

**EFFECTIVENESS OF IKOTOILETS IN ADDRESSING
SANITATION AMONG PUBLIC TOILET USERS IN
NAIROBI CENTRAL BUSINESS DISTRICT IN KENYA**

BY

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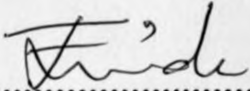
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DECLARATION

This research project report is my original work and has not been presented for a degree in any other University


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DEDICATION

This work is dedicated to my beloved family, my mother, Rose Nafuna Ndombi, my father Happy M'mbono Madegwa, and my brother Kelvin M'mbono Madegwa who have relentlessly encouraged me.

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It is with tears of joy that I realize I have been in a journey not by myself but with people so dear to me. I am thankful to the almighty God, for giving me the strength and wisdom to write this research project. It has been a wonderful learning experience on my academic life which was filled with challenges and rewards. The completion of this research study leads to a new beginning and a step forward towards my future. I would like to acknowledge:

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ABBREVIATIONS AND ACRONYMS

- NCBD:** Nairobi Central Business District
- MDG:** Millennium Development Goal
- SPSS:** Statistical Package for Social Sciences
- WSP:** Water and Sanitation Programme
- WHO:** World Health Organization
- UNICEF:** United Nations Children's Fund

ABSTRACT

The purpose of this study was to examine the effectiveness of Ikotoilets in addressing sanitation among public toilet users in the Nairobi Central Business District (NCBD). The study focused on Ikotoilets located in the NCBD and was guided by the following objectives: To determine the extent to which Ikotoilets have addressed sanitation by transforming social behavior for public toilet users in Nairobi Central Business District; To determine the extent to which Ikotoilets have addressed sanitation by developing entrepreneurial opportunities for public toilet users in Nairobi Central Business District; To determine the extent to which Ikotoilets have addressed sanitation by transforming urban scape for public toilet users in Nairobi Central Business District; and To determine the extent to which Ikotoilets have addressed sanitation by transforming conservation mechanisms for public toilet users in Nairobi Central Business District. The literature review covered the general status of social enterprises and sanitation in the world, and explained ways in which Ecotact Limited; a social enterprise is using the Ikotoilet to address sanitation among public toilet users in NCBD.

The research design was descriptive in nature and a mixed method was used, that constituted both qualitative and quantitative research designs. Probability and non-probability sampling techniques were used to select the sample size which was ninety five (95) in total constituting Ikotoilet management employees, Ikotoilet lower cadre employees and Ikotoilet users. Data was collected by administering questionnaires and use of interview guides and was then analysed using both quantitative and qualitative methods. The quantitative data was arranged to enable coding and tabulation before being entered into SPSS. It was analysed through the use of descriptive statistics, which included frequencies and percentages; while the qualitative data that included words was analysed by following key steps of analysing qualitative data: data organization; creating themes; analysing and interpreting information and then writing the report.

Study findings indicated that although it is evident that the Ikotoilet is effective in addressing sanitation among public toilet users in the NCBD through transforming social behavior; developing entrepreneurship; transforming urban scape and transforming conservation mechanisms, there are a few mechanisms that are either not known to the users or are not functioning as stated by Ecotact limited. For instance, the researcher established that tissue paper provided for use was not enough, and that soap is sometimes not available for use. The Ikotoilet users are also not aware of the baby's changing area in the female toilets, as it is not easily visible. There was a concern that the Ikotoilets are closed very early and thus should at least be opened later into the night and not as early as 6 pm. There are also a number of mechanisms that are not functional, like the radio speakers, light bulbs and the free toilet for disabilities. The researcher recommended to Ecotact Limited that more tissue paper should be provided and that soap should be available all the times. The users, especially the women should also be sensitized about the baby's changing area and all the mechanisms that have broken down should be repaired. This will ensure that sanitation is entirely addressed among public toilet users in the NCBD. A further study should be carried out with a larger sample that includes Ikotoilets all over Kenya, as different results may be found.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Sanitation has remained one of the few topics debated in the society, whether at work, home or even schools. Whenever you needed to visit a public washroom in Nairobi for instance, the available choices have been extremely limited, with most distinctly distasteful and dangerous. According to a research carried by the water and sanitation programme (WSP, 2004); public toilets provided by the Nairobi City Council were few and far between. When you entered them, you had to cautiously walk through a wet slippery floor, struggle to ignore the stench, and had to forgo amenities like toilet paper and running water to clean up afterwards, not to mention the risk of getting robbed by the thugs loitering around them.

Sanitation is the provision of facilities and services for the safe disposal of human urine and faeces. In a joint study by World Health Organization and United Nations Children's Fund, Safe disposal implies not only that people must excrete hygienically but also that their excreta must be contained or treated to avoid adversely affecting their health or that of other people (WHO/UNICEF, 2010). Adequate sanitation, together with good hygiene and safe water, are fundamental to good health and to social and economic development. That is in reference to a quote by Mahatma Gandhi who said in 1923, "sanitation is more important than independence"

Desire for privacy and to avoid embarrassment; desire for convenience and to avoid the discomforts or dangers of the bush (e.g. snakes, pests, rain), and wanting social acceptance or status are some of the key motivations for adequate sanitation in a society, Curti (2005). Lack of sanitation leads to diseases which are particularly correlated with poverty and infancy and alone account for about 10% of the global burden of disease, Prüss-Üstün, Bos, Gore, Bartram (2008). At any given time close to half of the urban populations of Africa, Asia, and Latin America have a disease associated with poor sanitation, hygiene, and water, Satterthwaite (1999). Of human excreta, feces are the most dangerous to health, John and Sons (1983).

Diarrhoeal diseases are the most important of the faeco-oral diseases globally, causing around 1.6–2.5 million deaths annually, many of them among children under 5 years old living in developing countries, (Mathers, Lopez, Murray, 2006). In 2008, for example, diarrhoea was the leading cause of death among children under 5 years in sub-Saharan Africa, resulting in 19% of all deaths in this age group, (Black, Cousens, Johnson, Lawn, Rudan, et al. 2008)

Regional disparities in sanitation coverage are huge. Whereas 99% of people living in industrialized countries have access to improved sanitation, in developing countries only 53% have such access. Within developing countries, urban sanitation coverage is 71% while rural coverage is 39%. Consequently, at present the majority of people lacking sanitation live in rural areas; this balance will shift rapidly as urbanization increases. Worryingly, over the past two decades, provision of improved sanitation has barely kept pace with increasing populations (WHO/UNICEF, 2010). It is stated that the world is still far from meeting the Millennium Development Goal (MDG) target for sanitation, and is unlikely to do so by 2015. Only 63% of the world now has improved sanitation access, a figure projected to increase only to 67% by 2015, well below the 75% aim in the MDGs. Currently 2.5 billion people still lack improved sanitation. (WHO/UNICEF, 2012)

In Kenya, sanitation countrywide estimates for 2008 by the WHO / UNICEF Joint Monitoring Programme indicate that 31% Kenyans had access to private improved sanitation. In urban areas an additional 51% of the population used shared toilets. In rural areas, open defecation was estimated to be still practiced by 18% of the population (WHO/ UNICEF, JMP 2010). In Nairobi, sanitation coverage (water closet or flush toilet connected to a sewerage system, septic tanks, Ventilated Improved Pit latrine and ordinary pit latrines) was about 23% in 2006-2007, (WASREB Impact Report, 2009). According to MDG 7, target 10 states, halve by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. It has been established that toilets need to be constructed to meet this target.

Njoroge (2002), in a study of the management of public toilets in Nairobi, found that there are a total of 138 public toilets in the city of Nairobi. Eighteen of these facilities are located within the NCBD – at bus stops, the railway station, recreational parks, and in a few other locations with heavy human traffic. Most of the city’s public toilets (87 percent) are found outside the NCBD, located to serve residential estates, markets, and commercial centers. Most of these toilets have been in a very poor condition; they are dilapidated, vandalized, and lack privacy (due to missing doors and windows). Roofing material and floor slabs are often damaged or absent. The water supply and electrical systems are often broken, following theft of piping, fittings, and other accessories. Njoroge (2002),

There is however considerable potential for private sector participation in public toilet management in Nairobi to turn this challenge into values. This is through social entrepreneurship, which is the work of a social entrepreneur, who recognizes a social problem and uses entrepreneurial principles to organize, create and manage a venture to make social change. A social entrepreneur accesses success in terms of the impact s/he has on the society. The primary focus is to maximize benefits for society and the environment by implementing innovative approaches to the key challenges the world is facing. Social entrepreneurship might be a way to help cope with the different issues Africa has to face every day by championing the Government to start looking at social enterprises as another avenue of delivering public service.

Social entrepreneurship can be termed as having profound implications in the economic system: creating new industries, validating new business models, and allocating resources to neglected societal problems, Drayton (1990). In India, for instance, Sulabh International, a social enterprise, is improving India’s sanitation, weakening the caste system, and helping those in the “untouchable” caste move into safer, more dignified jobs. Social entrepreneur Bindeshwar Pathak, established the enterprise which has developed the Sulabh Shauchalaya twin pit; pour flush toilet system and is now in use in more than 1.2 million residences and buildings built by Sulabh. This technology has been declared a Global Best Practice by the United Nations Human Settlements Programme

(UN-HABITAT) and is now recommended by the United Nations Development Programme (UNDP) for use by more than 2.6 billion people around the world.

In Kenya, Ecotact Limited, a social enterprise incorporated in 2006 in Nairobi, is a clear picture of how public-private partnerships can work on behalf of all people in providing innovative solutions to pressing social problems. Ecotact's fundamental purpose is to develop and stimulate local investments in social and environmental ventures that offer immense life-impacts to the general citizens. This includes investing in innovations to solve the problems of sanitation in urban centers, urban slums and public schools in Kenya and the region, in a sustainable way.

The enterprise has developed transformed aspects for public toilets to address sanitation by investing in the innovative *Ikotoilet-thinking beyond a toilet*; strategic partnerships; cutting edge technologies; a unique approach to social marketing and behavior change; innovative sanitation knowledge management; and waste management initiatives. Establishment of Ikotoilets is aimed at providing public conveniences that ensure consistency, cleanliness and conservation. It is a model that looks beyond the toilet and offers social transformations on our attitude towards public sanitation. Ikotoilets stresses the inseparable ties between sanitation and humanity.

Derived from ecological sanitation-*Iko* is a Swahili word depicting, existing. The Ikotoilet focuses on providing low-flush toilets in both the ladies and gents toilets; waterless urinals in gent's toilets; shower facilities; water saving taps and soap dispensers; dry toilet system – a facility for urine harvesting and water conservation; a free-of-charge toilet for the disabled; tanks for rain water harvesting; a changing area for babies; sanitary bins; full length mirror; music; snack shop; and shoe shine vendors. In doing so, the Ikotoilet initiative is trying to positively transform the public approach to maintaining a healthy living, while creating jobs and investing in social entrepreneurship activities. The introduction of micro enterprises that are compatible with sanitation adds the convenience perspective of a toilet thus breaking the cultural barriers associated with use of toilets in most developing countries. Ikotoilet integrates other add-ons depending

on viability and context in order to ensure sustainability. It has set up high hygienic standards, sanitation hospitality and an ambiance of convenience in the urban areas serving users in markets, parks and bus parks.

The main objective of the Ikotoilet is to address sanitation among public toilet users through:

Transforming urban scape by establishing a unique urban street-scape in terms of built form that enable users to link, utilize and associate closely with the toilet;

Transforming sanitation services by setting up hygienic standards, sanitation hospitality and an ambiance of convenience;

Transforming social behavior by investing in fashionable campaigns, interactions with opinion leaders, policy makers and use of creative marketing;

Transforming conservation by developing cutting-edge conservation innovations including a bio-digestion & urine harvesting system; water saving mechanisms like waterless urinals, low flush cisterns and water saving taps;

Developing entrepreneurship by setting up direct operations & management of Ikotoilets, youth enterprises, enterprise franchise models and introduction of micro enterprises

Ecotact limited launched the first Ikotoilet in 2007 and has since invested more than US\$1.2 Million in construction of 50 facilities in 12 Municipalities in Kenya and serving an average of 300,000 people daily with safe water and sanitation. Some of the facilities are operational, some are still under construction while the rest are awaiting official opening to start operating. Ecotact limited, through the Ikotoilet project, envisions building more than 100 units in Kenya by the year 2015. This research was therefore intended to focus on the extent to which objectives for the establishment of the Ikotoilets have been effective in addressing sanitation among public toilet users in Nairobi central business district.

