UNIVERSITY OF KWAZULU NATAL

SANITATION PRACTICES AND PREFERENCES IN UMGUNGUNDLOVU DISTRICT MUNICIPALITY

By

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DECLARATION

I the undersigned, Siphindile Shange, declare that the work contained in this dissertation is my own work and I have not submitted it to any other academic institution for an academic qualification.

Signed……Date……

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ABSTRACT

The study was on sanitation practices and preferences in uMgungundlovu District Municipality of South Africa and it aimed at providing strategies for improving basic infrastructure needs for the population in this area. Due to constraints in the resources the research was focused on Mpofana Local Municipality which is one of the 7 local municipalities in uMgungundlovu District. Mpofana Local Municipality has a population of 36 819. In the developing countries about 2.5 billion people do not have access to improved sanitary facilities and services. In the whole world 1 billion people do not have access to toilet facilities and instead they practice open defecation. According to UN Water, about 7 out of 10 ten people without improved sanitation are based in the rural areas. Some 2.4 billion people will remain without access to improved sanitary facilities and services in 2015. South Africa is one of these developing countries and there is need for more research to improve water and toilet facilities. The study used a questionnaire as the research instrument. The questionnaire was made up of 30 questions. A total of 120 Questionnaires were hand delivered to all the 120 households in the Mpofana Local Municipality. Respondents were given two weeks to complete the questionnaire and those who were not able to complete were given some extra time to do so. Queries or clarification on some of the questions were done at the point of collection. As a result all the questionnaires were completed giving a response rate of 100%. The data obtained from the respondents was analyzed using SPSS package, version 21.0. What emerged from the study is that the available sanitary facilities in uMgungundlovu are not adequate; some cultural and social beliefs that affect sanitary and hygienic practices were identified. Ways to improve the available sanitary facility in uMgungundlovu were suggested and some correlations between both the demographic data and cultural or social factors. The study had the limitation that resources could not allow us to use the entire population of the targeted area.

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CHAPTER ONE

INTRODUCTION AND OVERVIEW OF THE STUDY

1.1 Introduction

According to the World Health Organization (2015b) sanitation is the provision of water and toilet facilities that are safe for the people. Sanitation promotes the proper disposal of wastes from either human beings or animals. For people to achieve acceptable sanitation levels there is need for proper use of toilet and for people to avoid open space defecation. On the other hand, the Wikipedia (2015) defines sanitation as the hygienic processes that are promoted through prevention of the contact of human beings and their wastes as well as the proper disposal of these wastes. The hazards of wastes can either be in physical form, biological, microbiological or as some chemical agents of diseases. Sanitation is very important to this world and to people's lives to be specific. The various harmful or deadly bacteria that infect people and start diseases thrive in places with very poor sanitary facilities. Improved sanitation processes result in increased lifespan and improved living standards. Proper sanitation practises are very important to the survival, development and growth of the children. Improved sanitation facilities result in lower mortality and morbidity rates in the population, a cleaner environment, a better learning and retention among school children, improved nutrition for the children, safer food and water supplies. With better sanitary facilities there is more dignity and privacy for everybody. Most women and girls do not feel safe and comfortable to bath in open spaces such rivers. There is need to increase awareness of the importance of sanitation and hygienic processes so that we can develop a more permanent strategy and solution to the world's sanitation problem.

1.2 Motivation for the study

About 2.6 billion people in the developing countries do not have the proper sanitary facilities and services according to UNICEF (2008). Of these 2.6 billion people, almost 980 million are children below 18 years. Millions of children are dying every year from poor sanitation related diseases that can be prevented. Poverty is one of the fuels behind the spread of poor sanitation in the developing world. In most cases poor people live illegally in areas that are considered unfit for human habitation. In these sanitation deprived urban settlements, it is very common to see some children defecating in the public or open spaces that are available (McGranahan, 2015). Since these people have no government permission to live in these areas they have usually have no access to municipal sanitary facilities and services or health care. Unfortunately the health hazards caused by these illegal inhabitants do not only affect them but the nearby legal residential areas also. Diseases such as diarrhea, dengue fever, cholera and tuberculosis spread easily in these area with improper sanitation facilities and services according WHO (2002). South Africa and Pietermaritzburg to be specific is one of those cities with illegal settlements popularly known as *Mjondoro*.

1.3 Background to the study: uMgungundlovu District Municipality

The location of study is uMgungundlovu which is one of the 11 district municipalities of the KwaZulu-Natal province. The capital city of uMgungundlovu is Pietermaritzburg. The majority of the 1 017 763 people in uMgungundlovu speak Zulu according to South Africa 2011 Census (Statistics SA, 2011). uMgungundlovu is made up of 7 local municipalities as shown in Table 1.1.

Table 1.1: Population of uMgungundlovu District Municipality

Local Municipality	Population
Msunduzi	618536
uMshwathi	106374
uMngeni	92710
Richmond	65793
Mkhambathini	63142
Mpofana	38103
Impendle	33105

1.4 Focus for the study

The study was focused on Mpofana which is one of the 7 local municipalities in uMgungundlovu. Mpofana Local Municipality has a population of 38 103. Mpofana Local Municipality is approximately 40km from Pietermaritzburg in the western direction. Its boundaries are three other local municipalities namely uMngeni Local Municipality in the south, uMshwathi Local Municipality in the east and finally Impendle Local Municipality in the west.

1.5 Problem statement

In the developing countries about 2.5 billion people do not have access to improved sanitary facilities and services. In the whole world 1 billion people do not have access to toilet facilities and instead they practice open defecation. According to UN Water (2015) about 7 out of 10 ten people without improved sanitation are based in the rural areas. Some 2.4 billion people will remain without access to improved sanitary facilities and services in 2015. South Africa is one of these developing countries and there is need for more research to improve water and toilet facilities. For uMgungundlovu District Municipality to improve sanitation services within its jurisdictional area, it is important for it to understand the sanitation situation in its area, its adequacy and effectiveness. This will assist in developing strategies aimed at improving basic infrastructural needs for uMgungundlovu District Municipality.

1.6 Objectives of the study

The objectives of the study are to:

- Determine the sanitary facilities and services that are available to the households in the targeted area and also assess the adequacy of these facilities.
- Examine if the people in the targeted area are satisfied with the available sanitation facilities and services.
- Determine and assess the impact of cultural and social factors affecting sanitary and hygienic practices in the targeted area.
- Developing ways to improve the sanitary facilities and services in the targeted area.
- Determine some correlations between biographical data and the:
  (i) available sanitary facilities.
  (ii) cultural and social factors.

1.7 Research questions

The following research questions were formulated from the objectives given in Section 1.6.

- What are the sanitary facilities and services that are available to the households in the targeted area and are these facilities adequate?
- Are the people in the targeted area satisfied with the available sanitation facilities and services?
- Are there any cultural and social factors affecting sanitary and hygienic practices in the targeted area and is there an impact of these beliefs?
- Are there any ways to improve the sanitary facilities and services in the targeted area?
- Are there any correlations between biographical data and the:
  (iii) available sanitary facilities?
  (iv) cultural and social factors?

1.8 Research methodology

A total of 120 questionnaires were distributed to the selected households in Mpofana Local Municipality out of the population of 38103. The targeted population is only for households and social areas which are benefiting from the municipality service delivery. Since the questionnaires were hand delivered plus the fact those who were not able to complete in time were given extra time to do so, all the 120 questionnaires were returned giving an excellent rate of response of 100%. The study instrument was comprised of 30 questions. The questionnaire was presented in 4 different parts or sections that were to measure the various themes as captured below:

Section **A**: 8 questions which were mainly on personal or demographical data.

Section **B**: 11 questions mainly on facilities and services available to the households.

Section **C**: 5 Likert scale type of questions mainly on the cultural and social factors affecting sanitary and hygienic practices in Mpofana Local Municipality.

Section **D**: This was the last section in the questionnaire and was on the possible ways to improve sanitation facilities. The collected data was analysed using the SPSS version 12.0 statistical software. The study was done five months.

1.9 Structure of the dissertation

The dissertation is structured into six main chapters as follows.

Chapter One: This chapter gives a brief introduction to the study. It presents the background of the study, problem statement, objectives of the study, the formulated research questions, brief research methodology and limitations that the study faced.

Chapter Two: The chapter focuses on the theoretical aspects of the study in terms of literature review. The review discusses theoretical issues on sanitary facilities and services, cultural and social factors affecting sanitary and hygienic practices and ways for to improve sanitary facilities and services.

Chapter Three: Chapter Three presents the study methodology. In this chapter the procedures that were used to collect the data are discussed. These steps include the selection of sampling method and statistical justification, construction of the research instrument, pretesting of the research instrument, measuring the reliability of the research instrument, administration of the research instrument, study limitations and ethical issues.

Chapter Four: In this chapter the results obtained from the questionnaires in the research study are presented. The questionnaire acted as a primary tool which was used to collect data through its distribution to the targeted 120 households in Mpofana Local Municipality. The data obtained from the respondents was analysed using SPSS package, version 21.0.The results were presented as descriptive statistics through the use of tables, graphs and pie charts. In addition correlation analysis was also used to explore the relationships between various aspects in the sanitation practices and preferences.

Chapter Five: This chapter is mainly on research findings, discussions, interpretations and explanations. In this case the research findings were discussed, interpreted and explained in conjunction with the presented literature review. The main reason for examining previous work on related or similar studies was for comparison purposes so as to present the research contributions clearly to the stakeholders, business community and customers or consumers.

Chapter Six: This is the last chapter in this study. In this chapter study findings, study recommendations and conclusions to the study are presented. The chapter seeks to find whether the research problem has been solved, discuss implications of the study, recommendations to solve the research problem as well as making recommendations for future studies. Areas for further research and the limitations the study faced are also presented.

1.10 Limitations of the study

If the resources were permitting, the researcher could have conducted a census of the entire population of uMgungundlovu in order to give a true reflection of the study.

Unfortunately this was not possible because of the resource constraints and as a result only 120 households from Mpofana were used for study analysis.

1.11 Conclusion

Sanitation practices and preferences are supposed to be areas of concern for the whole world so that we can have a better world. Happiness in this world is never complete without the proper sanitary facilities. It is painful to see that some people delay or postpone their visit to the toilet simply because of the very bad hygiene the toilet facility has. When these people finally visit the toilet they try to avoid contact by hanging above the toilet chamber. A research done by Dutch Magazine (2009) has shown that not sitting down in a toilet can cause cystitis. Also postponing a toilet visit might cause waste products produced by the body to go into the blood stream. The study provided strategies for improving basic infrastructure needs for the population in uMgungundlovu District Municipality. From an environmental health perspective, the research findings and recommendations will provide important steps in preventing disease transmission and environment degradation. The municipal authorities can now rank existing sanitations options for district or local municipalities and then target their economic and technical efforts to promote only those technologies that are most likely to succeed in each and every target area.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The chapter focuses on the theoretical aspects of the study in terms of literature review. The review discusses theoretical issues on sanitary facilities and services, cultural and social factors affecting sanitary and hygienic practices and ways to improve sanitary facilities and services.

2.2 Sanitation

According to Van Minh and Nguyen-Vet (2011) sanitation is mainly about the provision of facilities and services for the hygienic disposal of human waste. In this case the human waste is in the form of the urine and feces. Van Minh and Nguyen - Vet went further to define an improved sanitation facility as one that can safely and hygienically separate human waste from people themselves. On the international development community, sanitation is rising up the agenda. At United General Assembly in 2010, basic sanitation was recognized as a human right (United Nations General Assembly, 2010). The universal access to proper sanitation facilities and services is being proposed as the global target for 2030 (The High-Level Panel of Eminent Persons on the Post-2015 Development Agenda, 2013; Water Aid, 2013). According to Mcgranahan (2014), there are serious challenges that are associated with sanitation facilities and services in the poor urban communities. These challenges include the challenge of affordability against acceptability by the people, housing tenure related challenges and the collective action challenge.

According to WHO/UNICEF/WSSCC (2012), Sanitation is very important and it includes the following activities:

- Proper handling and safe collection, storage, treatment and disposal of human waste. The disposal of human waste, include recycling or re-use of the faeces and urine.
- Management and recycling or re-use of household wastewater including its management. The wastewater is known as grey water or sludge.
- Management of rain or drainage water its treatment and disposal. This includes sewage recycling.
- Management, recycling and disposal of waste products from the industrial sites.
- Management of dangerous wastes such as radioactive sub-stances, hospital waste and other hazardous chemicals.

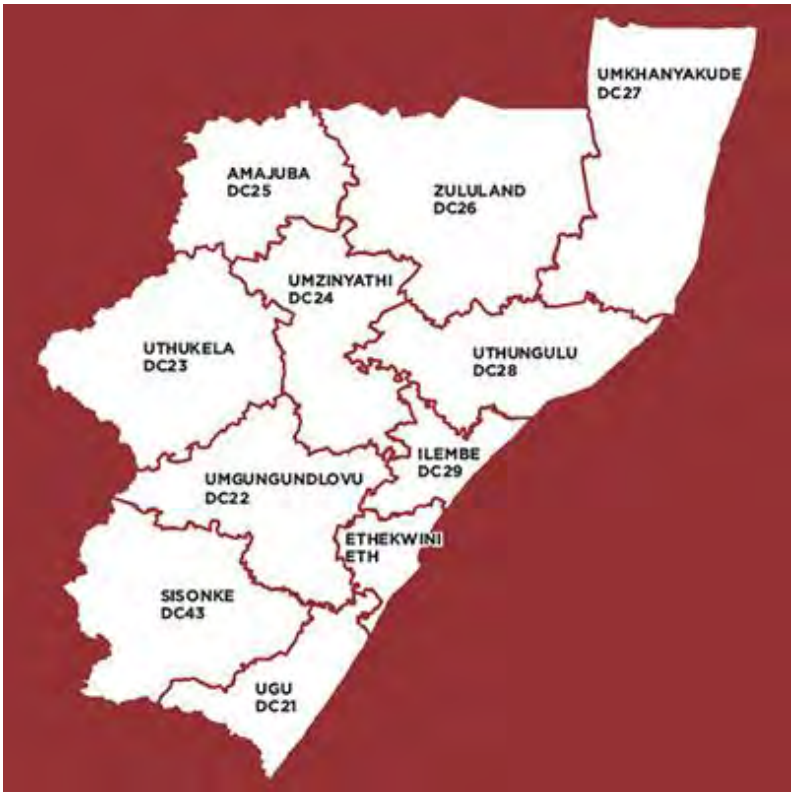


Figure 2.1: uMgungundlovu Map, Adapted from Google Map 2015a

uMgungundlovu is one of the 11 district municipalities of the KwaZulu-Natal province. There are two historical versions of the origin of the word Umgungundlovu according to PM (2015). Of these two, the correct version is not clear but both versions seem to make sense.

Version 1: The first version is that the Zulu King, Dingane who died in 1843 was known by his people as the "The Elephant". It was because of that his residence was also called uMgungundlovu literally meaning "The Abode of the Elephant".

Version 2: When the Location System was established in Natal by the Colonial Government in the 1840s, each location was placed under the control of a Zulu chief, who was directly responsible to Lieutenant-Governor Martin West in the capital, Pietermaritzburg. By a natural transition, the capital became known to the Zulu's as uMgungundlovu, the place where the Big Chief (Martin West) resided. This, then, is the significance of the elephant symbol of Pietermaritzburg, which features on the city's crest today.

Figure 2.2: Mpofana Map, Adapted from Google Map 2015b

Mpofana is one of the 7 local municipalities in uMgungundlovu. The word Mpofana is the Zulu name for the Mooi river and it means "place of the eland".

