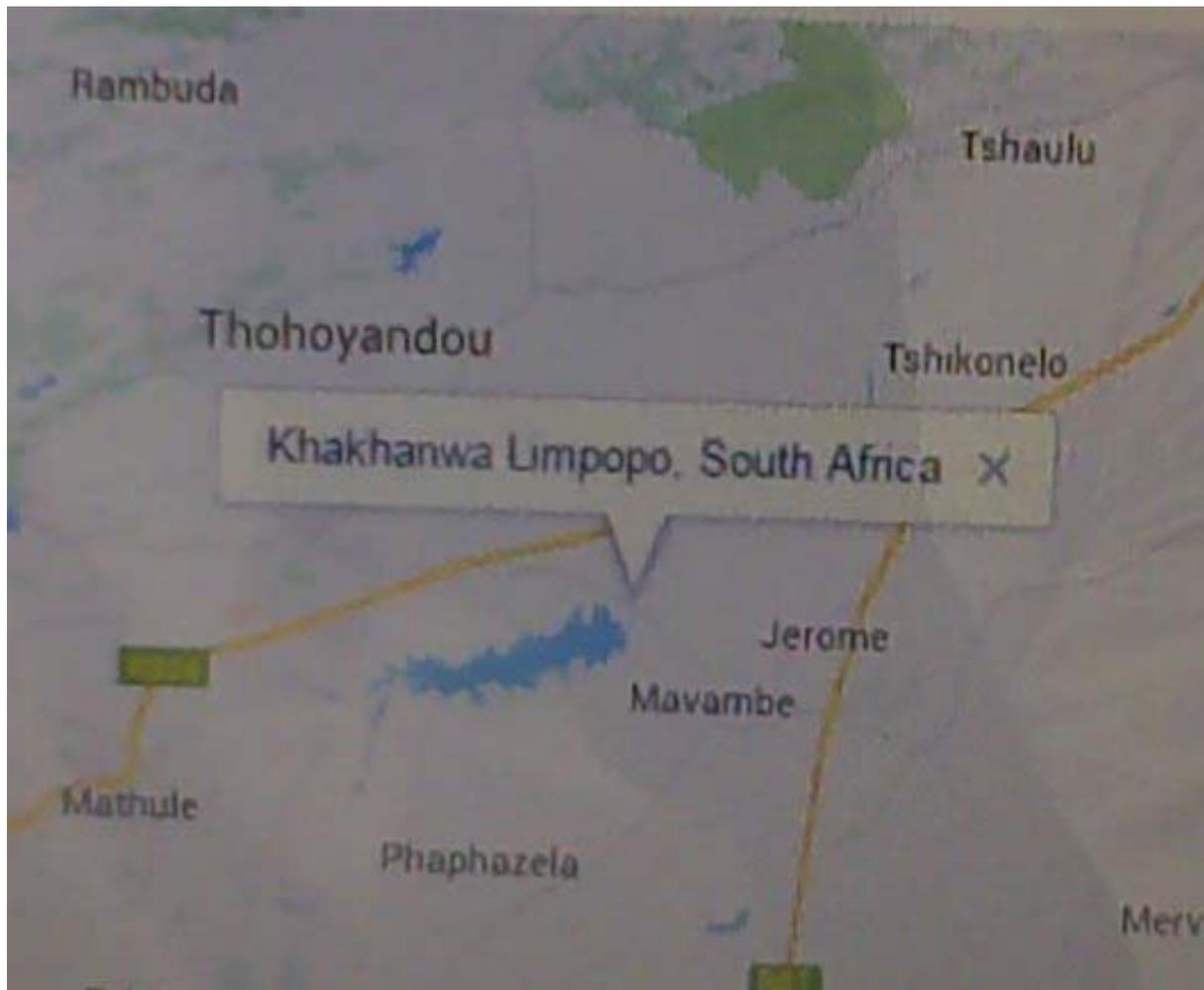


Figure 3.1. Map indicating location of Khakhanwa village in Thulamela municipality

3.4. Study population

Neuman (2011) defined population as the abstract idea of a large group of many cases from which a researcher draws a sample and to which results from a sample are generalised. In this study the population was all households of Khakhanwa Village.

3.5. Sampling

Maree (2009:79) defines sampling as the process used to select a portion of the population for study. Due to the small population of Khakhanwa Village, a total population was used for this study. The sample size was 377 households. Each household was represented by one participant and therefore only one individual per household was interviewed for the purpose of this study. The criteria for inclusion in the study were people aged 19 years and above. Both male and female respondents were used. The targeted population of 377 households

could not be reached and only 312 participants were interviewed. Some households were unoccupied and the traditional authority indicated that other families have relocated and some people work too far from home and are seldom found within their households. A few respondents indicated that they were not interested and they did not want to be part of the study.

3.6. Data collection tool

A questionnaire was used to collect data. Singh (2006) defined a questionnaire as a form which is prepared and distributed for the purpose of securing responses. A questionnaire was selected to collect data. The questionnaire for this study was guided by the study objectives and was developed after extensive study of literature on waste management. Close-ended questions were used. The researcher developed the questionnaire in English. The questionnaire was given to a language expert who translated it into Tshivenda language. The expert also back-translated the questionnaire to English. The purpose of the translation was informed by the fact that Khakhanwa residents are Venda-speaking. The questionnaire consisted of four sections, of which the first section was on demographic information of the participants; section B was on identifying the common wastes in Khakhanwa Village. Section C was on waste management practices and section D dealt with the knowledge about waste management.

3.7. Pre-test

The researcher conducted a pre-test on the instrument. The instrument was administered at a village nearby Khakhanwa. It was administered to 35 people both male and female aged 19 years and above. The aim of the pre-test was to check the validity of the instrument. The findings of the pre-test showed that some questions were confusing for the respondents and therefore the instrument was adjusted. The results of the pre-test were used to improve the instrument and hence the methodology as a whole.

3.8. Validity and reliability of data collection tool

3.8.1. Validity

According to Welman, Kruger and Mitchel (2005), validity is the extent to which the research findings accurately represent what is really happening in the situation. Face and content validity were ensured in this study. This was done by familiarising with literature and getting

a better view and knowledge on household waste management and practices based on local and international studies. Supervisors were also consulted to scrutinise the instrument.

3.8.2. Reliability

Reliability concerns the replicability of research findings and whether or not they would be repeated in another study, using the same methods (Ritchie and Lewis, 2003). This study employed the test-retest reliability, as stipulated by Foxcroft and Roodt (2009). To ensure reliability of the instrument, the researcher administered the same instrument twice (test-retest), one week apart to 35 of people from a village nearby Khakhanwa and compared the results. The results of the test-retest indicated the instrument is reliable because the correlation-coefficient(r) was 0,7.

3.9. Data collection methods

Data collection methods are procedures for collecting existing or new data on the basis at which the research questions can be answered, hypothesis tested, objectives fulfilled and problems solved (Du Plooy, 2009:105). Data was collected at Khakhanwa Village within households, using the structured questionnaire method. The researcher hand-delivered the questionnaires to the respondents in their homes during the day, introduced the questionnaire and clarified respondents where they did not understand. For those who were interested, they were then given consent forms to sign. The questionnaires were then administered to those who gave consent. Questionnaires were collected after completion. Some of the respondents, especially elders, indicated that they are illiterate. In that case the researchers read them the questions and answer options from the questionnaire and when they answered the researcher assisted them by completing the questionnaire as they answered with their exact answers. This method has been selected to reduce a low return rate compared to other methods. It also made the researcher fully engaged in the data collection process. The researcher made use of one research assistant who was trained in data collection and ethics of research. A research assistant was needed because there was much work that needed to be carried out and it would have been difficult for the researcher to carry out the work alone.