1.2 Statement of the Problem

The treatment and disposal of human waste is becoming increasingly important as the world population increases. 30% of Kenya's disease burden is sanitation-related, with many children dying from diarrheal diseases including dysentery, cholera and typhoid, Ministry of Public Health and Sanitation (2009), and the main source of diarrhoeal infection is human excreta (Cairncross, 1999). Such deaths can be prevented through investment in toilets, water and hygiene.

Toilet coverage has to reach 90% of a population to have an impact on community health (Ikin, 1994). In Kenya toilet cover is still low, with latrines available to less than 50% of the population (Mulama, 2009). Public toilets in Kenya have been characterized by overcrowding and poor lighting. They have also been inaccessible, unhygienic, lacked privacy, security and as a result, human waste is disposed of at informal drains.

It has been under these conditions that Ecotact Limited, a social enterprise, was founded to mitigate the lack of access to safe sanitation. In addition following the history public toilets in Kenya, there is a need to change the perception in which the public has on toilets. The Ikotoilet concept therefore provides a different perception; that of a toilet mall and simply looks at toilets for what they are-neat solutions to social problems.

It is prudent to know the extent to which the Ikotoilet is achieving its objectives. A study was therefore required to find out if the Ikotoilet model has been effective in transforming social behavior; developing entrepreneurship; transforming urban scape; and transforming conservation in Nairobi. This research focused on the extent to which objectives set for the establishment of the Ikotoilets have been effective in addressing sanitation among public toilet users in Nairobi central business district.

1.3 Purpose of the Study

The study intended to assess the effectiveness of Ikotoilets in addressing sanitation among public toilet users in NCBD.

1.4 Objectives of the Study

The objectives of this study were:

1. To determine the extent to which Ikotoilets have addressed sanitation by transforming social behavior for public toilet users in Nairobi Central Business District.
2. To analyse the extent to which Ikotoilets have addressed sanitation by developing entrepreneurial opportunities for public toilet users in Nairobi Central Business District.
3. To determine the extent to which Ikotoilets have addressed sanitation by transforming urban scape for public toilet users in Nairobi Central Business District.
4. To determine the extent to which Ikotoilets have addressed sanitation by transforming conservation mechanisms for public toilet users in Nairobi Central Business District.

1.5 Research Questions

1. What mechanisms has Ikotoilet used to transform social behavior among public toilet users in Nairobi Central Business District to address sanitation?
2. What entrepreneurial opportunities has Ikotoilet developed for public toilet users in Nairobi Central Business District to address sanitation?
3. What mechanisms has Ikotoilet used to transform urban scape for public toilet users in Nairobi Central Business District to address sanitation?
4. What mechanisms has Ikotoilet used to transform conservation for public toilet users in Nairobi Central Business District to address sanitation?

1.6 Significance of the Study

The findings of this study will help the management of Ecotact Limited determine if the Ikotoilet model is effective in addressing sanitation among public toilet users in NCBD. The findings will also help current funders understand the extent to which their funding has been resourceful and if the stated objectives are being met. It may also attract replication of the Ikotoilets as well as construction of sanitation/abolition blocks in Nairobi and other towns from potential funding agencies through provision of additional funding.

The Ministry of Public Health and Sanitation in Kenya's mission is 'to provide effective leadership and participate in provision of quality public health and sanitation services that are: equitable, responsive, accessible and accountable to Kenyans. The findings will therefore seek to assist the government to understand if private sector participation in public toilet management in Nairobi benefits the society.

Ecotact is in partnership with Roto Moulders Ltd, a local company specializing in plastic containers and related products to supply water tanks at a subsidized rate. These in turn are used to store harvested rain water. The UV Trojan East Africa company supports the provision of the ultraviolet (UV) drinking water fountain for the public in Ikotoilets, while Ecotact also has a contract with Tropical Promoters to provide the shoeshine infrastructure for the shine centers. In this regard, the findings will seek to assist the suppliers establish if the products provided assist in achieving objectives set.

To the youth, the findings will assist them recognize the micro enterprises available in the Ikotoilets which will result in exploitation of employment opportunities. To the general public, the findings will assist them realize the importance of the Ikotoilet in transforming their social behavior towards public toilets in order to address sanitation.

1.7 Delimitation of the Study

The study mainly focused on the Ikotoilet Project. The Ikotoilet was selected as a social enterprise model operating in Nairobi due to its quest to addressing a problem that society was reluctant to address by introducing transformed aspects in a public toilet. The study only concentrated on the Ikotoilets in Nairobi Central Business District, an area where the Ikotoilet was first established in 2007.

1.8 Limitations of the Study

The researcher envisaged the following limitations that hindered the successful achievement of the research objectives and affected the subsequent answering of the research questions. During data collection, it was difficult to interview users of the toilet who were in a hurry to use the toilet and quickly leave without having time to answer any

question. To overcome this, the researcher used convenience sampling where respondents were selected because of their convenient accessibility and proximity to the Ikotoilet.

1.9 Assumptions of the Study

It was assumed that the time for the research study would be sufficient and that the Ikotoilet users and Ikotoilet employees would contribute and respond effectively in answering the questions correctly and truthfully. It was also assumed that the sample represented the population and that the data collection instrument had validity and would measure the desired constructs.

1.10 Operational Definition of Significant Terms

Effectiveness: This is the extent to which objectives of the Ikotoilets have been met.

Sanitation: These are the measures that Ecotact limited, through the use of the ikotoilet, is using to promote proper disposal of human waste, for improving and protecting the health and wellbeing of the public toilet users.

Transforming: Refers to changing in character or condition of how things are. Ecotact is changing the condition of how the public views toilet through transforming social behavior, transforming conservation, and transforming urban scape.

Social Behaviour: Refers to behaviour controlled by Ecotact Limited to influence the users of the Ikotoilet.

Social Entrepreneur: Refers to Ecotact's Chief Executive Officer who is undertaking innovations, finance and business expertise in an effort to transform innovations into economic goods such as the Ikotoilet.

Urban Scape: This means urban landscape. It is the location surrounding the Ikotoilet structure, which welcomes the public to its doorstep. It is the visible and unique features of the Ikotoilet structure considered in terms of its aesthetic appeal.

Conservation: This refers to the materials on conservation and energy conservation, which are seen in the Ikotoilet as important to protect the natural world.

Nairobi Central Business District: This refers to the commercial and geographic heart of Nairobi City.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives an overview of literature that is related to the research problem presented in the previous chapter. It introduces the concepts of social entrepreneurship and sanitation; and explains the ways in which Ecotact Limited; a social enterprise is using the Ikotoilet to address sanitation among public toilet users in Nairobi Central Business District (NCBD). It further explains how one can measure effectiveness of toilets that address sanitation among public toilet users.

2.2 Social Entrepreneurship

The terms social entrepreneur and social entrepreneurship came into widespread use in the 1980s and 1990s, and was promoted by Bill Drayton, the founder of Ashoka: Innovators for the Public. Social Entrepreneurs generally are considered as individuals who have a vision for social change and who have the financial resources to support their ideas, Drayton (1990). In this study social entrepreneurs will be used as change agents with potential opportunities for influencing and changing the performance capacity of societies. For instance, a social issue on sanitation, social entrepreneurs envision how to solve an issue in a sustainable way”, “who are the most needy people they can employ”, “how can they empower individuals in the area and educate them to the need for sanitation”, “how can they recycle the waste” and of course “how can they achieve the maximum social / profit impact”. They therefore develop transformed aspects for public toilets in order to address sanitation, Drayton (1990).

Johnson (2000) views social entrepreneurship in three perspectives; Firstly, as a process of creating value by combining resources in new ways (Stevenson, et al, 1989; Schumpeter, 1934). Second, these resource combinations are intended primarily to explore and exploit opportunities to create social value by stimulating social change (Alvord et al., 2004) or meeting social needs and third, social entrepreneurship as a process, involves the offering of services and products but also refer to the creation of new organizations.

Social entrepreneurship has the potential for generating new energy, creating new intellectual capital, and providing new methods for solving old problems. Social entrepreneurship is aimed at improving personal and collective wellbeing in reducing inequalities and increasing social cohesion, as well as benefiting the community. Reis (1999), comments that this is done mainly through: Creation of decent jobs for marginalized and excluded people; Reintegration of people with difficulties into the labor market; Provision and delivery of collective goods and social services for low income individuals; Increase of social capital and Dissemination of social innovations. Social entrepreneurship is redefining problem solving by breaking and building new models, and therefore changing the equilibrium of the marginalized. Ecotact Limited, through the innovative Ikotoilet model, is addressing all these concerns.

2.3 Addressing Sanitation

Sanitation is the access to, and use of, excreta and wastewater facilities and services that provide privacy while at the same time ensuring a clean and healthful living environment both at home and in the immediate neighborhood of users, UN Water Task Force (2008)

Earthwatch, (2008), states that in 2004, only 59% of the world population had access to any type of improved sanitation facility. In other words, 4 out of 10 people around the world have no access to improved sanitation. They are obliged to defecate in the open or use unsanitary facilities, with a serious risk of exposure to sanitation related diseases. While sanitation coverage has increased from 49% in 1990, a huge effort needs to be made quickly to expand coverage to the Millennium Development Goal (MDG) target level of 75%. Investing in sanitation infrastructure involves a long project cycle. If the MDG sanitation target is to be achieved, innovative approaches need to be developed to reduce the time span from policymaking to services delivery. Earthwatch, (2008), adds that in the global statistics on sanitation, regions presenting the lowest coverage are sub-Saharan Africa (37%), Southern Asia (38%) and Eastern Asia (45%). Western Asia (84%) has the highest coverage among developing regions. Out of every three persons unserved, two live in Southern Asia or Eastern Asia.

Of the nearly one billion Africans, only 360 million (36%) have access to improved sanitation facilities, Earthwatch, (2008). Only 10 million gain annually access to improved sanitation facilities. To meet the MDG 7 target 10 for drinking water and sanitation, Africa will need to provide annually from 2008 to 2015 access to improved sanitation facilities for 45 million people. At the current rate of 10 million people that annually gain access to improved sanitation facilities, five-fold increase on current rate is demanded (Earthwatch, 2008).

In Kenya, World Health Organization (WHO) estimated that in 2002, 52% of Kenyans did not have access to improved sanitation. In rural areas, 57% of people lacked sanitation coverage, WHO, (2004). About 11% of all Kenyans use flush toilets. The most common form of sanitation facility is a pit latrine, which is used by nearly 64% of the population, while more than 16% have no facility and defecate in the bush, a field or in the open. Apart from those that do not use a latrine, 49% share their toilet with other households (Central Bureau of Statistics, 2004). The constitution of Kenya (2010), chapter four–the bill of rights: article 43 on Economic and Social Rights (b) clearly states that “everyone has a right to a reasonable standard of sanitation”. Ecotact Limited, one of the many social enterprises strives to develop innovative transformed aspects of public toilets to address the growing environmental sanitation cry in Africa and globally.

The joint monitoring report by World Health Organization and The United Nations Children's Fund (WHO/UNICEF) (2004) figures show that all sanitary facilities used, most are private, providing ready access to members of a household. In urban areas in developing countries though, many households share a toilet or use a public facility. Usually this proportion is less than 20% but in Kenya, the demographic Health Survey (2003) found that over 63% of the urban households shared an improved toilet facility. In Ghana, the world Health Survey (2004) found that 84% of those households that used a covered dry pit latrine shared the facility. Increasingly, in poorer urban areas and informal settlements, millions of people have no choice but to rely on public or shared toilets or practice open defecation or defecation into bags or waste materials (wrap and

throw, or flying toilets) as there is often no space on the plot where they live for a private facility.

WHO/UNICEF (2004) joint monitoring report's concerns regarding shared or public facilities are with their cleanliness (which often affects the likelihood of people using such facilities), and with the health risk to their users. It can be argued that the use of a public or shared facility is preferable to open defecation. With increasing urbanization, growing concentrations of people with very low incomes, and greater numbers of tenants and informal settlement, it is likely that more and more urban dwellers will rely on public or shared facilities. Even though 1.8 billion people have gained access to improved sanitation since 1990, according to the WHO/UNICEF Joint Monitoring Report (2012), the world remains off track for the sanitation target. It is essential to accelerate progress in the remaining time before the MDG deadline, and it is therefore important to encourage formation of social enterprises in building public toilets to address sanitation.