2.3 Sources of Water

Water is one of the most important liquids on this world. There are so many sources of the precious liquid and these include rain, rivers, lakes or dams, wells or springs.

We can classify sources of water into two main categories. These two categories are surface water and underground water. Surface water is the water that is present on the earth's surface in the form of rivers and lakes (Ambulkar, 2015). On the other hand we have underground water which is the water under the ground. This underground is the rainwater that seeps through the soil onto the hard rocks and collects as underground water. To obtain this water we dig wells or sink boreholes. The challenge that we have is to take this water to the people in form that is safe to drink or use. Mistakes in the proper sanitation of these water sources can cause serious health problems to the people. More on water source and drinking water can be found in Fuh Lin et al. (2015).

Figure 2.3: Outside water tap at unidentified household in Mpofana.

The White Paper on basic household sanitation was approved by the Cabinet of South Africa in September 2001. The Cabinet agreed a dedicated section for in charge of basic sanitation be formed so that service in delivery of sanitation be ensured (DWAF, 2001). The National Sanitation Programme Unit was established in 2002 by the Department of Water Affairs and Forestry (DWAF).

To those communities in South Africa that had never benefited in sanitation services in the past, the 2001 White Paper formed a sustainable framework for provision of sanitation. The White Paper focused on areas that had greatest need. These areas include the informal settlement and rural areas (DWAF, 2001).

The White Paper is a document that attracts International best practices. This accommodates the participation of community members and debates in planning and implementation of sanitation development programmes. The document also stresses the importance of health focused and developmental approaches. When dealing with sanitation there are critical linkages that must be considered. These linkages are between housing, water supply services, waste management and provision of health and hygiene education (van Vuuren and van Dijk, 2011).

As a way to support the above statement, it is very difficult to make a recommendation of the reticulated waterborne system for specific areas, or to make recommendation of on-site with full water supply when in fact there are no water facilities.

The White paper on basic household sanitation approved 12 policy standards households and these are:

- There is need to prioritise household sanitation and it must have linkage with the health and hygiene awareness.
- There is need for community Involvement where residents have full participation in the projects.
- There is need for integrated planning development with the Water Service Development Plan (WSDP). The sanitation backlog and long term plan for sanitation must be prioritised.
- Issues of environment and health development must be addressed.
- It is the Government's duty to provide the necessary basic sanitation to all the people.
- The allocation of funds be done in such a way that sanitation is prioritised. This is done to avoid risk of health that may result from adequate sanitation.
- There is need of allocation of sanitation resources to all regions. Sanitation programmes and projects must be done in all regions.
- All the provisions of sanitation systems done in all regions must be done water savings in mind.
- All individual or organisation found guilty of polluting the environment must be charged for that.

- Allocation budget for sanitation services: Budget for sanitation services must be maintainable in terms of capital costs and recurrent costs.
- In all plans for the improvement of sanitation facilities the environment must be taken into consideration. The environment must be protected in all endeavours to make sanitation facilities available to the people. The White Paper distinguishes sanitation between urban areas and the less densely settled or rural areas. VIPs latrines are normally used in rural areas and waste management is not easy.

It is therefore important to understand the community's level of satisfaction with the available sanitation as they are stakeholders in sanitation projects. Furthermore, as the government is mandated to provide basic sanitation to all, it is important to know the sanitary services that are there and more importantly to understand the adequacy of these services.

2.4 Water Services Act

Water Services Act (1997) of South Africa establishes and clarifies the institutional arrangements for water services provision in the country. The water provision service has the local government at the centre. The water service provision includes sanitation services also. According to this act, the Water Services Authority (WSA) has to ensure that there is cost-effective and sustainable access to adequate water and sanitation services for South African residents. The Water Services Provider (WSP) is responsible for the provision of Water and Sanitation services to the community. In this case uMgungundlovu District Municipality is the WSA and it's also play a role of WSP in the other six local municipalities.

Even though the local municipalities have the accountability and authority to manage water and sanitation services, the Water Services Act accommodates other government spheres so that to have responsibility within their financial capabilities to assist these local bodies. The Department of Cooperative Governance and Traditional Affairs in South Africa is the national department accountable for transferring funds to municipalities as prescribed in the Division of Revenue Act

(DORA). All funding for sanitation in uMgungundlovu District is subject to approval from Department of Water and Sanitation (DWS).

The Section 12 of the Water Services Act states that it is responsibility of the Water Service Authority (WSA) to come up with Water Services Development Plan (WSDP) for its area of jurisdiction. Detailed information is required for this development plan. According to van Vuuren and van Dijk (2011) “the health, social, and environmental benefits of improved sanitation are maximised when sanitation is planned for and provided in an integrated way with water supply and other municipal services”. The Water Services Department Plan (WSDP) is a component of the central mechanism to achieve *integrated planning and development planning* (IDP) (van Vuuren and van Dijk, 2011).

2.5 Toilet facilities

Disposal of human waste from households requires proper sanitary processes to be followed. The lack of proper toilet facilities can result in so many serious problems that are associated with poor sanitation such exposed faecal material. This exposed faecal material usual lead to many preventable diseases. The exposed matter also creates a breeding ground for diseases causing organisms and parasites. More on toilets can be seen in Gregory and James (2009).

Figure 2.4: Improved pit latrine built at an unidentified household in Mpofana

2.6 Rubbish collection

The management of waste has got some challenges in South Africa at the moment. The waste management service delivery in South Africa is local municipality function according to the South African Constitution (Act No. 108 of 1996).

Figure 2.5: Rubbish waiting for collection in Mpofana

The Mpofana Local Municipality authorities are trying their best to improve water supply, toilet facilities and rubbish collection services to the people.

2.7 Consequences of Poor Sanitation

According to McGranahan and Songsore (1994) and Songsore (2004) the urban environmental transition model "postulates that the nature of environmental problems and, therefore, sanitation challenges, in cities changes with levels of economic development". The model suggests that in those cities that are found in poor countries, sanitation health related challenges are found at the door steps of homes, neighborhoods and workplaces. These challenges include inadequate water supply and poor sanitation facilities and services, poor and overcrowded housing, poorly ventilated kitchens, disease causing insects, contaminated food, uncollected rubbish piles and poor or blocked drainage pipe system.

2.8 Health problems

Poor sanitation in most of the developing regions like Africa and Asia has caused a series of other problems. The poor sanitation that results from open defecation causes a widespread of health problems due the resulting unhygienic environment. Understanding social and cultural factors relating to such practices is critical in developing appropriate strategies of dealing with these.

The largest numbers of people in the world who are still practicing open defecation are found in India. According to UNICEF (2012), from the 1.2 billion inhabitants in that country, 103 million of them do not have proper water facilities that are safe for drinking. Besides the water facilities that are necessary for people almost 802 million people do not have the other basic sanitary facilities and services. High population density combined with poor sanitation creates a breeding ground for diseases such as typhoid and diarrhea.

2.9 Social safety

Besides health problems there are social safety consequences also. According to Bartlett (1999), “poor living environments have particularly far-reaching consequences for children and adolescents as they are more vulnerable than adults to a range of environmental concerns and more likely to be affected in ways that have longer-term repercussions “. Safety is compromised if children are forced to relieve themselves in the streets rather than safety of their home. Venturing into the streets to defecate compromises the safety of children especially women and young girls. About 400 rape cases that were reported in Bihar in India last year could have been avoided if the women had toilets in their homes. Most people want to relieve themselves in the secluded parts of their streets but unfortunately criminals also want to use these spots as their hiding places.

2.10 Environmental damage

Poor sanitation causes serious environmental damage. The environmental damage include negative publicity discouraging tourists from coming into the area, reduced exports of fish products, (Yapo et al., 2013). There are also unnecessary costs for buying chemicals and machines for clean-up operations.

2.11 Negative effect on education

Most rural schools in sub-Saharan Africa do not have proper toilets. The pit latrines do not have separate latrines for girls and boys. Not having separate latrines for young girls is results in the worst experience of their education life. This worst experience prevents the young girls from participating fully and poor performance at school (van Minh and Nguven-Viet, 2011).

2.12 Illegal business.

According to Owusu (2010) some people try to use the failure by municipal authorities to manage rubbish collection as an opportunity to start their own illegal business. They collect rubbish for a fee from one side of the community and dump it

on unauthorized place on the other side of the same community. People usually have no choice on how they dispose waste from their homes especially when the local municipality has failed. People just pay these unscrupulous people to get rid of rubbish from their door steps and they do not care about the final destination of the rubbish.

2.13 Source of violence and insecurity

Sometimes poor sanitation also acts a source of violence and insecurity. Community members sometimes beat up these members to discourage them from dumbing rubbish in their neighborhood. As a way of protecting themselves, the illegal rubbish collectors, team up and fight back resulting in widespread violence, (Wolfgang et al., 2011).

2.14 Stigmatization by other communities

The lack sanitary facilities and very poor physical living environment results in stigmatization by other communities with better sanitary facilities and services.
According to Owusu *et al*. (2008), “the negative characterization of poor urban communities as a result of their poor infrastructure and physical environment is associated with stigmatization of the population and individuals living in such communities”. Everything coming from the community including people, vegetables or any market product is considered bad. People from communities with better sanitary facilities and services do not want to be associated with anything that comes from these very poor communities. This is not fair for innocent kids who did not choose to be born in these poor communities.

2.15 Water contamination:

The chemical waste from some of the households usually end up in rivers, wells or lakes and this results in the chemical composition of the water being changed, (Mason, 2002) . This process is called water pollution and does not only affect human beings but it also affects other living organisms such as fish, birds and land animals. In other words the ecosystems that exist in the water are seriously affected.

Leachate is the liquid that forms when water trickles through areas that contaminated by chemicals and other hazardous substances. The harmful leachate does not only enter rivers or lakes only but it also finds its way into the underground water also.

2.16 Soil contamination:

Some of the harmful chemicals from the polluted rivers get into the soils where plants grow causing what is called soil contamination, (van der Perk, 2013). The edible plants that grow on these polluted soils take in these chemicals into their plant systems, and when human beings or animals eat plant they are seriously affected by the hazardous chemicals.

2.17 Air pollution

According to Gurjar et al. (2010) some of the waste from households and industries emit toxic or harmful gases into the atmosphere. This is called air pollution and the bad or harmful gases cause serious respiratory problems. The harmful chemicals are absorbed from the lungs and find their way into other parts of the human or animal body.

2.18 Loss of tourists and investors

Most always wants to visit places that have good sanitary facilities and services. Tourists want places that are clean, fresh and healthy. There is no way a city with poor sanitation can attract good people. Towns that are smelly and with human and animal waste all over have very poor living standards and will not lure investors, (van Minh and Nguven-Viet, 2011).

2.19 Loss revenue

Cities with very poor sanitation facilities and services are usually associated with very poor waste disposal. Poor waste disposal means there are no proper recycling processes of some of the waste resulting in loss of revenue. Recycling material from the waste can be sold for a reasonable amount of money if properly managed. According to van Minh and Nguven -Viet (2011) Indonesia lost an estimated US$6.3 billion due to poor sanitation and hygiene, equivalent to approximately 2.3% of the

GDP. Of the impacts evaluated, health and water resources contributed most to the overall economic losses estimated in the study.

2.20 Benefits of Proper Sanitation

2.20.1 Prevention of diseases

A recent paper by Shandra et al. (2011) demonstrated that higher levels of access to an improved water source and an improved sanitation facility are associated with lower levels of child mortality within Sub-Saharan African nations. Secondary barriers such as hygienic practices are usually good barriers of diseases. An example of useful barrier is hand washing with soap after using toilet or before meals. It can be shown that sometimes care at the toilet and water taps is not enough when fighting these diseases. For the fight against diseases to be effective people need in their behaviors so as to break the cycles of disease transmissions.

2.20.2 Cost savings

Cost-offsets are one set of benefits that related to the health impacts that are relatively easy to quantify. Cost-offsets can be defined as the costs avoided due to less illness. This less illness results from the improved sanitary facilities. The resulting benefits of improved sanitation accrue to both the health sector and to patients themselves. According Hutton et al. (2008) it is estimated that US$6.3 billion could be saved annually if proper sanitation and hygiene measures practices were introduced in Vietnam, Philippines, Indonesia and Cambodia. In the health sector cost savings are in the form of reduced number of treatments of diarrhea or cholera cases. Since there is no need to seek treatment, a large amount of money is saved on avoided avoid costs on travelling, drugs and caring (WHO, 2015a). The global cost savings of two possible intervention Option 1 and Option 2 were studied by Evans et al. (2004). The intervention cost of Option 1 was US$2.1 billion per year and this amount would rise to US$7.3 billion per year if intervention Option 2 was used. Evans et al. (2004) also found that for the health sector alone annual

investments of about US$20.5 million in Tanzania and about US$6.7 million in Vietnam would yield benefits of US$5.4 million and US$66.7 million respectively.

2.20.3 Days saved

Another set of benefits is obtained from the less illness are the avoided days that the people were supposed to be ill. In other words these are the days the people spend on their formal or informal employment or doing other productive activities in the household or school attendance. The value of this working time is the benefit of the improved sanitation or less illness. The gains from less illness are traditionally split into two main types. The two types are gains are in the form of lower morbidity and gains due to less death. This analysis is based on the fact the time spent sick represents an opportunity cost that is equal to the number of days valued at minimum wage rate. Using Option 1 the annual global value of days gained would be US$210 million. This amount rises to almost US$750 million if intervention Option 2 is used (WHO, 2015a).

2.20.4 School Attendance

Dollar et al. (1999) reported that on average for every 10% increase in female literacy a country's economy could grow by 0.3 percent. The increased literacy comes from the increased school attendance caused by proper sanitation facilities. The other major benefit of improving access to water and sanitation derives from the time saving short distance from the sanitation facilities. Time is saved when someone fetches water from a closer borehole than another one a distant away. Most people do not notice this difference in distance when it is for a day but when this distance is multiplied by 365 days in year it becomes very significant. Factoring other distances to other facilities such as latrine gives a very big distance. Saving these large distances translates into increased production at work, higher school attendance and more leisure time for the people.

2.21 Barriers to Improved Sanitation

There are various challenges associated with improving sanitation coverage. According to Duflo et al. (2012), there are three key barriers to improved sanitation namely:

(i) National supply solutions are not maintainable if provincial and local levels of government do not participate in the implementation at the local perspective.

(ii) Water and sanitation infrastructure is expensive and is not adequate in the developing world such as South Africa.

(iii) In some communities people may not be willing to pay for the improved sanitation facilities. This insufficient demand may make it impractical for the municipal authorities to provide the services in these areas or communities with insufficient demand.

According to Dittmer (2009), there are other barriers that are associated with improved sanitation and these are:

1. Expense and loss of resources (poverty in most communities)

   Pit latrines are not cheap when comparing to the income levels of most people in African urban communities and rural areas. People who cannot afford to own toilet prefer to defecate in the open field.

2. Smell, heat and maintenance of pit latrines

   Several people prefer to defecate in the open field, instead of their poorly constructed latrine. The main reason for this is the unpleasant smell coming from the poorly constructed toilet. This terrible smell discourages people from using it and they opt for the open field.

3. Safety of the latrine structure

   Most of the people prefer to use local material which is cheaper or affordable to build their pit latrine. The cheap material is not durable and this makes the people afraid of falling into the pit.

4. Environmental challenges.

   Some communities have soils that are not suitable for constructing a pit latrine. The soils may be too sandy or swampy such that it is very difficult to construct a pit latrine. Even if the pit latrine is constructed on the sandy or

swampy area, it is usually very unstable such that the users are not comfortable or afraid to use it.