3.10. Data analysis

Data analysis is the process of systematically searching and arranging the interview transcripts, field notes and the other materials that the researcher accumulated to increase their own understanding and to enable them to present what they have discovered to others (Boeijie, 2010:76). The researcher adopted data analysis steps, as suggested by Walliman (2011). These are the following: data reduction, data display and conclusion drawing. After data collection, the data was coded and summarised to make it manageable. The Statistical Package for Social Sciences (SPSS) version 22.0 was used to analyse data through frequency tables. Data was then displayed in graphs and tables.

3.11. Ethical considerations

The study was approved by the School of Health Sciences Higher Degree Committee and by the University of Venda Higher Degree Committee. The Research Ethics Committee of the University of Venda also approved the study and issued an ethical clearance certificate (Annexure A). The researcher also sought permission to conduct the study from the local authority at Khakhanwa Village. Each respondent had to complete a consent form. For the purpose of this study the researcher gave special attention to the following research principles:

3.11.1. Informed consent

Informed consent is the principle mechanism for describing the research study to potential participants and providing them with the opportunity to make autonomous and informed decisions regarding whether to participate (Marczyk, Dematteo and Festinger, 2005) Participants were given information sheets which provided further information on the study, the procedures that would be involved in the research and the uses of the research findings were explained. Each potential participant was given a chance to voluntarily decide whether or not to take part in the study, based on the information provided. Many participants think of financial or materialistic benefits as a reward for being part of research. However, the researcher explained to them in advance that there are no financial or material benefits that they will get, except that the information they are going to provide will benefit other people. All participants were therefore asked to sign the consent form.

3.11.2. Protection from harm

Research should never injure the people being studied, regardless of whether they volunteer for the study (Babbie, 2008:65). The study itself did not pose any potential harm. The respondents were assured that they could withdraw from the study should they feel they no longer wanted to proceed at any given time.

3.11.3. The right to privacy, confidentiality and anonymity

Research participants have a right to privacy and confidentiality. The researcher ensured that participants are granted such rights. The right to privacy was explained to them as well as the fact that they are not forced to reveal any information if they are not ready to. They were also made aware that their identity would be protected in that their real names would not be reflected on the questionnaires or the findings. Each questionnaire was assigned a number to avoid linking a questionnaire to a participant. Confidentiality was maintained through safeguarding the completed questionnaires and making sure that they are only accessed by the researcher and statistician.

3.12. Summary

In this chapter, research methodology, study design, study setting and sampling were discussed. The study has adopted quantitative cross-sectional design. The ethics that were considered in this study were also considered. The next chapter will focus on presentation of results.

CHAPTER 4: PRESENTATION OF RESULTS

4.1. Introduction

This chapter presents the study findings of the quantitatively collected data. The study aim was to describe waste management practices within households in Khakhanwa Village of Thulamela Municipality. This section presents the results in percentages and frequencies using pie chart, tables and graphs. The study findings are presented in the following sections: demographic information, common types of waste generated in Khakhanwa, waste management practices and knowledge of the impact of poor waste management.

4.2. Demographic profile of respondents

The questionnaire was administered to 312 participants who were residents of Khakhanwa Village. Table (4.1) below illustrates the demographic information of the study respondents, which includes the age, gender and house household size. The study was dominated by females participants who numbered 227, thereby constituting 72.8% of the study subjects, while males represented the remaining 27.2% (n=85). The majority of the respondents were aged 31 to 40 years (n=90; 28.8%), followed by 19 to 30 years (n=69; 22.1%), with the old age of 60 and above (n=35; 11.2%) representing a smaller population. The study was dominated by small households which consisted of three to four family members (n=126; 40.4%), followed by 7 to 8 members (n=48; 15.4) and 1 to 2 family members (n=47; 15.1%). The 8 and above family members was represented by small percentage of 6.4% (n=20).

Table 4.1 Demographic information of respondents

Characteristic	(frequency-n)	% (percentage)
Gender:		
Male	85	27.2%
Female	227	72.8%
Age:		
19-30 Years	69	22.1%
31-40 Years	90	28.8%
41-50 Years	76	24.4%
51-60 Years	42	13.5%
60 Years and Above	35	11.2%
Household size:		
1-2 family members	47	15.1%
3-4 family members	126	40.4%
5-6 family members	71	22.8%
7-8 family members	48	15.4%
8 family members and above	20	6.4%

4.2.1 Households' Source of income

The figure below indicates the sources of income of households of respondents. It was revealed that the main source of income in the majority households are social grants (49%) and wages (22%), whereas a small percentage were self-employment (13%) and odd jobs (10%) which do not pay much money. A small percentage of households (6%) did not have any income at all.

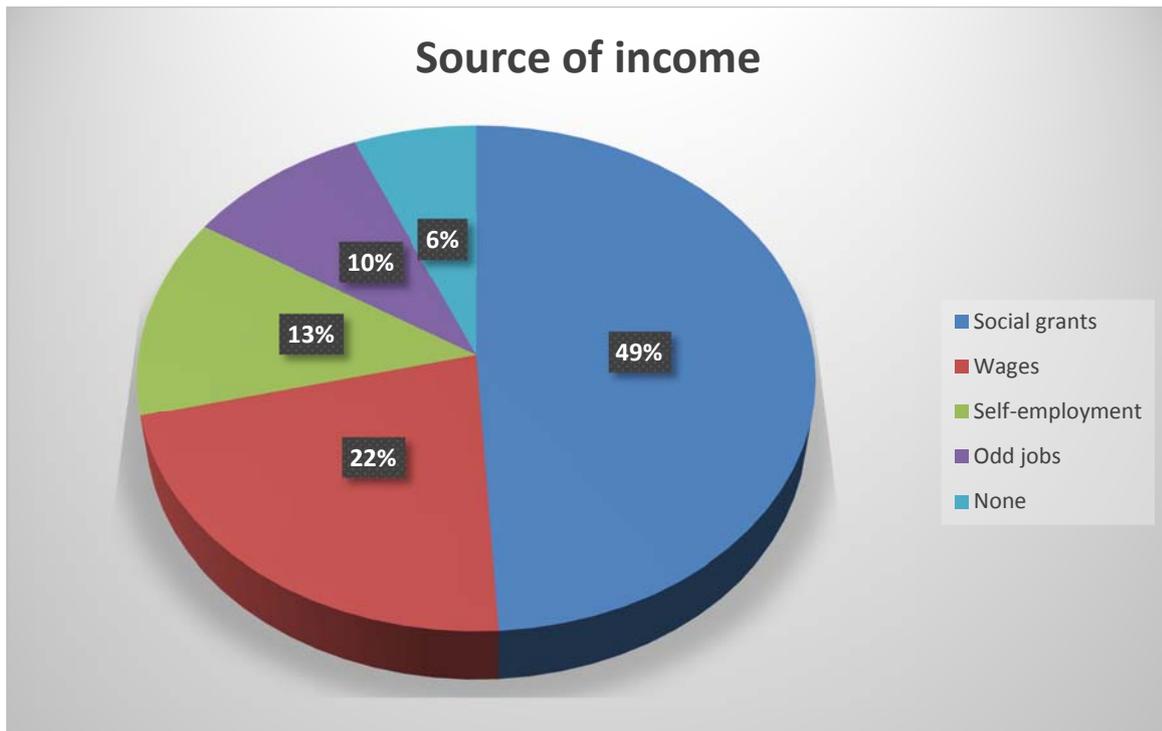


Figure 4. 1 Households' source of income

4.3. Common types of household wastes in Khakhanwa Village

This section presents the common waste types generated in Khakhanwa Village. The majority (n=256; 82.1%) of the participants felt that waste management is relevant to their community and environment, while a small percentage (n=56; 17.9%) felt it is not relevant. As shown in Table 4.2 below, plastics (32.7), decomposable wastes (61.5%) and napkins (37.8%) are the major common types of waste which are generated in Khakhanwa residential area. However, other types, such as bottles, tins and textile are found in small quantities. Table 4.2 illustrates more on the types of wastes found in Khakhanwa Village.

