



UNIVERSITY OF NAIROBI
School of the Arts and Design

Community Dialogue with Design: The Case of EcoSan Toilet in Kisumu, Kenya



Winifred Akinyi Oyuko Mbeche



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(B50/8418/06)

This thesis is submitted in partial fulfillment for the degree of
Master of Arts in Design in the School of the Arts and Design,
University of Nairobi

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Declaration

This study is my original work and to the best of my knowledge has not been presented in any other university for any award.

Signed  Date 14 April 2010

Winifred Akinyi Oyuko Mbeche (B50/8414/06)

This thesis is submitted in partial fulfillment of the requirements for the award of a Master of Arts degree in Design at the University of Nairobi.

Supervisor's Declaration

This Thesis has been submitted with my approval as supervisors.

Signed  Date 18/5/10

Dr Suki KK Mwendwa, School of the Arts and Design, University of Nairobi

Dedication

To Oyuko, Udo, Ambrose, Joanne and Akim with all my love
To God for being by my side throughout the experience/exposition

Acknowledgements

He gives strength to the weary and increases the power of the weak... (Isaiah 40:29-31)

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Definitions

Arborloo	A type of EcoSan toilet with a portable superstructure, with no urine diversion, and covering a shallow pit that fills in after approximately one year. The superstructure is then moved and a tree planted in the filled pit
Boda boda	Bicycle taxi transport popular in Kisumu city
Community	A body of people or family living together and sharing everything; communicate intimately with; to be in a state of heightened, intimate receptivity
Design interventions	Creative measures and/or processes to resolve challenges, problems or needs
Donor	Person or organization that makes a 'gift' or takes responsibility for providing capacity and/or resources for a project
Fossa Alterna	The <i>Fossa Alterna</i> is a type of EcoSan toilet that has two permanent pits with a portable superstructure. When one pit is full the latrine slab is moved to the other pit. The first pit is then covered with soil, and left to compost as the second pit is used. When the second pit fills up the contents of the first pit are emptied and the pit reused. Soil and ash are added with each use. (WSP-Africa Field Note, 2005)
Informal settlement	Informal settlement refers to levels of intensity of space arrangement and activities—buildings which are temporary, conceptual permanence and activities. Informal settlements accommodates both the visual look and activities observed
Jua Kali	Swahili term literally meaning 'hot sun': first used in reference to informal sector artisans, such as car mechanics and metalworkers who worked in open sheds under the hot sun for lack of premises. Gradually the term extended to refer to anyone in self-employment, whether in the open air or in permanent premises. The term later came to connote the informal sector.

Marketing	Marketing consists of activities by which one reaches customers and persuades them to buy or use a product or service
Management	Ability to take charge of a situation, people, resources or run a business
Mobility	Ability to move, not fixed in one position, able to move or flow easily; (of person) able to change one's social status
MSMEs	Micro, Small and Medium Enterprises refer to businesses that employ between 1-5, 5-49, and over 49 employees, with total sales of less than Kenya shillings 1 million, Ksh 1-5 million, and over Ksh 5 million per annum respectively.
Ownership	Owning as in property, idea or process
Partnership	Teaming up to work together towards a common goal
Recycle	Refers to materials that are reused for different purposes from the original purpose, for instance, recycling of paper for necklaces, toilet paper, use of recycled glass for mosaics etc, and in addition to recycle or compost organic material for reuse as fertilizer
Sanitation	The state of being clean and conducive to health
Skyloo	An EcoSan raised toilet with urine diversion and separate collection of urine and feces in a permanent structure that requires (6-12 months) emptying of the receptacle and transportation to a composting site.
Stakeholder	A word applied to groups, organizations (formal and informal, public, private and community) and individuals who have an important 'stake' or interest in a development process
Sustainability	A system or process or intervention that can be maintained effectively for a prolonged period—it takes into account, economic, social and environmental considerations in its planning and use
Traces	Delves back, follows, discovers and ascertains the course of development of the beginning of an idea, thought or concern

Trails	Imprints, or visible marks or impressions left by the passage of person or idea—history—the indication that something has been present
<i>Tuk tuk</i>	Tricycle taxi mode of transport popular in Kisumu city
Twinning	Bringing together of two people to work together as one unit

Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ADA	Austrian Development Agency
CBEs	Community Based Enterprises
CGIAR	Consultative Group on International Agriculture Research
CSO	Civil Society Organization
CWS	Cities Without Slums
HIV	Human Immunodeficiency Virus
GTZ	
ITDG	Intermediate Technology Development Group
KENSUP	Kenya Slum Upgrading Project
KICK	Kisumu Innovation Centre-Kenya
KIHBS	Kenya Integrated Household Budget Survey
KISORA	Kisumu Social Rights Association
KISWAMP	Kisumu Waste Management Programme
KIWASCO	Kisumu Water and Sanitation Company
KWAHO	Kenya Water for Health Organization
MCK	Municipal Council of Kisumu
MDGs	Millenium Development Goals
MOK	Municipality of Kisumu
MSMEs	Micro, Small and Medium Enterprises
MU	Maseno University
NCC	Nairobi City Council
NCBDA	Nairobi Central Business District Association
NEMA	National Environmental Management Authority
NGOs	Non Governmental Organizations
IDP	International Development Partners
PHAST	Participatory Hygiene and Sanitation Technology
RELMA	Regional Land Management Unit (Sida)
SANA	Sustainable Aid in Africa
SIDA	Swedish International Development Cooperation Agency
SMSEs	Small and Medium Scale Enterprises
StAD	School of the Arts and Design
UNHABITAT	United Nations Human Settlement Programme
UNICEF	United Nations Childrens Fund
UDTs	Urine Diverting Toilets

UON University of Nairobi
WHUP Water Hyacinth Utilization Project
WSP Water and Sanitation Programme (World Bank)
WSP-AF Water and Sanitation Programme-Africa

Abstract

This thesis explores the place of design in a community, focused specifically on how EcoSan¹, an innovative ecological waste management system. EcoSan has the potential to transform a community and provide healthy sustainable development.² I therefore attempt to investigate design-user dialogue, with reference to the need, idea, attitude, perception, acceptance, rejection and use of EcoSan toilets. In addition, the study hopes to explore through qualitative description, community needs, how these needs may contribute into appropriate and acceptable design interventions which mitigate sustainable life changes.

Ecological sanitation, or EcoSan, refers to a range of sanitation technologies in which human excreta is recovered, retained on-site, and eventually reused. This study attempts to elucidate Obunga community's dialogue with the EcoSan toilet as an alternative sanitation design intervention, in terms of perception, attitude and acceptance or rejection of the intervention. The study looks at factors hindering uptake and how demand for the EcoSan toilet can be scaled up by the community.

To investigate this dialogue, the research interviewed 91 households, and 21 focus group discussants, in Obunga's estimated population of 1,500 households.³ The sample for this research comprised households of community members residing in Obunga, who were interviewed using semi-structured questions for the household visits. The questions focused on Ecosan toilets and their construction, and included both areas where they had and did not have EcoSan toilets. A focus group discussion of women (11) and men (9) was done separately, and 7 key informants were interviewed informally. Profiling of the site was carried out through research projects undertaken by 4th year undergraduate students from School of the Arts and Design (StAD), and from a narrative provided by Mzee Olewe, one of the oldest residents of Obunga. Notes, sketches, photographs, illustrations, a diary, reference from journals, publications (both print and electronic) and exhibitions were part of the data collected and documented.

Chapter one traces the background and context of the problem of sanitation, and outlines the objectives of the study. Chapter 2 covers issues to do with perception and

¹ EcoSan refers to ecological sanitation which can be defined as a system that makes use of human excreta as a resource, where the available nutrients are used to improve on soil fertility in agricultural fields to enhance food production, with minimal risk of pollution of the environment as well as minimal threat to human health (quoted from Ngozi R. M. 2007 thesis, and cited in Morgan, 2004)

² Community refers to a body of people or family living together or in close proximity, sharing ideas, practices, things and share their way of doing things or activities

³ KNBS (2008); Mugenda, M.O & Mugenda, G.M. (2003)

understanding of design as it relates to sanitation, aspects of community dialogue with design, how design and development affects communities, and how design can drive development. The chapter looks at previous studies carried out on sanitation, and in particular, the evolution and uptake of EcoSan toilets, to find out and highlight similar as well as different practices or methods others employ for successful uptake of the design. Chapter three delves into the local context of the EcoSan situation in Obunga within Kisumu City. Chapter four describes the methodology of the study. Findings and analysis are discussed in Chapter five. Chapter six contains discussion, conclusions, recommendations and the way forward.

Chapter 1: Introduction

1.1 Overview

This thesis explores the place of design in a community focused specifically on how EcoSan⁴, an innovative ecological waste management system, has the potential to transform a community and provide healthy sustainable development.⁵ In attempting to investigate design-user dialogue, the study explores through qualitative description, community needs, how those needs may contribute to appropriate and acceptable design interventions which mitigate sustainable life changes. It therefore asks, is a good design necessarily a good design community intervention?

Sanitation determines good quality of life, especially social equity and its sustainability.⁶ It concerns personal and public hygiene including the disposal and management of waste to create and maintain a healthy and pleasant environment.⁷ However, rural-urban migration complicates the scene of sanitation, especially in city informal settlements. Rural-urban migration has, one, given rise to high populations of migrant workers in search of a livelihood; two, it has caused severe strain on an already overstretched infrastructure, posing real challenges to local governments in the provision of basic services.⁸ Against this backdrop, Africa is said to be the region with the poorest record of access to water and sanitation, with 72 percent of the urban population living in slums or informal settlements⁹, where it is predicted in the next 10 to 15 years much of the world's population is likely to be¹⁰.

Sanitation in developing countries include: open defecation, 'drop-and-store' (pit latrine) or 'flush-and-discharge'. Typically, flush and discharge is regarded as the ideal technology, for urban areas, whilst inhabitants in rural areas opt for drop-and-store (pit latrines) or open defecation. Studies indicate that high density population often determines the kind of sanitation to be found in the settlement, which means no space

⁴ EcoSan refers to ecological sanitation which can be defined as a system that makes use of human excreta as a resource, where the available nutrients are used to improve on soil fertility in agricultural fields to enhance food production, with minimal risk of pollution of the environment as well as minimal threat to human health (quoted from Ngozi R. M. 2007 thesis, and cited in Morgan, 2004)

⁵ Community refers to a body of people or family living together or in close proximity, sharing ideas, practices, things and who share their way of doing things or activities

⁶ Esrey *et al* (1998: 5)

⁷ Ngobi, R.M. (2007)

⁸ UN-HABITAT (2006: 1)

⁹ UN-HABITAT (2005)

¹⁰ UN-HABITAT (2005)

for indoor toilets.¹¹ Hence, open defecation is practiced in most places, specifically by children. Despite negative factors such as poor security at night, and no water for hand washing, the inhabitants of informal settlements are forced to dig pit latrines outside their dwellings. Plot size provides an indication on possibilities for urban agriculture and recirculation of nutrients, while questioning whether space is a factor for adopting a urine-diverting toilet as shown in Figure 1.1.



Figure 1.1 A village in Mokhotlong District, Lesotho showing VIP latrines and Obunga informal settlement depicting the living conditions (recycled tin metal structures; dirty, murky and untreated water sources) in the area (Source: WSP, 2004; The Researcher, 2007)

Access to water varies from standpipe to indoor water taps, vendors and private wells that often dry up during the dry season (Figure 1.2).¹² Water shortages, occasioned by irregular supply and high cost, leads to use of untreated water from streams and rivers despite the brownish color giving rise to risk of contamination. The rainy season provides a temporary supplementary outlet for residents to harvest rainwater. Conversely, pit latrines and septic tanks are sometimes prone to periodic flooding, overflow and/or collapse during this period, becoming smelly, and continue to be sources of disease infection and pollution in the community.