A study conducted by Kisterman (2008) shows that in Kyrgyzstan there were no formal infrastructure for sanitation. Basic pit latrine or septic tanks with no sanitary refinements were used in most of the rural areas. Most of these pit latrines were near the houses and were very unhygienic. The problem with these pit latrines was that they were occasionally emptied and the odour from the pits was just too much.

Another study was conducted by IRC's WASHCost for five years from 2008 up to 2012 for societies in Andhra Pradesh (India), Burkina Faso, Ghana, and Mozambique (Akvopedia, 2015). WASHCost gathered and analysed data for water, sanitation, and hygiene in urban, peri-urban and in rural areas of these countries. To gather the necessary information, the life-cycle costs method was used. A life-cycle method studies the composite relationship between service delivery, expenditure, poverty, efficiency and sustainability. According to WASHCost's "the main findings for sanitation were:

- Planning, monitoring, community expenditure in terms of sanitation policy and operating is not prioritised in countries where WASHCost conducted study;
- WASHCost study suggests that it is doubtful that poor families can be able to afford costs of a basic and decent sanitation system;
- Technically advanced latrines are expensive but do not provide better services. Expenditure reflects that is damaging provision levels and sustainability;
- Improved traditional pit latrines can be able to deliver similar levels of provision to more costly latrines, and do not appear to necessitate higher operating and maintenance expenditure;
- In Burkina Faso, Mozambique and Ghana, higher levels of provision are obtained in peri-urban/ small town areas in comparison to rural area, due to improved environmental protection and reliability. This concurs with commonly higher construction expenditure and regular costs. The necessity for improved sanitation in higher-density urban areas is actually recognised by households;

- The study creates a strong case for policy makers to change their sanitation priorities. Planning for demand construction and latrine construction is imperative. It is also important to prioritise planning for higher expenditure on support and actions to endorse latrine use and environmental protection, including schemes for pit emptying and the safe disposal of faecal sludge".

The socio-cultural barriers to abandoning open defecation are presented in Table 2.1

Table 2.1: Socio- cultural barriers to abandoning open defecation

Socio-cultural factors that reinforce open defecation practices	**Burkina Faso**	**Ghana**	**Mali**	**Nigeria**
Feel embarrass to be seen using toilet	√		√	
Latrine should not be in house to avoid bad smell in the household.	√	√	√	√
Latrine symbolize rich and not for poor family	√			
If someone provides food for you, you expected to defecate in that person field.	√			
Latrine associated with demonic spirit.		√		
If you use latrine, you might lose miracle power.		√		
Life span maybe shortens by using latrine.	√			
Defecating in the field is the continuation of ancestors' culture.				√
Regard open defecation as the best practice.	√			

Adapted from Water Aid's experience of CLTS in Africa (Dittmer, 2009)

Dittmer (2009) summarized the following cultural beliefs and social factors for each country as follows:

2.21.1 Embarrassment:

In certain societies in Burkina Faso and Mali, people are embarrassed to be seen approaching the direction of a latrine, especially by close family members. Most people prefer to have latrine in their houses in order to gain privacy in their households.

2.22.2 Odour

In all four focus countries, they don't accept to live with human excreta because they consider it be the source of very bad smell.

2.22.3 Social status (only certain people should own latrine)

Certain groups in Burkina Faso trust that latrines are only planned for rich families and you should not build latrines, even if you can afford the cost.

2.22.4 Returning favour

In Bwaba community in Burkina Faso, if someone gives you a meal then you are expected to use his field to defecate (and fertilise the crops), as a way of appreciation and thanking him/her.

2.22.5 Fear of evil spirit

In Ghana, they regard the use of open defecation as way of avoiding evil spirit or being possessed by demons. Half of the society in Tamale community of Ghana assumed latrines are bounded by evil spirits and to use latrine will strip them of their magical powers.

2.22.6 Continuation of culture practice

In parts of Mali and the Idoma people in Nigeria, open defecation is regarded as a continuation of ancestral culture. Older generation refuse to defecate in an enclosed area. Males do not allow females to share latrines with them because it is not a sign of respect.

2.23 Preference of appropriate technology

According to the White Paper (1996) on Science and Technology, it states that science and technology must contribute towards improving the standards of living of people in South African. The technical options or choices for the provision of adequate sanitation are not broadly recognized and the features are not well understood by users. Extensive choices or options available to the users depend on the environments. According to the Department of Water and Sanitation, choosing the appropriate technology is not based on the technical parts of each technology only but also on such aspects as the durability of the equipment, costs implications and affordability, life span, and partialities, organised capacity, job creation opportunities, and whether it is environmentally friendly. When a new technology is introduced into an area, there is always resistance at first until that region reaches a level of development that can take advantage of the technology being introduced (Basu and Weil, 1998).

Understanding local constraints on preference of technology depends on the level of understanding between the user and provider of technology. Feedback from the users is important and is used to redesign or in other ways to improve the technology so as to increase users' satisfaction (Murphy et al., 2009). The study by Murphy et al. attempted to understand sanitation practices and preferences from the community or users of technology. Assessing whether a technology is appropriate to an area is not a straightforward process. One must consider the available resources, local preference, time, and place (Murphy et al., 2009).

2.23.1 Selection of sustainable sanitation technologies

The method of choosing the most suitable technology from a variety of possibilities is the key function to the positive and sustainable operation of any facility. To choose the right technology is usually considered as an easy process, but is usually a fairly complex and demanding process. It involves careful assessment of factors, discussions with the beneficiaries and the operational authority. It also involves an understanding of the background of the integration of elements affecting the sustainability of the new technological system.

2.23.2 Steps in selecting technologies

According to the Department of Water and Sanitation, three steps are necessary when selecting the appropriate technology and these are:

STEP 1: There must be confirmation of the objectives and goals of acquiring the new technology.

- The expectations and importance must be clear.
- The goals must be achievable and must meet the expectations

STEP 2: Examination of all issues in the selection process

- All issues involved in the selection of technology must be examined and these issues include technological, social, institutional, economic, financial and health issues.

STEP 3: Operation plan

Economic planning for operation and maintenance of the new technology should be in place including hygiene awareness before the technology is acquired.

2.24 Conclusions

This chapter gave an account of what has been published on the topic by other scholars and researchers. The chapter covered the literature on sanitation, sources of water, the Water Services Act in South Africa, toilet facilities and rubbish collection. In addition consequences of poor sanitation and benefits of proper

sanitation are also presented. Barriers that are common to improved sanitation, cultural and social beliefs affecting sanitary facilities and selection of the appropriate sanitary technology are discussed. The next chapter will present the methodology of the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter was mainly on the literature review on sanitation practices and preferences. Now we have gathered the current and previous work on sanitation practices and preferences, then the next stage is to conduct the research. Conducting a research requires a clearly spelt out research methodology. Research methodology can be defined as a systematic way to solve a problem or as the science of studying how a specific study is supposed to be carried out (Delvin, 2006). As an example a researcher may be required to know the most suitable method for the chosen study, the order of accuracy of the results obtained from a method and the efficacy or accuracy of the method. These three aspects make up what we may constitute a research methodology. More on research methodology can be obtained from Bryman and Bell (2007), Coolican (2009) or Jackson (2008). In this chapter the procedures that were used to collect the data are discussed. These procedures include the selection of the sampling method and statistical justification, construction of the research instrument, pretesting of the research instrument, measuring the reliability of the research instrument, administration of the research instrument, study limitations and ethical issues.

3.2 Aim and Objectives of the Study

The study aims to provide strategies for improving basic infrastructure needs for the population in uMgungundlovu District Municipality. From an environmental health perspective, this information is an important step in preventing disease transmission and environment degradation. Policy makers can rank existing sanitation options for district or local municipality and then target their economic and technical efforts to promote only those technologies that are most likely to succeed in each and every district or local municipality.

The study aims to achieve the following objectives:

- To determine the sanitary facilities and services that are available to the households in the targeted area and also assess the adequacy of these facilities,
- To examine if the people in the targeted area are satisfied with the available sanitation facilities and services,
- To determine and assess the impact of cultural and social factors affecting sanitary and hygienic practices in the targeted area.
- To come up with ways to improve the sanitary facilities and services in the targeted area.
- To determine some correlations between biographical data and the
  (i) available sanitary facilities.
  (ii) cultural and social factors.

3.3 Research Questions

The following research questions were formulated from the objectives.

- What are the sanitary facilities and services that are available to the households in the targeted area and are these facilities adequate?
- Are the people in the targeted area satisfied with the available sanitation facilities and services?
- Are there any cultural and social factors affecting sanitary and hygienic practices in the targeted area and is there an impact of these believes?
- Are there any ways to improve the sanitary facilities and services in the targeted area?
- Are there any correlations between biographical data and the:
  (i) available sanitary facilities?
  (ii) cultural and social factors?

3.4 Location of the study and selection of participants

3.4.1 The location of study

The location of study is uMgungundlovu which is one of the 11 district municipalities of the KwaZulu-Natal province. The capital city of uMgungundlovu is Pietermaritzburg. The majority of the 1 017 763 people in uMgungundlovu speak Zulu according to South Africa 2011 Census (Statistics SA, 2011). uMgungundlovu is made up of 7 local municipalities as shown in Table 2.1.

Table 3.1: Population of uMgungundlovu District Municipality

Local Municipality	Population	%age
Msunduzi	618 536	60.77%
uMshwathi	10 6374	10.45%
uMngeni	92 710	9.11%
Richmond	65 793	6.46%
Mkhambathini	63 142	6.20%
Mpofana	38 103	3.74%
Impendle	33 105	3.25%
Total	**1 017 763**	**99.98**

3.4.2 Sampling

Random sampling was used to select one of the local municipalities and Mpofana Local Municipality was selected for study. Mpofana Local Municipality has an established numbering system for all households in the urban and semi- urban areas so as to facilitate record keeping for their service delivery. In rural areas the municipality use numbering system together with names of sub-wards to facilitate service delivery. Mpofana local Municipality has a population of 38103 but the study targeted only households and social areas which are benefiting from the municipality service delivery. Mpofana Local Municipality has four wards and 30 houses were randomly selected for the study in each ward thus giving a total of 120 households. Only those respondents with a minimum of 18 years were used as participants.

3.5 Construction of the research instrument

The study used a questionnaire as the research instrument. The questionnaire was made up of 30 questions. The research instrument had 4 main sections from A to D. Section A was mainly on the demographics, Section B was on the facilities and services available to the households, Section C was on cultural and social factors affecting sanitary and hygienic practices while Section D was on proposals to improve sanitation facilities. The questionnaire is presented in Appendix B.

3.6 Pretesting and validation of research instrument

The questionnaire was tested on 10 households in Mpofana Local Municipality but households were not from the 120 selected for the main study. The necessary changes were made.

3.7 Reliability of research instrument

The Chronbach's alpha coefficient was found to be 0.78 which indicated that the research instrument was reliable.

3.8 Administering the questionnaire

A total of 120 Questionnaires were hand delivered to all the 120 households in the Mpofana Local Municipality. Respondents were given two weeks to complete the questionnaire and those who were not able to complete were given some extra time to do so. Queries or clarification on some of the questions were done at the point of collection. As a result all the questionnaires were completed giving a response rate of 100%.

3.9 Limitations

If resources could have allowed us to have a complete enumeration of the entire population in uMgungundlovu the results could have given a true reflection of the study. Unfortunately this was not possible because of the resource constraints and as a result only 120 households were used in the analysis.

3.10 Ethical Considerations and Limitations

In carrying out the study it was crucial to ensure that ethical issues were taken care of. Before the study could be done permission had to be sort in the form of an ethical clearance letter from the university through presentation of the study proposal and questionnaires. Measures were taken to protect the autonomy of respondents and to prevent social stigmatisation and secondary victimisation of respondents. In order to abide with the institution's ethical policies the collection of data was not to include the following:

- Access to confidential information without prior consent of participants
- Participants being required to commit an act which might diminish self-respect or cause them to experience shame, embarrassment, or regret
- Participants being exposed to questions which may be experienced as stressful or upsetting, or to procedures which may have unpleasant or harmful side effects
- The use of stimuli, tasks or procedures which may be experienced as stressful, noxious, or unpleasant
- Any form of deception

An informed consent form was given to the potential respondent for their acknowledgement. The informed consent form is given in Appendix A. The consent noted that the participation in the study would be voluntary. The potential respondent had the choice to refuse to participate or withdraw from the study at any time with no negative consequence. It was pointed out that there was no monetary gain from participating in the survey. It was highlighted on the consent documents and the questionnaire that confidentiality and anonymity was to be upheld (UKZN, 2014).

3.11 Data Analysis

The data obtained from the respondents was analysed using SPSS package, version 21.0. The results were presented as descriptive statistics through the use of graphs, cross tabulations and other figures for the quantitative data that was collected.

3.12 Conclusion

The study used a questionnaire, personally administered to 130 households. The questionnaire was pretested to make sure that it was not ambiguous. The analysis of collected data was done using the SPSS software package. The researcher believes that the applicable methods used for this study were reliable and valid for the collection of relevant data. The next chapter will give a presentation of data and the applicable analysis.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.1 Introduction

In this chapter we present the results obtained from the questionnaires in the study. The questionnaire acted as a primary tool which was used to collect data through its distribution to the targeted 120 households in Mpofana Local Municipality. The data obtained from the respondents was analysed using SPSS package, version 21.0.The results were presented as descriptive statistics through the use of tables, graphs and pie charts. In addition correlation analysis was also used to explore the relationships between various aspects in the sanitation practices and preferences.

4.2 The Sample

A total of 120 questionnaires were distributed to the selected households in Mpofana Local Municipality. Since the questionnaires were hand livered plus the fact those who were not able to complete were given extra time to do so all the 120 questionnaires were returned giving an excellent rate of response of 100%. According to Statistics SA (2015), a household'' means a group of people who live together at least four nights a week, eat together and share resources, or can be defined as a single person who lives alone.

4.3 The Research Instrument

The study instrument was comprised of 30 questions. The questionnaire was presented in 4 different parts or sections that were to measure the various themes as captured below:

Section **A**: Questions were mainly on personal or demographical data (8 questions).

Section **B**: Questions were mainly on facilities and services available to the households (11 questions).

Section **C**: Questions were mainly on cultural and social factors affecting sanitary and hygienic practices in Mpofana Local Municipality (5 questions).

Section **D**: This was the last section in the questionnaire and was on possible ways to improve sanitation facilities (6 questions).

4.4 Reliability of the research instrument

Reliability and validity are two of the most important precision aspects that are supposed to be considered during the construction of a research instrument. One option of verifying reliability is measuring the same subjects several times. In this case the research instrument is said be reliable if the same results are obtained after when we measuring the same subjects several times. A reliability coefficient of 0.70 or higher is regarded as “acceptable”. The table below shows the Cronbach’s alpha scores obtained from the questionnaire items. See Cronbach (1951) for more on Cronbach alpha reliability coefficient.

Table 4.1: Cronbach alpha scores

		Number of Items	Cronbach's Alpha
Section B	To determine the sanitary facilities and services available to the households	11	0.857
Section C	To identify the cultural and social factors affecting sanitary and hygienic practices	5	0.783
Section D	To propose or suggest improved sanitary facilities	6	0.864
	Overall	22	0.842

The overall reliability score obtained from each of the three sections of the questionnaire exceeded the acceptable lower limit 0.70. The overall reliability score of 0.842 indicates a high degree of reliability thus the research instrument is reliable for this study.