Table 4.2: Common types of wastes

Types of waste	Always		Most of the time		Some of the time		Rarely		Never	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Decomposable	192	61.5%	77	24.7%	29	9.3%	14	4.5	-	-
Plastics	102	32.7%	84	26.9%	86	27.6%	35	11.2	5	1.6%
Empty boxes	55	17.6%	63	20.2%	115	36.9%	67	21.5%	12	3.8%
Bottles	17	5.4%	72	23.1%	111	35.6%	98	31.4%	14	4.5%
Napkins	118	37.8%	39	12.5%	32	10.3%	25	8%	98	31.4%
Tins	25	8%	84	26.9%	103	33%	94	30.1%	6	1.9%
Textile	28	9%	56	17.9%	102	32.7%	114	36.5%	12	3.8%

4.4 Household waste management practices

Table 4.3 illustrates the household waste management practices in Khakhanwa Village, where it was found that refuse pits and open dumping are the most favoured practice of waste disposal. All the types of wastes generated in Khakhanwa, such as bottles, decomposable vegetables, food remnants, napkins, plastics, and so on, are disposed of in refuse pits and in open dumping. Dumping in water was reported by very few people. Controlled tipping was never (66.3%=never) reported as a mode of waste disposal and the municipality was reported as not doing anything regarding waste collection. Refuse such as napkins, tins and bottles were observed in open dumping sites. Wastes that cannot be burned easily, such as bottles, tins and napkins are greatly disposed of through open dumping. Wastes that are easier to burn, such as decomposable wastes, plastics, boxes and textile were reported to be disposed of in refuse pits.

Table 4.3: Household wastes versus disposal method

Types of waste	Refuse disposal practices									
	Refuse pit		Open dumping		Water source		Controlled tipping		Collected by municipality	
Decomposable (vegetables, food remnants etc)	273	87.5%	39	12.5%	-	-	-	-	-	-
Plastics	281	90.1%	31	9.9%	-	-	-	-	-	-
Empty boxes	266	85.3%	45	14.4%	-	-	-	-	-	-
Bottles	67	21.5%	224	71.8%	12	3.8%	9	2.9%	-	-
Napkins	96	30.8%	168	53.8%	18	5.8%	22	7.1%	7	2.2%
Tins	82	26.3%	202	64.7%	17	5.4%	10	3.2%	1	0.3%
Textile	227	72.8%	65	20.8%	19	6.1%	1	0.3%	-	-

Figure 4.2 shows that among other types of waste disposal, burning of refuse is another major practice among Khakhanwa households, wherein 61.5% of refuse is burnt. It also illustrates that the municipality does not collect waste from the households and respondents are not taking their wastes to legal dumping sites. Some of the wastes are stored in refuse pits and some discarded in open dumps. More than 80% reported that they do not take their wastes to controlled tipping sites. Less than five percent reported that they always dispose their waste in water bodies.



Figure 4.2 Waste disposal practices

Figure 4.3 below presents the availability of waste collection bins in the households of Khakhanwa Village. Just over 10% of the respondents reported that they always have waste collection bins within their households and over 89% never had a waste bin in their households. It can also be seen from the table that all (100%) reported that the municipality has never provided them with waste collection bins. Furthermore, over 99% has indicated that the municipality has never collected wastes in their area.

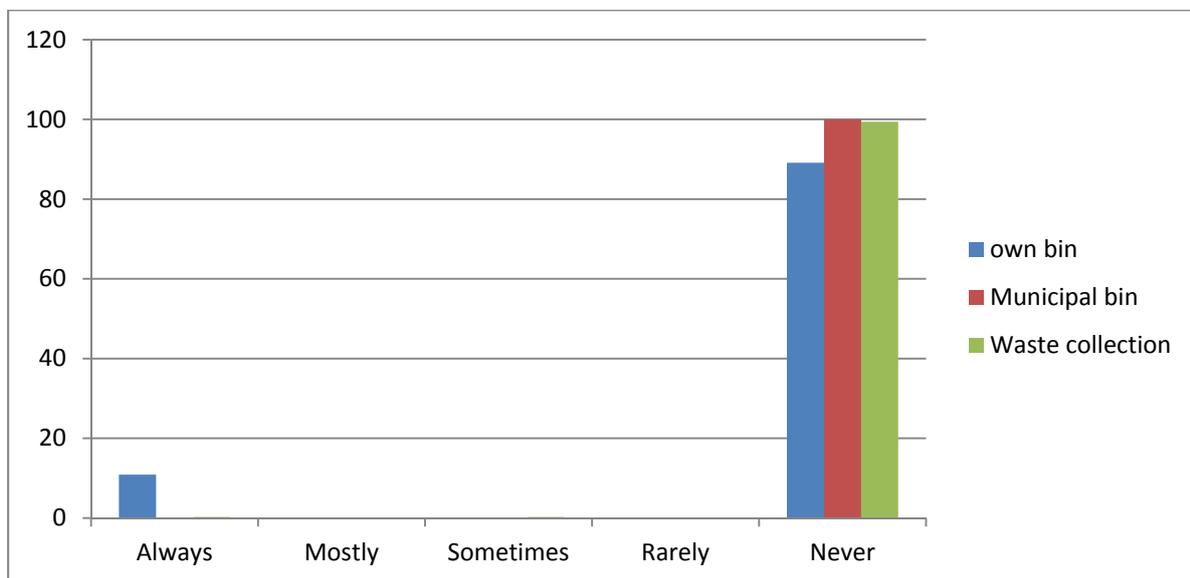


Figure 4.3 Availability of waste collection bins

4.5 Knowledge of the impact of poor waste management

Table's 4.4a-e indicate the cross tabulation and frequencies on the level of awareness regarding the impact of poor waste management on health and environment. The responses of the study participants indicate that the participants are highly aware of poor waste management, as shown by the frequencies. This shows that the respondents have a high level of knowledge regarding impact of poor waste management. Table 4a illustrates the study findings on the aspect that says waste management is everyone's responsibility. From the 312 participants, 52.2% and 35.3 % strongly agreed and agreed respectively that indeed it is the responsibility of everyone in the household to practice waste management. However a very small number of people said they disagreed. Tables 4.4b-e depict the findings on the notion that waste management is good for good health, wherein the majority respondents revealed that waste management is good for health and poor management is harmful to the environment as well as health.

Table 4.4: Knowledge of the impact of poor waste management

a) Waste management is everyone's responsibility

Gender	Strongly Agree	Agree	Not Certain	Disagree	Strongly Disagree	Total
Male	46	29	7	2	1	85
Female	117	81	18	9	2	227
%	52.2%	35.3%	8.0%	3.5%	1.0%	100%
Total	163	110	25	11	3	312

b) Proper waste disposal is important for good health

Gender	Strongly Agree	Agree	Not Certain	Disagree	Strongly Disagree	Total
Male	35	44	2	2	3	85
Female	95	106	22	2	1	226
%	41.7%	48.1%	7.7%	1.3%	1.0%	100%
Total	130	150	24	4	4	312

c) Household waste can be dangerous to one's health

Gender	Strongly Agree	Agree	Not Certain	Disagree	Strongly Disagree	Total
Male	43	36	2	1	2	85
Female	94	103	22	5	1	226
%	43.9%	44.6%	8.0%	1.9%	1.6%	100%
Total	137	139	25	6	5	312

d) Domestic waste can be harmful to the environment

Gender	Strongly Agree	Agree	Not Certain	Disagree	Strongly Disagree	Total
Male	28	43	10	1	3	85
Female	81	110	26	6	4	227
%	34.9%	49.0%	11.5%	2.2%	2.2%	100%
Total	109	153	36	7	7	312

e) Disposing waste in water is good practice

Gender	Strongly Agree	Agree	Not Certain	Disagree	Strongly Disagree	Total
Male	0	3	11	25	46	85
Female	6	9	35	69	108	227
%	1.9%	3.8%	14.7%	30.1%	49.4%	100%
Total	6	12	46	94	154	312

4.6. Summary

The findings of this study show that decomposable wastes, plastics and napkins are the major types of wastes in Khakhanwa Village. The study also revealed that most of the waste produced is stored within the homes and burned. The second major habit of waste disposal was disposing the household wastes in open fields. It was evident in the findings that the respondents are aware of the impact of poor waste management. Most respondents disagreed with the practice of disposing wastes in water bodies.