2.4 Ways in which Ikotoilet is Addressing Sanitation Among Public Toilet Users

The treatment and disposal of human waste is becoming increasingly important as the world population increases. Human excreta should be managed as a potentially dangerous material. The construction of latrines is a relatively simple technology that may be used to control the spread of infectious diseases. Studies have shown that latrine coverage has to reach 90% of a population to have an impact on community health (Ikin, 1994).

In Africa, Ecotact a social enterprise in Kenya is spearheading sanitation and environmental interventions with a business perspective. Ecotact builds "Ikotoilet" malls in places where municipalities cannot keep up with the rapid pace of urbanization, while their high-profile social marketing campaigns raise awareness of hygiene and water conservation. The malls have become popular meeting places that provide ecologically sensitive sanitation together with other small business services. The Ikotoilet is a unique urban streetscape intervention aimed at creating memory and link space and service, thus promoting interactions on the streets, (Kuria, 2009) Ecotact Limited has invested in key transformations to address sanitation. These transformations include;

2.4.1 Transforming Social Behaviour

Social transformation is a critical aspect for toilet use. Ecotact moves away from the traditional focus that a toilet is a space that cannot link with other day to day interactions (rural approach- toilets are located in far corners). The Ikotoilet is stimulating social transformations in order to achieve significant sanitation milestones. Ecotact intends to make sanitation beauty, sexy, and fashion product, and to achieve this they have collaborated with a Miss Earth Kenya organization with an aim of developing a community outreach model to demonstrate the beauty and value of sanitation. They have also engaged in innovative campaigns, sports and awards for slums and the public in all Ikotoilet facilities. Other key activities include investing in fashionable campaigns, creative marketing, production of knowledge products, interactions with opinion leaders, policy makers and the so called 'noble' personalities in the society and a well trained workforce. Ikotoilet ensures the public understand and appreciate behavior transformation as a critical aspect for sustained clean toilets. Integrated add-ons also strengthen the interaction between the facilities and the public.

2.4.2 Developing Entrepreneurship

Ikotoilet is evolving an enterprise model that is driven by local need to improve urban environment through investment in environmentally responsive projects, including both sanitation facilities in urban and low income settlements. The Ikotoilet is a complete toilet mall- within the space, toilets and showers, cold refreshments with snacks, shoe shining services, air time vending, newspaper vending. The introduction of micro enterprises that are compatible with sanitation adds the convenience perspective of a toilet thus breaking the cultural barriers associated with use of toilets in Africa. Ikotoilets integrates other add-ons depending on viability and context in order to ensure sustainability. Ikotoilet sets up high hygienic standards, sanitation hospitality and an ambiance of convenience in the urban areas serving users in markets, parks and bus parks. Ikotoilet's entrepreneurship development is expected to improve sanitation.

2.4.3 Transforming Urban Scape

By thinking beyond the toilet, Ikotoilet model offers a unique urban scape intervention that aims at creating memory and link of space and service-promoting interactions on the streets. Ikotoilet offers an architectural piece, unique color and finish that are uniform for cognizance. The form, a strong solid frame with slanting walls with recess, protruding suspended canopy offering a visible reception-has been mistaken by many as a small restaurant-but the point is not missed. The interiors have been recessed for strategic corporate branding, which also form a basis for major revenue boost.

Environmental concerns forms the core focus of the Ikotoilet and thus the architecture aims at being a matrix of both space and environment. This is strengthened by use of waterless systems and harvesting of urine for agricultural utilization, increased usage of natural lighting and ventilation, increase in rainwater harvesting and overall landscaping. Ikotoilet's transformed urban scape is expected to improve sanitation.

2.4.4 Transforming Conservation

The Ikotoilet model has developed cutting-edge conservation innovations. These include development of a complete Dry-toilet system, a bio digestion system and urine harvesting system. The initiative has provided innovative access to technologies in order to consolidate behavior and stimulated an enabling environment in improving water, sanitation and hygiene conditions leading to risk reduction of diarrheal disease and other related illnesses. By providing the necessary hardware behavior development is improved. Ikotoilet is keen on exploring and demonstrating potentials for nutrient and energy recovery from human waste and the biogas produced in the Ikotoilets is used for cooking and lighting. Ikotoilet also provides access to clean, safe, hygienic and sustainable sanitation facility where the users can also get safe, clean Ultra Violet treated water for drinking.

In addition, Ecotact is developing a wide menu of options for disposal systems of human waste, with a focus to optimizing recovery and utilization of waste, through bio-digestion, composting and urine harvesting. The collection and handling of urine at the

toilet is done while adhering to the highest health and safety standards. These cutting edge transformed conservation innovations are expected to improve sanitation.

Ikotoilet-thinking beyond a toilet, the idea and implementation framework, social, economic and political influencing strategy has won in the last three years: Winner of the 2010 UN Dubai Best Practice Award; Guinness World Record on Hygiene 2010; Africa Social Enterprise of the Year 2009; Schwab Fellowship on social entrepreneurship 2009; World Toilet organization Hall of Fame 2008; Lemelson Fellowship on technological innovations; and Ashoka Fellowship on Public Innovation for 2007.

2.5 Measuring Effectiveness

Erlendsson (2002) defines effectiveness as the extent to which objectives are met-‘doing the right things’. Cameron (2000) stipulated four generic approaches in which one can assess an organization’s effectiveness. He says that an organization can be measured using either one the following four attributes.

The effectiveness of toilets that address sanitation among public toilet users can be measured by comparing results or outputs with previously stated goals or objectives. This approach is appropriate when goals are clear, consensual, time bound and measurable. Effectiveness may be gauged on how well a social enterprise is able to acquire all the resources it requires to deliver fully. This is appropriate when the amount of results is pegged on the inputs (Cameron, 2006).

There is also the internal process where this factor measures the ‘health’ of the systems in an organization. It seeks to establish whether there is smooth flow information, and if employee loyalty, commitment, job satisfaction and trust prevail. Also, the strategic stakeholders satisfaction seeks to measure the level of fulfillment by the relevant stakeholders. However in many situations, stakeholders may have conflicting interests. Therefore the social enterprise would need to establish a strategic balance (Todnem, 2005). This research therefore focused on the extent to which objectives of the Ikotoilet have been effective in addressing sanitation among public toilet users.

2.6 Theoretical Framework

Schaefer and Lamm (1992) define a theory as "a set of statements that seek to explain problems, actions or behavior." Sociological theories are complex theoretical frameworks that sociologists use to explain and analyze various social actions, social processes and social structures. This research was grounded in theory of Adoption and diffusion model to explain the theoretical framework of the study.

Diffusion as defined by Rogers (2003) is a "process by which an innovation is communicated through certain channels over time among the members of a social system." This process consists essentially in the communication of new ideas, whether it occurs autonomously, irrespective of any intervention, or directed and managed. The Diffusion theory by Rogers is grounded in sociology and describes the social process by which an innovation is communicated through certain channels over time among the members of a social system. Diffusion can be seen as a process of personal and social change. It is a process by which alteration occurs in the structure and foundation of a social system. When new ideas are invented, diffused and adopted (or rejected), leading to certain consequences, social change occurs.

Adoption is seen as the first or minimal level of behavioral utilization, Rogers (2003). Adoption is the decision of a specific decision unit (individual, group or firm) to begin using a new technology. It is the culmination of the mental processes of shaping a positive opinion or attitude towards a new idea. From the point of first awareness the individual goes through a process of information processing and develops a persuasion that depends on individual characteristics, the environment or the characteristics of the innovation and leads finally to implementation (or rejection) of the new technology. The model built heavily on normative theories about decision making models and considered the following stages: Awareness-of the existence of a new innovation or policy measure; Interest-collecting further information about it; Evaluation- reflection on its advantages and disadvantages; Trial-trial innovations/ behavior changes on a small scale; Adoption/acceptance-applying innovation/behavior changes.

The four main constructs of the diffusion of innovations theory are innovation, communication channels, time and social system. Rogers defines an innovation as an idea, practice, or object that is perceived as new by an individual or other unit of adoption. A communication channel is the means by which messages get from one individual to another. Time is the innovation-decision period that is, the length of time required to pass through the innovation-decision process, while a social system is defined as a set of interrelated units that are engaged in joint problem solving to accomplish a common goal.

The adoption and diffusion of an innovation within an institution does not guarantee its successful integration for its continued use. A strong stable advocacy is needed to ensure the conditions necessary for technology adoption and diffusion, training in its technical aspects and application to real needs is crucial to its integration beyond the innovators and early adopters. Time for experimentation and development of applications is essential.

The Relevance of adoption and diffusion perspective in this study is that the theory focuses on the way social enterprises play a role in ensuring that the society are able to adopt new technology and methodologies and use them as a way to address sanitation among public toilet users. The theory looks at empowering users of the Ikotoilet with the necessary skill, knowledge and technology that will assist them to overcome the negative attitudes towards public toilets and eventually help in addressing the sanitation issues in NCBD. The theory also poses a challenge to both the user in that it allows room for one to create an interest in what the innovative Ikotoilet model is offering: Transformed urban scape; Transformed social behavior; Transformed conservation; and Developed entrepreneurship. For the social entrepreneur, it challenges one to being sensitive in identifying the individual societal needs of the users of Ikotoilet on sanitation issues so as to be effective.

2.7 Conceptual Framework

Chinn and Kramer (1999) define a concept as a “complex mental formulation of experience”. A conceptual framework is the operationalization of the theory. It's a written or visual presentation that explains either graphically, or in narrative form, the main things to be studied – the key factors, concepts or variables - and the presumed relationship among them, Miles and Huberman, (1994).

The aim of the researcher's conceptual framework was to study effectiveness of Ikotoilets, in addressing sanitation among public toilet users in NCBD. The conceptual framework states the objectives of the Ikotoilets that includes: transforming social behavior; developing entrepreneurship; transforming urban scape; and transforming conservation. Under these objectives, there are variables that Ecotact has used to address sanitation among public toilet users in Nairobi central business district.