4.5 Biographical data of Participants

The demography of the 120 participants took into consideration the race, age, gender, level of qualification, size of families, occupation and family income of participants. All the participants were heads of the families. According to the Wikipedia (2015), family or household income is “a measure of the combined incomes of all people sharing a particular household or place of residence. It includes every form of income, e.g., salaries and wages, retirement income”. The information offered some insights into the composition of the participants relative to gender, age, level of qualification, size of households, occupation as well as family income of the respondents.

4.5.1 Gender and Age Distribution

Most respondents in the study were between 26 and 45 years of age (20,83% were between 26 -35 years and 35.00% were between 36 – 45 years of age) with more females in the 36 – 45 years age group of the 120 participants, 66 were females and 54 were males.

The composition of the participants in terms of gender and age is shown in the Table 4.2 and Figures 4.1 and 4.2 given below.

Table 4.2: Gender distribution by age.

Age limits (years)	Gender		Totals	%ages
	Male	Female		
18-25	7	12	19	**15.83%**
26-35	15	10	25	**20.83%**
36-45	18	24	42	**35.00%**
46-55	11	9	20	**16.67%**
56-65	2	7	9	**7.50%**
Above 65	1	4	5	**4.17%**
Totals	**54**	**66**	**120**	**100%**

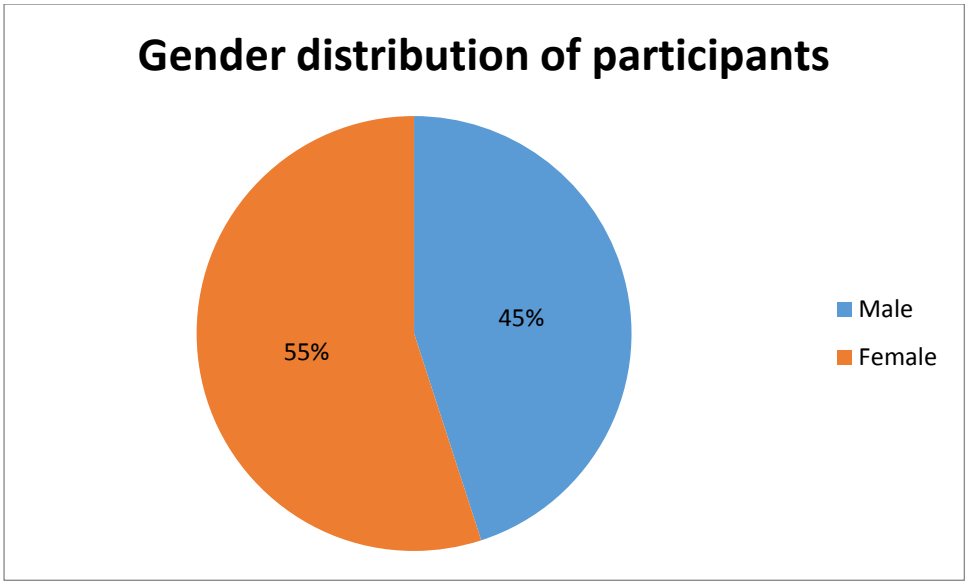


Figure 4.1: Gender distribution of participants

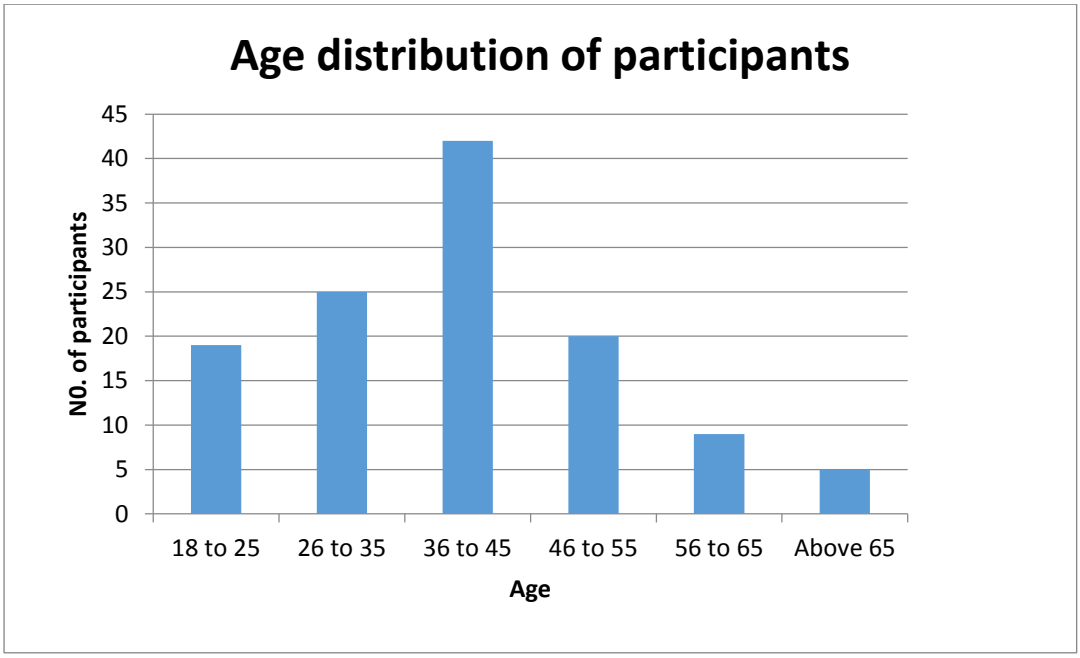


Figure 4.2: Age distribution of participant

4.5.2 Participants' levels of qualification

Participants' levels of qualifications are presented as shown in Table 4.3 and Figure 4.3. The qualification variable is important as it reveal important information about its relationship to the sanitary facilities they use, cultural and social factors. The composition of the participants in terms of gender and qualification level is shown in the Table 4.3 below.

Table 4.3: Composition of the participants in terms of gender and qualification level

Highest level of qualification	**Gender**			
	Male	**Female**	**Total**	**%age**
Matric	31	40	71	**59.19%**
Certificate	4	7	11	**9.17%**
Diploma	5	12	17	**14.17%**
Degree	6	3	9	**7.50%**
Postgraduate	4	3	7	**5.83%**
Other	4	1	5	**4.16%**
Total	**54**	**66**	**120**	**100%**

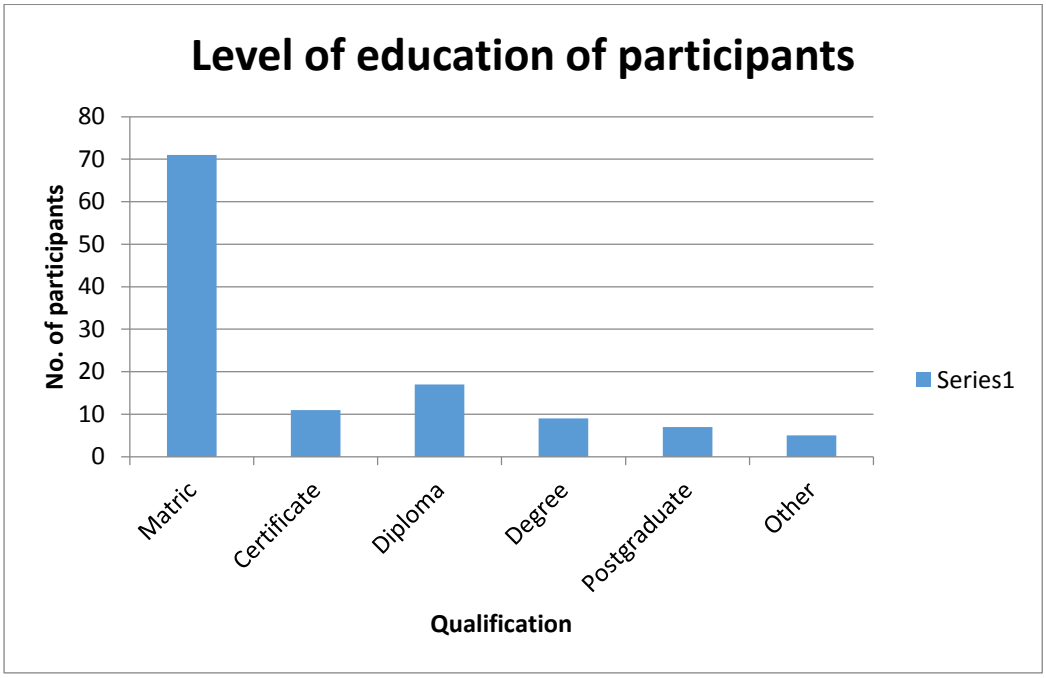


Figure 4.3: Levels of education of respondents

4.5.3 Sizes of households

The family sizes of the participants are shown in Table 4.4 and Figure 4.4 given below. Most participants (48.33%) had an average of 2-4 members in their families.

Table 4.4: Family sizes of participants

Size of family	Count	%age
1 person	18	15.00%
2-4 people	58	48.33%
5-8 people	31	25.83%
Above 8 people	13	10.83%
Total	120	100%

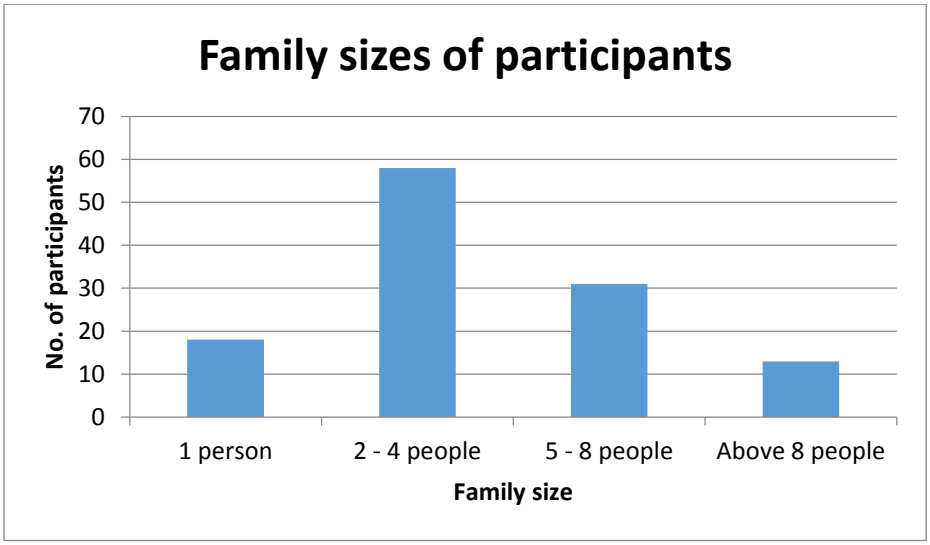


Figure 4.4: Family sizes of respondents

4.5.4 Income distribution of the participants

The composition of the participants in terms of income is given Table 4.5 and Figure 4.5 below

Table 4.5: Family income distribution of the participants

Salary bracket	Salary range	Count	%age
Bracket 1	Below 3500	11	9.17%
Bracket 2	R3500 ≤ salary < 5500	23	19.17%
Bracket 3	R5500 ≤ salary < 7500	46	38.33%
Bracket 4	R 7500 ≤ salary < 10000	21	17.50%
Bracket 5	Salary of R 10000 or more	19	15.83%
Total		120	100%

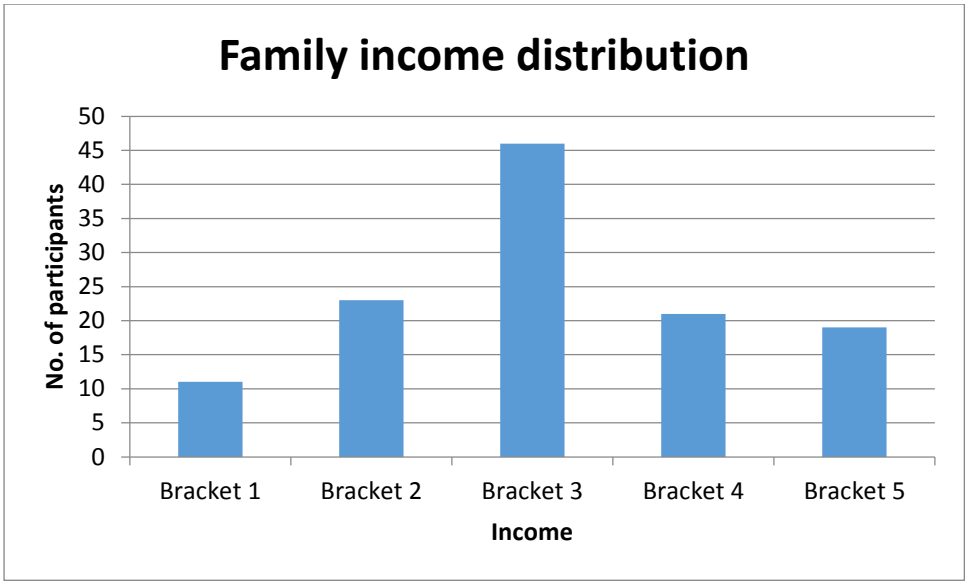


Figure 4.5: Family income distribution of participants

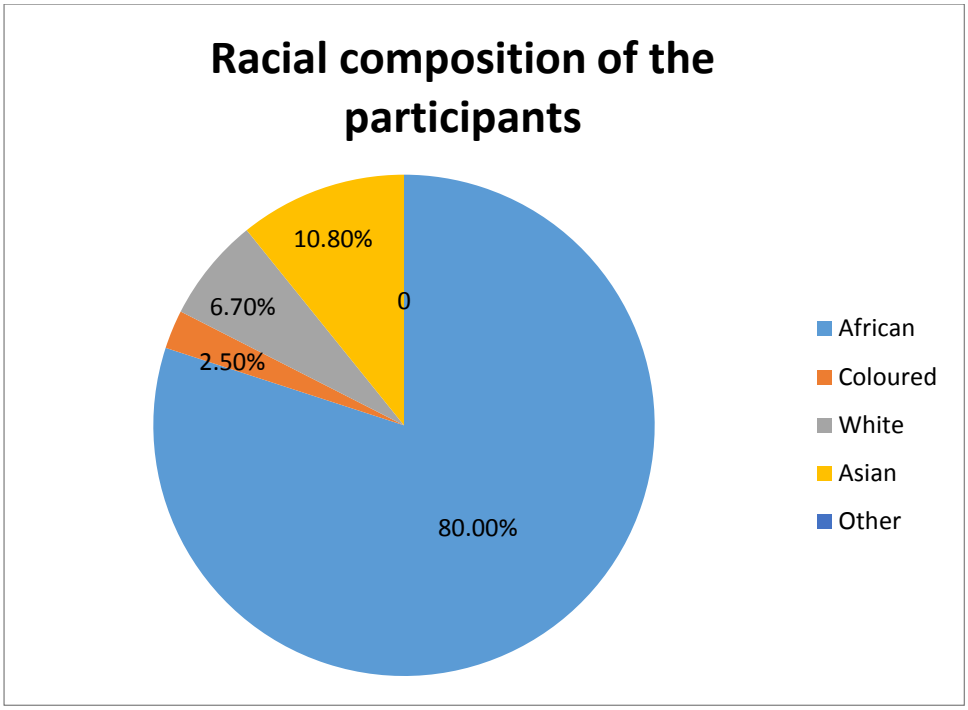
4.5.5 Distribution of race

The racial composition of the participants is given in Table 4.6 and Figure 4.6 below.

Table 4.6: Racial composition of the participants

Race	**Count**	**%age**
African	96	80.00%
Coloured	2	1.67%
White	8	6.67%
Asian	14	11.67%
Other	0	0.00%

Figure 4.6: Racial composition of the participants



4.6 Responses to the items

4.6.1 Available facilities

Q9: Where are you getting your drinking water? The distribution of the participants on this question is presented in Table 4.7 and Figure 4.7 given below.