¹¹ EcoSanRes (2004: 5)

¹² EcoSanRes (2004: 4)



Figure 1.2 Obunga informal settlement depicting water sources the area (Source: Adede, StAD student, 2007)

Alternative sanitation systems, (ecological sanitation), that are based on equity, disease prevention, and sustainability, have been devised and are widely used. These sanitation systems work on the principle of dehydration or decomposition. For example, historically, evidence suggests that a third of the toilets in the city of Stockholm were actually of a urine-diverting design, and now there are none.¹³ Markedly, ecological sanitation systems were introduced not to address sanitation problems but to meet growing environmental concern. Swedes, advocate to leading an environmentally friendly life, installing urine diverting toilets; so that urine and solid waste are used as fertilizer.¹⁴ In contrast, developing countries mainly seek ecological sanitation systems to protect the environment, improve access to sanitation, as well as a means to meet the Millennium Development Goals (MDGs). Currently, many governments and agencies in Africa are exploring the role of ecological sanitation, or EcoSan, within their environmental sanitation and hygiene improvement programs. However, despite convincing environmental and economic reasons to support this approach, acceptance of the

¹³ Drangert J-O. & Hallström, (2002)

¹⁴ Kvarnström *et al* (2006)

technology has been very limited so far.¹⁵ Kenya, too, is exploring with EcoSan toilets, and Kisumu is one of the locations where the sanitation facilities are on trial.

1.2 Historical background of Kisumu City

Originally known as Port Florence, Kisumu is the third largest town in Kenya; the headquarters of Kisumu District and Nyanza Province respectively. Kisumu is derived from a Luo word *Kisumo*—which means a place where the hungry get sustenance.¹⁶ Due to its strategic location on Lake Victoria, Kisumu has grown from a railway terminus and internal port in 1901 to a leading commercial, trading, industrial, communication and administrative centre for Lake Victoria basin. In 1903, the township boundaries were gazetted and the name Port Florence was changed to Kisumu. In 2006, Kisumu (see Figure 1.3 highlighted in yellow) was declared a UN Millenium City by the former UN Secretary General Kofi Annan.

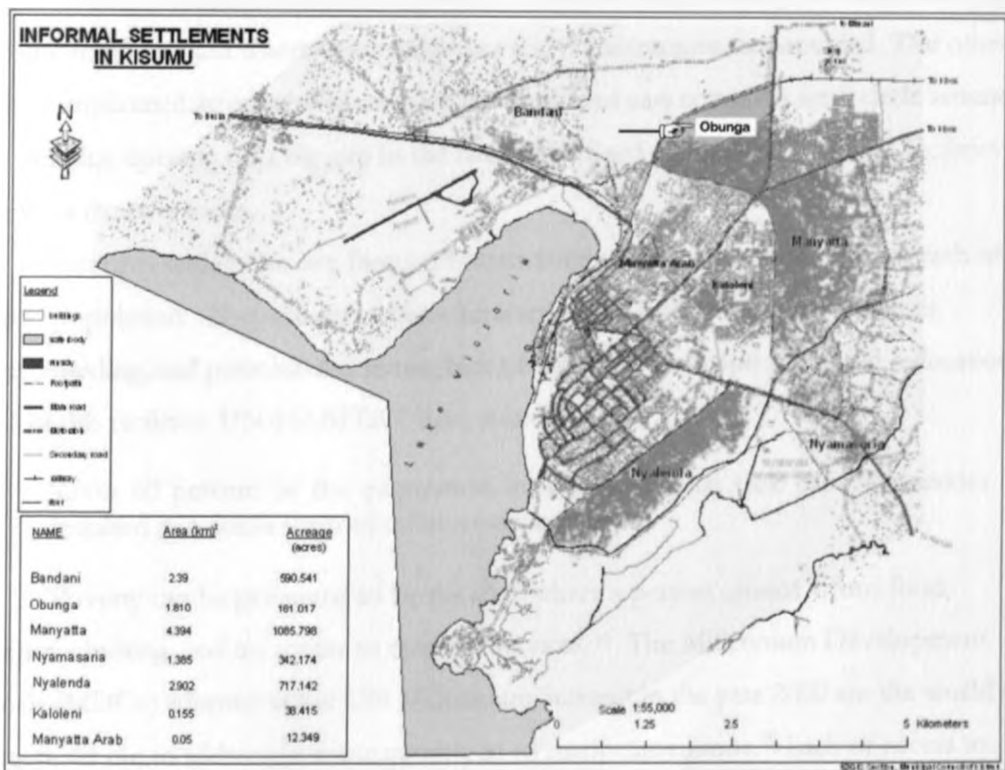


Figure 1.3 Map of Kisumu City showing the distribution of informal settlements (Source: GIS, Municipal Council of Kisumu, 2008)

¹⁵ WSP (2005)

¹⁶ UN-HABITAT (2005)

The City's endowment, (Lake Victoria and fertile agricultural land), gave rise to a thriving economy that provided employment opportunities in the fishery industry as well as large-scale production of molasses, cotton, rice, and sugar. Despite its rich resource base, Kisumu is still one of the poorest cities in Kenya with problems of food insecurity, growing urban poverty and high prevalence of HIV/AIDS as key concerns. About 60% of Kisumu population lives in slums and over 15% have HIV/AIDS.¹⁷

The development of informal settlements (peri-urban settlements) in Kisumu goes back to the advent of the city as a railway terminus in 1898. During this period, many people came from the surrounding areas to engage in barter trade, exchange tools, foodstuffs and livestock—an activity that continues to date. The elements that characterize the shape and forms of the slums can be attributed to selective urbanization of pre-independent Kenya, perpetuated by the independent government. As a result, Kisumu town today is zoned into two distinct areas. One is the well planned central part, which hosts government offices, the port, an industrial area, housing for middle and high income residents, and where service delivery and infrastructure are provided. The other a belt of unplanned informal settlements that developed as a complete semi-circle around the old city, opening up a big gap in the rates of planned residential and social facilities between the two zones.

Informal settlements are frequently associated with poverty, and rapid growth of urban population. They are also often characterized by high population densities, overcrowding, and poor infrastructure, lack of access to water and sanitation, education and health facilities. UN-HABITAT have stated that,

‘Over 60 percent of the population lives in areas that lack basic necessities required in a dense form of urban environment’¹⁸.

Poverty can be perceived to be the state where a person cannot afford food, shelter, clothing, and no access to essential services.¹⁹ The Millennium Development Goals (MDGs) adopted at the UN Millennium Summit in the year 2000 are the world's targets set out to address extreme poverty in its many dimensions.²⁰ Lack of access to

¹⁷ *Situation Analysis of Informal Settlements in Kisumu*, UNHABITAT (2005)

¹⁸ UNHABITAT (2005: 16)

¹⁹ Absolute poverty is defined as a state where one cannot raise the income required to meet the expenditure for purchasing a specified bundle of basic requirements. “A Situational Analysis of Poverty in Kenya”, Working Paper, KIPRA (WP/6/2002)

²⁰ The Millennium Development Goals (MDGs) adopted at the UN Millennium Summit in 2000 are the world's targets set out to address extreme poverty in its many dimensions—income poverty, hunger, disease, lack of infrastructure and adequate shelter, and exclusion—while promoting gender equality, education, and environmental sustainability (UN Millennium Project. 2005).

health care, clean water and sanitation, education, shelter and insufficient income are primary causes of poverty. The poor devote almost all resources to consumption, thus poverty slows the engine that drives development.

Given the growth patterns of industry, coupled with the fluidity of residential location in the areas next to the central business district, informal settlements have 'leapfrogged', as migrant workers come in droves seeking employment and means to make a living. The net immigration flow from the surrounding districts of the Lake Basin was and still is propelled by the variety of attractive resources available to the population and investors within the region. Moreover, landowners changed the original use of their houses to the more lucrative uses such as provision of cheap slum housing. Furthermore, creating an impetus for migration is the cultural tradition of land inheritance, which lends to pressure being exerted on land, coupled with poor agricultural productivity. As a result, the bulk of migrants move into the informal settlements, and in the process exacerbate the situation in the already impoverished settlements. The EcoSan toilet is a design intervention that hopes to improve health and, by extension, alleviate poverty. As a result, interrogate the community's dialogue and or interaction with it, to see it is or can be successful in attaining its goal.

Informal settlements

Obunga typical to other urban and peri-urban areas is no different in being a highly-polluted and disease-ridden habitat.²¹ Extreme living conditions for the urban poor in as for those in Obunga are reflected in overcrowded housing, unavailability of infrastructure and lack of public toilets in developing countries (Figure 1.4). The few existing sanitation facilities are often unhygienic, causing millions to suffer and die from sanitation related diseases. Further exacerbating the situation is the deteriorating environment, and the cycle of poverty-disease increases.²²

Out of a total population of 32 million people, about 31 percent of Kenyans receive their drinking water from a pipe (household or communal tap); while 37 percent obtain water from an open spring, stream, or river. The rest get water from wells, water vendors or other sources.²³ WHO estimates that in 2002, 38 percent of Kenyans lacked

²¹ Esrey *et al* (1998: 1)

²² Esrey *et al* (1998)

²³ Central Bureau of Statistics (2004)

access to safe drinking water. However, when looking only at rural areas, this number increases to 54 percent.²⁴



Figure 1.4 Obunga informal settlements depicting the living conditions (toilet/bathroom and uncollected garbage) in the area (Source: Adede, SIAD Student, 2007)

Obunga is just one of the informal settlements that dot the skyline of Kisumu peri-urban region. The Kisumu industrial area provides the main source of livelihood for Obunga’s residents. Housing in this informal settlement is characterized predominantly by rooming housing that is lacking in physical infrastructure and the provision of basic services. Since the mid-1990s, acceleration in change of land use from agriculture to housing has further fragmented land in Obunga. Below is a map magnifying the Obunga informal settlement (Figure 1.5).

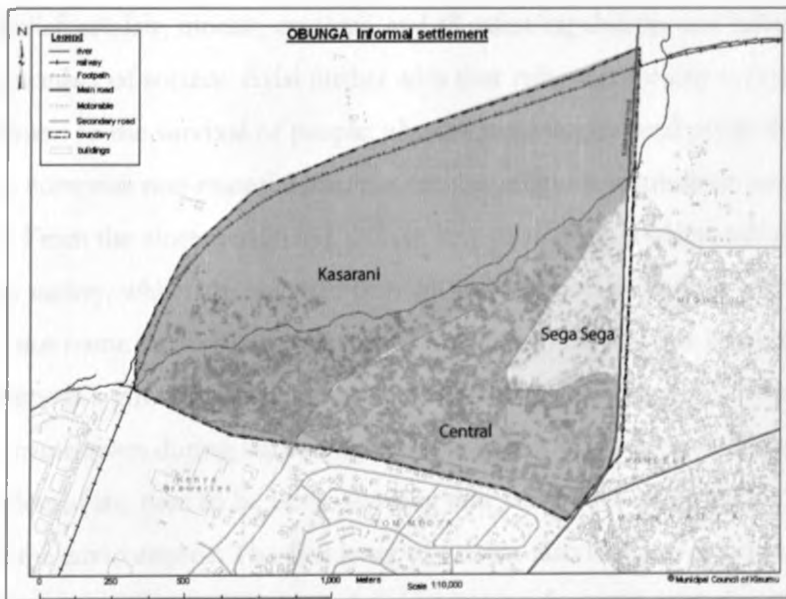


Figure 1.5 An Obunga informal settlement is made up of Kasarani, Segga Segga and Central sections. (Source: GIS, Municipal Council of Kisumu, 2008)

²⁴ WHO (2004)

As pressure for plots to build houses grows, the size of plots has continued to get smaller and rents have exponentially continued to rise²⁵. Furthermore, with no road network, the few tracks operating as roads are often impassable due to poor drainage and tightly squeezed houses and other buildings. Against this backdrop, handcarts, *boda bodas*²⁶ and pushcarts are used to navigate within the settlement, whilst public transport can only be accessed from the main road. Concurrent with the aforementioned challenges, is the issue of water shortages which is a major problem. Due to the shortage of water and exorbitant water prices, many residents are often forced to use untreated water from streams, springs, wells or the lake leading to a high level of resultant water-borne diseases. In addition, indiscriminate sinking of boreholes without due consideration to the location of pit latrines has also resulted in the use of contaminated water, leading to outbreaks of diarrhea and typhoid. Occasionally, burst sewer lines from the adjacent settlements often spew waste on roads, further exposing and endangering the residents.