Independent Variables

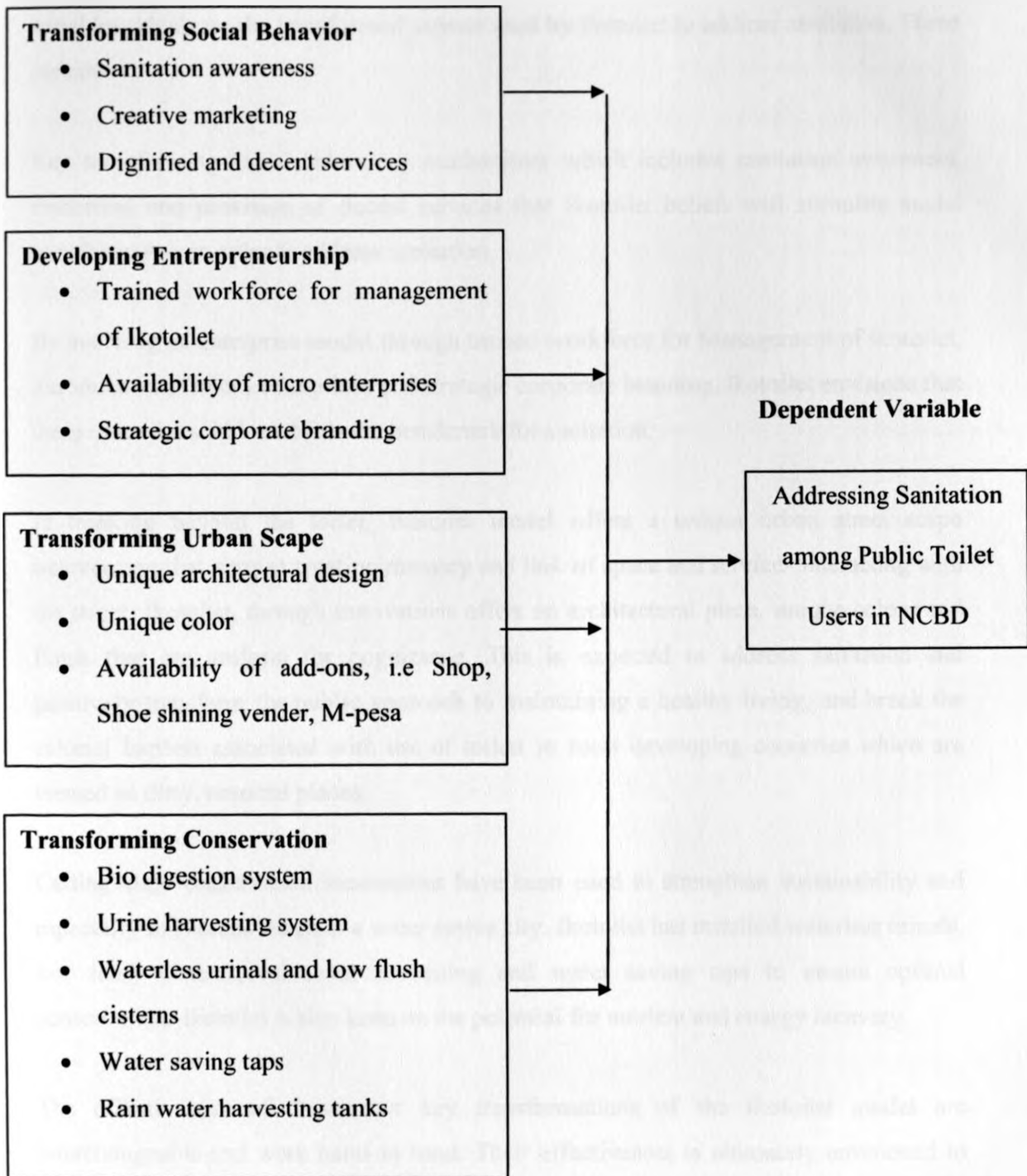


Figure 1: Conceptual Framework Model

In this conceptual framework, for effective sanitation, there are four independent variables which are the transformed aspects used by Ikotoilet to address sanitation. These include:

Key transforming social behaviour mechanisms which includes sanitation awareness, marketing and provision of decent services that Ikotoilet beliefs will stimulate social transformation in order to address sanitation.

By evolving an enterprise model through trained workforce for Management of Ikotoilet, introduction of micro enterprises and strategic corporate branding, Ikotoilet envisions that these operations will establish the benchmark for sanitation.

In thinking beyond the toilet, Ikotoilet model offers a unique urban street scape intervention that aims at creating memory and link of space and service- interacting with the street. Ikotoilet, through innovations offers an architectural piece, unique colour and finish that are uniform for cognizance. This is expected to address sanitation and positively transform the public approach to maintaining a healthy living, and break the cultural barriers associated with use of toilets in most developing countries which are viewed as dirty, unsocial places.

Cutting edge conservation innovations have been used to strengthen sustainability and especially in Nairobi which is a water scarce city. Ikotoilet has installed waterless urinals, low flush cisterns, rainwater harvesting and water saving taps to ensure optimal conservation. Ikotoilet is also keen on the potential for nutrient and energy recovery;

The effectiveness of these four key transformations of the Ikotoilet model are interchangeable and work hand in hand. Their effectiveness is ultimately envisioned to address sanitation among public toilet users in NCBD.

2.8 Summary of Reviewed Literature

This chapter reviewed the relevant literature in relation to the research questions presented in this study. It demonstrated the concepts of social entrepreneurship, and gave examples of social enterprises that are addressing sanitation. Sanitation among public toilet users as addressed by different nations was also reviewed highlighting key global, regional and national statistics and examples. Ways in which Ikotoilets are addressing sanitation among public toilet users were concretely demonstrated and techniques of measuring their effectiveness presented.

The research study was grounded in theory of Adoption and diffusion model to explain the theoretical framework of the study which was elaborated and relevance to the research study highlighted. Finally, the conceptual framework model related to the research study was drawn to give a visual presentation of the independent and dependent variables being studied.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a discussion of the research methodology that was used in this study. It detailed the research design to be used; the target population of interest; the sample size and technique; research instruments; data collection methods and analysis; and presentation techniques of the findings. It also explained the validity and reliability of the research instruments and ethical conditions that were considered.

3.2 Research Design

A research design is the plan aimed at fulfilling the objectives (Cooper and Schindler, 2000). This study aimed at examining the effectiveness of Ikotoilets in addressing sanitation among public toilet users in NCBD. A mixed method design sufficed in this situation, with the use of both qualitative and quantitative research design. Quantitative research involves data collection, analysis and interpretation. It is mainly a statistical analysis method to solve the research problem, because data used in it, is mathematical and statistical form. Qualitative research is based on texts and images, pictures etc., Creswell (2003).

The researcher used a descriptive survey as they describe characteristics associated with the subject population. According to Koul (1984) a descriptive study is useful in obtaining information concerning the current status of phenomena and describes what exists with respect to variables or conditions in a situation. The justification for using a descriptive design was that it enabled the researcher to collect in depth information about the population being studied. The descriptive design enabled the researcher to analytically explain findings based on the variables tested and hence enabled proper and succinct recommendations to be provided.

3.3 Target Population

According to Cooper and Schindler (2000), a target population is the total collection of elements about which we wish to make inference. In this research study, the target

population revolved around the six Ikotoilets in the NCBD including; an Ikotoilet in Jeevanjee Gardens; Old Nation; Accra Road; National Archives; AgaKhan Walk; and Uhuru Park.

The target population was all the Ikotoilet employees in the NCBD, constituting of the management team who are 7 in total (6 supervisors per toilet and 1 overall manager). It also constituted the lower cadre employees (toilet cleaners, toilet cashiers, shop keepers and shoe shiners) who add up to 36 lower cadre employees from all the 6 Ikotoilets. It also included Ikotoilet users who according to the records of the Ecotact management (2012) are approximately 3,000 people who visit the Ikotoilets in the NCBD per day.

3.4 Sample Size and Sample Technique

Sampling procedure is a systematic process of identifying individuals for a study to represent a larger group from which they are selected, Mugenda and Mugenda (2003, p 53). The sample size for this study was as shown below.

Table 3.1: Sample Size

Category	Population	Sample size
Ikotoilet Management Employees	7	3
Ikotoilet Lower cadre Employees	36	32
Ikotoilet Users	3,000	60
Total		95

The sampling technique used by the researcher was a mixed method of sampling that included both Probability sampling and non-probability sampling. The researcher used stratified random sampling to stratify the target population into strata. These strata are Ikotoilet management employees, Ikotoilet lower cadre employees and Ikotoilet users as shown in Table 3.1.

To select the Ikotoilet management employees the researcher used Purposive sampling. According Mugenda and Mugenda (2003), purposive sampling technique allows a researcher to use cases that have the required information with respect to the objectives of the study. With a total target population of 7 Ikotoilet management employees, the researcher purposively selected 2 management Ikotoilet employees from any of the 6 Ikotoilets and the 1 overall manager to represent the whole group for sampling, making a total of 3 management Ikotoilet employees.

Simple random sampling method was used to select the Ikotoilet lower cadre employees who constitute of shoe shiners, toilet cleaners, shopkeepers, and toilet cashiers. According to Krejcie and Morgan table for determining sample size from a given population, a sample size of 32 is selected from a population size of 36. The researcher therefore selected 32 Ikotoilet lower cadre employees to represent the total population which was generalized to the larger population, providing equal chances of all Ikotoilet lower cadre employees to be included in the study without bias. The researcher gave a number to every Ikotoilet lower cadre employee and placed the numbers in a container and then picked any number at random. The subjects corresponding to the numbers picked were included in the sample.

Convenience sampling, which according to (Cooper and Schindler 2000) is a non-probability sample that is unrestricted, was used by the researcher to sample the Ikotoilet users. Following that during data collection, it was difficult to interview users of the Ikotoilet who were in a hurry to use the facility and quickly leave without having time to answer any question; the researcher used convenience sampling where respondents were selected because of their convenient accessibility and proximity to the Ikotoilet. The respondent conveniently sampled 10 Ikotoilet users from each of the Ikotoilets, bringing a total of 60 Ikotoilet users.

3.5 Research Instruments

The researcher used research instruments for both quantitative and qualitative collection of data. The data collection instruments consisted of questionnaires and an interview guide.

Questionnaires were used to collect data from the Ikotoilet Lower Cadre employees. The researcher used the Likert type scale to measure the perception, values and behavior (Rensis 1932). A matrix of statements was used and the rating scales consisting of numbers were used to rate subjective and intangible components of the research. The likert scale comprised of 1 to 4 response categories. These categories indicated the extent to which the respondent agreed with the statements where 1= strongly disagree and 4 = strongly agree.

The questionnaire consisted of 2 sections; the first section had questions on the background information about the respondent. The second part highlighted the effectiveness of the Ikotoilet facility. The questions in this second part were categorized into four sections that covered the extent to which Ikotoilets have addressed sanitation by transforming social behavior for public toilet users in NCBD; extent to which Ikotoilets have addressed sanitation by developing entrepreneurial opportunities for public toilet users in NCBD; extent to which Ikotoilets have addressed sanitation by transforming urban scape for public toilet users in NCBD; and extent to which Ikotoilets have addressed sanitation by transforming conservation mechanisms for public toilet users in NCBD.

The researcher also used oral administration of an interview guide to collect data from the Ikotoilet management employees and the Ikotoilet users. This entailed a one to one talk between the researcher and the respondents. Both interview guides consisted of questions in one section that highlighted the effectiveness of the Ikotoilet facility. The questions were categorized into four sections that covered extent to which Ikotoilets have addressed sanitation by transforming social behavior for public toilet users in NCBD; extent to which Ikotoilets have addressed sanitation by developing entrepreneurial opportunities

for public toilet users in NCBD; extent to which Ikotoilets have addressed sanitation by transforming urban scape for public toilet users in NCBD; and extent to which Ikotoilets have addressed sanitation by transforming conservation mechanisms for public toilet users in NCBD.

3.5.1 Pilot Testing

The research instruments were pre-tested by conducting a pilot test with a sample of 19 respondents. The respondents included the remaining 4 Ikotoilet managers that were not part of the researcher's main study; the remaining 4 lower cadre Ikotoilet employees and 10 Ikotoilet users from all the Ikotoilets. The pilot testing was conducted to find out if the questions measured what it is supposed to measure and that the respondents could understand and interpret questions correctly and also to measure how long the questions will take.

3.5.2 Validity of the Instruments

Validity is concerned with the questions "Am I measuring what I intend to measure?" The problem of validity arises because measurement in the social sciences is, with very few exceptions, indirect (Nachmias and Nachmias, 1996). Professionals and experts from Ecotact limited were requested to assess and check the instruments measurement capabilities and ensure that the content was within the linguistic capabilities and understanding of the Ikotoilet employees and users. The researcher and the professionals checked how appropriate the content of the instrument is to the study; how comprehensive the content is in measuring all the constructs of the variable being measured; if the content logically gets at the intended variable; how adequate the sample of items or questions represent the content to be measured; and if the instrument format was appropriate. For an instrument to be valid, it must be reliable.

3.5.3 Reliability of the Instruments

The researcher did a pre-test on the questionnaires to test reliability. Mugenda and Mugenda (1999) define reliability as a measure of the degree to which a research instrument yields consistent results or data after repeated trials. Split-half technique was

used and aimed at determining the coefficient of internal consistency or reliability coefficient. The research instrument was split into two subsets, one consisting of odd numbered questions and the other of even numbered questions. The score of all the odd and even numbered questions of responses in the pilot study were computed. According to Hunt, Tyrrell and Nicholson (2000), a correlation greater than 0.8 is described as strong, whereas a correlation less than 0.5 is described as weak. The results showed a linear association with reliability of instrument with a Pearson Correlations coefficient (R) of 0.817 at 95% significance level $p=0.05$. Given this correlation value, the study concludes that the reliability of the research instrument is strong.

3.6 Data Collection Procedure

Before collecting data, the researcher cleared with the University of Nairobi and then proceeded to apply for a permit from the National Council for Science and Technology. The researcher then proceeded to seek permission from Ecotact limited for data collection in the Ikotoilets. Both qualitative and quantitative data were collected at the Ikotoilet sites using questionnaires and interview guides.