Table 4.7: Source of drinking water

Source	**No. of participants**	**%age**
From the household water tap	78	65.00%
From a water tap away from home	24	20.00%
From the well or borehole near the house	11	9.17%
From the valley river	7	5.83%

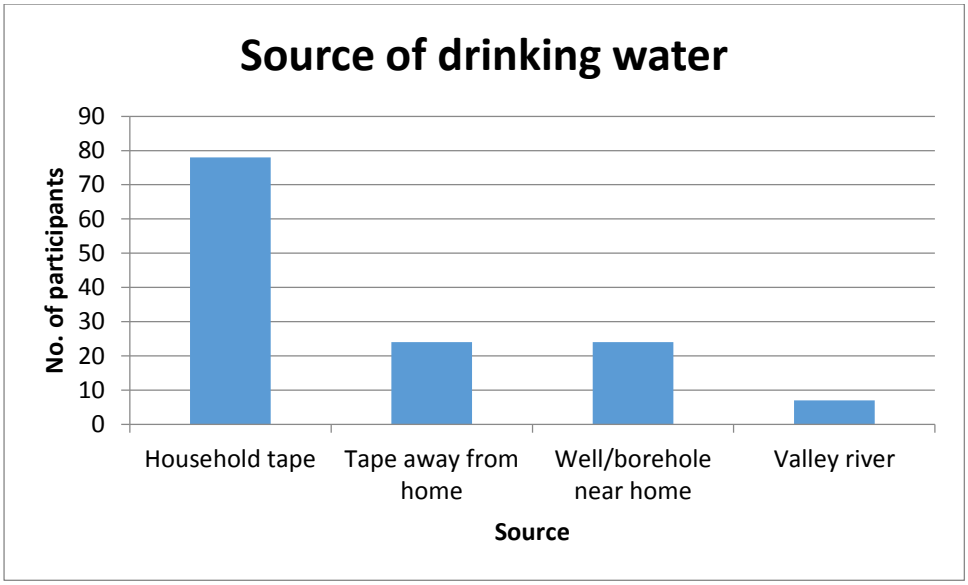


Figure 4.7: Source of drinking water

Q10: Do you share this water source with the other households? The participants' responses are summarized in Table 4.8 and Figure 4.8 below.

Table 4.8: Sharing of water facilities

Response	Count	%age
Yes	41	34.17%
No	79	65.83%

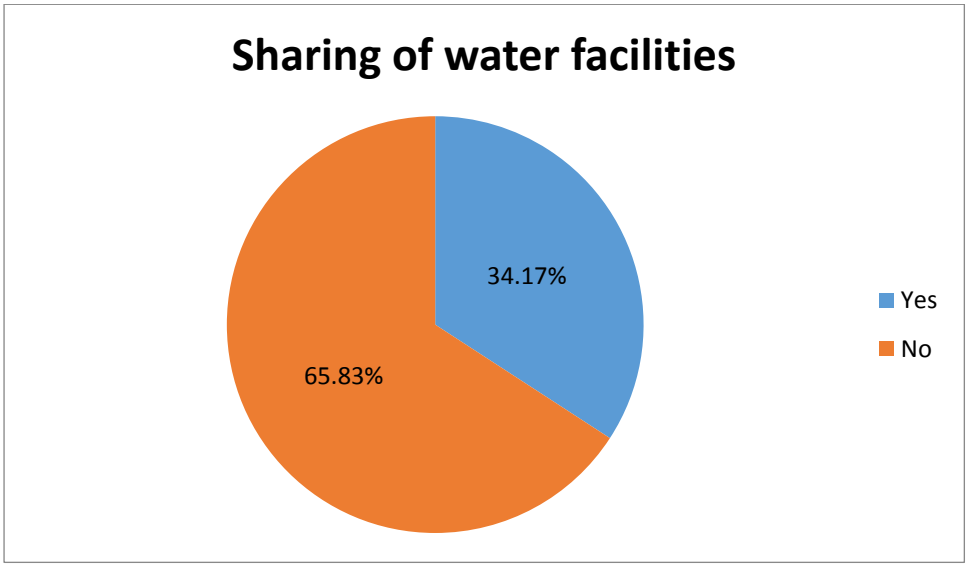


Figure 4.8: Sharing of water facilities

Q11: To what extent does the water you get meet your needs? The data is summarized in Table 4.9 and Figure 4.9.

Table 4.9: Extent to which the water meets your needs

Response	Count	%age
Meet all my needs	102	85.00%
Meet some of my needs	12	10.00%
Does not meet my needs	6	5.00%
No water facility at all	0	0.00%

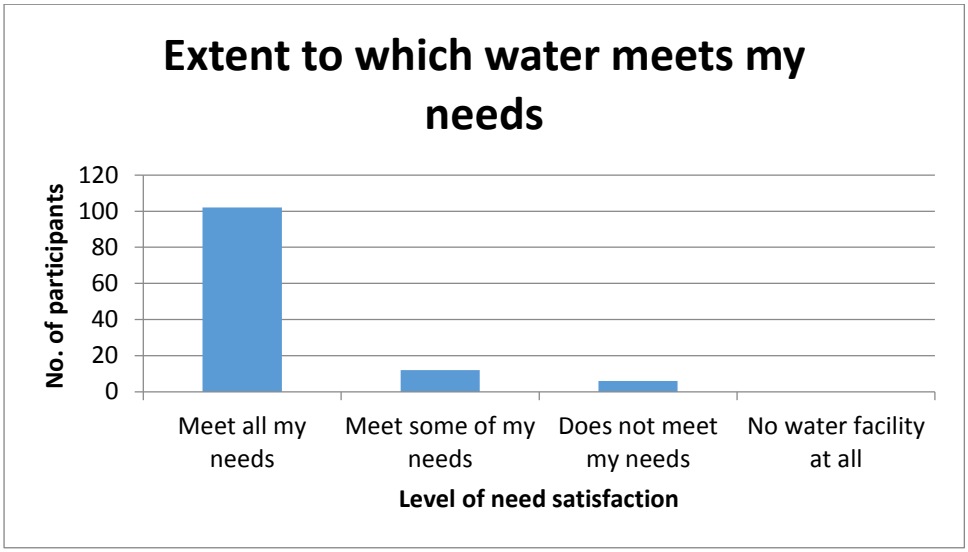


Figure 4.9: Extent to which water meets my needs

Q12: Why are you not having access to water in your home? The reasons for not having access to water are presented in Table 4.10 and Figure 4.10 below.

Table 4.10: Why are you not having access to water in your home?

Response	No. of participants	%age
Cannot afford the bill	15	12.50%
Municipality is not capable of bringing water	18	15.00%
Other reasons	9	7.50%

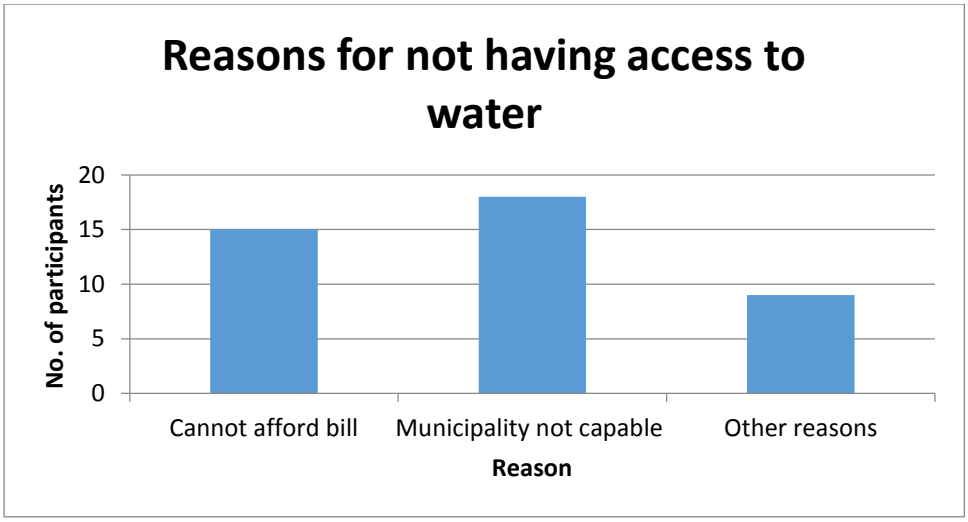


Figure 4.10: Reasons for not having access to water

Q13: What do you usually do to the water that you get to make it safer to drink? The data from the respondents is presented in Table 11 and Figure 11.

Table 4:11: Step taken to make water safer for drinking

Response	**Count**	**%age**
Nothing (using it like that)	97	80.83%
Boiling	14	11.67%
Bleach/use chlorine	0	0.00%
Using a water filter	0	0.00%
By letting it stand and settle	9	7.50%
Other ways	0	0.00%

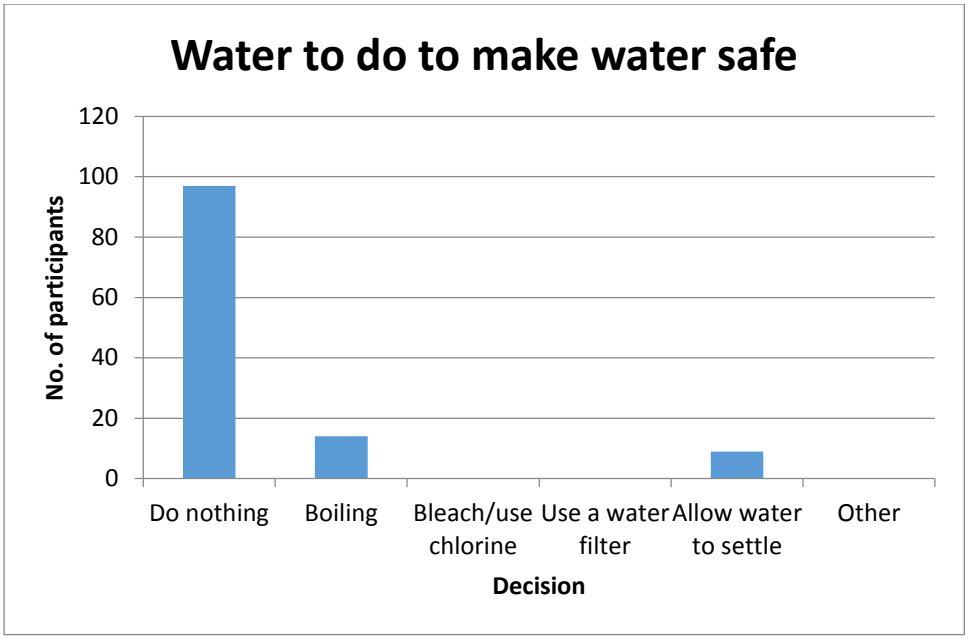


Figure 4.11: What to do to make water safe

Q14: How do you dispose the wastewater at your home? The responses from the participants are summarized in Table 4.12 and Figure 4.12. When asked on how the participants disposed of their wastewater, it was found that 76.67% or 92 of the 120 participants make use of the waterborne sewerage system.

Table 4.12: How do you dispose the wastewater at your home?

Response	**Count**	**%age**
Pour it in a sink	92	76.67%
Throw it outside the house	6	5.00%
Water your garden	14	11.67%
Pour it in pit latrine or use it to flush the toilet	8	6.67%
Other ways	0	0.00%

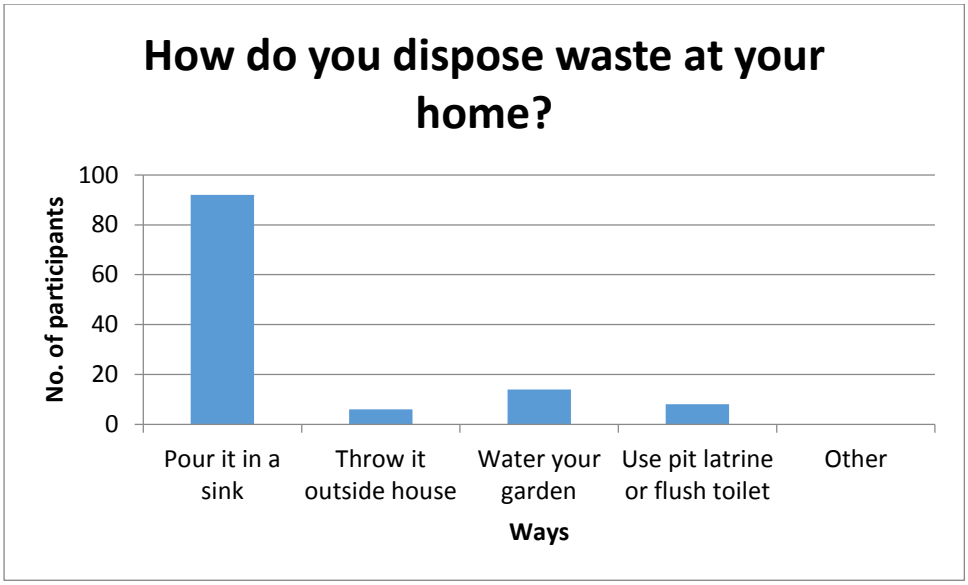


Figure 4.12: How do you dispose the wastewater at your home?

Q15: What type of toilet do you have? The data on the type of toilet facility the participants have is summarized as shown in Table 4.13 and Figure 13.

Table 4.13: What type of toilet do you have?

Response	**Count**	**%age**
Traditional Pit Latrine	21	17.50%
Ventilated Improved Pit Latrine	12	10.00%
Flush Latrine piped to septic tank	5	4.17%
Flush Latrine piped to sewer line	81	67.50
Other	1	0.83

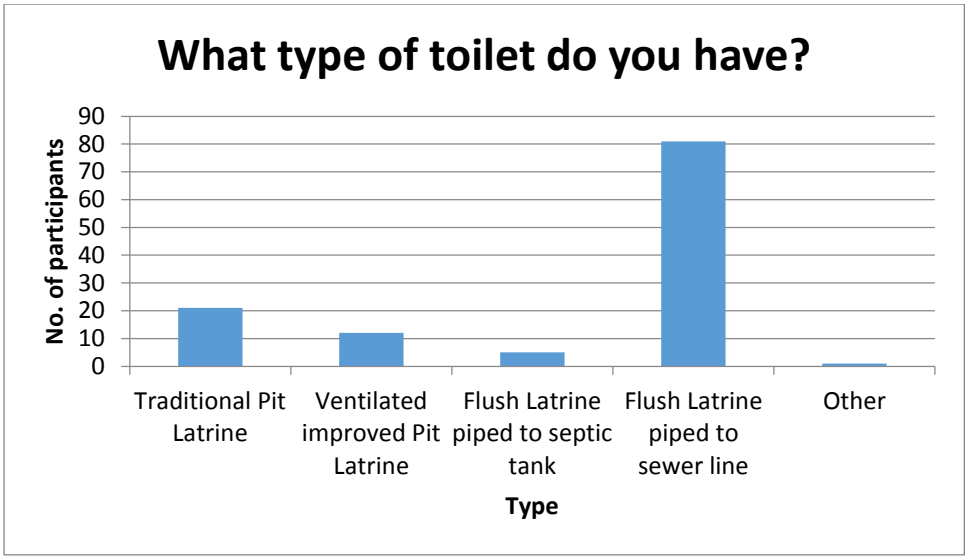


Figure 4.13: What type of toilet do you have?

Q16: Do you share this toilet facility with the other households? Summaries of the responses are given in Table 4.14 and Figure 4.14**.** On the question of sharing their toilet facility with other households, it was found that 79 respondents (65.83%) do share their facilities with other household.

Table 4.14: Do you share this toilet facility with the other households?