CHAPTER 5: DISCUSSION

5.1. Introduction

This section provides a discussion on the study findings on household waste management practices at Khakhanwa Village. The findings will also be related to the literature presented in chapter two of this study. The main focus of the findings will be on the demographic profiles of the respondents, the major types of wastes handled at Khakhanwa Village, the waste management practices and the knowledge of impact of poor waste management.

Almost three quarters of the participants were females. This means that households are dominated by females and that they take responsibility for waste management. This finding is supported by Abin (2012), who found that in most households, the responsibility of waste handling and management is left to women and girls. This suggests that women are the ones who are left behind during the day managing the family while some men go out to work. A study by the United Nations Environmental Programme, (2009) further supports this further by saying that this may be because women are in daily contact with wastes in their households and because women tend to be the most marginalised groups in many societies. It can be agreed that generally, women are the ones who are faced with waste handling and disposal due to the patriarchal culture in South Africa. Based on the findings of this study, women are the ones who take most of the responsibility of waste handling within households. Although there are some men who participate in waste management, it is at a very minimal level.

Young adults aged 31 to 40 dominated the study. This shows a trend of unemployment among young adults of Khakhanwa Village. The statistics further revealed that over 40% of the households consist of 3-4 members. This shed some light on the fact that most of the households are nuclear families consisting mostly of parents and their children. A very large percentage, almost half of the households, is dependent on social grants and 9% has no identified source of income. This therefore posits that the poverty rate and unemployment rate at Khakhanwa Village is very high, with only 22% of the families with defined income in the form of wages. Poverty rate is highest in rural areas. Lack of adequate source of income possibly leads to poor waste management due to unaffordability of waste services.

5.2. Common types of household wastes

Decomposable wastes, napkins, plastics and empty boxes respectively are the most handled wastes on a weekly basis. Bottles, tins and textile are the least handled wastes among the households. Arora and Agwaral (2011) have indicated that civilisation and globalisation have affected our lifestyle and daily activities such that nowadays more and more disposable goods are manufactured for one-time use. This is seen by the loads of wastes that are found within households regularly. This means that if nothing is done, then we will have even more and more waste to deal with in years to come. All respondents (100%) reported that they handle decomposable wastes on different levels. Less than 2% reported that they never handle the most disturbing wastes, such plastics and tins.

Decomposable wastes, plastics and boxes are all disposed of in pits within the households and in open dumping. Bottles, tins, napkins and textile were reported to be disposed of in water bodies by a very little percentage of respondents. The low disposal of wastes in water bodies shows that people are aware that it is a bad practice. Also, a very small number of people reported that some of their wastes such as bottles, tins, napkins and textile are delivered to controlled tipping sites. Regarding the source of income, one could say that the majority of Khakhanwa households cannot afford to carry their wastes to Muledane, where the nearest controlled legal dumping site is located.

Less than 2.5 % reported that the napkins and tins are collected by the municipality. This indicates that the municipality is not playing any essential role in terms of waste collection at Khakhanwa Village. This goes against the National Environmental Management: Waste Act 59 of 2008 which stipulates that the local municipality has to deliver waste, management services, including waste removal, waste storage and waste disposal that is accessible to the whole community and adheres to national norms and standards. The findings also contradicts with the National Domestic Waste Collection Standards, (2011), which state that the municipalities are responsible for collecting wastes from all households and where the distance is a barrier; onsite disposal should be an alternative solution.

5.3 Household waste management and practices

Statistics have shown that a very large number of respondents store their household wastes within their home in refuse pits. The correct arrangement is that a refuse pit should be placed at least 20 metres away from the kitchen, (Ukpong and Udophia, 2011). A refuse

pit within most of the households of Khakhanwa Village is mostly just a few meters from the house. These findings are validated by Boadi and Kuitunen (2005) who conducted a study in Ghana and found that the majority of households store solid wastes in their homes and a small percentage store their wastes outside their homes. They further indicated that wastes that are stored inside the home are usually associated with house flies in the home and kitchens. As a result, many children were found with diarrhoea. This means that the residents of Khakhanwa Village and their families run a risk of infections due to wastes stored within their homes and closer to their houses.

Amongst other methods, burning of waste was reported to be very common among Khakhanwa residents. Burning of wastes is forbidden by the Makhado Municipality Draft Environmental Waste Management by- Laws (n.d), which states that no person may burn waste, except at an authorised incinerator operated by the municipality; or a place designated by the municipality for such purpose. Burning of refuse has been found to emit carbon dioxide, reduces air quality and highly contributes to global warming (Fakere, Fadairo and Oriye, 2012). The burning of wastes at Khakhanwa Village occurs due to the large amounts of wastes within households that are not collected. Since many residents cannot afford transporting their waste to disposal sites, while the available and produced wastes are either burnt or dumped, mostly in open fields and less in rivers.

The researcher observed that some open dumping is alongside the roads and close to the homesteads. This is in line with the findings of Kamara (2006) that between 20 and 80 percent of solid waste in African cities is disposed of by dumping it in open spaces, water bodies and surface drains as a result of inadequate infrastructure. Boadi and Kuitunen (2005), also support this by saying that the poor dispose their wastes in open spaces, drains and water bodies, while some residents burn their wastes. According to Ukpong and Udophia, (2011), a refuse disposal facility or dump is normally used by rural communities who do not have access to a landfill site. The site must be identified in consultation with the local health officer. Unfortunately, there is no such refuse disposal facility in Khakhanwa area and surrounding areas. This results in continuous illegal dumping of household wastes.

Illegal dumping is considered to be one of the most common problems in South Africa. Illegal dumping of wastes affects both big and small municipalities, and this practice impacts negatively on the environment and health of people (Godfrey and Oelofse, 2009). Such inadequate waste disposal creates serious environmental problems that affect the health of

humans and animals and cause serious economic and other welfare losses (Sarker, Sarker, Islam and Sharmin, 2012).

A large number of residents in Khakhanwa Village reported that they do not have waste collection bins. The 10% that has waste bins bought them on their own because the municipality has never provided them with bins. Nirgude, Naik, Prasad and Nagaraj (2014) also made the same findings and concluded that the most common problems for waste disposal reported were non-availability of dust bins (84.5%) and municipal vans (22.6%) for regular collection of solid waste. On top of this, the Thulamela municipality does not collect wastes at Khakhanwa village and other rural villages. This goes against the National Domestic Waste Collection Standards of 2011 which alluded that each household must be provided with a bin/ receptacle to ensure that waste is safe, does not leak; animals cannot enter, bins do not corrode and protect health and environment. These standards indicate that recyclable wastes should be collected once every two weeks and non-recyclable wastes should be collected once a week. This means that even if the community can buy their own bins, the waste will still have to be disposed in the open fields or be burnt because it will not be collected. Kamara (2006) also conducted a study and found out that waste collection coverage in South African cities is generally highest in the 'urban core' and is lowest in the scattered settlement. This is supported by Boadi and Kuitunen (2005) who also noted that home collection of solids wastes is limited to medium and low wealth households.