3.7 Data Analysis Technique

After collecting data from the field, both Quantitative and Qualitative methods of data analysis were used. The quantitative data was edited for accuracy, uniformity, consistency and completeness and arranged to enable coding and tabulation before being entered into Statistical Package for Social Sciences (SPSS). It was then analysed through the use of descriptive statistics, which included frequencies and percentages; while the qualitative data that includes words was analysed by following key steps: Data organization which involved reading data thoroughly from field notes which were edited; Creating themes which involved detecting various categories in the data and then establishing a relationship among these categories, then generating themes; Analysing and interpreting information where the researcher evaluated and analyzed the data to determine the adequacy of information and the credibility, usefulness, consistency and validation; and then writing the report where the researcher gave a vivid descriptive account of the situation under study. The analyzed data was presented using tables.

3.8 Ethical Considerations

Participation in the study was purely voluntary. The interview was conducted in a private place to ensure that no other person listened to the interviews. Respondents were orally consented and guaranteed absolute anonymity and confidentiality due to the sensitive nature of the ethics survey. The respondents were also assured that the information obtained was only to be used for the purposes of the study and that their names will not be linked to information they give. It was made clear that the respondents will not directly benefit for taking part in the interview. However, the information they gave helped the researcher come up with findings that will be useful in the management of Ecotact Limited.

3.9 Operationalization of Variables

Table 3.2: Operationalization Table

Research Objective	Variable	Indicator	Measurement	Level of scale	Data collection	Type of analysis	Level of analysis
To determine the extent to which Ikotoilets have addressed sanitation by transforming social behavior for public toilet users in NCBD	Transforming social behavior	-Sanitation awareness	-confirmation of sanitation awareness	Nominal	Questionnaire	Quantitative	Descriptive
		-Interaction with opinion leaders	created -Number of opinion leaders involved	Ratio	Questionnaire	Quantitative	Descriptive
		-Creative marketing	-confirmation of creative marketing	Nominal	Interviews	Qualitative	Descriptive
		-Dignified and decent services	-Feedback of services from users -Feedback from Ikotoilet employees	Nominal Nominal	Interviews Interviews	Qualitative Qualitative	Descriptive Descriptive

Research Objective	Variable	Indicator	Measurement	Level of scale	Data collection	Type of analysis	Level of analysis
To determine the extent to which Ikotoilets have addressed sanitation by developing entrepreneurial opportunities for public toilet users in NCBD	Developing entrepreneurship	-Trained workforce for Management of Ikotoilet;	-Number of trained workforce for management of Ikotoilet	Ratio	Interviews	Qualitative	Descriptive
		-Availability of Micro enterprises;	-confirmation of microenterprises available	Nominal	Questionnaires	Quantitative	Descriptive
		-Strategic corporate branding	-confirmation of corporate branding	Nominal	Interviews	Qualitative	Descriptive

Research Objective	Variable	Indicator	Measurement	Level of scale	Data collection	Type of analysis	Level of analysis
To determine the extent to which Ikotoilets have addressed sanitation by transforming urban scape for public toilet users in NCBD	Transforming urban scape	-Unique color	-Level of proper Maintenance of the facility in terms of cleanliness	Ordinal	Questionnaires	Quantitative	Descriptive
		-Unique architectural design	-Level of proper Functionality of equipment in the Ikotoilet	Ordinal	Interviews	Qualitative	Descriptive
		-Availability of add-ons, i.e Shop, Shoe shining vender	-Number of employment opportunities provided	Ratio	Interviews	Qualitative	Descriptive

Research Objective	Variable	Indicator	Measurement	Level of scale	Data collection	Type of analysis	Level of analysis
To determine the extent to which Ikotoilets have addressed sanitation by transforming conservation mechanisms for public toilet users in NCBD	Transforming conservation	-Waterless urinals & Low flush cisterns;	-Number of waterless urinals in use	Ratio	Interviews	Qualitative	Descriptive
			-Number of low flush cisterns in use	Ratio	Interviews	Qualitative	Descriptive
		-Water saving taps	-Number of water saving taps	Ratio	Interviews	Qualitative	Descriptive
		-Rain water harvesting tanks;	-Confirmation of rain water harvesting tanks	Nominal	Questionnaires	Quantitative	Descriptive
		-Bio digestion system;	-confirmation of a bio digestion	Nominal	Questionnaires	Quantitative	Descriptive
		-Urine harvesting system	-confirmation of urine harvesting system	Nominal	Questionnaires	Quantitative	Descriptive
				Nominal	Questionnaires	Quantitative	Descriptive
				Nominal	Questionnaires	Quantitative	Descriptive

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter focused on the presentation, interpretation and analysis of findings based on primary data collected from the respondents using questionnaires and interview guides. The research was conducted on Ikotoilet management employees, Ikotoilet lower cadre employees and Ikotoilet users in NCBD. Data was presented and analyzed in the following themes; extent to which Ikotoilets have addressed sanitation by transforming social behavior, developing entrepreneurship, transforming urban scape and transforming conservation among public toilet users. The data obtained was analyzed using descriptive statistics.

4.2 Response Rate

In regards to the response rate, thirty two (32) questionnaires were sent out to the Ikotoilet lower cadre employees and all of them responded. Sixty (60) Ikotoilet users and three (3) Ikotoilet management employees were interviewed. The researcher received assistance from Ecotact Limited, in order to receive the 100% return rate.

4.3 Demographic Characteristics of the Respondents

The following section shows the demographic characteristics of the respondents that included Ikotoilet lower cadre employees, Ikotoilet management employees and Ikotoilet users.

4.3.1 Gender of the Respondents

Table 4.1 shows the frequency and percentage of the gender distribution of the Ikotoilet lower cadre employees:

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Table 4.1: Gender Distribution of the Lower Cadre Employees

Gender	Frequency	Percentage
Male	20	62.5
Female	12	37.5
Total	32	100.0

The Ikotoilet lower cadre employee respondent's data indicated that 20 (62.5%) of the respondents were male and 12 (37.5%) were female. This could imply that majority of the Ikotoilet lower cadre employees who constitute the ikotoilet cashiers, shoe shiners, shopkeepers and Ikotoilet cleaners, are males.

The Ikotoilet management employee respondent's data indicated that two (2) of the respondents were male and one (1) was female. This further shows that Ikotoilet employees constitute more men than women.

The Ikotoilet users' respondent's data indicated that 50% of the respondents were male and 50% were female. This means that both male and female equally use the Ikotoilet. Table 4.2 shows the frequency and percentage of the gender distribution of the Ikotoilet users.

Table 4.2: Gender Distribution of the Ikotoilet Users

Gender	Frequency	Percentage
Male	30	50.0
Female	30	50.0
Total	60	100.0

4.3.2 Age of the Respondents

Table 4.3 shows the frequency and percentage of the age of the Ikotoilet lower cadre employees.

Table 4.3: Age of the Lower Cadre Employees

Age	Frequency	Percentage
Under 20	2	6.3
20-29	23	71.9
30-39	7	21.9
40-50 and above	0	0
Total	32	100.0

The Ikotoilet lower cadre employee respondent's data indicated that 23 (71.9%) of the respondents were between the age of 20-29 years. This concurs to (Drayton 1990) study that states that social enterprises are allocating resources to neglected societal problems such lack of job opportunities especially among the youth. From the above data, most of the Ikotoilet lower cadre employees fall in the age bracket of youths. The Ikotoilet management employee respondent's data indicated that two (2) of the respondent's age range are between 20-29 years, and one of them has an age range of between of 40-50 years.

4.3.3 Level of Education

Table 4.4 showing the frequency and percentage of the level of education of the Ikotoilet lower cadre employees;

Table 4.4: Level of Education of the Lower Cadre Employees

Level of Education	Frequency	Percentage
Secondary level	26	81.3
Diploma Level	5	15.6
Degree Level	1	3.1
Total	32	100.0

The Ikotoilet lower cadre employee respondent's data indicated that majority of the respondents, had secondary certificates with a frequency and percentage of 26 (81.3%). This could imply that for you to qualify to be a lower cadre employee at Ikotoilet, you need to at least have a secondary school certificate. The Ikotoilet management employee

respondent's data on the other hand indicated that one (1) of the management employees has a diploma and the other two (2) have degrees.

4.3.4 Number of Years Worked at Ikotoilet

Table 4.5 shows the frequency and percentage of the number of years the Ikotoilet Lower Cadre Employees have worked at Ikotoilet;

Table 4.5: Numbers of Years Worked at Ikotoilet for the Lower Cadre Employees

Years of work at Ikotoilet	Frequency	Percentage
Less than 1 year	13	40.6
1-2 years	11	34.4
2-3 years	4	12.5
3-4 years	3	9.4
4-5 years	1	3.1
Total	32	100.0

The Ikotoilet lower cadre employee respondent's data indicated that majority of the respondents have been working at Ikotoilet for less than one year with a frequency and percentage of 13 (40.6%), and 11(34.4%) have worked between 1-2 years. The Ikotoilet management employee respondent's data on the other hand indicated that two (2) of the respondents have been working at Ikotoilet between 1-2 years, and the other one (1) has been working for over 5 years. This shows that most of the Ikotoilet employees have been working there for not more than 2 years.

The following section answers the findings of the research questions. Various variables have been used to establish the effectiveness of ikotoilets in addressing sanitation, including: transforming social behavior, developing entrepreneurship, transforming urban scape and transforming conservation mechanisms among public toilet users in NCBD.

4.4 Transforming Social Behaviour among Public Toilet Users in NCBD

The Ikotoilet lower cadre employee respondent's data indicated that majority of the respondents strongly agreed that tissue paper, water and soap is provided for use, having

the highest frequency and percentage of 27(84.4%), 23(71.9%), and 20(64.5%) respectively. The percentage index shows that 48.8% strongly agreed and 35.7% agreed that Ikotoilet is addressing sanitation by transforming social behavior among public toilet users in the NCBD; while 4.7% disagreed and 10.8% strongly disagreed on the same. The results in the Table 4.6 shows the opinion of the lower cadre employees on the extent to which Ikotoilet is addressing sanitation by transforming social behavior.

Table 4.6: The Opinion of the Lower Cadre Employees

Extent to which Ikotoilets have addressed sanitation	Strongly Agree	Agree	Disagree	Strongly Disagree
Ikotoilet has invested in creative marketing	16(53.3%)	10(33.3%)	0	4(13.3%)
Ikotoilet has engaged in innovative sanitation campaigns	9(31.0%)	16(55.2%)	0	4(13.8%)
Ikotoilet has brought interactions between public and the policy makers	3(10.3%)	16(55.2%)	3(10.3%)	7(24.1%)
Ikotoilet has brought interactions between the public and celebrities	4(14.3%)	13(42.9%)	2(7.1%)	9(35.7%)
The baby's changing area has attracted women to change their babies nappies	10(34.5%)	10(34.5%)	4(13.8%)	5(17.2%)
Soap is provided for hand washing	20(64.5%)	10(32.3%)	0	1(3.2%)
Water is provided for hand washing	23(71.9%)	9(28.1%)	0	0
Tissue paper is provided for use	27(84.4%)	5(15.6%)	0	0
Showers are available for use	17(58.6%)	7(24.1%)	3(10.3%)	2(6.9%)
The Ikotoilet is clean and hygienic all day long	20(62.5%)	11(34.4%)	0	1(3.1%)
The doors in the ikotoilets are lockable	16(55.2%)	11(37.9%)	0	2(6.9%)
The ikotoilets have hooks behind the doors, to hung bags, coats	9(45.0%)	7(35.0%)	3(15.0%)	1(5.0%)
Percentage Index	48.8	35.7	4.7	10.8

The Ikotoilet management employee respondent's data indicated that Ecotact limited has transformed Social Behavior by providing, sanitation awareness, creative marketing and dignified and decent services. Ecotact limited provides to its users: tissue paper and liquid hand washing soap for use while in the toilet; and bathing soap which is available for buying if one wants to shower. One of the managers said that "Ecotact has introduced innovative campaigns like the hand washing campaigns in schools and the management has developed a partnership with the community to demonstrate the beauty and value of hygienic defecation." They have deliberately engaged with religious leaders, policy makers, celebrities, and comedians to ensure reduction of any socio-religious barriers that minimize sanitation promotion. For provision of dignified and decent services, Ecotact has ensured that all the doors in the toilet are lockable and the facility is cleaned throughout the day. They also have a baby's changing area in all the female toilets, and a shower facility in both the male and female toilets.