Response	Count	%age
Yes	41	34.17%
No	79	65.83%

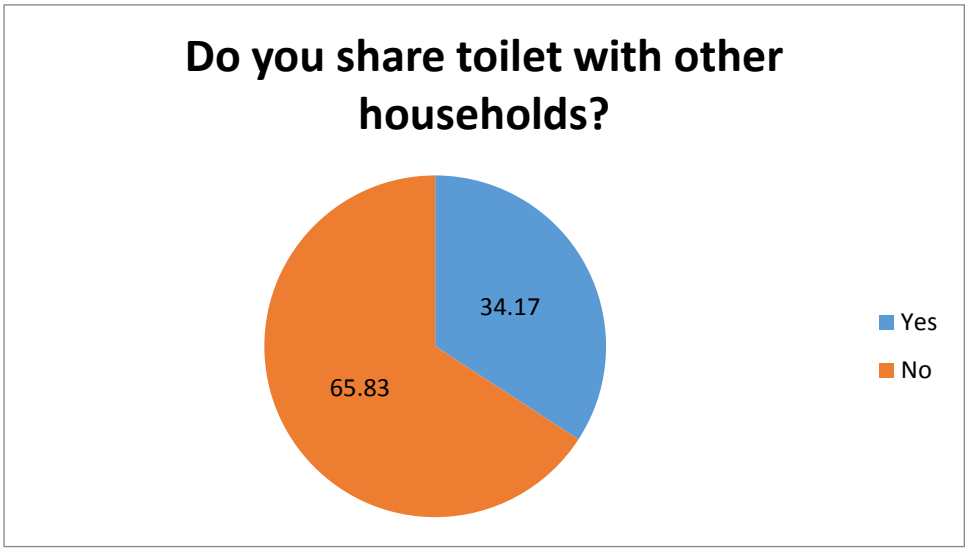


Figure 4.14: Do you share toilet facility with other households?

Q17: How do you dispose baby waste (i.e. waste from nappies or pampers)? Answers to this question are presented in Table 4.15 and Figure 4.15.

Table 4.15: How do you dispose baby waste?

Response	**Count**	**%age**
Put in municipal rubbish bins	5	4.17%
Dig and burry outside house	16	13.33%
Put in the pit latrine or flush toilet	96	80.00%
Throw away in the nearest bush	3	2.50%
Other ways	0	0.00%

Figure 4.15: How do you dispose baby waste?

Q18: What cleaning materials do your family use in the toilet? The respondents selected more than one option and that is why the total count is 224 and not 120. The answers to this question are summarized in Table 4.16 and Figure 4.16.

Table 4.16: What cleaning materials do your family use in the toilet?

Response	Count
Water	81
Tissue paper	61
Ordinary paper	22
Nothing	43
Other (including tree leaves)	17

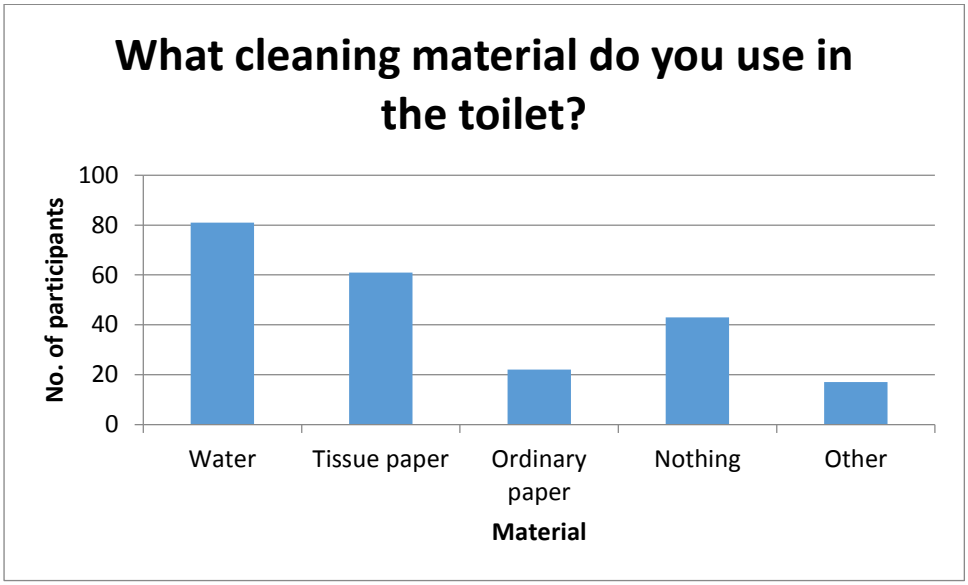


Figure 4.16: What cleaning materials do your family use in the toilet?

Q19. Do you wash your hands after using the toilet? The responses are summarized as given in Table 4.17 and Figure 4.17.

Table 4.17: Do you wash your hands after using the toilet?

Response	Count	%age
All the times	76	63.33%
Sometimes	23	19.17%
Not at all	21	17.50%

Figure 4.17: Do you wash your hands after using the toilet?

4.7 Cultural and social factors affecting sanitary and hygienic practices

According to Zimmermann (2015), culture can be defined as “the characteristics and knowledge of a particular group of people, defined by everything from language, religion, cuisine, social habits, music and arts”. The Center for Advance Research on Language Acquisition (CARLA, 2015) goes a step further, defining culture “as shared patterns of behaviors and interactions, cognitive constructs and understanding that are learned by socialization”. Thus, it can be seen as the growth of a group identity fostered by social patterns unique to the group.

The word "culture" derives from derives from the Latin "colere," which means to tend to the earth and grow, or cultivation and nurture. "It shares its etymology with a number of other words related to actively fostering growth,"

The responses to cultural and social factors affecting sanitary and hygienic practices are summarized in Table 4.18.

Table 4.18: Cultural and social factors affecting sanitary and hygienic practices

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Q20: Water is a free gift from God or …	2 (1.67%)	4 (3.33%)	11 (9.17%)	42 (35.00%)	61 (50.83%)
Q21: Water is controlled by a spiritual…	3 (2.50%)	2 (1.67%)	18 (15.00%)	78 (65.00%)	19 (15.83)
Q22: Dirty water or dirty natural …	5 (4.17%)	2 (1.67%)	14 (11.67%)	64 (53.33%)	35 (29.17%)
Q23: The remaining water after …	1 (0.83%)	3 (2.50%)	12 (10.00%)	63 (52.50%)	41 (34.16%)
Q24: Using the remaining water after…	2 (1.67%)	6 (5.00%)	8 (6.67%)	62 (51.67%)	42 (35.00%)

4.8 Improving sanitary facilities

The responses for improving sanitary facilities are summarized in Table 4.19.

Table 4.19: Improving sanitary facilities

	Yes	**No**
Q25: Are you satisfied with the type of toilet and sanitary facilities you…	89 (74.17%)	31 (25.83)
Q26: Suppose that there is new sanitary technology for toilets available…	113 (94.17%)	7 (5.83%)
Q27: Are you willing to take part in the provision and management of …	74 (61.67%)	46 (38.33%)
Q28: Is sharing of water facilities a good idea?	108 (90.00%)	12 (10.00%)
Q29: Suppose you have your own toilet facility. Are you willing to share …	45 (37.50%)	75 (62.50%)
Q30: Are you willing to pay more than what you are paying the…	19 (15.83%)	101 (84.17%)

4.9 Correlation Analysis

In this section the Pearson's Product Moment Correlation Coefficient was used to analyse the correlation of various factors in this study. The various factors considered are level of education, size of family, family income, age of respondents, available sanitary facility and then social and cultural beliefs.

4.9.1 Correlation between level of education and type of sanitary facility

Table 4.20: Level of education and type of sanitary facility

		Level of education	Sanitary facility
Level of education	Pearson Correlation	1	0.712
	Sig. (2-tailed)		0.017
Sanitary facility	Pearson Correlation	0.712	1
	Sig. (2-tailed)	0.017	
	N	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

The analysis shows that there is positive correlation between level of education and type of sanitary facility a household has (Pearson correlation coefficient r =0.017).

4.9.2 Correlation between size of family and type of sanitary facility

Table 4.21: Correlation between size of family and sanitary facility

		Size of family	Sanitary facility
Size of family	Pearson	1	0.138**
	Sig. (2-tailed)		0.003
Sanitary facility	Pearson	0.138**	1
	Sig. (2-tailed)	0.003	
	N	120	120

**. Correlation is insignificant at the 0.01 level (2-tailed).

The analysis shows that there is no significant correlation between the size of family and type of sanitary facility the households are using (Pearson correlation coefficient=0.138).

4.9.3 Correlation between family income and type of sanitary facility

Table 4.22: Correlation of family income and type of sanitary facility

		Family income	Sanitary facility
Family income	Pearson	1	0.789**
	Sig. (2-tailed)		0.118
Sanitary facility	Pearson	0.789**	1
	Sig. (2-tailed)	0.118	
	N	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis shows that there exists a strong positive correlation between family income and type of sanitary facility the household has (Pearson correlation coefficient r = 0.789).

4.9.4 Correlation between age of respondents and cultural/social factors

Table 4.23: Correlation of age of respondents and cultural/social factors

		Age of respondents	Cultural factors
Age of respondents	Pearson	1	0.364**
	Sig. (2-tailed)		0.012
Cultural factors	Pearson	0.364**	1
	Sig. (2-tailed)	0.012	
	N	120	120

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis shows that there exists a weak correlation between age of respondents and cultural factors (Pearson correlation coefficient= 0.364).

4.9.5 Correlation between level of education of respondents and cultural/social factors

Table 4.24: Correlation of level of education of respondents and cultural factors

		Level of education respondents	Cultural factors
Level of education of respondents	Pearson	1	-0.415**
	Sig. (2-tailed)		0.056
Cultural factors	Pearson	-0.415**	1
	Sig. (2-tailed)	0.056	
	N	120	120

The correlation analysis shows that there exists a negative correlation between the level of education of respondents and cultural factors (Pearson correlation coefficient r= -0.415). The more the educated the participant is the more he does not want to hear about cultural beliefs.

4.9.6 Correlation between size of family and cultural factors

Table 4.25: Correlation of size of family and cultural factors

		Size of family	Cultural factors
Size of family	Pearson	1	0.108**
	Sig. (2-tailed)		0.002
Cultural factors	Pearson	0.108**	1
	Sig. (2-tailed)	0.002	
	N	120	120

The correlation analysis shows that there is no or very weak correlation between the size of family and cultural or social factors (Pearson correlation coefficient r=0.108). This means that people can decide to believe or not to believe and this has nothing or very little to do with the size of their families.

4.9.7 Correlation between family income and cultural factors

Table 4:26: Correlation of family income and cultural factors

		Family income	Cultural factors
Family income	Pearson	1	0.058**
	Sig. (2-tailed)		0.003
Cultural factors	Pearson	0.058**	1
	Sig. (2-tailed)	0.003	
	N	120	120

The correlation analysis shows that there is no correlation between family income and cultural factors (Pearson correlation coefficient=0.058). The family income cannot determine whether the cultural and social beliefs are acceptable in the household or not.

4.10 Conclusion

The chapter presented the results as tables, graphs and pie charts. Some correlation analysis was done in order to explore the relationships between some biographic factors and type of sanitation facility or cultural and social factors. The detailed discussions of the results are given in the next chapter.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

This chapter is mainly on research findings, discussions, interpretations and explanations. In this case the research findings were discussed, interpreted and explained in conjunction with the presented literature review. The main reason for examining previous work on related or similar studies was for comparison purposes so as to present the research contributions clearly to the stakeholders, business community and customers or consumers

5.2 Biographical data of participants

5.2.1 Age distribution

The number of heads of households decreases with an increase in age as presented in Table 4.2 and Figure 4.1. This is because as people get older they become dependent on their children and at the same time ceasing to be heads of households. As given in Table 4.6 the majority of the respondents are Africans and as we know Africans stay and take care of their old parents. In other racial households they place their parents to stay at old age homes.

5.2.2 Gender composition

The gender composition of participants presented in Figure 4.1 is very normal. Nowadays there are so many women heading households. There are several reasons why women become heads of families. Some of these reasons are because they become widows, single mothers or sometimes the husband becomes a dependent and as a result the wife makes all major decisions. Also in this modern time, most female professionals opt not get married even though they may have children. The problem is that marriages are too oppressive and most women want to enjoy all the freedom they can have.

5.2.3 Level of education

As presented in Table 4.3 and Figure 4.2, women are almost equally educated as compared to their male counterparts. It is a concern that 59% of these heads of households have only a matric as their highest level of education (Table 4.3 and Figure 4.2). It can also be noted that as the level of education increases the women becomes fewer than men (Table 4.3). This can be explained by the fact there are more female heads of households (Table 4.2 and Figure 4.1) which may mean more responsibilities for women and lesser time than men for furthering their studies.

5.2.4 Distribution of race

The racial composition was made up of Africans who are the majority (80%), followed by Asians (11.67%), Whites (6.67%) and then Coloureds making 1.67% of the population.

5.2.5 Family sizes

From Table 4.4 and Figure 4.3 it can be shown that the family sizes distribution follows a normal distribution with more participants in family sizes of 2-4 people. This is because of the high costs associated with caring for high family numbers. According to Figure 4.3 fewer people are from families with only 1 person or more than 8 people. The large family sizes are from the African race and is likely to be due to the extended families associated with African societies.

5.2.6 Family income

The family income distribution is presented in Table 4.5 and Figure 4.4. In this case family income is the combined income of the whole family. For example if there are two people in the household earning a salary then the family income is the combined income of these two. Income does not necessary have to be salary. Some households got their income from selling vegetables. So the income in this case is the total money the family gets per month after subtracting costs.

5.3 Available facilities and services available

In this section we take a closer look at the sanitary facilities and service that are available to the households in Mpofana Local Municipality. A total of 11 questions on the questionnaire where used to extracted the required information from the participants. These questions are from Q9 to Q19 of the questionnaire and are discussed as follows:

Q9: Where are you getting your drinking water?

From the data collected from the participants it appears as if the majority of the people (65%) have a water tap in their homes and 20% get their water from a tap away from home. A significant portion of the population is getting its water supply from sources that unlikely to be safe for drinking. This portion is made up of 9.17% who are getting their water supply from wells or boreholes and another 5.83% who are obtaining their water from a river. The chances of these people getting diseases are high. Wells and rivers are not safe for drinking. Waterborne diseases are caused by drinking contaminated or dirty water. Contaminated water can cause many types of diarrheal diseases, including Cholera, and other serious illnesses such as Guinea worm disease, Typhoid, and Dysentery. Water related diseases cause 3.4 million deaths each year. Bleaching and water filters remove the bacteria and pathogens that contaminate water to decrease the incidence of waterborne diseases.

Q10: Do you share this water source with the other households?

The responses of the participants show that 79% of the population are not sharing their water facilities. About 34.17% are sharing water facilities and this means that there is need for the local municipality to do more work so that these people get water facilities in their homes. Diseases can easily spread when people are sharing water facilities.

Q11: To what extent does the water you get meet your needs?

The majority making up 85% of the population have enough water supply for their basic needs. The water facilities available are meeting the needs of 10% of the people but 5% are not having enough water supplies. This poses a problem as most the disease causing unhygienic conditions are associated with lack of water supply.

Q12: Why are you not having access to water in your home?

For those who do not have access to water in their homes 12.50% cannot afford municipal bills so it is better for them to get water from public tapes. About 15% claim that the municipality is not capable of bringing water into their homes. Besides these main reasons of not having water in their homes 7.50% have other reasons which they believe are preventing water from getting into their homes.

Q13: What do you usually do to the water that you get to make it safer to drink?