Poor waste management is not confined to Khakhanwa only or South Africa for that matter. The problem of solid waste is a universal one, as waste exists in every society (Ukpong and Udofia, 2011). Other countries are experiencing the same problem too. In South India for example, the non-availability of dust bins, irregular visits of municipal vans for household waste collection and lack of knowledge regarding importance of segregation of waste were found to be the principal problems in the practice of solid waste disposal by urban slum families (Nirgude et al, 2014). In Cameroon, like many other African countries, waste management is poorly practiced (Georges, 2015). It was found that poverty is the main contributor to poor waste management in Khakhanwa. In addition financial constraints are affecting other countries' state of waste management. For example, in Pakistan, poor solid waste management practices, lack of funds and irresponsible behaviour of dwellers reflect the worst case scenario in the country (Naem and Nasi, 2012).

5.4. Knowledge on impact of poor waste management

A reasonably large number of people in Khakhanwa agree and strongly agree that waste management is a responsibility of all people within a household. In addition, they are aware that proper waste management is important to our health and the environment. A very small percentage, amounting to 1.9% and 3.8 % strongly agree and agree respectively that disposing wastes in water bodies is a good practice. This shows lack of knowledge on their part. About half of the respondents totally disapprove of dumping waste into water bodies. Jatau (2013) suggests that sufficient knowledge on waste management may help people protect themselves from infections such as malaria, diarrhoea, typhoid fever, cholera and hepatitis. Therefore, adequate knowledge on the impact of poor waste management and disposal may influence people to adopt positive waste management practices, which in turn can promote personal hygiene.

This study contradicts Abin (2012), who argues that in day to day life, many people, especially women, are unaware of the proper waste disposal practices and its harmful impact on human health and environment. The residents of Khakhanwa are aware of proper waste disposal. In addition they know the importance of good waste management practice, although the saying of practicing what we preach is not being here. This is because the respondents are aware of the dangers of poor waste management, yet they continue practicing poor waste management. This may be due to lack of alternatives to dispose their wastes. Only 14.7% is not certain whether dumping waste in water bodies is good practice or not. All the statements evaluating the knowledge and awareness of waste management, had a level of uncertainty not greater than 14.7%. This shows that most of the respondents are certain about their views and able to communicate their views.

The uncertainty regarding the impact of poor waste management is a concern as Sarker et al, (2012) indicated that haphazard refuse disposal is a serious threat to the immediate environment because it leaves the environment dirty and polluted, thus posing a danger to the health of the inhabitants. If people are uncertain whether disposing wastes in rivers is right or wrong, it implies that they can respond anyhow to the situation and this can result in practising wrong disposal methods.

This brings us to why proper waste management is not being practiced, while people are aware of the consequences of poor waste management. Poverty is one of the reasons. It is because residents cannot afford waste collection services. As was seen in the income profile

in chapter 4, most of the families (49%) live on social grants which are not enough to meet all the basic needs of these families. The South African Local Government Association (2014) has singled out refuse removal and sewage collection and disposal as some of the human basic needs. However, looking at their financial backgrounds, waste management is not a priority for most of the villagers.

The little income within households is used for basic needs such as food, than waste management. Another understanding of the cause that leads to poor waste management is ignorance. Naem and Nasi, (2012) concluded that poor solid waste management practices, lack of funds and irresponsible behaviour of dwellers in Pakistan reflect the worst case scenario in the country. This means that some people practice poor waste management out of choice. Ignorance poses a danger to humans and the environment because ignorant people are not aware that they are being ignorant. However the effects of their ignorance will be continuous. The financial status of a country as a whole also contributes to the state of waste management. This is reflected in the Waste Management Strategy of South Africa (2011), which confirmed that waste management in South Africa has various challenges due to rapid economic growth and historical waste services backlog. In 2007 only 61% of South African households were receiving household waste collection services, with the services skewed in favour of the urban residents.

If the legislations were being properly followed at Khakhanwa area, the issue of poverty would have been curbed substantially because the National Environmental Management: Waste Act (2008) indicated that collection of domestic wastes should also create job opportunities for the local community. This opportunity can be both financial benefiting to the community and informative about proper waste management at the same time. Banga (2011) conducted a study in Zambia on 468 households and found that 59.4% of the household separate their wastes within their household. Some households separate their wastes because they want them to be disposed of efficiently while some want to make manure from the separated wastes. If proper knowledge is disposed to people, the separation of waste can be a great start for recycling. Recycling can be beneficial in reducing wastes and if sustainable, and can have financial benefits as well.

5.5. Summary

More women are often faced with the responsibility of waste handling within households than men. Studies have shown that this is mostly because of gender oppression and lack of education. Studies also shows that people are aware of the impact of poor waste

management. However, they continue with poor waste management practices anyway. Rural areas continue to be disadvantaged while urban areas have better waste collection services. Lastly, poverty in rural areas greatly contributes to poor waste management.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This section presents the conclusion of the study based on the findings and data analysis in chapter four. The conclusions will be followed by the recommendations with the aim of improving waste management, especially in rural areas.

6.2 Conclusions of the researcher

Decomposable wastes are found in almost every household. Napkins have emerged as a predominant type of waste and there is poor handling of it in rural areas due to lack of waste services. This is because it cannot be burnt or decompose easily. As a result, napkins are currently the most common wastes that are found lying alongside roads. However, napkins did not matter as wastes in rural areas before. This is because environmental friendly napkins were used. The environmental friendly napkins could be reused over and over again, unlike the currently used ones that are only for one time use. Plastics are also very common in Khakhanwa. Tins, bottle and textile wastes are the least common. However many of them are being discarded in Khakhanwa Village on a daily basis.

Some of the wastes produced, such as decomposable wastes, plastics, boxes and textile, are stored within homes and they are mostly burnt or disposed of in open fields only. Bottles, tins and napkins are mostly disposed of in open fields than within households. Very few people take their wastes to places where there is controlled tipping while few others dispose their wastes in rivers. Rural areas have least access to waste services. There is also lack of waste collection bins in rural areas. A small percentage has their own waste bins. The municipality does not provide any noticeable waste collection services in rural areas. Although the burning of wastes has its own adverse consequences, burning of wastes has been found to be preferred by many residents. Those wastes that cannot easily burn are mostly disposed of in open dumping and in rivers. Although dumping of wastes was reported by a small percentage, it is worrying to find that in the 21st century people are still disposing waste in water bodies.

People are aware of the dangers of poor waste management to people and the environment. Most of the respondents agreed that waste management is a responsibility for all people in the household. In addition, the level of uncertainty is very low and the respondents are

aware that poor waste management poses danger to their health and their environment. Disposal of wastes in rivers is discouraged, which shows that the residents do know the impact of this practice. However, although the residents of Khakhanwa Village are aware of the impact that poor management has on human health and the environment, proper waste management is not being followed.

6.3 Recommendations

Based on the conclusions reached in the study, the researcher therefore makes the following recommendations:

6.3.1 Common types of domestic wastes

It is recommended that the promotion of the reduction, reuse and recycle of wastes method be strengthened in order to reduce the quantity of wastes within households. This will reduce the amount of wastes that are disposed of in open fields and rivers, especially non-decomposable wastes.

Communities should initiate projects aimed at recycling wastes. These projects should be sustainable, so that they can be income-generating and benefiting both the community and the municipality.

6.3.2 Household waste management practices

The government should prioritize waste collection from rural areas too, because the current waste management practices in rural areas pose a danger to humans, animals and the environment as a whole. The implementation of the National Environmental Management: Waste Act 59 of 2008 and its regulation, the National domestic waste collection standards, 2011, should be put in motion in rural areas, as well.

The communities should use environmentally friendly napkins, as napkins were found to be predominant and pose the most danger to the communities.

6.3.3 Knowledge of the impact of poor waste management

The Department of Education should include in their curricula waste management education to learners from an early age, so they can grow up with awareness, knowledge, responsibility and ability to practice safe waste management.