1.3 Context of the problem, JoLuo, culture and sanitation

Ayisi²⁷ defines culture as the sum total of the material and intellectual equipment whereby they satisfy their biological and social needs and adapt themselves to their environment. According to Malinowski²⁸ culture is that complex whole which includes knowledge, belief, art, law, morals, customs, and all other capabilities and habits acquired by man as a member of society. Ayisi further adds that culture embraces everything which contributes to the survival of people; physical, sociological and psychological factors which comprise non-material interests such as religious institutions and ritual observations. From the aforementioned, culture may provide an understanding of the behaviours in society, which are acquired through socialization, education and experience. Luos name their children after the time of day that they are born, for example: Atieno is a girl born at night; Akinyi is morning; Achieng when the sun is high. Akeyo is the name given during harvesting, Apiyo and Adongo are twins, with Apiyo the name of the first of the twin to be born, showing that *JoLuo* have an intrinsic cultural awareness of the environment. The first letter of a name also indicates gender, for example, Otieno would be the name of a boy and Atieno for a girl, both for the same

²⁵ *Situation Analysis of Informal Settlements in Kisumu*, UNHABITAT (2005)

²⁶ Bicycle taxi transport popular in Kisumu city

²⁷ Ayisi, E.O (1979: 1)

²⁸ Malinowski, quoted from Taylor

name. Names are indicative of character, order of events, or issues, and can carry political nuances which are used to convey negative or positive meanings. In effect, culture in this context, provides a platform through which one can understand how a community dialogues with design.

The Luo are Nilotic-speakers of Nyanza Province; are the same people as those living in northern Uganda, south-west Ethiopia, south Sudan and northern Tanzania. Members of the Luo community are homogeneous in language [*Dholuo*] and make up the third largest tribe of Kenya. Historically, studies reveal that the Luo originally migrated from the Bahr al-Ghazal region of Sudan.²⁹ Throughout the mid and late twentieth century, they settled in three districts around Lake Victoria, with a varied landscape ranging from flat and dry by the lake, to green and hilly in the eastern uplands. Their neighbors include the Nandi, Gusii, Maasai, and Kuria, and they also have dealings with migrant Indian, Middle Eastern, and Somali traders in the towns.

Livelihood

Although JoLuo practice agriculture, keeping cattle is deeply entrenched in their social fabric, and is an essential aspect of their social structure. Cattle are used in negotiating bride price or in mourning, cow dung for plastering walls and floors of houses, and a mixture of cow urine and sour milk for making ghee. Cattle are perceived as a sign of wealth and used in trade. In the latter half of the twentieth century, some Luo men migrated to plantations, towns and cities within the country, for employment. However, cattle are still found in many homesteads, even in peri-urban settlements. Similarly, several large sugar plantations within Nyanza Province are a source of manual labour. In rural areas of Luo Nyanza, fresh-water fishing in Lake Victoria is the most important economic activity. The fish is consumed locally while some, especially the Nile perch is exported to Europe and other countries.³⁰ The fishing industry employs many people resulting in heavy rural to urban traffic, majority of whom settle in the informal settlements, thus adding strain to the already dense and crowded housing, equipped with poor or no basic sanitation service.

²⁹ Accessed at <http://www.everyculture.com/Africa-Middle-East/Luo.html> (5 May 2009 at 4.26 pm)

³⁰ Accessed through <http://www.kenya-information-guide.com/luo-tribe.html> (May 8 2009) 4:43pm

Traditionally, the Luo are patriarchal.³¹ Patriarchy, bride-wealth, and polygamy³² are common practices. The community is *patronymic*, which means they name after their fathers or ancestors. Marriage is not only between a man and woman but between families and involves kinsmen from both families. However, special rules of conduct are expected from all involved and a discreet social distance is maintained.³³ The Luo custom requires that respectful social distance should be maintained between a husband and his wife's mother, and in extreme cases social contact is prohibited. This prohibition extends to the use of common facilities such as a toilet, bathroom, or bedroom.

Reproduction is a basis of the value system by which men exchange products, progressing from cultivation to chickens; to goats; to cows, and finally, to women. Fertility is a societal concern pegging the success of marriage, and a wife's social status is dependent on producing children. The man's status is stamped in the ownership and subsequent headship of a home. Whereas though owning a toilet improves one's social status in the community, sharing sanitation facilities with a mother in law is unacceptable. As a result, the existing rooming plan prevailing in informal settlements coupled with the absence of one's own sanitation facility puts pressure on relationships, often compromising one's sense of dignity. Often times the mother-in-law is forced to seek accommodation elsewhere.

As demonstrated in the above example, there is need to understand the cultural, gender and gender relations as reflected at the different levels of society. Women are often responsible for health and social care provision, (at home and at the workplace), and men have a greater opportunity to pursue choice careers/work. In addition men participate in the decision-making processes at all levels of public life, for instance, this includes the choice of water and sanitation, and whether there is a toilet or not and its location.

Power relations

Amongst the Luo, gender roles are specific. For instance, wives keep separate houses within the circular homesteads of the larger polygamous families; they farm

³¹ Patrilineage consists of all the descendants through the males of a single male ancestor (taken from *Notes and Queries in Anthropology*, London: Routledge and Kegan Paul, 1960)

³² Polygamy is a general term for plural marriage including both polygyny (more than two wives) and polyandry (two husbands or more)

³³ Ayisi, E.O (1979)

separate fields and maintain separate granaries; husbands are normally considered the heads of the homesteads (see Figure 1.6).

Similarly, farm work is assigned according to gender. Women shoulder the time-consuming task of caring for the basic staple crops, whereas men are responsible for the cash crops—and generally do less of the farming. As fishermen, only men are allowed to go to the lake to fish while the women are left on the

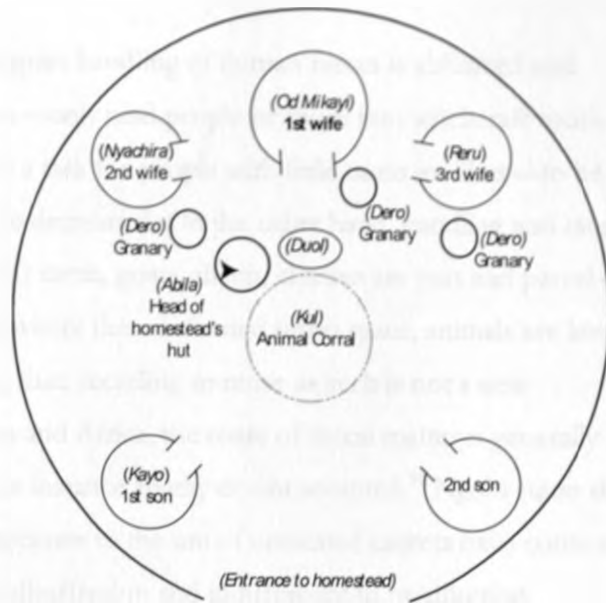


Figure 1.6 An illustration of the plan of a traditional Luo homestead (Source: Researcher in consultation with Prof Walgio Orwa, Great Lakes University, Kisumu, 2009)

shores to wait for the catch. Women’s role as caregivers places the responsibility of cleaning and managing hygiene-related matters of the house. They bear the burden of fetching water for cooking, bathing and sanitation, and tilling subsistence crops, but are not consulted and have no choice, or say in acquisition or location of a water or sanitation facility. Lack of facilities in the modern context inhibits hygienic behaviour. Dirty hands give rise to poor health for themselves and their families. Where sanitation facilities are shared or almost non-existent, alternative means that can provide some form of dignity and security must be sought, such as a simple structure with a door or even curtain that can blot out stares and provide privacy from onlookers.

Age is deeply respected in Luo culture. Allocation of bride-wealth, cattle, land, and to some extent, labour and cash is the prerogative of elders. According to Luo ideology, age, wealth, and respect come together, and it is considered natural that elders control family resources. Elders are also the representatives of their families to the outside world. When and where disputes occur, elders are called upon to arbitrate. Ancestor worship plays a predominant role in the traditional *JoLuo* culture. Ancestral and other spirits are active forces in their world, deeply entrenched and intertwined in beliefs of many Luos, even among those of the Christian faith.

Local Luo custom dictates that faeces is “bad” and has the potential for negative consequences to family members. It is culturally believed that one can be bewitched

through their faeces and in this respect handling of human faeces is abhorred and considered almost an abomination—only mad people or those into witchcraft touch faeces. The handling is considered a task for people with little or no intellect—to be compared to such a person is to be demeaned. On the other hand, handling and reuse of animal faeces is practiced widely for cattle, goats, sheep, chicken are part and parcel of the community, to the extent that where there is limited or no space, animals are housed together with the family. Implying that, recycling or reuse as such is not a new phenomenon. In Europe, America and Africa, the reuse of faecal matter is generally regarded with disaffection, in some instance apathy or not accepted.³⁴ Ngobi states that various kinds of socio-cultural responses to the use of untreated excreta have come up ranging from abhorrence through disaffection and indifference to predilection.

Rural-urban migration, the current cosmopolitan composition of communities, increased inter-marriage between ethnic communities, even among the Luo, has had a big impact on community dynamics. Traditions, value systems and culture have in effect been changed as evidenced in the acculturation of the Luo people.

Kisumu and sustainability

Kisumu is one of the three major cities of Kenya that together with Nairobi and Mavoko, were selected to pilot the implementation of the global initiative Cities Without Slums (CWS) Sub-regional Programme for Eastern and Southern Africa. CWS was launched in 2003 with the signing of a Memorandum of Understanding (MoU) between the Government of Kenya and UN-HABITAT for collaboration in response to increasing poverty in the region. CWS is part of the Kenya Slum Upgrading Project (KENSUP), a collaborative effort established to provide a framework to sustain long-term nationwide slum upgrading in Kenya.³⁵

Sustainability³⁶ is crucial to growth and development. Lack of sustainability negates interventions and measures to solve problems. One needs to understand the socio-cultural context of the historical perspective of a community, in the hope that such knowledge can feed ongoing and envisaged processes of design interventions sustain-

³⁴ WHO (2006)

³⁵ The programme seeks to assist Member States in the sub-region to achieve the Millenium Development Goal 7 Target 11 of “Cities Without Slums,” by strengthening institutional arrangements, building partnerships and supporting the improvement of conditions of peoples living and working in slums. (Anna Kajumulo Tibaijuka, UN-HABITAT, 2005).