The Ikotoilet user's respondent's data indicated that Ikotoilets have engaged in creative marketing, and some of the users like the advertisements inside the Ikotoilet, while others have never seen them. To address sanitation, Ikotoilet has included a baby's changing area in the female toilets, of which almost all the female respondents are not aware of as it is not easily visible. In some Ikotoilets, one of the users said that "this area has been transformed to a mini store, where crates, buckets and cleaning mops are stored." Majority of the users are aware that there is a shower facility in the Ikotoilet saying that "it provides convenience for those who need to shower after a long travel." All the users agreed that tissue paper is provided for use when visiting the Ikotoilet although some felt that what is provided is very little for use. The users are aware that there is soap provided for hand washing after using the Ikotoilet but say that at times the soap is not available. Water is also provided for hand washing after visiting the Ikotoilet, sometimes through the water taps, and at times using water stored in buckets. The users say that the Ikotoilet is clean whenever they visit it, but at times it is very wet, hence a need to be cleaned severally. The users stated that some of the doors in the facility are lockable, while others are not. They also stated that there are some doors that have hooks for hanging there bags/coats but some doors do not have these hooks.

4.5 Developing Entrepreneurial Opportunities for Public Toilet Users in NCBD

The Ikotoilet lower cadre employee respondent's data indicated that majority of the respondents strongly agreed that the shop and the shoe shining services in the Ikotoilet is benefiting the public having the highest frequency and percentage of 25(78.1%) and 24(75%) respectively. The percentage index shows that 54.4% strongly agreed and 36.6% agreed that Ikotoilet is addressing sanitation by developing entrepreneurial opportunities among public toilet users in the NCBD; while 1.9% disagreed and 4.3% strongly disagreed on the same. The results in the Table 4.7 shows the opinion of the lower cadre employees on the extent to which Ikotoilet is addressing sanitation by developing entrepreneurial opportunities.

Table 4.7: The Opinion of the Ikotoilet Lower Cadre Employees

Extent to which Ikotoilets have addressed sanitation	Strongly Agree	Agree	Disagree	Strongly Disagree
Ikotoilet employees are trained by Ecotact management	14(43.8%)	16(50.0%)	1(3.1%)	1(3.1%)
The shop in the Ikotoilet is benefiting the public	25(78.1%)	7(21.9%)	0	0
The shoe shinning services in the Ikotoiletis benefiting the society	24(75.0%)	6(25.0%)	0	0
These job opportunities have attracted more people to the Ikotoilet facility	17(53.1%)	12(37.5%)	0	3(9.4%)
Ikotoilet has invested in environment friendly technologies	10(35.7%)	14(50.0%)	2(7.1%)	2(7.1%)
Introduction of shop has changed the perception of the public on public toilets	13(44.8%)	14(48.3%)	0	2(6.9%)
The shoe shinning services has changed perception of the public on public toilets	15(50.0%)	13(43.3%)	1(3.3%)	1(3.3%)
Percentage Index	54.4	36.6	1.9	4.3

The Ikotoilet management employee respondent's data indicated that Ecotact limited has developed Entrepreneurship by training its workforce for Management of Ikotoilet; providing micro enterprises; and developing strategic corporate branding. One of the managers stated that "Ecotact has supported young people by providing employment employees and offer training to all new staff as well as refresher training after every six months." Ecotact has developed micro enterprises that include a snack shop, mpesa shop, shoe shine vendors and Agro vets. Another manager mentioned that "each Ikotoilet has a shop which serves a great number of customers, especially because the toilets are conveniently located near markets, bus stations and other highly populated areas." The shops also sell various products and services such as snacks, refreshments, airtime e.t.c. Each Ikotoilet also has shoe shinning services and with the even distribution of the Ikotoilets in NCBD, the public can access these services from anywhere. In developing strategic corporate branding, Ecotact is providing advertising spaces/boards inside and outside the toilets and companies encouraged to advertise and pay for the service.

The Ikotoilet user's respondent's data indicated that the users stated that the shop in the Ikotoilet is benefiting the public, and also acts as an income generating tool to the shopkeepers, creating employment. The users also stated that the shoe shinning services is benefiting the public, as majority of the people use the services daily. Again this is a form of income generating tool to the shoe shiners and hence creating employment. Majority of the users stated that "the shop and mpesa services have changed their perception of public toilets in NCBD as it shows that the toilet has to be kept clean, in order to run a shop besides it." The users also felt that these services also set up high hygienic standards, sanitation hospitality and an ambiance of convenience in the urban areas serving users in markets, parks and bus parks. According to Ecotact limited, the Ikotoilet is a complete toilet mall- within the space, toilets, cold refreshments with snacks, shoe shinning services, air time vending, and newspaper vending. The users therefore felt that the introduction of micro enterprises that are compatible with sanitation adds the convenience perspective of a toilet thus breaking the cultural barriers associated with use of toilets in Africa.

4.6 Transforming Urban Scape for Public Toilet Users in NCBD

The Ikotoilet lower cadre employee respondent's data indicated that majority of the respondents strongly agreed that, Ikotoilets have been strategically built around the NCBD, although more Ikotoilets should be added; having the highest frequency and percentage of 14(70%) and 14(51.9%) respectively.

The percentage index shows that 49.6% strongly agreed and 45.4% agreed that Ikotoilet is addressing sanitation by developing entrepreneurial opportunities among public toilet users in the NCBD; while 2.2% disagreed and 2.1% strongly disagreed on the same. The results in the Table 4.8 shows the opinion of the lower cadre employees on the extent to which Ikotoilet is addressing sanitation by transforming urban scape.

Table 4.8: The Opinion of the Lower Cadre Employees

Extent to which Ikotoilets have addressed sanitation	Strongly Agree	Agree	Disagree	Strongly Disagree
The Unique architectural design has promoted interactions around the ikotoilets	10(40.0%)	14(56.0%)	1(4.0%)	0
Unique colour of the Ikotoilet is pleasant	13(48.1%)	13(48.1%)	0	1(3.7%)
There is music in the Ikotoilet facility	11(37.9%)	14(48.3%)	2(6.9%)	2(6.9%)
The free toilet for persons with disabilities has encouraged them to use it	18(64.3%)	8(28.6%)	0	2(7.1%)
The ikotoilet's painting is well maintained	14(51.9%)	12(44.4%)	0	1(3.7%)
Ikotoilet's hygiene is well maintained	14(50.0%)	12(42.9%)	2(7.1%)	0
Surrounding, overall landscape of Ikotoilet is well trimmed with flowers	12(41.4%)	14(48.3%)	3(10.3%)	0
Ikotoilet has natural lighting and ventilation	11(40.7%)	16(59.3%)	0	0
Ikotoilets are strategically built in NCBD	14(51.9%)	13(48.1%)	0	0
More Ikotoilets should be added	14(70.0%)	6(30.0%)	0	0
Percentage Index	49.6	45.4	2.2	2.1

The Ikotoilet management employee respondent's data indicated that Ecotact has transformed urban scape by providing a unique architectural design and unique color which offers a unique urban street scape intervention that aims at creating memory and link of space and service- interacting with the street. The ikotoilets are repainted on a quarterly basis. One of the managers stated that "the availability of add-ons, i.e snack shop, shoe shining vender, M-pesa are convenient for those in hurry and want to avoid queuing in supermarkets and malls." The radio facility is also another add on in the ikotoilets which according to the management, the concept looks beyond the toilet and hopes to achieve social transformations on our attitude towards human excreta. A free toilet for persons with disability is also available for use hence making the Ikotoilet innovation all inclusive and free from discrimination.

The Ikotoilet user's respondent's data indicated that the users felt that the unique architectural piece, unique color and finish and add that it makes the facility beautiful. All Ikotoilets have radio speakers in the facility, but the users are not aware of the music that plays in the back ground in the toilet, as they hardly hear it and most of the speakers are out of order. Some of the users stated that they were aware of the free toilet for persons with disabilities, which is highly commendable, although others are not aware of this facility stating that "it has not been easily labelled." Some say that there is only one facility for persons with disability in each Ikotoilet, hence making it hard for both male and female to conveniently use it. The users agree that the Ikotoilets have good natural lighting and ventilation, however in the evening the toilets get dark as most of the lighting bulbs are out of order. Majority of the users think Ikotoilets have been strategically built around the NCBD and even suggested that more should be built to avoid queuing in some of the Ikotoilets. Some of the users said that "the ikotoilets are closed very early and thus should at least be open later into the night." Ikotoilet model offers a unique urban scape intervention that aims at creating memory and link of space and service-promoting interactions on the streets, and most of the users agreed to this.

4.7 Transforming Conservation Mechanisms for Public Toilet Users in NCBD

The Ikotoilet lower cadre employee respondent's data indicated that majority of the respondents strongly agreed that the water taps for washing hands after using the toilet are functional and that water is always available to wash hands and flush the toilet after use having the highest frequency and percentage of 19(70.4%) and 15(60%) respectively. The percentage index shows that 36.2% strongly agreed and 31.3% agreed that Ikotoilet is addressing sanitation by developing entrepreneurial opportunities among public toilet users in the NCBD; while 14.2% disagreed and 15.4% strongly disagreed on the same. The results in the Table 4.9 shows the opinion of the lower cadre employees on the extent to which Ikotoilet is addressing sanitation by transforming conservation mechanisms.

Table 4.9: The Opinion of the Lower Cadre Employees

Extent to which Ikotoilets have addressed sanitation	Strongly Agree	Agree	Disagree	Strongly Disagree
The water taps for washing hands after using the toilet are functional	19(70.4%)	7(25.9%)	1(3.7%)	0
Water is always available for use to flush the toilets	15(60%)	9(36%)	0	1(4%)
Water is always available to wash hands after use of the toilet	17(65.4%)	8(30.8%)	0	1(3.8%)
Rain water is harvested for use	5(20.8%)	6(25%)	4(16.7%)	9(37.5%)
Urine is harvested for agricultural use	2(9.1%)	10(45.5%)	6(27.3%)	4(18.2%)
Biogas is generated for use from the bio-digester	4(17.4%)	3(13%)	10(43.5%)	6(26.1%)
The waterless urinals in the men's toilets have helped save water use	9(33.3%)	12(44.4%)	3(11.1%)	3(11.1%)
The toilets are flushable	10(13.3%)	8(29.6%)	3(11.1%)	6(22.2%)
Percentage Index	36.2	31.3	14.2	15.4

The Ikotoilet management employee respondent's data indicated that Ecotact has transformed conservation mechanisms by developing a bio digestion system; urine harvesting system; waterless urinals and Low flush cisterns; water saving taps; and rain water harvesting tanks. The water saving taps only removes water when pressed leaving no chances of leakage or water wastage out of carelessness. The low flush toilets significantly use less water than a full flush toilet as it uses 6 litres per flush as opposed to the usual 13.2 litres. One of the managers stated that "water is available in the taps to wash hands and if water is not available, water is placed in buckets for use." Rain water is also harvested for use using the water harvesting tanks. For urine harvesting, one of the managers said that "Ecotact has partnered with Jomo Kenyatta University of Agriculture and Technology (JKUAT) to harvest and carry out a scientific research on the use of urine fertilizer for agricultural purposes." Some of the Ikotoilets have a biodigester which generates biogas for both lighting and cooking purposes.

The Ikotoilet user's respondent's data indicated that the users feel that the Ikotoilet model has developed cutting-edge conservation innovations which include the use of waterless urinals which the male users are aware of. The users say that water is always available for use to flush the toilets; however, some said that "water is available in buckets." Most of the users use the water saving taps to wash their hands after visiting the toilets. In cases where the water taps are not functional, the users are forced to use water from a bucket that has been provided. There are some Ikotoilets in which rainwater is harvested, and hence water is always available for use according to the users.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes and discusses the findings of the study and presents conclusions, recommendations and suggestions for further research. The purpose of this study was to establish the effectiveness of Ikotoilets in addressing sanitation among public toilet users in the Nairobi Central Business District (NCBD).

5.2 Summary of Findings

The summary of findings have been categorized following the study themes; extent to which Ikotoilets have addressed sanitation by transforming social behavior, developing entrepreneurship, transforming urban scape and transforming conservation mechanisms among public toilet users in NCBD.