From the responses that were obtained from the participants it may appear as if people in the targeted are not aware of ways to make water safer for drinking. If water is coming from a tape, it does not necessarily mean it is safe to drink. About 80.83% do not do anything to the water. They just drink it like that. Only 11.67% take an extra step and boil it before drinking. About 7.5% of the targeted population allow the water to settle first, collect the clear water at top and then throw away the dirty dregs at the bottom. Again water being clear does not necessarily imply that it is safe for drinking. People should be educated about water filtering and using bleaching or chlorine to make water safer for drinking.

Q14: How do you dispose the wastewater at your home?

Majority of the participants (76.67%) pour wastewater in a sink, 5% throw it outside the house and 6.67% pour it in their pit latrine or flush toilet which is fine. The problem is the 11.67% who use it to water their garden. This poses a health hazard to the families.

Q15: What type of toilet do you have?

A large number of participants (67.57%) have flush latrine piped to the sewer line, 17.50% have traditional pit latrine, 10% have ventilated improved pit latrines and 5% have flush latrines piped to the septic tank. A very small number 0.083% have other which usually means no toilet at all. The traditional pit latrines owned by about 17.50% are not good. Without proper control, flies can bring back diseases into the house from those pits. Also most people do not use them at night since there is a distance from the main house and there is usually no light or electricity in these toilets. The local municipality must work hard to improve toilet facilities.

Q16: Do you share this toilet facility with the other households?

Even though the majority of the participants (65.83%) do not share toilet facilities, 34.14% is a significant number of people who share facilities. Most of the infectious diseases are spread through sharing of sanitary facilities such as toilets.

Q17: How do you dispose baby waste?

Baby waste disposal is another serious concern for those fighting for sanitary hygiene. It is worrying when 4.17% put in municipal rubbish bins and 2.50% throw away in the nearest bush. The majority of the participants have flush toilets and even though the baby waste is disposed by flushing, the baby pampers cannot be disposed by flushing. Most people have no choice except to flush the baby waste and then dump the remaining pampers in the municipal rubbish bins. The municipal rubbish trucks come once every week and this is too long as these rubbish bins are within the easy reach of children.

Q18: What cleaning materials do your family use in the toilet?

With this question participants had the choice of picking more than one option. About 67.50% use water, 61.00% use tissue paper, 18.33% use ordinary paper, 35.83 just walk away and 14.17% use other ways including tree leaves. The 35.83% who use nothing is a worrying unhealthy situation. Even though we may believe that it is normal for a person who is working somewhere to visit the toilet early in the morning

and go to bath or shower immediately after that. There are so many unanswered questions. What if you are not going to work or it is a weekend?

Q19: Do you wash your hands after using the toilet?

About 63.33% wash their hands all the times, 19.17% sometimes wash their hands and 17.50% do not wash at all. Most people who do not wash their hands do not have a choice. If it is a pit latrine then there is usually no water to wash your hands. Disease awareness campaigns are necessary for these people. There are so many diseases that have killed so many people and caused by been unhygienic sanitary facilities. People must be made aware of these diseases and they must know that these diseases can be prevented or avoided.

5.4 Cultural and social factors affecting sanitary and hygienic practices

In all the questions on cultural and social factors affecting sanitary and hygienic practices, most of the respondents are not agreeing as shown in Table 4.18. By analysing question by question we can see that the majority of the participants do not agree to the cultural and social factors affecting sanitary and hygienic practices. About 85.83% (35.00+50.83) disagreed with statement in Q20, 80.83% (65.00+15.83) disagreed with Q21, 82.5% (53.33+29.17) did not accept the Q22, 86.66% (52.50+34.16) did not agree with Q23 and 86.67% (51.67+35.00) disagreed with statement Q24. Very small fractions (less than 6%) of the participants are agreeing to these five statements on social and cultural factors.

5.5 Improvement of sanitary facilities

When it comes to improvement of sanitary facilities the participants had mixed opinions.

Q25. Are you satisfied with the type of toilet and sanitary facilities you have?

The majority of the participants (74.17%) are happy with the toilet and sanitary facilities they currently have. There is still more work for the local municipal to assist the remaining 25.83% who do not have toilet facility they are keen to have.

Q26. Suppose that there is a new sanitary technology for toilets available in your ward. Are you interested in having this new technology at your house?

As for any new sanitary technology that may be available in their ward, 94.17% of the participants are willing to grab it and bring it to their homes. Maybe the remaining 5.83% are not willing to accept it immediately but will wait until the technology has been tested or tried by others.

Q27. Are you willing to take part in the provision and management of improved sanitary systems in your ward?

Not all the participants (61.67%) are willing to take part in the provision and management of improved sanitary systems in the ward. About 38.33% want to mind their private sanitary systems and they are not interested in working for others.

Q28. Is sharing of water facilities a good idea?

When it comes to sharing of water facilities most participants (90%) are willing to share. Most participants understand the importance and value of water to any household and that people cannot be denied access to this precious commodity. The few (10%) participants who are not willing to share may be afraid of the spreading of diseases.

Q29. Suppose you have your own toilet facility. Are you willing to share the toilet facility with other households who are not necessarily your relatives?

As seen in Q28 most participants are willing to share but when it comes to toilet facilities it becomes a different story. Only 37.50% of the participants are willing to

share. A good reason may the dangers associated with sharing of toilet sanitary facilities. This is the most likely reason why 62.50% are not willing to share.

Q30. Are you willing to pay more than what you are paying the municipality to improve the sanitary conditions of the shared water facilities and shared toilet facilities available?

In real most of the people want good facilities but the problems comes when it comes to paying for them. Only 15.83% are willing to pay more than what they are paying now for better shared sanitary facilities. About 84.17% are not willing to pay more for shared facilities that do not benefit them as individuals.

5.6 Correlation Analysis

The Pearson's Product Moment Correlation Coefficient was used to determine the correlation between various factors in this study. The various factors considered were level of education, size of family, family income, age of respondents, available sanitary facility and then social and cultural beliefs.

5.6.1 Correlation between level of education and type of sanitary facility

The analysis shows that there is a positive correlation between level of education and type of sanitary facility a participant has (Pearson correlation coefficient r =0.712). The more educated a person is the more he or she is aware of the importance better sanitary facilities and services.

5.6.2 Correlation between size of family and type of sanitary facility

The analysis shows that there is no significant correlation between the size of family and type of sanitary facility the households are using (Pearson correlation coefficient=0.138).

5.6.3 Correlation between family income and type of sanitary facility

The correlation analysis shows that there exists a strong positive correlation between family income and type of sanitary facility the household has (Pearson correlation coefficient r = 0.789). The higher the family income the more money is available for better sanitary facilities.

5.6.4 Correlation between age of respondents and cultural/social factors

The correlation analysis shows that there exists a weak correlation between age of respondents and cultural factors (Pearson correlation coefficient= 0.364).

5.6.5 Correlation between level of education of respondents and cultural/social factors

The correlation analysis shows that there exists a negative correlation between the level of education of respondents and cultural factors (Pearson correlation coefficient r= -0.415). This means the more the educated the participant is the more he/she does not want to hear about cultural beliefs.

5.6.6 Correlation between size of family and cultural factors

The correlation analysis shows that there is no correlation between the size of family and cultural/social factors (Pearson correlation coefficient r=0.108). This means that people can decide to believe or not to believe and this has nothing or very little to do with the size of their families they come from.

5.6.7 Correlation between family income and cultural factors

The analysis shows that there is no correlation between family income and cultural factors (Pearson correlation coefficient=0.058). The family income cannot determine whether the cultural and social beliefs are acceptable in the household or not.

5.7 Conclusion

The chapter presented discussions on biographical data, facilities and services available, cultural and social factors, ways to improves sanitary facilities and then correlations of the various factors under study. The next chapter presented conclusions to the study, recommendations, implications of the study and areas for further study.

CHAPTER SIX

RECOMMENDATIONS AND CONCLUSIONS

6.1 Introduction

This chapter will summarise, recommend and conclude the research findings. The chapter will tie up the five objectives presented in Chapter One with the research findings and then bring the study to a closure. The main aim was to provide strategies for improving basic infrastructure needs for the population in uMgungundlovu District Municipality. The objectives were achieved as presented in Section 6.2.

6.2 Where the objectives answered?

Through the research instrument that was used for this study, the following objectives were achieved:

6.2.1 Objective 1: To determine the sanitary facilities and services available to the households in the targeted area and also assess the adequacy of these facilities.

Source of drinking water:

The majority of the people (65.00%+20.00% = 85%) have access to safe water supply and this is pleasing. From the responses that were obtained from the participants it may appear as if people in the targeted were not aware of ways to make water safer for drinking. Water coming from a tape does not necessarily mean it is safe to drink. About 80.83% do not do anything to the water they drink. They just drank it like that. Only 11.67% took an extra step and boiled it before drinking. About 7.5% of the targeted population allowed the water to settle first, then collected the clear water at top and then threw away the remaining dirty dregs. Again water being clear does not necessarily imply that it is safe for drinking.

People should be educated about water filtering and bleaching as meth to make water safer for drinking. The 18% (= 9.17%+5.83%) of the people got the water from boreholes, wells and rivers. These sources of water for drinking are not safe. According to Vestergaard (2015), waterborne diseases are caused by drinking water that is contaminated. Many types of diarrheal diseases such as Cholera and other serious illnesses such as Guinea worm disease, Typhoid, and Dysentery are caused by drinking contaminated water. Water related diseases cause 3.4 million deaths each year. Bleaching and water filtering remove the bacteria and pathogens that contaminate water and this decreases the incidence of waterborne diseases.

Adequacy of drinking water sources:

The water facilities in the targeted area for research were not adequate, a significant number of people (34.17%) are sharing water sources. About 12.50% of the people claimed that they did not have water in their homes because they cannot afford the municipal water bills. The most disappointing thing is that 15% of the people were blaming the local municipality for being not able to bring water into their homes. These people were able to pay municipal bills but it is the municipality that is not capable of bringing the water facility into their homes. The other 7.50% had other reasons. The danger of sharing drinking water sources with other households may cause spreading of diseases. A disease outbreak in one household can easily spread to other households sharing the same drinking water source. Safe drinking water is everybody's business. Managing drinking water source is supposed to be a shared responsibility among the households sharing the drinking water resource.

Toilet facilities

A large number of participants (67.57%) have flush latrine piped to the sewer line, 17.50% have traditional pit latrine, 10% have ventilated improved pit latrines and 5% have flush latrines piped to the septic tank. A very small number, 0.083% had other which in most cases means no toilet at all. The traditional pit latrines owned by about 17.50% are not good. Without proper control, flies can bring back diseases into the house from those pits. Also most people do not use them at night since they are a

distance away from the main house and there is usually no light or electricity in these toilets. The local municipality authorities must work hard to improve toilet facilities.

Adequacy of toilet facilities

The toilet facilities are not adequate; a significant number of people (34.17%) are sharing the toilet facilities. There are so many dangers of sharing toilet facilities with other households. According the Dutch Magazine (2009), most people do not want to sit down when using a shared toilet due to bad hygiene and they always try to postpone going to that shared toilet. These people try to avoid contact by hanging above the toilet chamber. The Dutch research has shown that not sitting down in a toilet can cause cystitis. Also postponing a toilet visit might cause waste products produced by the body to go into the blood stream.

6.2.2 Objective Two: To examine if the people in the targeted area are satisfied with the available sanitation facilities and services.

Some of the people are not satisfied with the facilities they have. This is shown from some of the responses from the participants as follows:

Extent to which does the water you get meeting needs

The water supply is not meeting the needs of 18% (12%+6%) of the people. Thus all these people are not satisfied with whatever water facilities they have at the moment. How can one be happy when water supplies are not meeting your needs?

Sharing of water and toilet facilities

Sharing is not usually a choice in real life. Most people would want to have their own private water facilities. They share because there is not option and they cannot afford their own facilities. About 34.17% of the people share water and toilet facilities and these people are happy with the sharing. Repairs or replacements of shared facilities take time because the users have to report to authority which is usually not

possible after hours or during holidays and weekends.

Municipality not cable of bringing water into homes

The fact that the municipality is not capable of bringing water into their homes makes people unhappy. These people have the money to pay for the facilities but it is municipality that is incapable of bringing the services to the people. If water cannot be brought into home then it means your toilet cannot be inside your house.

Are you satisfied with the type of toilet and sanitary facilities you have?

The majority of the participants (74.17%) are happy with the toilet and sanitary facilities they currently have. There is still more work for the local municipal authorities to assist the remaining 25.83% who are not happy with facilities they have

6.2.3 Objective 3: To determine and assess the impact of cultural and social factors affecting sanitary and hygienic practices in the targeted area.

According to Hofstede (1984), “culture is the collective programming of the mind which distinguishes the members of one category of people from another’. The African cultural beliefs in charms or *muthi* as is known in South Africa have failed to die even though both the Christianity religion and western civilization have eaten large chunks of these beliefs.

According to Mander et al. (2015) the trade in traditional medicines in South Africa is estimated to be worth R2.9 billion per year, representing 5.6% of the National Health budget. There are 27 million consumers for this trade and is vibrant and widespread. It is estimated that at least 133 000 people are employed in the business. The largest percentage of people in this business is from rural women. From the responses of Q20-24 at most 6.67% of participants agree to the cultural and social factors. Two of the five beliefs can have disastrous effects on the much needed hygiene to our societies. Obviously after bathing a baby or a beautiful young daughter the water becomes dirty.

Now the same water is used to clean vegetables and fruits at someone's market to attract customers. This is very unacceptable and unhygienic. Diseases can easily spread from the beautiful baby to the large numbers of customers that come to the market.

It is still not understood how some members of societies still accept these very strange cultural beliefs. Imagine someone who is already affected by some illness dies and is taken to the mortuary where there is the danger of contracting more infectious diseases from other corpses. This person's body is brought home and bathed in preparation for burial which is alright. The problem comes when the water after cleaning an infected corpse is used to clean household utensils in the belief that the spirit of the diseased will remain in the family. The danger is that the infectious diseases that killed the person is passed from one dead person to the living relatives.

6.2.4 Objective 4: To come up with ways to improve the sanitary facilities and services in the targeted area.

When it comes to improvement of sanitary facilities the participants had mixed opinions.

New sanitary technology for toilets available

As for any new sanitary technology that may be available in their ward, 94.17% of the participants are willing to grab it and bring it to their homes. Maybe the remaining 5.83% are not willing to accept it immediately but will wait until the technology has been tested or tried by others.

Participation in the provision and management of improved sanitary systems

Not all the participants (61.67%) are willing to take part in the provision and management of improved sanitary systems in the ward. About 38.33% want to mind their private sanitary systems and they are not interested in working for others.

Sharing of water facilities

When it comes to sharing of water facilities most participants (90%) are willing to share. Most participants understand the importance and value of water to any household and that people cannot be denied access to this precious commodity. The few (10%) participants who are not willing to share may be they are afraid of the spreading of diseases.

Sharing of toilet facility with other households

As for water facilities most participants are willing to share but when it comes to toilet facilities it becomes a different story. Only 37.50% of the participants are willing to share. A good reason may the dangers associated with sharing of toilet sanitary facilities. This is the most likely reason why 62.50% are not willing to share.

Paying more to improve the shared water and toilet facilities

In real life most of the people want good facilities but the problem comes when it is time to pay for them. Only 15.83% are willing to pay more than what they are paying now for better shared sanitary facilities. About 84.17% are not willing to pay more for shared facilities that do not benefit them as individuals.

6.2.5 Objective 5: To determine some correlations between biographical data and the

(i) available sanitary facilities.

(ii) cultural and social factors.