³⁶ Sustainability here refers to a system or process or intervention that can be maintained effectively for a prolonged period—it takes into account, economic, social, environmental and more recently consideraons in its planning and use

ably. This study attempts to discuss how methodology and effective networking can foster community change in attitude and behavior towards their environment in the quest for sustainable social, economic, cultural and political development. International Labour Organization (ILO) in support of sustainable approaches stated that,

‘People all over the world are searching for new and creative ways of working together to tackle society’s increasingly complex challenges.’³⁷

Kisumu City was declared a *Millenium City* by the UN in 2006, with the aim of fulfilling the Millenium Development goals (MDGs) of reducing poverty, hunger, disease, illiteracy, environmental degradation, marginalization and discrimination against women by 2015.³⁸

To fulfill these goals requires an interdisciplinary platform, as well as a multidimensional approach to pursue and exchange ideas, work out design methodologies on sustainable interventions for positive attitude and behaviour change. An integrated approach to sharing the socio-economic and political opportunities available, taking into account the uniqueness and diversity of different cultures or social arrangements must be considered. According to MDG 10 STI, this requires commitment to building human capacities, through entrepreneurial and innovative activities by strengthening linkages and partnerships between industry and communities, integral to forging a creative economy. This effort would consolidate, integrate current and past interventions and build upon lessons learnt to improve the living conditions of communities for a sustainable green environment.³⁹

For example, to consolidate these partnerships, and in order to encourage a practical hands on approach to solving design problems for sustainable livelihoods, the School of the Arts and Design (StAD)⁴⁰, of the University of Nairobi have collaborated with the Urban Environment section of UN-HABITAT, the Municipal Council of Kisumu (MCK) and Umande Trust in the KISWAMP⁴¹ Reality Studio⁴² 2008. Figure 1.7

³⁷ILO, *The Future of Urban Employment*. (1998: 49)

³⁸Many stakeholders, development partners, non-governmental organizations, community based organizations, researchers, students collaborate with the municipality of Kisumu and the Government to apply integrated interventions (UN-HABITAT, 2006).

³⁹ Home2: The Poetics and Politics of Housing in Kenya (Mwendwa S. K. K., 2008).

⁴⁰ The School of the Arts and Design (StAD), in the University of Nairobi, was established in January 2006. It grew out of the previous Department of Design (DoD), which was in existence since 1967, within the Faculty of Architecture, Design and Development. University of Nairobi Strategic Objective 17: To strengthen linkages, partnerships and develop new ones between industry and communities, as integral to StAD translates commitment as building human capacities, through entrepreneurial and innovative activities (MDG 10 STI) to ensure a creative economy. (StAD Concept Paper, 2007)

⁴¹ KISWAMP project aims at promoting Integrated Sustainable Waste Management Practices through involvement of community-based groups, MSMEs and civil society organizations in providing urban services for poverty reduction for communities in Kisumu under the Local Coordinating Unit, with the Solid Waste Working Group at the centre of the implementation. The interventions are directed to contribute to employment and income generation (MDG1), improve living conditions for the urban poor women and men (MDG3), provide a cleaner environment through waste collection and disposal (MDG7)

outlines the schematic process of this collaborative structure and provides its historical background, on the holistic and interdisciplinary approach initiated to mitigate solid waste management problem in Kisumu City, in the hope of using Kisumu City as a model for other Millenium Cities.

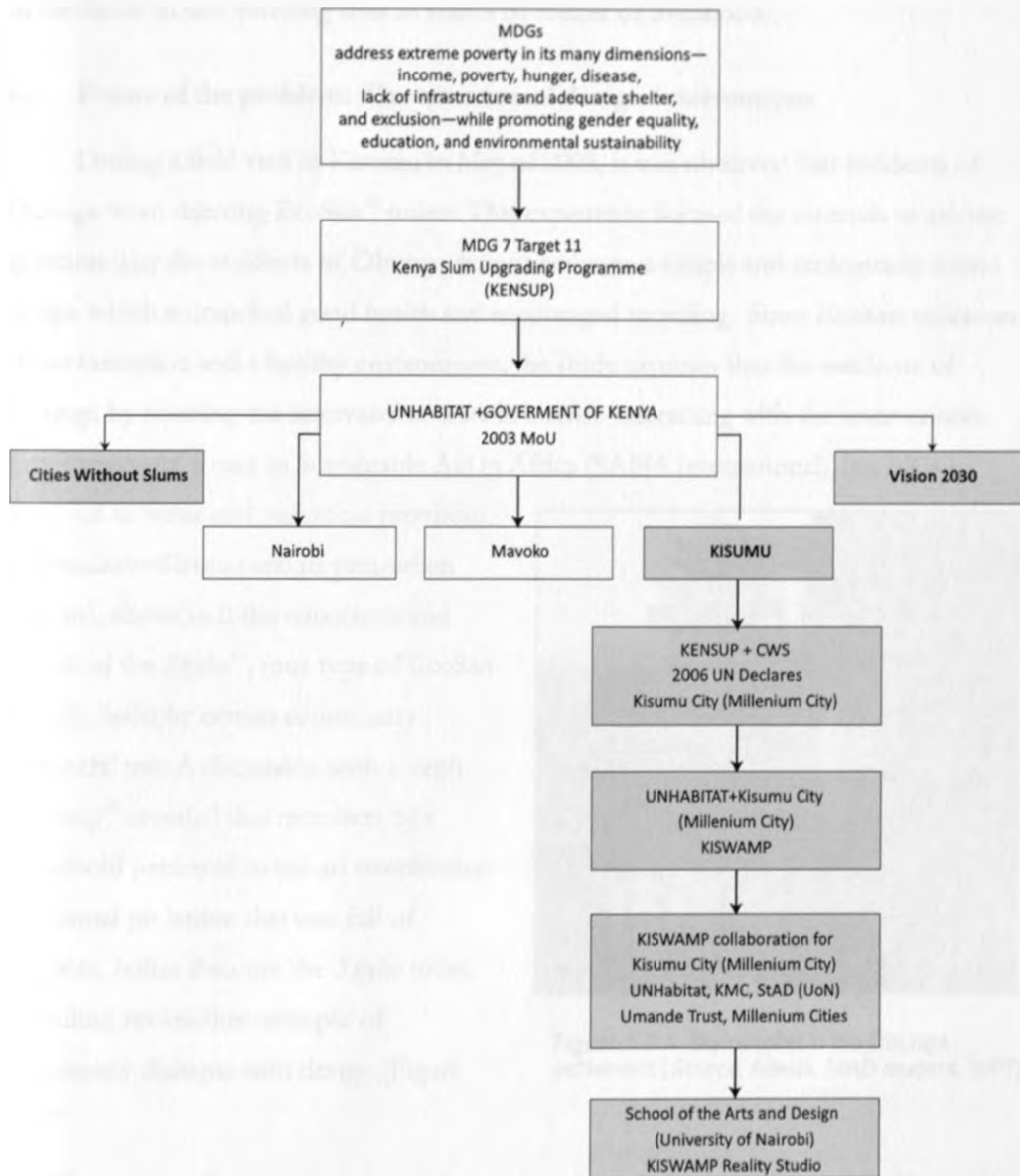


Figure 1.7 Schematic diagram of the collaborative structure between UNHABITAT, UON and Kisumu Municipality (Source: Researcher, 2008)

and offer employment and improving the living conditions for youth (MDG8). (StAD Concept Paper, 2007)

⁴² The ‘reality approach’, as a further development of a qualitative approach, is a rapid but insightful collection of data of diverse information using several sources of gathering information rather than via statistical replication i.e., secondary data, direct observation in the field, semi-structured interviews, preparation of maps and diagrams etc. (StAD Concept Paper, 2007)

Cities like Kisumu are growing fast, and the municipality public service system is unable to cope with the demands of its urban growth. Furthermore, the effects of globalization and climate change are also affecting communities in new ways which they do not necessarily understand nor foresee, often forcing them out of their original homesteads to new dwelling sites in search of shelter or livelihood.

1.4 Focus of the problem: The question of design interventions

During a field visit to Kisumu in May of 2008, it was observed that residents of Obunga were rejecting EcoSan⁴³ toilets. This experience focused the research to ask the question why the residents of Obunga did not embrace a simple and ecologically sound design which entrenched good health and encouraged recycling. Since EcoSan toilets are about sanitation and a healthy environment, the study assumes that the residents of Obunga by rejecting the intervention were in a sense interacting with the intervention. Simultaneously, a visit to Sustainable Aid in Africa (SANA international), (an NGO involved in water and sanitation provision to Nyanza—Kisumu and its peri-urban regions), showcased the reluctance and refusal of the *Skyloo*⁴⁴, (one type of EcoSan design), toilet by certain community members' use. A discussion with Joseph Ochieng⁴⁵ revealed that members of a household preferred to use an overflowing traditional pit latrine that was full of maggots, rather than use the *Skyloo* toilet, providing yet another example of community dialogue with design (Figure 1.8).⁴⁶



Figure 1.8 A *Skyloo* toilet in the Obunga settlement (Source: Adede, StAD student, 2007)

Community dialogue with design here means, people interact with each other, with the environment and objects, with shared ideas and activities. Collectively these

⁴³ An Ecologically sanitized toilet that separates urine and faeces for reuse as an agricultural product

⁴⁴ An EcoSan raised toilet with urine diversion and separate collection of urine and faeces in a permanent structure that requires (6-12 months) emptying of the receptacle and transportation to a composting site.

⁴⁵ Joseph Ochieng, SANA International (2008)

⁴⁶ Other examples of community dialogue with design included the assigning of toilets and kitchens outside one's main house, the use of *Boda boda*⁴⁶ bicycle and *tuk tuk* taxis as preferred means of transportation

constitute a dialogue. Freedoms encourage dialogue. Dialogue occurs at points of interest (focal or convergent points). New ideas and concepts of design succeed on the strength of the interest and interaction they generate. These ideas and concepts become an end and a means to dialogue that design facilitates with the community through the design products. In addition, rental housing in Obunga, trade in second hand clothes and handcrafted products, are some efforts at negotiating life in a relatively harsh environment. The use of products and systems to eke a living is another form of community dialogue with design (see Figure 1.9). Shared toilets—pit latrines is a preserve of those with the facility, and those without toilets defecate in the open or what is also known locally as ‘flying toilets’—faecal matter wrapped in plastic paper and thrown away. In essence, this experience of communal toilet further highlights the dialogue between the community and design, prompting the question of how this toilet could be designed to cater for all the preferences of those using it.



Figure 1.9 Community dialogue with design in Obunga (Source: Adede, StAD student, 2007)

For example, the *Washa washa*⁴⁷ constructed for the community women to use in a bid to ease washing of clothes was, one year after its construction, still not being used, because the intervention was located far away from the dwellings of the women, thus making it inconvenient and difficult for them to accomplish other chores they otherwise do alongside washing of clothes near their houses. This rejection of the *washa washa* based on its encumbrance illustrates another example of community’s way of dialoguing with design.

Intrigued by the adverse living conditions of Obunga residents and curious to find out how the community negotiates life and dialogues with their environment brought to

⁴⁷ A manual-foot pedaled washing machine designed in 2006 by two students from Sweden

mind several thoughts and questions. Rejection could be one manner in which the community negotiates its needs and values.