5.2.1 Transforming Social Behaviour

The Ikotoilet management employees say that Ecotact limited has transformed social behavior by providing, sanitation awareness, creative marketing and provided dignified and decent services. From the findings, the researcher found that whereas the Ikotoilet lower cadre employees agree that sanitation services and awareness have been provided, following that they strongly agreed that tissue paper, water and soap is provided for use, having the highest frequency and percentage of 27(84.4%), 23(71.9%), and 20(64.5%) respectively; the Ikotoilet users felt that tissue paper provided for use was not enough, and that soap is sometimes not available for use.

Whereas Ikotoilet management employees agree that Ecotact limited has provided dignified services by providing a baby's changing area in the female toilets, the Ikotoilet users say that they are not aware of this baby's changing area, as it is not easily visible as the area has been transformed to a mini store, where crates, buckets and cleaning mops are stored. Ikotoilet management employees also say that Ecotact limited has addressed

sanitation by providing decent services in ensuring that the doors of the Ikotoilets are all lockable and have hooks for hanging bags/coats. The Ikotoilet users however stated that some of the doors are lockable, while others are not. They also stated that there are some doors that have hooks for hanging their bags/coats but some doors do not have these hooks.

5.2.2 Developing Entrepreneurship

From the findings the researcher found out that Ecotact limited has developed entrepreneurship by training its workforce for management of Ikotoilet; providing micro enterprises; and developing strategic corporate branding. The Ikotoilet lower cadre employees strongly agreed that the shop and the shoe shining services in the Ikotoilet is benefiting the public having the highest frequency and percentage of 25(78.1%) and 24(75%) respectively. The Ikotoilet users also agreed that the Ikotoilet is benefiting the public, and also acts as an income generating tool to the shopkeepers, hence creating employment. They also agree that the shoe shining services is benefiting the public, as majority of the people use the services daily and this acts as an income generating tool to the shoe shiners and hence creating employment.

5.2.3 Transforming Urban Scape

The Ikotoilet management employees say that Ecotact limited has transformed urban scape by providing a unique architectural design and unique color which offers a unique urban street scape intervention that aims at creating memory and link of space and service- interacting with the street. The Ikotoilet lower cadre employees strongly agreed that Ikotoilets have been strategically built around the NCBD, although they say more Ikotoilets should be added; having the highest frequency and percentage of 14(70%) and 14(51.9%) respectively. The Ikotoilet users also agreed to this and stated that more Ikotoilets should be built to avoid queuing in some of the facilities. Some of the users even suggested that the Ikotoilets are closed very early and thus should be opened at least later into the night and not as early as 6 pm.

Whereas the Ikotoilet management employees say that Ecotact limited has provided radios in the Ikotoilets to play music in the background, the Ikotoilet lower cadre employees agree that the music speakers are there but are all spoilt. The Ikotoilet users also agree that although there are radio speakers in the Ikotoilets, most of the speakers are spoilt; and they have therefore never heard the music in the background. In addition, whereas the Ikotoilet management employees say that Ecotact limited has provided a free toilet for persons with disabilities, the Ikotoilet lower cadre employees say that most of the toilets have broken down and are not in use. The Ikotoilet users state that the free toilet for persons with disabilities is only one in each facility, it has not been easily labeled and others are not functional, hence making it hard for both male and female to conveniently use it.

Despite the fact that according to Ikotoilet management employees who say that Ecotact limited has built Ikotoilets with natural ventilation and lighting, the Ikotoilet lower cadre employees say that in cases where it gets dark before the ikotoilets are closed, this is at 6.00 pm, there are light bulbs that have been provided for use with electricity, and while other ikotoilets use solar bulbs. The ikotoilet users however feel that in the evening the toilets get dark as most of the lighting bulbs are out of order.

5.2.4 Transforming Conservation Mechanisms

The Ikotoilet management employees say that Ecotact limited has provided facilities and services for safe disposal of human urine and faeces by providing transformed conservation mechanisms having developed a bio digestion system; urine harvesting system; waterless urinals and Low flush cisterns; water saving taps; and rain water harvesting tanks. The Ikotoilet lower cadre employees therefore strongly agreed that the water taps for washing hands after using the toilet are functional and that water is always available to wash hands and flush the toilet after use having the highest frequency and percentage of 19(70.4%) and 15(60%) respectively. Whereas the Ikotoilet users agree that water is always available for use to wash hands and flush the toilets, the water to

flush the toilet is always available in buckets as most of the flush cisterns are not available.

Despite the fact that the Ikotoilet management employees say that Ecotact limited has developed a bio digestion system and urine harvesting system, the Ikotoilet users say they are not aware of these mechanisms.

5.3 Discussion of Findings

The research study was guided by diffusion and adoption theory by Rogers (2003) and the theory looked at empowering users of the Ikotoilet with the necessary skill, knowledge and technology that will assist them to overcome the negative attitudes towards public toilets and eventually help in addressing the sanitation issues.

5.3.1 Transforming Social Behaviour

From the study results, it can be noted that Ikotoilet has transformed social behaviour, by providing sufficient water, soap and tissue paper. This shows that adequate services and products have been provided to address sanitation among public toilet users in NCBD. According to a research carried by the water and sanitation programme (2004); public toilets provided by the Nairobi City Council had no amenities like toilet paper and running water to clean up afterwards. Ecotact limited has now provided these amenities for use and from the findings; the respondents strongly agreed that these amenities have actually been provided. The researcher however noted that liquid hand washing soap provided for use while in the toilet is not always available as there are some instances where Ikotoilet users have complained of its unavailability.

In a study by Curti (2005), he mentioned that the public toilet users have the desire for privacy and to avoid embarrassment; desire for convenience and to avoid the discomforts or dangers of the bush (e.g. snakes, pests, rain), and wanting social acceptance or status which are some of the key motivations for adequate sanitation in a society. The researcher noted that Ecotact Limited concurs to this study, as they have ensured that there are decent services in the Ikotoilet, including lockable doors and availability of

hooks for hanging bags/coats. Some ikotoilets however have doors that are not lockable and others do not have hooks. In addition, from the findings, dignified services have been provided, such as the Ikotoilet's baby's changing area in the female toilets, but unfortunately this is not known to the ikotoilet users.

5.3.2 Developing Entrepreneurship

In a study by Drayton (1990), he states that social entrepreneurship is creating new industries, validating new business models, and allocating resources to neglected societal problems. From the findings, the researcher noted that the micro enterprises provided by Ecotact limited such as shop keeping services, shoeshine services, is benefiting the public and also acts as an income generating tool. This concurs to the study as Ecotact limited is creating employment by generating new industries, validating new business models, and allocating resources to neglected societal problems such lack of job opportunities especially among the youth in Kenya.

5.3.3 Transforming Urban Scape

According to a research carried by the water and sanitation programme-WSP, (2004); public toilets provided by the Nairobi City Council were few and far between. But now, from the findings, the Ikotoilet lower cadre employees and Ikotoilet users agree that Ikotoilets have been strategically built around the NCBD; and this may imply that Ecotact limited is providing convenient services to the public. In addition, the respondents request to have more facilities build to avoid queuing in some of the facilities, or opened at least later into the night, may imply that the public value the services that the Ikotoilet is providing.

Mulama, (2009) stated that public toilets in Kenya have been characterized by overcrowding and poor lighting. Ecotact limited has however built Ikotoilets with natural ventilation and lighting. From the findings, Ecotact limited has put light bulbs in the Ikotoilets for lighting, although it gets dark at times in the facilities as most of the lighting bulbs are out of order.

5.3.4 Transforming Conservation Mechanisms

According to a report by (WHO/UNICEF, 2010), Sanitation is the provision of facilities and services for the safe disposal of human urine and faeces. The Ikotoilet management employees concur to the statement as they say that Ecotact limited has provided facilities and services for safe disposal of human urine and faeces by developing a bio digestion system; urine harvesting system; waterless urinals and Low flush cisterns; water saving taps; and rain water harvesting tanks. From the study results, although water is always available for use to flush the toilets, the water is available in buckets as most of the flush cisterns are not available. In addition, despite the fact that Ecotact limited has developed a bio digestion system and urine harvesting system, it is not available in all the facilities.

5.4 Conclusions of the Study

Following the research findings from the Ikotoilet management employees, Ikotoilet lower cadre employees and Ikotoilet users, the researcher concluded, that although it is evident that the Ikotoilet is effective in addressing sanitation by transforming social behaviour, developing entrepreneurships, transforming urban scape and transforming conservation mechanisms among public toilet users in the NCBD, there are a few mechanisms that are either not known to the users or are not functioning as stated by Ecotact limited.

1. In transforming social behavior for instance, the researcher concluded that although liquid hand washing soap is provided for use while in the toilet, Ecotact limited at times take long to replace the liquid soap. In addition, it also takes long for Ecotact Management to make repairs, following that there were some doors that were not lockable. From the findings, the researcher can also conclude that Ecotact limited has either not provided the baby's changing area for use as they say they have, or they have just not ensured that the area is easily accessible for use.
2. In developing entrepreneurship, the researcher concluded that Ecotact limited has indeed created employment by generating new industries, validating new business models, and allocating resources to neglected societal problems such as lack of job

opportunities especially among the youth in Kenya, who according to the findings are the majority of the employees in the Ikotoilets.

3. In transforming urban scape, the researcher concluded that the Ikotoilets are effective among public toilet users as the users agree that they have been strategically built in the NCBD and even suggest that more should added. The researcher also concluded that although light bulbs are provided to light the ikotoilets in the evening, it seems Ecotact limited has not taken the initiative to change the light bulbs that are faulty; hence it becomes dark in the evenings.
4. In transforming conservation mechanisms, the researcher concluded that although water is always available for use to flush the toilet and wash hands, Ecotact limited has removed all the flush cisterns and replaced them with water buckets and jugs to flush the toilets. The researcher also concluded that the bio digestion system and urine harvesting system that have been developed for use are currently not fully utilized in all the facilities.

5.5 Recommendations of the Study

In view of the above findings and discussions of the study, the researcher made the following recommendations to Ecotact Limited:

1. More tissue paper should be provided for use to the public toilet users visiting the Ikotoilet and Ecotact Limited should ensure that soap is provided for hand washing at all times after using the Ikotoilet.
2. Ikotoilet users, especially the women, should be sensitized on the baby's changing area. This will encourage mothers with babies to utilize this space. Ecotact limited should also ensure that this area is easily accessible for use. The public should also be informed that advertising space has been provided inside the ikotoilets.
3. All the radio speakers in the Ikotoilets should be repaired and music played as stated and the light bulbs that are not working should be replaced with functional bulbs.

4. The broken toilets for persons with disability should be repaired and visibly labeled. To promote convenience, the management should ensure that there is a separate facility for both men and women.
5. Lastly, Ecotact limited should consider building more Ikotoilets to avoid the long queues in some of the facilities and also consider having the facilities open later in the night.

5.6 Suggestions for Further Research

Based on the findings of the study the researcher made the following suggestions for further research:

1. A research should be made to compare what transformations other public toilets in the NCBD have taken to address sanitation among public toilet users. This will be useful for any new social enterprise that is to be established to concentrate on new transformations to address sanitation.
2. Following that Ikotoilets have been built all over Kenya; a research should be undertaken with a larger sample that includes Ikotoilets all over Kenya, as different results may be found.

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APPENDICES

APPENDIX I: Letter of Transmittal

EMAH MADEGWA
UNIVERSITY OF NAIROBI
P.O Box 30197
NAIROBI

Dear Respondent,

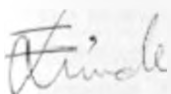
I am carrying out research on the effectiveness of ikotoilets in addressing sanitation among public toilet users in Nairobi central business district. This is in partial fulfillment of the requirement of the Masters of Project Planning and Management degree program at the University of Nairobi.

This study uses Ecotact Limited as a social enterprise using the Ikotoilet Model as an entrepreneurial principal to address sanitation. You have been selected as one of the respondents and the result of this study will provide the management with the necessary information.

This is an academic research and confidentiality is strictly emphasized, your name will not appear anywhere in the report. Kindly spare some time to complete the questionnaire attached.

Thank you in advance,

Yours sincerely,



Emah Madegwa

APPENDIX II: Questionnaire for Lower Cadre Ikotoilet Employees

Kindly answer the following questions. The researcher would like to assure you that the information gathered will be kept confidential and used strictly for the purpose of this research only. Do not write your name anywhere in this paper. However, the usefulness of the information to the researcher will solely depend on your honesty.