6.3 Correlation Analysis

The Pearson's Product Moment Correlation Coefficient was used to determine the correlation between various factors in this study. The various factors considered were level of education, size of family, family income, age of respondents, available sanitary facility and then social and cultural beliefs.

6.3.1 Correlation between level of education and type of sanitary facility

The analysis shows that there is a positive correlation between level of education and type of sanitary facility a participant has (Pearson correlation coefficient r =0.017). The more educated a person is the more he or she is aware of the importance better sanitary facilities and services.

6.3.2 Correlation between family income and type of sanitary facility

The correlation analysis shows that there exists a strong positive correlation between family income and type of sanitary facility the household has (Pearson correlation coefficient r = 0.789). The higher the family income the more money is available for better sanitary facilities.

6.3.3 Correlation between age of respondents and cultural/social factors

The correlation analysis shows that there exists a weak correlation between age of respondents and cultural factors (Pearson correlation coefficient= 0.364).

6.3.4 Correlation between level of education of respondents and cultural/social factors

The correlation analysis shows that there exists a negative correlation between the level of education of respondents and cultural factors (Pearson correlation coefficient r= -0.415). This means the more the educated the participant is the more he/she does not want to hear about cultural beliefs.

They were no significant correlations between the other factors.

6.4 Recommendations to solve research problem

In view of the study findings as well as applicable literature reviews the research made the following recommendations:

- As shown by the results a lot of people are willing to share water facilities. We recommend that the municipal bring more shared water facilities in the targeted area of study.
- More awareness of the dangers of cultural and social beliefs. People should be made aware of the diseases associated with unhygienic conditions. No dirty water should be used for cleaning vegetables and fruits at the market. Water from washing corpse has diseases that can easily pass on to the living relatives.
- Sharing of toilet facilities by households is unacceptable to most people. The authorities should consider this when making plans for communities. Most of the people may be willing to share water facilities but sharing of toilet is unacceptable. The provision of shared toilet facilities is supposed to be minimal as people prefer private toilets.
- When considering water consumption and provision of toilet facilities for communities the majority of the households are made up of 2-4 people. Even the planning of sewer facilities 2-4 members per household should be considered in planning.
- When making plans for service charges the municipality may want to impose that the family income of the majority of the people is between R5500 and R7500. All future charges should be made within the reach of the majority of the people.
- Municipal authorities have to work hard in bringing water to the 18% of the population who do not have access to shared safe tap water. These people obtain water from wells and rivers putting them at high risk of waterborne diseases.
- Drinking water safety awareness campaigns are very necessary in Mpofana Local Municipality. Most people do not take the extra step of making water safer for drinking. People should be made aware of the ways of making water safer for drinking which includes water filtering, bleaching, or chlorination.
- Coming to disposal of waste water and baby waste. Most people are not aware of the dangers. It is unhygienic to throw wastewater outside the house or water gardens. This dirty water may have diseases that may

affect children who play outside the house. Throwing baby waste in nearest bush is also very unhygienic. Flies may bring back to the house the diseases from the baby waste.

- People must be encouraged to clean themselves after using the toilet. A significant number (35.83%) use nothing. It is better to forgo favourite beer for a day or two or hair saloon for a week so as to buy tissue for your toilet. People should be encouraged to wash their hands all the times after using the toilet.
- When planning for sanitary facilities for communities municipal authorities should consider mainly those in low income bracket for shared facilities. There is correlation between family income bracket and type of facility the household will have. Those with higher family income will usually have their own better facilities. Proper planning and the necessary help must be given to those struggling to build their own facilities.

6.5 Limitations of study

A census of the entire population in uMgungundlovu District Municipality could have provided more accurate results for this study. Unfortunately this was not possible as there were limited resources in terms of funds and numbers of research assistants available for the study. Only a total of 120 households from Mpofana Local Municipality were used for study.

6.6 Recommendations for future studies

The current study was carried out mainly on facilities and services available to the households, cultural and social factors affecting sanitary and hygienic practices and possible ways to improve sanitary facilities. It may be necessary to:

- Determine how safe the drinking water in Mpofana Local Municipality is. This can be done by taking samples and testing the water for diseases, contamination or level of pollution.
- Determine common diseases in the area by collecting fresh human waste and test for common diseases that are caused by poor sanitary conditions

and then come up with measures to control or reduce the spread of these diseases.

6.7 Conclusions

The issue of sanitation is not only very important to South Africa but the whole world as whole. At UN meetings, sanitation makes up some of the most important agendas. Large amounts of moneys are reserved for sanitary facilities in so many countries throughout the world. Poor sanitation has grave consequences and improved sanitary facilities have very good benefits as shown in Chapter Two. The objectives of this study have been achieved, recommendations have been made and areas for further studies have been pointed out.

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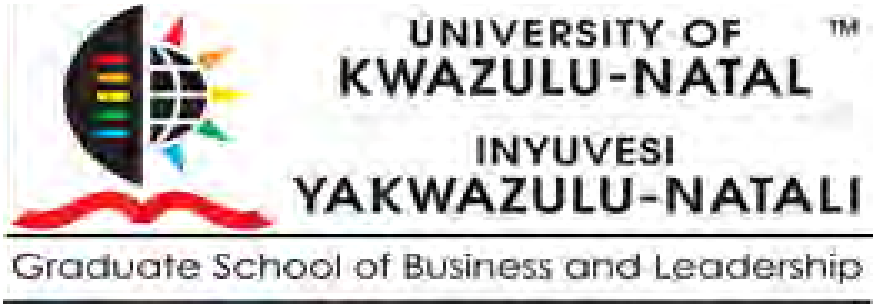
Appendix 1-Consent document



Dear Respondent,

MBA Research Project

Researcher: Siphindile Shange (0027 83 961 3435)
Email Address: shange@umdml.gov.za
Supervisor: Dr. Elias Munapo (0027 31 260 8943)
Email Address: munapoe@ukzn.ac.za
Research Office: Ms Mariette Snyman (0027 31 260 8350)
Email Address: Snymanm@ukzn.ac.za

I, Siphindile Shange (Student Number: 212561924), an MBA student at the Graduate School of Business and Leadership, of the University of KwaZulu-Natal, kindly invite you to participate in a research project entitled:

SANITATION PRACTICES AND PREFERENCES IN UMGUNGUNDLOVU DISTRICT MUNICIPALITY

The study aims to achieve the following objectives:

- to determine the sanitary facilities and services that are available to the households in the targeted area and also assess the adequacy of these facilities,
- to examine if the people in the targeted area are satisfied with the available sanitation facilities and services,
- to determine and assess the impact of cultural and social factors affecting sanitary and hygienic practices in the targeted area and
- to come up with ways to improve the sanitary facilities and services in the targeted area.
- to determine some correlations between biographical data and the
  (iii) available sanitary facilities.
  (iv) cultural and social factors.

The study will provide strategies for improving basic infrastructure needs for the population in uMgungundlovu District Municipality. From an environmental health perspective, this information is an important step in preventing disease transmission and environment degradation. Policy makers can rank existing sanitations options for district or local

municipality and then target their economic and technical efforts to promote only those technologies that are most likely to succeed in each and every district or local municipality.

Your participation is this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequences. There would be no monetary gain emanating from participating in this research. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, University of KwaZulu-Natal.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me or my supervisor, the details of which are listed above.

The survey should take about 10 – 15 minutes to complete. I hope you will take some of your precious time to complete.

Sincerely

Student/Researcher Signature: …….. Date: ……

These two pages are to be retained by the participant.

Dear Respondent,
MBA Research Project
Researcher: Siphindile Shange (0027 83 961 3435)
Email Address: shange@umdml.gov.za
Supervisor: Dr. Elias Munapo (0027 31 260 8943)
Email Address: munapoe@ukzn.ac.za
Research Office: Ms Mariette Snyman (0027 31 260 8350)
Email Address: Snymanm@ukzn.ac.za

Research Project Title:

SANITATION PRACTICES AND PREFERENCES IN UMGUNGUNDLOVU DISTRICT MUNICIPALITY

CONSENT

I …….(Full names of participant)

Working for …….(Full company name)

Hereby confirm that I fully understand the contents of this document and the nature of the research project and I consent fully to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT: ……

DATE : …….

QUESTIONNAIRE - SANITATION PRACTICES AND PREFERENCES

THE PARTICIPANT OR RESPONDENT IS THE HEAD OF THE HOUSEHOLD

SECTION A: PERSONAL DATA

Date Questionnaire Was Completed

(dd/mm/yyyy)

Household ID

Participant's Unique ID

Agreed to Participate

1. Yes ☐
2. No (Then stop completing questionnaire) ☐

Preferred Language

1. English ☐
2. Zulu ☐
3. Other ☐

GENERAL QUESTIONS

Please tick or mark with an X on the appropriate block.

Q1. Where is your house located?

Ward……..Local……..……..District……..

Q2. Your race is

African ☐
Coloured ☐
White ☐

Asian ☐
Other ☐

Q3. How old are you?

18 ≤ age < 25 ☐
25 ≤ age < 35 ☐
35 ≤ age < 45 ☐
45 ≤ age < 55 ☐
55 ≤ age < 65 ☐
65 years and above ☐

Q4. Level of education:

Matric ☐
Certificate ☐
Diploma ☐
Degree ☐
Postgraduate ☐
Other (specify)_____ ☐

Q5. Sex:

Female ☐
Male ☐

Q6. What is the size of your family?

1 person ☐
2 – 4 people ☐
5 – 8 people ☐
Above 8 people ☐

Q7. What is your occupation? ……

Q8. What is your monthly family income?

Below 3500 ☐
R3500 ≤ salary < 5500 ☐
R5500 ≤ salary < 7500 ☐
R 7500 ≤ salary < 10000 ☐
Salary of R 10000 or more ☐

SECTION B: Facilities and services available to the household

Q9. Where are you getting your drinking water? (Family income is the combined income of the family)

From the household water tap ☐
From a water tap away from home ☐
From the well or borehole near the house ☐
From the valley river ☐

Q10. Do you share this water source with the other households?

Yes ☐
No ☐

Q11. To what extent does the water you get meet your needs?

Meet all my needs ☐
Meet some of my needs ☐
Does not meet my needs ☐
No water facility at all ☐

Q12. Why are you not having access to water in your home?

Cannot afford the bill ☐
Municipality is not capable of bringing water ☐
Other reasons (specify)_____ ☐

Q13. What do you usually do to the water that you get to make it safer to drink?

Nothing (using it like that) ☐
Boiling ☐
Bleach/use chlorine ☐
Using a water filter ☐
By letting it stand and settle ☐
Other (specify)_____ ☐

Q14. How do you dispose the wastewater at your home?

Pour it in a sink ☐
Throw it outside the house ☐
Water your garden ☐
Pour it in pit latrine or use it to flush the toilet ☐
Other (specify)_____ ☐

Q15. What type of toilet do you have?

Traditional Pit Latrine ☐
Ventilated Improved Pit Latrine ☐
Flush Latrine piped to septic tank ☐
Flush Latrine piped to sewer line ☐
Other (specify)_____ ☐

Q16. Do you share this toilet facility with the other households?

Yes ☐
No ☐

Q17. How do you dispose baby waste (i.e. waste from nappies or pampers)?

Put in municipal rubbish bins ☐
Dig and burry outside house ☐
Put in the pit latrine or flush toilet ☐
Throw away in the nearest bush ☐
Other (specify)_____ ☐

Q18. What cleaning material do your family use in the toilet? (You may select tick more than one of the options).

Water	☐
Tissue paper	☐
Ordinary paper	☐
Nothing	☐
Other (specify)_____	☐

Q19. Do you wash your hands after using the toilet?

All the times	☐
Sometimes	☐
Not at all	☐

SECTION C: Cultural and social factors affecting sanitary and hygienic practices

Q20. Water is a free gift from God or nature. We are not supposed to pay for it.

Strongly agree	☐
Agree	☐
Neutral	☐
Disagree	☐
Strongly disagree	☐

Q21. Water is controlled by a spiritual power and is an instrument filled with divinity. Making a river or a water source dirty may have serious spiritual consequences on the offender.

Strongly agree	☐
Agree	☐
Neutral	☐
Disagree	☐
Strongly disagree	☐

Q22. Dirty river water or a dirty natural water source is as a result of evil spirits or a curse.

Strongly agree	☐
Agree	☐
Neutral	☐
Disagree	☐
Strongly disagree	☐

Q23. The remaining water after bathing a baby or a young beautiful girl is good for attracting customers to a fruit or food business when this water is used to wash fruits or utensils or to prepare the food for sale.

Strongly agree	☐
Agree	☐
Neutral	☐
Disagree	☐
Strongly disagree	☐

Q24. Using the remaining water after bathing a corpse of a relative to clean household utensils will make the spirit of the dead remain in the family.

Strongly agree ☐
Agree ☐
Neutral ☐
Disagree ☐
Strongly disagree ☐

SECTION D: Improving sanitary facilities

Q25. Are you satisfied with the type of toilet and sanitary facilities you have?

Yes ☐
No ☐

Q26. Suppose that there is new sanitary technology for toilets available in your ward. Are you interested in having this new technology at your house?

Yes ☐
No ☐

Q27. Are you willing to take part in the provision and management of improved sanitary systems in your ward?

Yes ☐
No ☐

Q28. Is sharing of water facilities a good idea?

Yes ☐
No ☐

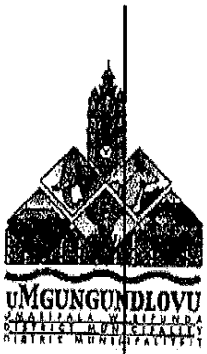
Q29. Suppose you have your own toilet facility. Are you willing to share the toilet facility with other households who are not necessarily your relatives?

Yes ☐
No ☐

Q30. Are you willing to pay more than what you are paying the municipality to improve the sanitary conditions of the shared water facilities and shared toilet facilities available?

Yes ☐
No ☐

Appendix 3-Gatekeeper letter



02 March 2015

To whom it may concern

RE: Name of Student: Siphindile Shange

Student number: 212561924

Supervisor: Dr. Elias Monapo

Dissertation topic: **A study of Sanitation Practices and Preferences in uMgungundlovu District Municipality.**

Gatekeeper's permission is hereby granted by Bheki Mbambo for the above student to conduct research by engaging the community at uMgungundlovu District Municipality for the purposes of her academic research.

The main aim of her research is to study the Sanitation Practices and Preferences for Mpofana Local Municipality situated within uMgungundlovu District Municipality. The procedure has been explained to me and I therefore give consent to this survey which will be conducted using questionnaires.

I understand that community will voluntarily participate in this study and that there will be no penalties should they wish to withdraw from participating and also data collected will be treated with due confidentiality and anonymity.

Kind regards

EB Mbambo
HOD Technical Department

Office of the Municipal Manager
PO Box 3235, Pietermaritzburg, 3200
242 Langalibalele Street, Pietermaritzburg, 3201
Tel: 033 8976763 Fax: 033 3045512

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

02 April 2015

Ms Siphindile Shange (212561924)
Graduate School of Business & Leadership
Westville Campus

Dear Ms Shange,

Protocol reference number: HSS/0257/015M
Project title: Sanitation practices and preferences in uMgungundlovu District Municipality

Full Approval – Expedited Application

With regards to your application received on 26 March 2015. The documents submitted have been accepted by the Humanities & Social Sciences Research Ethics Committee and **FULL APPROVAL** for the protocol has been granted.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

Please note: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Dr Elias Munapo
Cc Academic Leader Research: Mr M Hoque
Cc School Administrator: Ms Zarina Bullyraj / Ms Gina Mshengu

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
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