1.5 Background to the Ecosan toilet

Sanitation and the provision of good hygienic disposal of human waste is a basic human need. According to Professor Sandy Cairncross,

‘It is said that 2.4 billion people, or more than half the population of the developing world, lack sanitation. One of the Millenium Development Goals is to halve that fraction by 2015. Lack of access to safe water, sanitation and hygiene causes 1.6 million deaths a year, mainly due to diarrhea and mainly among young children...the number of people in the world who lack sanitation is more than double those who lack access to safe water’ (WSP, 2004).

In contrast, ecological Sanitation (EcoSan) or urine diverting toilets (UDTs) is ‘an innovative sanitation initiative, in the broadest sense—ranging from simply planting a tree on a disused toilet pit, through to composting human excreta. It combines local construction practices with ecological approaches to develop, popularize and market a new range of pit toilets (WSP, 2007). The toilet design enables communities to safely use human waste as manure. Human waste is rich in nutrients that are beneficial to crop and food production.’ However, human waste is not generally viewed as a valuable resource, mainly due to the perception that it is an unhygienic waste product. According to Jackson,

The EcoSan approach recognizes that human waste is a valuable resource, and designs latrines that enable faeces to be effectively and safely utilized. Despite convincing environmental and economic reasons to support this approach, acceptance of the technology has been very limited so far.⁴⁸

Introduced to Kenya in the late 1990s, the EcoSan technology is yet to take off successfully in some parts of the country. From a 2002 study commissioned by the Water and Sanitation Program-Africa (WSP-AF) of the World Bank, less than 100 EcoSan toilets had been constructed (a figure that has only marginally increased). In Kisumu, the *Skyluo* version of the EcoSan toilet was introduced and built as an alternative to pit latrines, especially in areas with high water tables and community reliance on shallow water wells for utility. Nevertheless, they were found to be unpopular, partly due to cultural issues associated with urine diversion and handling of faeces. Studies reveal that

⁴⁸ WSP-Africa (2005: 2)

acceptance has been slow with only 8 out of 15 toilets constructed still in use.⁴⁹ Success of the EcoSan technology was noted in Makueni District (south east of Nairobi), where 3 initial demonstration *Arborloo*⁵⁰ toilets had been replicated to 57 within a year. Reasons given for this success were (i) the health and agricultural benefits were clear to the community; (ii) the *Arborloo* was easy to construct and affordable.

The rejection by the Obunga community to an environmental sanitation technology with economic overtones as seen in Makueni necessitates the need to enter into the community, and listen to what may not have been said. This may better inform the design process and add a human touch to the process.

This study uses the grounded theory in its approach to investigate the community-design-use dialogue. Other methodologies are also employed but the grounded theory is reliant on first-hand information and high face-validity of data, and hence provides the opportunity to start on the ground—where the people are.

1.6 Objectives and justification of the study

The essence of this study, therefore, is to demystify design and the design process as elitist; find out what needs to inform design interventions, why some designs work and why others do not work. Finally, seek out why a ‘good design’ is not necessarily a good intervention. In terms of intervention, it would be important to understand what role, if any, does politics, gender, attitudes, perceptions, and culture play in determining and/or influencing individual and community decisions and choices. In answering these and related questions, this study hopes to contribute some knowledge towards unraveling community traits that may lead to why a ‘good design’ intervention may seem to work, is successful in one community setup and may not succeed elsewhere. In other words, is culture a part of the success of design intervention?

Arising from the foregoing, the main aim of this study is:

- To establish and explain the disconnect between design interventions and community with the study of the uptake of ecological toilets
- To highlight community characteristics and perceptions, who they are, what they do and why they do what they do using the toilet as a case study

⁴⁹ WSP-Africa (2005: 4)

⁵⁰ The *Arborloo* is an EcoSan toilet with a portable superstructure with no urine diversion, covering a shallow pit that fills after approximately one year. The superstructure is then moved and a tree planted in the filled pit (WSP-Africa, 2005: 3)

1.7 Scope and limitation of the study

This study is confined to Obunga informal settlement. Initially it 'trailed' the research projects fourth year StAD students were working on under the umbrella of the 'Reality Studio 2008' collaborative project, and the communities in the Bandani, Manyatta and Obunga peri-urban areas. The research study focuses on the EcoSan toilet as a case study looking at the community's attitudes, perceptions and dialogue with design interventions, in making a case for the toilet's 'design' as a tool for sustainable development'.

Due to constraints in time and finances the study is limited to a few sites. Nevertheless, it is hoped that the case will generate valuable information that can elucidate the consideration for dialogue with design to drive sustainable development, and highlights its challenges.

In summary these are the questions:

- Does EcoSan toilet as one of the proposed designs fulfill the needs of the community? Is the design 'good' and appropriate to users?
- Is a 'good' design necessarily a good design community intervention?
- Can dialogue and networking foster a new and creative community attitude and behavior towards their environment?

Chapter 2: Ecological Sanitation

2.1 Overview

The past decade has seen rapid development and diffusion of ecological sanitation around the world. Ecological sanitation, or EcoSan, refers to a range of sanitation technologies in which human excreta is recovered and retained on site, and eventually reused. Early contributions by the World Bank and the Swedish International Development Cooperation Agency (Sida) laid the foundation for the international development projects which began to flourish in the late 1990's.¹ This paved way for the first international EcoSan-dedicated conference in 2001, which was held in Nanning, China, to share the status and experiences achieved in promoting ecological sanitation toilets globally. Recently, there has been an explosion of published material in the field of EcoSan. As a result, many international development organizations around the world are now building various types and designs. Nevertheless, whilst the theoretical value of the technology is apparent, understanding the challenges in the acceptance and use of eco-friendly sanitation alternatives to conventional technologies for developing countries like Kenya, still remains.

Ecological sanitation has received unparalleled attention in recent international debates on development, due to its ability to provide adequate sanitation to households, including a nutrient-rich product, and its protection of water resources. In response to achieving the Millennium Development Goals, in particular the goal of *ensuring environmental sustainability*, the target to *halve the proportion of the world's population without access to safe water and improved sanitation*, and to *reverse the loss of environmental resources*², the EcoSan intervention has the potential to be a valuable contribution to integrated water resource management strategies.

However, studies reveal that communities often have negative associations with human excrement. Faeces have an offensive smell, contain a variety of pathogens that are harmful to human health, and often provoke aversion. Often, this disgust can be augmented in the negative cultural sentiments regarding the handling of human excrement to some user groups. According to Dranger³ "Human faeces are disgusting enough to exemplify the saying that 'evil should be fought with evil'". This of course raises the

¹GTZ (2003)

² United Nations (2005)

³ Drangert, J. (2004: 24)

question, as to what, then, would motivate a household to violate these general human sentiments, especially in a society that does not have the culture or tradition of reusing or handling human waste, to choose and adopt an EcoSan toilet?

This chapter sets the scene by giving an overview of the contemporary sanitation practices in developed and developing countries. It examines the historical context behind the design and development of the EcoSan toilet. Emphasis is made on how design is perceived and understood, including how a community dialogues with design interventions. This is followed by a discussion on how design and development affects and infects communities. In addition, it reviews previous studies carried out on sanitation in general, highlighting the success and failure of the technology against different urban settings.

2.2 Sanitation practices in the developing world

The scale of the sanitation crisis in Africa is enormous – over 303 million people – had no access to basic sanitation in the year 2000. Between 1990 and 2000, the number of people gaining access to improved sanitation failed to keep pace with population growth. Yet rural-urban migration continues and is projected to grow faster and become bigger (UN-HABITAT, 2006; Winblad *et al*, 2004). The combination of poor progress, population growth, extremely weak economies and sometimes civil strife mean that the MDG targets facing Africa seem almost insurmountable.⁴

The quality of life in city informal settlements⁵ is riddled with insufficient infrastructure to provide water, sanitation and manage solid waste. Present sanitation coverage in informal settlements is dismal, with 40 percent of all the people in the world without any sanitation service (UN, 2004). Limited government sanitation services means communities make do with what is provided or improvise, thus paying higher prices to water vendors. In many areas soil conditions are inappropriate for conventional types of sanitation, and elsewhere the water table is often too high, rendering ground water susceptible to pollution. In addition, conventional latrines (i.e. the septic tank and sewage treatment systems, often discharge into the environment with little or no sanitation, or nutrient removal. Severe health consequences are one outcome of the insufficient

⁴ WSP (2005: 2)

⁵ From several visits to informal settlements in different locations, for example Kibera in Nairobi (8 May 2008) and Obunga (March 2007, 12 May 2008), Manyatta (12 May 2008) and Nyalenda (13 May 2008) in Kisumu

infrastructure.⁶ Extensive research shows that human excreta can be responsible for the transmission of diarrhea, schistosomiasis, cholera, typhoid, and other infectious diseases affecting children and adults in their millions. Statistics from the World Health Organization (WHO) estimates that nearly 2.5 million children die of diarrhea that good sanitation could have prevented; 3.3 million people die annually from diarrhea-causing diseases, and 1.5 millions suffer, at any one time, from parasitic worm infections stemming from human excreta and solid wastes in the environment. WHO's concern is that,

‘Poor progress in the management of human excreta coupled with the lack of hygiene is a major environmental threat to the world's water resources, and a fundamental stumbling block in the advancement of human dignity.’⁷

Benedickson⁸ argues that contemporary hazards, such as pollution, are often more toxic and potentially catastrophic, with far more spatial impacts than those that characterized the nineteenth century. The effects of this century are cumulative and irreversible, and craft their way invisibly. Recent United Nations estimates global wastewater production at 12,000 km³, roughly equivalent to Lake Superior. Barry Jackson sums up this grim reality by stating,

‘Sanitation and hygiene are fundamental to good health and dignity, and improving sanitation and hygiene practice are household matters. However they are often strongly influenced by community *'trends'* and so it is useful to learn about and compare the perceptions of hygiene and sanitation at household, community and *'official'* levels.’⁹

What Barry seems to indicate is that local social development is crucial in its own right? The current global trend of urbanization is creating pressure on the world's ecosystem. This is exacerbated by municipal governments (in developing countries) unwillingness or inability to provide sufficient water and sanitation services.¹⁰ Consequently, low-income households rely on some kind of drop-and-store (pit latrine) sanitation technology to deal with their needs. Ghimire has pointed at that,

‘Researchers worldwide have raised an alarm that people deserve to have access to resources required to meet their basic needs, economic safety and where possible, upward social mobility. Nevertheless, interventions can only be

⁶ Bigio *et al*, 2004: Nairobi City Water and Sewerage Company, 2009

⁷ WHO (1998: 4)

⁸ Benedickson, J. (2007: 244)

⁹ WSP (2004: 2)

¹⁰ Esrey *et al* (1998)

realized and sustained when they have the dual objective of protecting and improving livelihoods and ecological conditions.¹¹

According to a Water and Sanitation Program –Africa (WSP-Af 2004) report, part of the reason for the failure to realize significant progress over access to sanitation is attributable to reliance on approaches that are dependent on government subsidies or donor sponsored latrine construction. The failure of these methods is due to the lack of demand, the production of products or services which cannot be sustained beyond the subsidy, or the solutions replicable at scale.

2.2.1 Sanitation in the Kenyan context

As urban cities around the world continue to grapple with the challenge of providing adequate and affordable sanitation services for all sectors, Kenya is no exception to this rule. The Government of Kenya's desire to provide its people with the highest possible standard of social service is made all the more acute by a colonial history, during which most Africans were second-class citizens in their own country. As a result, they were provided with fewer social services, far below those enjoyed by the expatriates. This effectively created a two-tiered system.¹² Historically, in Nairobi and Kisumu, provision of sanitation facilities for zoned residential estates were earmarked for low income Africans in pre-independent Kenya who used the bucket system, where sludge emptying had to be carried out periodically. Similarly, whereas the middle income residential areas used the 'eastern' type toilet where one squats and flushes after use, the European quarters were fitted with 'western' type seat toilets with 'flush and discharge' facilities.