The government and its stakeholders should provide outreach programme, awareness campaigns and capacity-building within communities with the aim of improving the current waste management practices and protecting our environment.

Furthermore, future researchers should focus on the impact of poor waste management on humans and the environment as a result of lack of services in rural areas.

6.4. Limitations of the study

- The limitation of the current study is the fact that data was collect in one village. Therefore the findings need to be generalised with caution.

In spite of the above-mentioned limitation, the study provides important information on waste management practices.

6.5. Summary

The overall conclusion of this study is that rural areas generally do not receive waste services. The wastes that are produced in the households are either burnt or disposed of in Tshivenda version of the consent form open fields. The residents of Khakhanwa Village are aware of the impact poor waste management on human health and the environment. However, although people are aware of these impacts, they do not stop the poor waste management practices.

References

- Abin, B. (2012) A Correlative Study to Assess the Knowledge and Practice of Household Waste Management among Housewives in selected Rural Community at Mangalore with a view to Provide an Information Pamphlet. Unpublished thesis (M. Sc. Nursing), Rajiv Gandhi University of Health Sciences
- Achankeng, E. (2003) Globalisation, Urbanisation and Municipal Solid Waste Management in Africa. *African Studies Association of Australasia and the Pacific 2003 Conference Proceedings*: University of Adelaide.
- Agwu, M.O. (2012) Issues and Challenges of Solid Waste Management Practices in Port-Harcourt City, Nigeria- a behavioural perspective. *American Journal of Social and Management Sciences*. 3(2)
- Arora, L. and Agarwal, S. (2011) Knowledge, Attitude and Practices Regarding Waste Management in selected hostel Students of University of Rajasthan, Jaipur. *International Journal of Chemical, Environmental, and Pharmaceutical Research*, 2(1) pp. 40-43
- Ayoub, N., Musharavati, F. and Gabbar, H.A. (2014) A Future Prospect for Domestic Waste management in Qatar. International conference on Earth, Environment and life sciences
- Babbie, E. (2008) The Practice of Social Research. 11th ed. California: Thomson Wardsworth.
- Banga, M. (2011) Household knowledge, Attitudes and Practices in Solid Waste Segregation and Recycling: The Case of Urban Kampala. *Zambia Social Science Journal*, 2(1) pp. 27-39
- Bless, C., Higson-Smith, C. and Kagee, A. (2006) Fundamentals of Research methods. 4th ed. Cape Town: Juta.
- Boadi, K.O. and Kuitunen, M. (2005) Environmental and Health impact of Household Solid Waste Handling and Disposal Practices in Third World Cities. *Journal of Environmental Health*, 68(4), pp. 32-36
- Boeijie, H. (2010) Analysis in Qualitative Research. London: Sage

De Vos, A.S., Strydom, H., Fouche', C.B. and Delport, C.S.L. (2005) *Research at Grass Roots*. 3rd Ed. Pretoria: Van Schaik Publishers

Doru, A.P. and Smaranda, V. (2010) Good Practices regarding Solid Waste Management Recycling. 7(22)

Du Plooy, G.M. (2009) *Communication Research Techniques, Methods and Applications*, 2nd ed. South Africa: Juta

Fakere, A.A., Fadairo, G and Oriye, U. (2012) Domestic Waste Management and Urban Residential Environment: Focus on Akure, Nigeria. *International Journal of Engineering and Technology*, 2(5) pp. 878-887

Foxcroft, C. and Roodt, G. (2009) *Introduction to Psychological Assessment in the South African Context*. 3rd ed. Cape Town: Oxford University Press

Georges, D. (2015) *Household Solid Waste Management in Limbe, Cameroon: Practices, Problems and Prospects*. Unpublished Thesis (MSc), Pan African Institute for Development West Africa

Godfrey,L. and Oelofse, S. (2009) *The State of Domestic Waste Management in South Africa*. Centre for Scientific and Industrial Research (CSIR), Pretoria.

Jatau, A.A. (2013) Knowledge, Attitudes and Practices Associated with Waste Management in Jos South Metropolis, Plateau State. *Mediterranean Journal of social sciences*, 4(5) pp. 1-10

Kamara, A.J. (2006) Household participation in domestic waste disposal and recycling in the Tswane metropolitan area: An environmental education perspective. Unpublished thesis (MSc), University of South Africa

Kumar, M. and Nandini, N. (2013) Community Attitude, Perception and willingness towards Solid waste Management in Bangalore city, Karnataka, India. *International Journal of Environmental Sciences*, 4 (1) pp. 87-95.

Marczyk, M., Dematteo, D. and Festinger, D. (2005) *Essentials of Research Designs and Methodology*. Canada: John Wiley and Sons

Maree, K. (2007) *First Steps in Research*. Pretoria. Van Schaik Publishers.

Mihaela, S. (2011) *Substantiation Criteria Feasibility of Solid Household Waste Management Alternatives*: University of Petrosani.

Modebe, I.A., Onyeonoro, U.U., Ezeama, N.N., Ogbuagu, C.N. and Agam, N.E. (2009) Public Health Implication of Household Solid Waste Management in Awka South East Nigeria. *The Internet Journal of Public Health*. 1 (1).

Naem, E. and Nasir, S.J. (2012) Solid Waste Management issues in small towns of Developing World: A case study of Taxila City. *International Journal of Environmental Sciences and Development*, 3 (2) pp. 167-171

Neuman, W.L. (2011) *Social Research Methods: Qualitative and Quantitative Approaches*, (9th Ed.) New York: Allyn and Bacon.

Nirgude, A.S., Naik, P.R., Prasad, V.G. and Nagaraj, K. (2014) Solid Waste Disposal Practices in an Urban Slum area of South India. *Indian Journal of Applied Research*, 4 (11) pp. 1-2

Ritchie, J. and Lewis, J. (2003) *Qualitative Research Practice*. London: Sage

Rubin, A. and Babbie, E. (2010) *Research methods for Social Work* (7th ed.). United States of America: Linda Schreimber Publishers

Sarker, B.C., Sarker, S.K., Islam, M.S. and Sharmin, S. (2012) Public Awareness and Disposal of Solid Wastes and its impact. *Journal of Environmental Sciences and Natural Resources*. 5(2) pp. 239-244

Saidon, M. (2013) Environmental Returns to Education. *Journal of Environmental Research and Management*. 4(8) pp. 302-309

Singh, Y.K. (2006) *Fundamentals of Research Methodology and statistics*. New Delhi: New Age International

South Africa, *Constitution of the Republic of South Africa no 108 of 1996*

South Africa. Department of Environmental Affairs. *National Domestic Waste Collection standards* (2011)

South Africa, Makhado Municipality Draft Environmental Waste Management By- Laws (n.d)

South Africa, *National Environmental Management: Waste Act 59 of 2008*

South Africa, *National Environmental Management: Waste Amendment Act 26 Of 2014*

South Africa, *National Waste Management Strategy* (2011)

South Africa, *South African Local Government Association* (2014)

South Africa, *Thulamela Individual Development Plan.2013/2014*

South Africa, Vhembe district municipality profile, (2011), *Cooperative Governance and Traditional Affairs*

Statistics South Africa, *Census Data. Available from <http://www.census2011.adrianfrith.com/place/966188> [accessed 19 march 2016]*

Statistics South Africa, (2012) *General Household Survey*

Tsega, A.F. and Reddy, U. (2013) Community Awareness of Solid Waste Management Practices: A case study of Ethiopia. *International Journal for Science and Technology*, 8 (1) pp. 55-59

Ukpong, I.E. and Udofia, E.P. (2011) Domestic Solid Waste Management in a Rapidly Growing Nigerian City of Uyo: *Journal of Human Ecology*, 36(3) pp.229-235

Ultra, C.I. and Ultra, A.A. (2013) Solid Waste Management Practices of Households in the University of Eastern Philippines. *Journal of Energy Technologies and Policies*, 3 (11) pp. 32-34

United Nations Environmental Programme, (2005) *Solid Waste Management*. Vol 1.