SECTION A: BACKGROUND INFORMATION

1. Job Title _____
2. Gender : Male () Female ()
3. Education Level:

Secondary level ()	Diploma level ()	Degree Level ()
------------------------	----------------------	---------------------
4. What is your age range?

Under 20 years ()	20-29 years ()	30-39 years ()
40-50 years ()	above 50 yrs ()	
5. Years of Work with Ikotoilet:

Less than 1 year ()	1-2 years ()	2-3 years ()
3-4 years ()	4-5 years ()	

SECTION B: EFFECTIVENESS OF IKOTOILET

Please put a circle where a question Indicates the extent to which you agree with the statements by using a scale of 1 to 4 where 1= strongly disagree and 4 = strongly agree.

6. Extent to which Ikotoilets have addressed sanitation by transforming social behavior among public toilet users in NCBD	Strongly Agree	Agree	Disagree	Strongly Disagree
a) Ikotoilet has invested in creative marketing i.e advertising inside and outside the toilet	4	3	2	1
b) Ikotoilet has engaged in innovative sanitation campaigns for the public.	4	3	2	1
c) Ikotoilet has brought interactions between public and the policy makers (i.e Ministers, Members of parliament)	4	3	2	1
d) Ikotoilet has brought interactions between the public and celebrities (i.e Miss Kenya, musicians, and comedians)	4	3	2	1
e) The baby's changing area in the ikotoilet has attracted women to change their	4	3	2	1

babies nappies				
f) Soap is provided for hand washing after using the Ikotoilet	4	3	2	1
g) Water is provided for hand washing after using the Ikotoilet	4	3	2	1
h) Tissue paper is provided for use when visiting the Ikotoilet	4	3	2	1
i) Showers are available for use in the Ikotoilet	4	3	2	1
j) The Ikotoilet is clean and hygienic all day long	4	3	2	1
k) The doors in the ikotoilets are lockable	4	3	2	1
l) The ikotoilets have hooks behind the doors, to hung bags, coats	4	3	2	1

7. Select below products that have been provided for use in the Ikotoilet

Hand Soap- Bar () Hand soap – Liquid () Bathing Soap ()

Tooth paste () Tissue paper ()

Others

8. How many times is an ikotoilet facility cleaned in a day?

Once () Twice () Throughout the day ()

9. Extent to which Ikotoilets have addressed sanitation by developing entrepreneurial opportunities for public toilet users in NCBD	Strongly Agree	Agree	Disagree	Strongly Disagree
a) Ikotoilet employees are trained by Ecotact management on how to operate the ikotoilet	4	3	2	1
b) The shop in the Ikotoilet is benefiting the public	4	3	2	1
c) The shoe shining services in the Ikotoilet is benefiting the society	4	3	2	1
d) These job opportunities have attracted more people to the ikotoilet facility	4	3	2	1
e) Ikotoilet has invested in environment friendly technologies i.e (waterless urinals, rain water harvesting tanks, bio	4	3	2	1

digesters)				
f) Introduction of shop has changed the perception of the public on public toilets in NCBD	4	3	2	1
g) Introduction of shoe shining services has changed the perception of the public on public toilets in NCBD	4	3	2	1

10. Types of microenterprises available

Snack Shop () Shoe Shine Vender () Newspaper Vender ()

ATM () Chemist () Mpesa vendor ()

Other

11. Extent to which Ikotoilets have addressed sanitation by transforming urban scape for public toilet users in NCBD	Strongly Agree	Agree	Disagree	Strongly Disagree
a) The Unique architectural design has promoted interactions around the ikotoilets	4	3	2	1
b) The Unique colour of the ikotoilet is pleasant	4	3	2	1
c) There is music in the ikotoilet facility	4	3	2	1
d) The free toilet for persons with disabilities has encouraged them to use the facility	4	3	2	1
e) The ikotoilet's painting is well maintained	4	3	2	1
f) The ikotoilet's general hygiene is well maintained	4	3	2	1
g) The surrounding and overall landscape of the Ikotoilet is well trimmed with flowers	4	3	2	1
h) The Ikotoilet has natural lighting and ventilation	4	3	2	1
i) Ikotoilets have been strategically built around the NCBD	4	3	2	1

j) More Ikotoilets should be added in the NCBD	4	3	2	1
--	---	---	---	---

12. How often is an ikotoilet repainted?

Once a year ()

Twice a year ()

other

13. Extent to which Ikotoilets have addressed sanitation by transforming conservation mechanisms for public toilet users in NCBD	Strongly Agree	Agree	Disagree	Strongly Disagree
a) The water taps for washing hands after using the toilet are functional	4	3	2	1
b) Water is always available for use to flush the toilets	4	3	2	1
c) Water is always available to wash hands after use of the toilet	4	3	2	1
d) Rain water is harvested for use	4	3	2	1
e) Urine is harvested for agricultural utilization using the urine harvesting system	4	3	2	1
f) Biogas is generated for use from the bio digester	4	3	2	1
g) The waterless urinals in the men's toilets have helped save water use	4	3	2	1
h) The toilets are flushable	4	3	2	1

14. Are sanitary bins provided for use?

Yes ()

No ()

15. Are dustbins provided for use?

Yes ()

No ()

1. Is there a bio digestion and urine harvesting system in this Ikotoilet?

Yes ()

No ()

Thank you for participating.

APPENDIX III: Interview Guide for Ikotoilet Managers

SECTION A: BACKGROUND INFORMATION

1. Job Title _____
2. Gender : Male () Female ()
3. Education Level:
Secondary level () Diploma level () Degree Level () other ()
4. What is your age range?
Under 20 years () 20-29 years () 30-39 years ()
40-50 years () above 50 yrs ()
5. Years of Work with Ikotoilet:
Less than 1 year () 1-2 years () 2-3 years ()
3-4 years () 4-5 years ()

SECTION B: EFFECTIVENESS OF IKOTOILET

6. Extent to which Ikotoilets have addressed sanitation by transforming social behavior among public toilet users in NCBD.
 - a) What creative marketing is in the Ikotoilet? _____
 - b) What innovative campaigns has Ikotoilet developed for the public to address sanitation?

 - c) Has Ikotoilet brought interactions between public and the policy makers (i.e Ministers, Members of parliament) _____
 - d) Has Ikotoilet brought interactions between the public and celebrities (i.e Miss Kenya, musicians, and comedians) _____
 - e) Is there a baby's changing area in the ikotilet? _____
 - f) Are showers available for use in the Ikotoilet? _____
 - g) What products that have been provided for use in the Ikotoilet

h) Hand Soap- Bar () Hand soap – Liquid () Bathing Soap () Tooth
paste ()
Tissue paper () others _____

i) How many times is an ikotoilet facility cleaned in a day?
a. Once () Twice () More than twice () Throughout()
j) Are the doors in the facility lockable? _____

7. Extent to which Ikotoilets have addressed sanitation by developing entrepreneurial opportunities for public toilet users in NCBD.

- a) Does Ecotact provide training to the Ikotoilet employees on direct operations of ikotoilet facility? _____
- b) What types of microenterprises are available in the Ikotoilet Facility?
- c) Snack Shop () Shoe Shine Vender () Newspaper Vender ()
ATM () Chemist () Mpesa vendor () other _____
- d) Is the shop in the Ikotoilet benefiting the society? _____
- e) Is the shoe shinning services in the Ikotoilet benefiting the society? _____
- f) Has the introduction of (shop, shoe shinning services, air time vending) broken the perception the public has on public toilets in Kenya? _____
- g) Has the introduction of (shop, shoe shinning services, air time vending) ensured sustainability of the facility? _____
- h) Do the interiors of the Ikotoilet have strategic corporate branding, Yes () No ()

8. Extent to which Ikotoilets have addressed sanitation by transforming urban scape for public toilet users in NCBD.

1. Has the Unique architectural design promoted interactions around the ikotoilets

2. Has the Unique maroon color promoted interactions around the ikotoilets

3. Has the Shop attracted the public to the toilet? _____
4. Has the Shoe shining services attracted the public to the toilet? _____
5. Is there music in all the ikotoilet facilities? _____
6. Has the free toilet for the persons with disability encouraged them to use the facility? _____
7. How often is an ikotoilet repainted?
 Once a year () Twice a year () other _____

A. Extent to which Ikotoilets have addressed sanitation by transforming conservation mechanisms for public toilet users in NCBD.

- a) Are there water saving taps for washing hands after toilet use?

- b) Is Safe, clean Ultra Violet treated water provided for drinking to the public?

- c) Is water always available for use to flush the toilets?

- d) Is water always available to wash hands after using of the toilet?

- e) Is Rain water harvested for use using the water harvesting tanks?

- f) Is Urine harvested for agricultural utilization?

- g) Is there a bio digester in this Ikotoilet? Yes () No ()
- h) Is there a urine harvesting system in this Ikotoilet? Yes () No ()
- i) Do the waterless urinals in the mens toilets help save water use?

APPENDIX IV: Interview Guide for Ikotoilet Users

SECTION A: EFFECTIVENESS OF IKOTOILET

A. Extent to which Ikotoilets have addressed sanitation by transforming social behavior among public toilet users in NCBD.

1. Do the ikotoilet employees have good relations with the users? _____
2. Are you aware of the baby's changing area in the ikotoilet? _____
3. Are you aware that there is a shower facility in the ikotoilet? _____
4. Is soap provided for hand washing after using the Ikotoilet? _____
5. Is Water provided for hand washing after visiting the Ikotoilet? _____
6. Is Tissue paper provided for use when visiting the Ikotoilet? _____
7. Is the ikotoilet facility always clean whenever you visit it? _____
8. Are the doors in the facility lockable? _____

B. Extent to which Ikotoilets have addressed sanitation by developing entrepreneurial opportunities for public toilet users in NCBD.

- a) Do you think the shop in the Ikotoilet is benefiting the public? _____
- b) Do you think the shoe shinning services in the Ikotoilet is benefiting the public?

- c) Does the Shop attract you to the toilet? _____
- d) Do the Shoe shining services attract you to the toilet? _____
- e) Do the shop services change your perception of public toilets in NCBD? _____
- f) Do the shoe shining services change your perception of public toilets in NCBD?

- g) Do you like the advertisements used inside the Ikotoilet? _____

C. Extent to which Ikotoilets have addressed sanitation by transforming urban scape for public toilet users in NCBD.

- a) Do you like the unique architectural design of the ikotoilets? _____
- b) Do you like the colour of the ikotoilets? _____
- c) Are you aware that there is music that plays in the back ground of the toilet?

- d) Are you aware that there is a free toilet for Persons with Disabilities? _____

e) Do you think the ikotoilet's general hygiene is well maintained? _____

f) Do you think the ikotoilet's wall painting is well maintained? _____

g) Does the ikotoilet have good lighting and ventilation inside? _____

h) Do you think Ikotoilets have been strategically built around the NCBD? _____

D. Extent to which Ikotoilets have addressed sanitation by transforming conservation mechanisms for public toilet users in NCBD

a) Is water always available for use to flush the toilets? _____

b) Are you aware that the urinals do not use water? _____

c) Do you use the water taps for washing hands? _____

APPENDIX V: Krejcie and Morgan Table

TABLE FOR DETERMINING SAMPLE SIZE FROM A GIVEN POPULATION

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Krejcie, Robert V., Morgan, Daryle W., "Determining Sample Size for Research Activities", Educational and Psychological Measurement, 1970.

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APPENDIX VI: Research Authorization

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2213472
254-020-310571, 2213123, 219470
Fax: 254-020-318245, 318246
When replying please quote
secretary@ncst.go.ke

P.O. Box 30623-00100
NAIROBI KENYA
Website: www.ncst.go.ke

NCST/RCD/14/012/812

Our Ref:

Emah Muhambe Madegwa
University of Nairobi
P.O Box 30197
Nairobi



Date **22nd June 2012**

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Effectiveness of Ikotoilets in addressing sanitation among public toilet users in Nairobi Central Business District*" I am pleased to inform you that you have been authorized to undertake research in Nairobi for a period ending **31st July, 2012**.

You are advised to report to the **Provincial Director of Education, the Provincial Commissioner, Nairobi Province and the Town Clerk, Nairobi City Council** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


DR. M. K. RUGUTT, PhD, HSC
DEPUTY COUNCIL SECRETARY

Copy to:

Provincial Director of Education
Provincial Commissioner
Nairobi