A 2004 World Bank study on the history of provision of public toilets in Nairobi indicates that many of the public toilets were constructed at suburban market centres prior to the country's independence in 1963, with the addition of a few more in the 1970s and 1980s. Thereafter, the Nairobi City Council did not have a clear policy regarding construction and maintenance of public toilets, including rehabilitation in an emergency.¹³ This may illuminate the lack of sanitation provision for the poor, who lived outside the service provision boundaries.

¹¹ Ghimire *et al* (2006: 3)

¹² ILO (1973: 5.30)

¹³ WSP (2004)

Accordingly, the common sanitation practices are defecating in the bush, often practiced in rural areas where there is plenty of open spaces, but becomes problematic in cities when space is reduced, the 'pit latrine' (long-drops or drop-and-store) and 'flush toilets' (flush-and-discharge). In the case of water-based flush toilets, human waste is typically disposed through a sewerage collection system. Excreta (urine and faeces) are transported through sewerage pipes to centralized wastewater treatment facilities. Thereafter, the wastewater undergoes treatment, and is later discharged into a river, lake or ocean. A 2005/06 KIHBS report points out that a majority of Kenyans do not have comparable forms of hygienic sanitation, with only a modest 30 percent having flush toilets. Even then, water shortages in the city have made these toilets highly unhygienic.

In rural and peri-urban Kenya, the dominant mode of excrement disposal is the pit latrine, based on containment and indefinite storage of human waste.¹⁴ Examination of a more rural region like Nyanza Province, (where this research was conducted), the usage of pit latrines is even more widespread, with approximately 66% of the population using a pit latrine. The majority of the remaining population in Nyanza (26% of the total), has no sanitation facility at all and use "the bush" or open defecation.¹⁵

2.3 Sanitation practices in the first world

Wynn noted that for centuries people in the developed countries have been flushing waste and waste-related products into waterways, treating them as nature's sewers. He states that in the First World, the toilet is a fundamental part of the sanitation system, designed to hide and to carry away human excreta by the flushing action of water. The (toilet) room is intensely private where actions can be carried out covertly, and the device itself provides seemingly quick, quiet, and effective disposal of the evidence of these necessary deeds. Politely referred to as 'toilet', 'WC' and 'throne room' address and reinforce cultural taboos of Western societies where urination in public is an abhorrent conduct¹⁶. As Wynn points at that,

Arguably, toilets connected to sewage systems solve a social problem by simply transferring the waste elsewhere, to be handled properly, by so-called effluent societies. However, the culture of flushing has not solved the problems

¹⁴ Esrey *et al.* (1998: 3)

¹⁵ Central Bureau of Statistics (2004)

¹⁶ Benedickson(2007: vii)

of effluent disposal, as evidenced in his concern over the long-standing and dangerous treatment of waterways as nature's sewers.¹⁶

Advances made towards sanitation systems that treat the different types of waste, eliminating and cleaning up the effluent before have not ensured clean water without toxic pollutants being released into the natural water supply. Treatment plants or oxidation ponds cannot ensure that water courses do not get contaminated midstream from on site waste products, or industrial effluents, because the former have no control on location of settlements.

2.3.1 The international perspective

In the international development field, the dominant paradigm in addressing sanitation has been to try to provide select communities with industrialized sewage systems. However, these types of systems are often a poor technological fit for many less economically developed places.¹⁷ The initial capital cost of installing piped sewerage networks often makes them too expensive to be an affordable or viable option.¹⁸ Even when a community does build a piped network, it is not always accompanied by a wastewater treatment system. 90 percent of the wastewater in developing countries is discharged into receiving, untreated water bodies¹⁹ affirming Wynn's statement that 'we' are the main cause or agents of environmental degradation, both individually, and collectively. Biologically enhanced primary treatment has been proposed for wider use as an economically and technically appropriate first step in wastewater treatment in many developing countries. However, conventional forms of centralized sanitation still include large operation and maintenance costs, high rates of water consumption, frequent service to the wealthy and neglect of the poor²⁰, hence, they would not be practical in developing countries.

How then should the challenge of sanitation and access to acceptable sanitation be addressed sustain-ably? New strategies and methods are required to improve sanitation, ensure equitable access for everyone, to protect human health, and environmental resources in order to move towards the goal of achieving sustainability. This will require political will, more openness to learning from personal experiences and those of others, new and innovative approaches that apply a mix of technologies and systems. These

¹⁶ Wynn (2007: xxi)

¹⁷ Kalbermatten, (1980)

¹⁸ Esrey, S.A. (2001)

¹⁹ Esrey, S.A. (2001); Schlick, (2001)

²⁰ GTZ (2004)

approaches need to consider the impact of a sanitation system on the ideas of equity and the environment, to allow for alternatives if a proposed sanitation system cannot be implemented completely, with an awareness of changing situations or crises.²¹

Most of the possibilities that have been developed to solve sanitation systems are challenging to implement. The costs of each intervention are considerable, while complete and accurate indices for expenditure and benefits, is impossible. Though heavy investments from the 1980s has brought clean water supply to millions around the world, public health gains have been far lower than anticipated because progress on the sanitation front has lagged behind, hence urgent action to scale the provision of improved sanitation is necessary. While development impacts on environmental resources, development is also dependent on the state of environmental resources available. The challenge therefore, is to induce sustainability through diligent use of environmental resources for continuous and lasting development, hence improve people's living environments.²²

Simpson-Hebert *et al*²³ on sanitation promotion concur with WSP-Africa²⁴ studies on the need to involve intended users of any sanitation services. To involve intended users implies listening to them, crafting policies that they find friendly, and engaging sustainable design. Benedickson (2007: 327)²⁵ also supports this view when he argues that *'society is more inclined to value economic activity at the expense of environmental quality.'* In general, privy development over ecosystems and ignoring public health concerns is at the root of sanitation-related problems. Some of these problems are manifested in pollution of air and water by discharge of all manners, and the disruption of habitats and the lives they support.

2.3.2 Summary

All of the above discussions, on sanitation in the developing and developed worlds, point at a design that works for conditions among the poor living in informal settlements or rural Kenya. The design of EcoSan toilets needs to consider and answer the following questions:

- Does EcoSan toilet as one of the proposed designs fulfill the needs of the community? Is the design 'good' and appropriate to users?

²¹ WHO (1998: 7)

²² Lyse, (2002: 6)

²³ Simpson-Hebert, M. & Wood, S. (1998: 7)

²⁴ WSP-Africa (2005: 2)

²⁵ Benedickson, J. (2007: 327)

- If the design is 'good', why is the community of Obunga, in Kisumu City hesitant to accept it?

Friedrick Engels in reviewing Francois Guizot's 1850 pamphlet described a situation in England, similar to the challenges Kenya has of the working class environment. He wrote the following about 'The Condition of the Working Class in England in 1845':

'If anyone wishes to see in how little space a human being can move, how little air -- and such air -- he can breathe, how little of civilization he may share and yet live, it is only necessary to travel [to Manchester, England]... The cottages are old, dirty and of the smallest sort, the streets uneven, fallen into ruts and in part without drains or pavement; masses of refuse, offal and sickening filth lie among standing pools in all directions; the atmosphere is poisoned by the effluvia from these, and laden and darkened by the smoke of a dozen tall factory chimneys.'²⁶

Evidently, the people in the English context bathed indoors in tubs, but used communal toilets. It is possible that the cold weather, stringent laws, urban overcrowding, and social construct, among others played a role in getting people to accept sanitation standards in ways that might not apply in Africa, even though the conditions echo a similar setting in present Africa's informal settlements. Hence, the urgent need to pursue the ecological sanitation approach

2.4 The ecological sanitation approach

Esrey *et al* strongly advocate that,

'Sanitation is a key determinant of both equity in society, and society's ability to sustain itself. If we cannot meet sanitation challenges, we will not be able to provide for the needs of the present generation without hindering that of future generations. Thus, sanitation approaches must be resource minded, not waste minded. Similarly, there can be no equity as long as half the world's population goes without even basic sanitation.'²⁷

In this event, sanitation being resource minded adds value by providing an economic base along with sanitation service thus making it more acceptable. Given the sanitation crisis and related health effects of poor sanitation, water shortage, pollution, food insecurity, and the urban explosion for millions of people there is an urgent need for a paradigm shift. This will enable populations to embrace alternative sanitation systems such as ecological sanitation. The 'ecological sanitation' approach, or 'eco-san in short',

²⁶ Engels, F. (1850)

²⁷ Esrey *et al* (2004)

characterized by 'sanitization and recycling', seeks to provide alternative and conventional sanitation, which Esrey *et al* sees as being,

'based on an approach to sanitation anchored on three fundamental aspects; rendering human excreta safe, preventing pollution rather than attempting to control it after we pollute, and using the safe products of sanitized human excreta for agricultural purposes.'²⁸

EcoSan differs from other decentralised sanitation systems (such as a pit latrine) in that there is a deliberate focus on the reuse of excreted material as opposed to treating it as a waste. In the words of Dr. Uschi Eid, Parliamentary State Secretary, Federal Ministry for Economic Cooperation and Development at the opening of an ecological sanitation symposium in 2000, he noted that,

'Practical solutions are already being tried out in developing and developed countries, but it is not everyone that has heard about them. What is lacking is the awareness that this is a sustainable alternative, compatible with the needs of the future. The concept of Ecological Sanitation looks at water not in isolation but in the context of agriculture, erosion control and the maintenance of soil fertility in the broadest sense. Thus, Ecological Sanitation makes a major contribution to the implementation of the United Nations Convention to Combat Desertification that defines the principles that are beneficial in utilizing scarce resources, such as that of decentralizing responsibility or of popular participation. The fact that the Convention is based on the principle of partnership is of vital importance for the maintenance of soil fertility.'²⁹

Partnerships and holistic approaches allow for integration of various options that together provide the foundation of sustainable solutions. Against this backdrop it is important to note that ecological sanitation (EcoSan) is not a single new technology, but "an approach which takes economic, ecology and social parameters into account...by promoting...new sanitation principles and concepts"³⁰ as clearly stated by McCann. Studies reveal that it is an eco-friendly sanitation practice which has been in use for years in many countries. For example, Esrey *et al*³¹ points out that in Northern Vietnam hundreds of thousands of rural households use ecological toilets and recycle their products in agriculture. In Yemen, there is evidence of hundreds of traditional versions of ecological toilets, among these, successes and failures have been noted and provides lessons to learn from both. The 2004 edition of *Ecological Sanitation* (Winblad), the 1980's

²⁸ Esrey *et al* (1998: 4)

²⁹ Eid, U. (2000)

³⁰ McCann, B. (2005: 28)

³¹ Esrey *et al* (1998: 44)

World Bank publication titled "Appropriate Technology for Water Supply and Sanitation", and Peasey³² (2000) provides a comprehensive review of different types of EcoSan toilets.