Walliman, N. (2011) *Research Methods: The Basics*. New York: Routledge

Wellman, T., Kruger, F. and Mitchell. (2005) *Research Methodology* (3rd Ed.). Cape Town: Oxford University Press.

Xotole, M., Xali., M. and Barchiesi, F. (2001) *Municipal Service Project: the commercialisation of waste management in South Africa*

Zurbrugg, C. (2003) Urban Solid Waste Management in low Income Countries of Asia: how to cope with the Garbage Crisis. *Urban Solid Waste Management Session: South Africa*

APPENDIX A: QUESTIONNAIRE: The study of waste management practices within households in Khakhanwa Village, Thulamela Municipality

Note

1. This information is purely used for study purpose at the University of Venda. The study will not reveal any personal names of the respondent.

- Do not write your name on this questionnaire.
- It is completely voluntary
- please answer all questions

SECTION A: DEMOGRAPHIC INFORMATION

1. Age..... years

2. Gender

2. Household size.....

4. Main sources of income a.....

b.....

SECTION B: COMMON WASTES IN KHAKHANWA VILLAGE

Please tick on the relevant boxes

5. Do you think believe management is relevant to you?

Yes	No
-----	----

6. Which type of wastes do you handle weekly?

Types of wastes	Always	Most of the time	Some of the time	Rarely	Never

(a) Decomposable wastes (vegetables, food remnants, etc.)					
(b) Plastics					
(c) Empty boxes					
(d) Napkins					
(e) Bottles					
(f) Tins					
(g) Textile					
(h) Others					

SECTION C: HOUSEHOLD WASTE MANAGEMENT PRACTICES

7. Do you practice waste management?

Yes	No
-----	----

8. Where do you dispose of the following wastes?

Types of wastes	Refuse pit	Open dumping	Water source	Controlled tipping	Collected by municipality
(a) Decomposable wastes (vegetables, food remnants, etc.)					
(b) Plastics					
(c) Empty boxes					
(d) Napkins					
(e) Bottles					
(f) Tins					
(g) Textile					
(h) Others					

9. Access to waste services (please tick the relevant answer in the box)

Types of services	Always	Most of the time	Some of the time	Rarely	Never
a) Is there any waste collection bin at your household?					
b) Does the municipality provide waste collection bins for you?					
c) Does the municipality collect waste from your household?					

10. Which disposal method of waste do you mostly use? Tick on the relevant box

Disposal Methods	Always	Most of the time	Some of the time	Rarely	Never
a) Refuse pit					
b) Open dumping					
c) Dumping into water body(rivers)					
d) Controlled tipping					
e) Do you burn your refuse					
f) Wastes collected by the municipality					

SECTION D: KNOWLEDGE ON IMPACT ON POOR WASTE MANAGEMENT

11. Please rate the following statements

Statements	Agree	Strongly agree	Not certain	Disagree	Strongly disagree
a. Waste management is a responsibility for all people within the household					
b. Proper waste disposal is important to your health					
c. Domestic wastes can be dangerous to your health					
d. Domestic wastes can be harmful to the environment					
e. Depositing wastes in water sources is a good practice					

THANK YOU FOR YOUR COOPERATION.

APPENDIX B: TSHIVENDA VERSION OF THE QUESTIONNAIRE

Dzimbudziso: ngudo ya kulangele kwa mathukhwi mahayani vhuponi ha khakhanwa

Kha vha dzhiele nzhele zwi tevhelaho

- A vha kombetshedzwi u dadza helino bammbiri
- Vha songo nwala madzina avho ngomu
- Vha khou humbelwa u fhindula mbudziso dzothe

KHETHEKANYO A: ZWIDODOMBEDZWA ZWA MUDADZI

- 1 Minwaha
2. Mbeu.....
3. Nomboro ya vhathu mutani
4. Hune muta wa wana hone masheleni (a).....
(b)

KHETHEKANYO YA B : TSHAKHA DZA MATHUKHWI

Ri humbela vha sumbedzise phindulo yavho ngau tala ngomu ha tshibogisi

5. Vha vhona kulangele kwa mathukhwi ku tshi vha kwama na

Ee	Hai
----	-----

6. Ndi afhio mathukhwi ane a wanalesa kha vhege nga vhege mutani wavho?

Tshaka dza mathukhwi	Tshifhinga Tshothe	Kanzhi	Tshinwe Tshifhinga	Zwiakonda	Naluthihi
a. Mathukhwi a sinaho nga othe(Masalela a zwiliwa, Miroho)					
b. Matshekasi					
c. Mabogisi					
d. Maleri					
e. Mabodelo					

f. Zwikotikoti					
g. Malabi					
h. Zwinwevho					

KHETHEKANYO YA C: KULANGELE KWA MATHUKHWI NGOMU HAYANI

7. Vha a didzhenisa khau langa mathukhwi ngomu hayani?

Ee	Hai
----	-----

8. Vha lata ngafhi mathukhwi a tevhelaho

	Dindini La hayani	Dakani	Milamboni	Huno latiwa Iwa mulayo	A dzhiwa nga masipala
a. Mathukhwi a sinaho nga othe(masalela a zwiliwa, miroho					
b. Matshekasi					
c. Mabogisi					
d. Maleri					
e. Mabodelo					
f. Zwikotikoti					
g. Malabi					
h. Zwinwevho					

9. U swikelelea ha tshumelo dza mathukhwi

Tshaka dza tshumelo	Tshifhinga Tshothe	Kanzhi	Tshinwe Tshifhinga	Zwiakonda	Naluthihi
a Vha na bini lau shela mashika hayani ?					
b. Masipala ua vha netshedza mabini au shela mashika?					
c. Masipala u a vha hwalela					

mashika?					
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10. Ndi ifhio ndila ine vhai shumisa khau khau langa mathukhwi a tevhelaho

	Tshifhinga Tshothe	Kanzhi	Tshinwe Tshifhinga	Zwiakonda	Naluthihi
a.Ndi posa dindini la thukhwi ngomu hayani					
b. A latiwa dakani kana ho vuleaho sa midavhini					
c. Ndi posa mulamboni					
d. Ndia isa huno latiwa hone thukhwi lwa mulayo					
e. A tou fhisiwa					
f. A tou hwaliwa nga masipala					

KHETHEKANYO YA D: NDIVHO NGA HA MASIANDOITWA A USA LANGA ZWAVHUDI MATHUKHWI.

11. Ri hambela vha anganyeke zwitatamennde zwi tevhelaho

Zwitatamennde	Ndia tendelana nazwo	Ndi a tenda nga maanda	Athina vhutanzi	Athi tendelani nazwo	Athi tendi naluthihi
a.U langa mathukhwi ndi vhudifhinduleli ha vhathu vhothe.					
b. U langa mathukhwi lwavhudi ndi zwa ndeme kha mutakalo wanga					
c. Mathukhwi ane a wanala <u>hayani</u> anga vha khombo kha mutakalo wavho?					
d. Vha vhona unga mathukhwi aya a khombo kha mupo?					
e.Vha vhona u lata mathukhwi milamboni hu vhudifari ha vhudi na?					

NDI LIVHUWA TSHUMISANO YAVHO

APPENDIX C: INFORMATION SHEET

Information Sheet for people participating in the study of waste management practices within households of Khakhanwa village

Thank you for your interest in this project about the household waste management practices. Please read this information sheet carefully before deciding whether or not you want to participate. If you decide to participate, I thank you. If you decide not to participate, there will be no disadvantage on you.