2.5 The Ecosan toilet as a design concept

A design is deemed to be 'good' when the design is accepted, and is used consistently for what it has been designed for (the brief). Good designs are always adapted to, copied and readily replicated, and often modified to suit user needs. Erlhoff³³ describes design as,

'The way we live our entire lives—surrounded and organized by design. It is the way we take a bath, drive, package things, view the world through our glasses—programme of our activities, hence, mirrors and influences our choice(s).' (Figure 2.1)

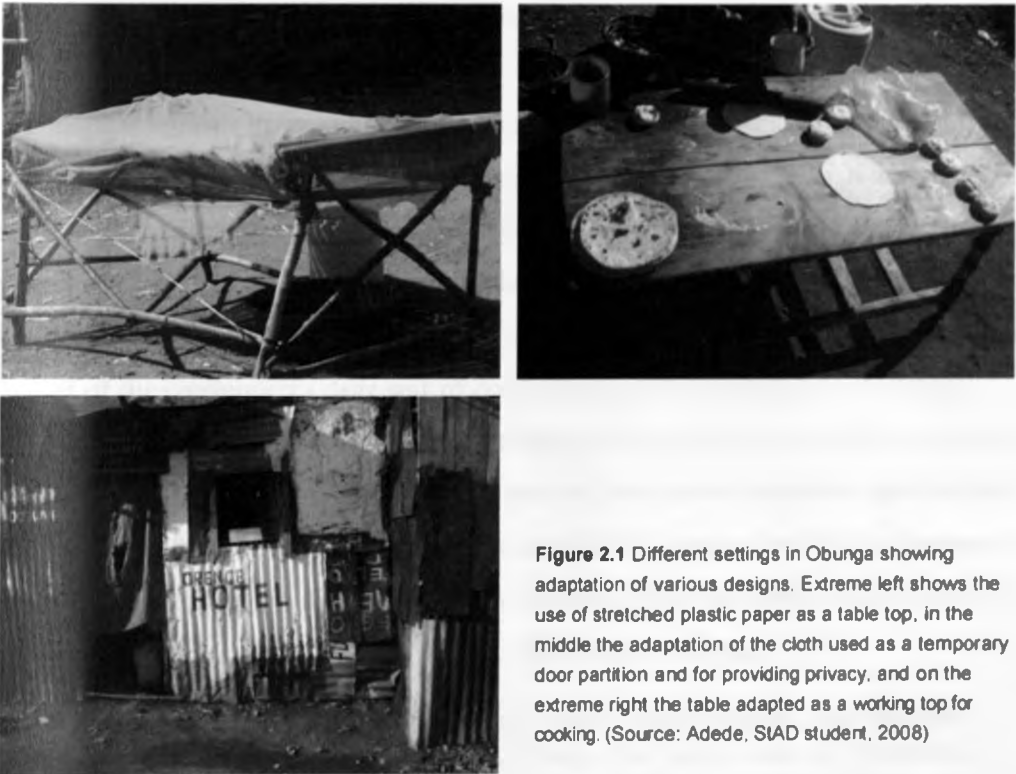


Figure 2.1 Different settings in Obunga showing adaptation of various designs. Extreme left shows the use of stretched plastic paper as a table top, in the middle the adaptation of the cloth used as a temporary door partition and for providing privacy, and on the extreme right the table adapted as a working top for cooking. (Source: Adede, SIAD student, 2008)

The clothes we select to wear and how we wear them, the houses we decide to live in and how we live in them, the soap we choose to use in bathing or washing clothes and how we use them, the toilets we use and how we use them, informs who we are and how we view ourselves. Similarly, although toilets and their use is a subject often shied away

³² Peasey, A. (2000)

³³ Erlhoff, M. (2005)

from, perhaps more due to the covertness of or embarrassment over the activities undertaken in the premises, it is a fundamental and intrinsic facility that is central to our daily activities. Provision of a good toilet therefore is a necessity. We sometimes stumble over design, (one may not know precisely why a certain object or idea appeals to them), misinterpret objects (by not understanding their value, origin, use or purpose), or simply dislike them (perhaps the colour, shape, size or material or context used or ideological predisposition. For example, the association and dialogue with a particular design, for example, shabbiness or wearing of torn clothes is often associated with poverty and beggars. Erlhoff adds that design is not simply a good thing in itself, it is a process. He states in his book on Product Design that,

‘Design requires exposure to constant tests to evaluate its success or failure, and is a useful provocation, opening up new experiences, even compelling the change of behaviour, and anticipating what may only be accepted as the norm in future.’

Design is intrinsic in providing a platform for working together with a problem, understanding the problem and being a creative part of the solution. Though design is at times misunderstood, misplaced, misrepresented, ignored and/or relegated to the periphery, it needs to be brought forward in playing a crucial role in the “sustainable creative process”. ‘Sustainable’ here is defined as being in the state where it becomes a part and parcel of the community’s daily way of doing things and responding to challenges, thereby not only accepting the process but in relating to the problem become(s) part of the process. Understanding design and the design process provides a foundation upon which transferring ideas, activities and programmes can be built to sustain livelihoods. Interaction and dialogue with the design element or object becomes more hands-on, practical-oriented and easier to make meaning of and work with. According to Ashton,

‘Design helps people distinguish and enjoy ideas, make choices, and navigate their way in their day to day activities. Design can also create an enormous amount of pleasure and satisfaction in those who generate it...they are expressions that indicate the diversity and richness of any given culture. *Ashton* sees it as one of those fascinating traits of being human.’³⁴

A practical example of design as an expression indicative of diversity and creativity is the *boda boda* bicycle taxis that are the preferred form of transport for many people in Obunga and other environs within Kisumu city. They are affordable, effective and available. However, design requires team work, collective responsibility and an integrated

³⁴ Ashton, (2006:)

multi-pronged approach as it cannot stand alone. For instance, for design interventions, such as the EcoSan toilet to be effective calls for focused, participatory and strategic interdisciplinary partnerships to achieve a proactive community change in perceptions, attitudes and behavior. Understanding a community calls for sensitivity into how they see, interact and dialogue with elements of design in their day to day activities before, and at the offshoot of a new design concept such as that of the EcoSan toilet.

Studies by the Water and Sanitation Program Africa (WSP-Africa) recognise that interventions (the design) such as the ecological toilets may not suit everybody. To a large extent acceptance depends upon preferences of the community and degree of 'user involvement' for management of the technology, as evidenced by the selection of type of EcoSan in different regions or localities. For instance in Malawi, the *Arborloo*³⁵ and *Fossa Alterna*³⁶ proved more popular than the *Skyloo*³⁷ due to cost and value of added fertility to soil, and limited or no contact with contents (did not conflict with cultural norms or practices). Furthermore, their contents looked harmless and did not smell. The *Skyloo* on the other hand needed a 'full involvement', as well as considerable user education (Figure 2.2). Moreover, the handling of its contents proved to be a barrier, with many owners preferring to pay someone else to handle them. This action indicates that design alone may not be a deciding factor, but, design at a reasonable cost, providing a product that the community can use as part of their daily lives is how it can contribute and be accepted.

³⁵ *Arborloo* refers to a portable superstructure with no urine diversion, covering a shallow pit (1 metre deep) that is used until full, after approximately one year. After each use, a mixture of soil and ash is added to produce balanced compost, dry the faeces, prevent odour and increase pathogen destruction. On filling up, the slab and superstructure are moved to another pit. A thick layer of soil is added to the pit and a young tree planted on the soil. The tree grows and utilizes the compost to produce fruit. (WSP-Africa Field Note, 2005)

³⁶ The *Fossa Alterna* has two permanent pits with a portable superstructure. When one pit is full the latrine slab is moved to the other pit. The first pit is then covered with soil, and left to compost as the second pit is used. When the second pit fills up the contents of the first pit is emptied and the pit reused. Soil and ash are added with each use. (WSP-Africa Field Note, 2005)

³⁷ *Skyloo* refers to a raised toilet with urine diversion and separate collection of urine and faeces in a permanent structure that requires periodic (6-12 months) emptying of the receptacle and transportation to a composting site.

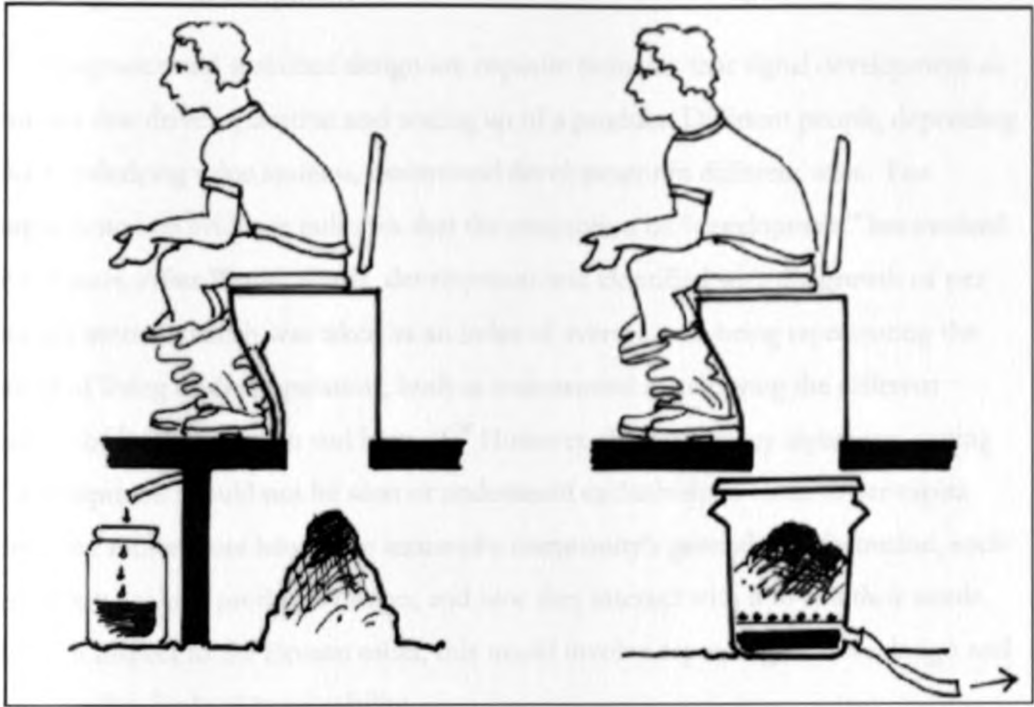


Figure 2.2 From top: an illustration of eco-toilet (Source: Winblad *et al.*, 2004); left: an *Arborloo* in Malawi; *Fossa Altera* in Zimbabwe (Source: P. Morgan, WSP-Af, 2005); and *Skyloo* in the Obunga settlement (Source: Adede, STAD student, 2007; illustration of *Skyloo* from Winblad *et al.*, 2004)

2.6 Design and development

Acceptance and sustained design are requisite elements that signal development as precursors that drive replication and scaling up of a product. Different people, depending on their underlying value systems, understand development in different ways. For example, historical evidence indicates that the conception of “development” has evolved over the years. After World War II, development was identified with the growth of per capita real income, which was taken as an index of average well-being representing the standard of living of the population, both as instrumental in achieving the different objectives of living and as an end in itself.³⁸ However, there are many arguments stating that development should not be seen or understood exclusively to relate to per capita income, but rather more broadly in terms of a community’s general transformation, such as an acceptance of a product’s design, and how they interact with it to suit their needs. Thus, with respect to the Ecosan toilet, this would involve espousing its basic design and developing this for local sustainability.