The Aim of the Project

This project is being undertaken as part of the requirements for a Master's degree in Public Health at the University of Venda, with the following aims:

- to identify common types of wastes at Khakhanwa Village
- to describe the waste management practices
- to assess awareness on impact of poor waste management

Participants Needed for This Study

One person from each household is needed to represent the family. Participants should be prepared to take part in the study

Free Participation

Informed consent- each respondent has a right to decline to be part of the study if necessary. Each participant will be requested to complete a consent form and only those participants who completed the consent forms will participate in the study.

Confidentiality

Confidentiality will be considered by ensuring that the research process and findings are only used for research purposes

Results of the Study

A copy of the dissertation will be made available to the university library so that future researchers can have access to it. Another copy will be submitted to the Department of Public Health, University of Venda. Where possible, the researcher will present the findings at seminars and conferences and publish the findings in peer reviewed journals.

Questions of the Participants

Should you have any questions or concerns regarding the project, either now or in the future, please feel free to contact me on 079 776 2445/ mabadahanyev@gmail.com or my Supervisor Dr Tshitangano, Department of Public Health, University of Venda

APPENDIX D: TSHIVENDA VERSION OF THE INFORMATION SHEET

Ndi livhuwa dzangalelo lavho kha ino thandela ine yavha ngaha kulangele kwa mathukhwi vhuponi ha mahayani. Ndi humbela vha vhale mafungo aya nga vhuronwane vha kone u dzhia tsheo khauvha tshipida tsha thoduluso iyi. Ndi nga livhuwa ngamaanda arali vhangata kalela u vha tshipida hone arali vha sa zwi takalela ahuna masiandoitwa au hana havho u vha tshipida.

Tshipikwa tsha ino thandela

Ino thandela icou bveledziwa sa thodea ya digirii ya masitasi kha muhasho wa mutakalo gudedzini la Venda huna zwipikwa zwi tevhelaho :

- U topola mifuda ya mathukhwi ano wanalesa vhuponi ha Khakhanwa
- U divhesa ngaha ndila ine mathukhwi a langulwa ngayo
- U todulususa ngaha ndivho ine yavha hone kha masiandoitwa a kulangele kuvhi kwa mathukhwi.

Hu todea vhatu de kha thandela iyi

Muthu muthihi kha muta munwe na munwe u do todea o imela muta wonoyo. Vhane vha do tama u dzhenelela vha do tea uvha na vhuduimiseli kha ngudo iyi.

U dzhenelela ahu kombetshedzwi muthu

Muthu munwe na munwe una pfanelo yau tenda kana u hana uvha tshipida tsha ngudo iyi. Muthu munwe na munwe ane a tama u dzhenelela u do tea u saina thendelano yau sumbedza uri o tenda uvha tshipida. Vhathu vhane vha do saina thendelano iyo ndi vhone vhane vhado dzhenelela kha ngudo iyi.

Tshiphiri

Zwothe zwine vha do fhindula zwido tsireledziwa nahone zwa shumiswa hu tshi itelwa thandela iyi fhedzi. Ahuna ane ado divha uri vhone vho fhindula zwifhio. Zwidodombedzwa zwavho azwi nga buliwi na fhethu na huthihi

Mawanwa a ngudo iyi

Khandiso ya mawanwa a ngudo iyi ido wanala laiburari ya gudedzi la Venda hu u itela uri vhane vha nga tama u todulususa vha tshiya phanda vha wane inwe ndivho. Inwe khandiso ido wanala kha muhasho wa mutakalo henefho gudedzini. Hune zwa do konadzea, mawanwa a ngudo iyi a do andadzwa kha madzulo o fhambananaho a dovha hafhu u andadzwa kha manwalwa o senguluswaho.

Mbudziso kha vhane vha tama u dzhenelela

Vha nga diwana vhana mbudziso kana u vhilahela ngaha ngudo heino, zwino kana tshifhinga tshidaho, khavhapfe vho vhofoholowa u kwama Mabadahanye Vhonani kha nomboro ya 0797752445 kana kha mabadahanyev@gmail.com kana mulanguli wanga vho dokotela Tshitangano kha muhasho wa zwa mutakalo gudedzini la Venda.

APPENDIX E: CONSENT FORM

Consent Form for Participation in the study on waste management practices within households in Khakhanwa Village

I have read the information sheet concerning the project and I understand what the project is all about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:

1. My participation is entirely voluntary
2. I am free to withdraw from the project at any time without any disadvantage.
3. I am aware that my personal information will not be included in the final document and all personal information supplied by me will remain confidential throughout the project.
4. I will receive no payment or compensation for participating in the study.
5. I am willing to participate in this research project.

.....

Names [participant]	[Signature]	[Date]
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.....

[Signature of the researcher]	[Date]
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APPENDIX G: REQUEST LETTER TO KHAKHANWA LOCAL AUTHORITY

University of Venda

P. Bag X5050

Thohoyandou 0950

Date:

Local authority

Khakhanwa village

Dear Sir/Madam

Re: Request for permission to conduct a study on waste management practices at your village

I am Mabadahanye Vhonani, a master's student at the University of Venda. As a requirement of my master's degree in Public Health, I am expected to conduct a research project. I will be investigating the waste management practices within households in Khakhanwa Village, Thulamela Municipality. I would like your permission to conduct my research in your village.

Participation in the study is entirely voluntary and any individual from your village may withdraw at any time without any consequence held against them.

Your permission and assistance will be highly appreciated. Should you have any queries, please do not hesitate to contact me on 079 776 2445 or at mabadahanyev@gmail.com.

Thank you

Yours sincerely

Mabadahanye V

Annexure A: ETHICAL CLEARANCE

**RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR**

**NAME OF RESEARCHER/INVESTIGATOR:
Ms V Mabadahanye**

**Student No:
11590906**

PROJECT TITLE: The study of waste management practices within households in Khakhanwa Village, Thulamela Municipality.

PROJECT NO: SHS/16/PH/15/1808

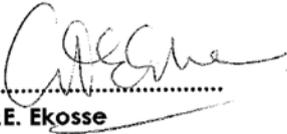
SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr TG Tshitangano	University of Venda	Supervisor
Dr NS Mashau	University of Venda	Co-Supervisor
Ms V Mabadahanye	University of Venda	Investigator - Student

**ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE**

Date Considered: August 2016

Decision by Ethical Clearance Committee Granted

Signature of Chairperson of the Committee: 

Name of the Chairperson of the Committee: Prof. G.E. Ekosse

UNIVERSITY OF VENDA
DIRECTOR RESEARCH AND INNOVATION
2016 -08- 22
Private Bag X5050 Thohoyandou 0950



University of Venda

PRIVATE BAG X5050, THOHOYANDOU, 0950, LIMPOPO PROVINCE, SOUTH AFRICA
TELEPHONE (015) 962 8504/8313 FAX (015) 962 9060
"A quality driven financially sustainable, rural-based Comprehensive University"

Annexure B: LETTER FROM LANGUAGE EDITOR

SCHOOL OF HUMAN AND SOCIAL SCIENCES

9 April 2017

School of Health Sciences
University of Venda
Private Bag X5050
Thohoyandou
0950

Dear sir/madam

This letter serves to certify that I have proof-read Ms V. Mabadahanye's mini-dissertation, titled, "The Study of Waste Management Practices Within Households in Khakhanwa Village, Thulamela Municipality".

The proof-reading entailed editing some parts of it, where I felt it would make the document more understandable; for example, to avoid wordiness, redundancy; sub-diving a long sentence into two or more shorter ones, etc. However, I have not tempered with the content of the mini-dissertation, except where I found that this constituted repetition or made the content confusing.

The mini-dissertation is now ready for submission and/or examination.

Thank you for your time.

Sincerely


.....
V.T. Bvuma
Mobile: 083 423 9227



University of Venda

UNIVERSITY OF VENDA

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