Development may occur when a community not only embraces the design such as the Ecosan toilet (in some cases), but where their interaction and dialogue with the toilet prompts modification and replication for wider distribution and use. EcoSan toilet has the potential to be an income earner to improve peoples lives. For example, it might translate into business ventures, where entrepreneurs with the technical know-how make similar toilets, or adapt new designs to generate income. This process would then consolidate and reaffirm Amartya Sen’s³⁹ statement that considers *development as a freedom*, and emphasizes development as,

‘A process of expanding the real freedoms that people enjoy. Freedoms are both primary ends and principal means to development—they are connected, linked to one another and can strengthen one another.’⁴⁰

Sen further believes that,

‘Development can expand substantive freedoms, directing attention to the ends that make development important, rather than merely to some of the means that, among other things, play a prominent part in the process.’⁴¹

Development therefore, according to Sen’s argument is not just about the growth of gross national product (GNP) or personal incomes, or industrialization, technological

³⁸ Andreassen, B.A and Marks, S.P. (2006)

³⁹ Sen, A. (1999: 3)

⁴⁰ Sen, A. (1999: 3)

⁴¹ Sen, A. (1999: 3)

advance or social modernization, it is in the way we sustain our livelihoods. This point is important in relationship to design, that is the basis of the material culture that supports these livelihoods.

Understanding community habits and idioms, (language, prejudices and preferences), makes it possible to garner and propel ideas towards a collective and cohesive way of communicating or dialoguing with design. The implementation of design interventions such as the EcoSan toilet should not overlook these issues. The right to development is considered a collective right, simultaneously enjoyed individually by the citizens of a country and exercised collectively through policies and institutions.⁴² Sen continues to argue that the right to development is a right to both the process and its outcomes, with development being a process over time rather than a finite event.

At the Shanghai Conference in May 2004, a case study by the WSP World Bank on 'Global Learning Process on Scaling Up Poverty Reduction' showed that transformation in the rural water and sanitation sector in Ghana was realised when,

'The centralised supply-driven model was changed to an integrated system, in which local government and communities planned together. The communities operated and maintained their own water services, and the private sector was active in providing goods and services.'⁴³

Sen in reference to the field note, posits that,

'Equity in the distribution of resources and effective participation in the social, economic and political decision making process by its' community can spur development and alleviate poverty, tyranny, systematic social deprivation, intolerance, and the neglect of public facilities.'⁴⁴

By taking such approaches demonstrates Sen's argument that the tendency to view provision of basic services, such as water and sanitation, as the duty of the government raises the expectation of a community, and also challenges many communities and leadership. It engenders a culture of over dependency and lack of will for self reliance. Sen⁴⁵ argues that 'the liberty of political participation and dissent, opportunities to receive basic education, health, water and sanitation, and participation in the labour market are conducive to development even if not seen to be doing so directly'. The importance to

⁴² Sen, A. (1999: 3)

⁴³ WSP World Bank (May 2004: 2)

⁴⁴ Sen, A (1999: 6)

⁴⁵ Sen, A. (1999: 6)

freely interchange—with words, goods and gifts characterizes the way human beings in society live and interact with each other. By way of example, Sen suggests that,

Crucial development challenges of many developing countries today include the need for freeing labour from explicit or implicit bondage that denies access to the open labour market.⁴⁶

Denial of access to product markets is often among deprivations many small cultivators and struggling producers suffer under traditional arrangements and restrictions. Political will and good governance (political decision making process) are therefore, essential and integral ingredients needed for sanitation and sustainable livelihoods.

2.7 Globalization, culture and design

Living in the current age, accelerated globalization has emerged as a key player in development. As a result of the communication revolution, people are more intensively connected than ever before worldwide; it is possible to gain access to and share knowledge of other cultures. However, there is a concern that globalization perpetuates and accelerates the skewed distribution of the world's wealth, overarching the commercial culture over other values that might be more social.⁴⁷ Pro-poor environment concerns and sanitation related programmatic issues have lagged behind as a consequence.

Current urban development ignores the fact that cities need to be environmentally, socially and economically sustainable at the same time for development to be realized effectively. Many new problems have cropped up in the face of the old ones, of persistent poverty, unfulfilled basic needs, famine and widespread hunger, political conflicts and violation of basic freedom, worsening environmental threats, and the sustainability of economic and social lives.

Today effective development requires an integrated approach to educate and address environmental issues alongside those of growing poverty, rising inequity and lack of access to health, water and sanitation. Consequently, in order to share resources equitably and prudently, it is important to understand other cultures. McMichael⁴⁸ argues that it *is difficult to appreciate another person's culture especially when it does not mirror one's own*, yet, there is a need to do this since a wider perspective stimulates the challenge to evaluate one's own culture *sociologically and to think reflexively about social change, development, and*

⁴⁶ Sen, A. (1999: 7)

⁴⁷ McMichael, P. (2004)

⁴⁸ McMichel, P. (2004: xvii)

international inequality. An integrated approach provides an opportunity to incorporate lessons from the limited impact of sanitation in other parts of the globe to inform strategies and policies, and to bridge the gap between policy and local practice.⁴⁹ In this case culture becomes an important aspect.

Culture refers to the attitudes and behavior that characterize a particular social group or organization, and understanding culture is important for meaningful exchange of ideas and for communication. While business provides profit, culture provides meaning from which we make sense of life. People may not be global citizens but they are global consumers. Activities that are not income-generating are often scoffed at or viewed as insignificant! For instance, a community of cotton farmers in rural Kenya may not understand the intricate global cotton market trends, or relate directly to the intricacies surrounding demand-driven global market. Nevertheless, the farmer does not realize how the resulting implications and consequences affects him when planning to plant or harvest, or recognize the need and potential revenue and other benefits of global ideas, such as the 3Rs (recycling, reduce, reuse), let alone the benefits and or implications of ecological sanitation. Budgetary allocation by the farmer is however, directed on service(s) which generate income for the farmer's family sustenance as opposed to services reflective of the farmer's cultural peculiarity or uniqueness. Perception in this regard is therefore a key factor, affecting the decision making process, hence important in understanding cultural attitudes and behavioral traits of a community to ideas and/or situations.

McMichael⁵⁰ suggests that in developing one's own survival strategies some of the community problems can be solved by encouraging grass-root activities that seek to formulate and implement alternative, and sustainable forms of development that focus on the community's basic needs, both material and cultural, as indispensable parts of the development process. Hence national efforts to upgrade informal settlements must understand the intricacies of social and cultural issues prompted by the diversity of communities for meaningful dialogue that can result in effective, adaptable and sustainable ideas and or interventions.

The United Nation's Millenium Declaration in 2000 states that *development* has evolved from material attainments and economic growth to a broad based notion of human development . Therefore, principles that presently guide development initiatives, inform and inspire efforts to *make the right to development a reality for all* a call for moral and

⁴⁹ WSP-East Asia Pacific (2002: 2)

⁵⁰ McMichel, P. (2004: xxiii)

ethical motivation, and collective responsibility to mobilize efforts, to overcome development challenges and create necessary conditions for effecting and sustaining actions. Similarly, there is a need for an enabling legal, political, economic and social environment, which is sensitive to, and reflective of, the local context for the realization of the right to development. The human being is the most important element in the equation and is therefore the focal point of address. Any action or policy being mooted must consider how it will primarily impact the human factor. This would therefore re-define traditional notions of what design is.

2.7.1 Culture and the community

Bujo defines a community as,

‘A body of people or family living together and sharing everything that impacts on their social, economic and political lifestyles, living in a particular locality and to an extent sharing cultural, ethnic or religious characteristics.’⁵¹

What this definition implies is that a community provides for history (their history), a sense of belonging—an identity with a chance to echo, reflect and translate the sense of commonality into everyday chores and activities, in sharing facilities, common interests, working together, striving to improve the welfare of those they commune with.

Bujo⁵² further observes that the importance of the communal dimension in the African context lies on the premise that the African person lives within an extended family composed of the living and the ‘living dead’.⁵³ The feeling of togetherness is anchored on the clan’s or tribe’s reference to a common founding ancestor, often identified along their location, ethnicity and cultural characteristics. He continues on to argue that,

‘Traditional community’s thought systems follow or are guided by a set of connected things or parts; an organized body of material or immaterial things; the established political or social order; a complex of methods or rules governing behaviour...along ethnic and cultural boundaries or lines.’

Which would imply that cultural thought systems to a large extent governs community behavior, attitude and perception. However, in cosmopolitan communities, ethnicity and cultural characteristics have been combined and merged to create a new

⁵¹ Bujo, B. (1998: 18)

⁵² Bujo, B. (1998: 15)

⁵³ Africans believe the dead are not really dead because their spirits are alive

culture unique to the locality, a form of modernization, which is not necessarily westernization.⁵⁴

What these arguments imply is that communities thrive on their diversity, and are interdependent on each other, offering different kinds of support and skills that collectively form a cohesive and closely knit social, economic, political and cultural fabric, which in turn inform the engine that can fuel and drive development. Their social and cultural backgrounds inform the societies they live in, and provide a design dialogue template that orders their activities on a day to day basis. This in effect governs and influences their choices, decisions and preferences, as I argue within this research.

2.8 Community adoption of EcoSan

Studies by WSP-Africa reveal that the community adoption of EcoSan technology has been mixed. Some researchers suggest that the uptake is slow because a paradigm shift in the management of excreta is necessary.⁵⁵ This argument suggests that the benefits of excreta reuse are not seen as quickly as the costs associated with handling and disposal because individuals' behavior must change to adapt to the new technology and practice. It is only with time, that the benefits of excreta reuse become visible after adoption of an EcoSan toilet. In addition to general widespread cultural aversions to handling excreta⁵⁶, Feachem (1983) report that the taboo sometimes associated with those who handle faeces in a community will cause others to be less inclined to be associated with that stigma. Douglass⁵⁷ theorized that "uncleanliness" arises from "matter out of place... which must not be included if a pattern is to be maintained." Applying this to the case of EcoSan, faeces should be excluded from normal daily patterns of life. Drangert⁵⁸ suggests designing toilets to keep feces out of normal sight, as a general rule.

With the importance to the EcoSan toilet as a case study, Winblad⁵⁹ describes communities on a "faecophilic-faecophobic" continuum. A "faecophilic" community (literally, a faeces-loving community) is one that has tradition of reusing and recycling excrement, and has no problem talking about it, handling it, and smelling it. Some East Asian communities are examples of faecophilic cultures—Winblad notes China as one such community. It is important to note that many of the earliest EcoSan toilets were

⁵⁴ Mwendwa, S.K.K. (2000)

⁵⁵ Feachem, (1983); Peasey, A. (2000)

⁵⁶ Drangert, J.-O. (2004)

⁵⁷ Douglass, (1966)

⁵⁸ Drangert, J.-O. (2004)

⁵⁹ Winblad, U. (2004)

based on a design that originated in Vietnam, which was culturally suited. Therefore it is no surprise that sub-Saharan Africa tends to be a "faecophobic" community that has no tradition of reusing or dealing with human excrement, because of historical practice of shifting agriculture. JoLuo practiced shifting agriculture. Winblad (2004: 100) in this case context goes on to say that,

'There was no need for farmers to recycle human excreta and as shifting agriculture often meant a semi-nomadic life there was no tradition of building permanent wells and toilets.'

In dealing with a faecophobic culture, it requires an *'attempt to fundamentally change residents' views of fresh faeces* if faeces reuse is to be promoted. However, Drangert as a possible solution suggests that maybe thought needs to be given to *'transforming the faeces to another product that has no connection to do with fresh faeces'* to counter the cultural notions.⁶⁰ As a result, EcoSan programs in many places in the world use systems that try to 'transform' the faeces before anyone has to handle or move it, which is not the case in Obunga, Kisumu, Kenya.

2.8.1 The Case of Sweden

Awareness of environmental conservation is relatively high in contemporary Sweden. Most people are conversant with recycling and effective structures are already in place for separation of waste at the household level. In 1989, in the North of Bohuslän, in the town of Skärkäll, the idea of an ecological village was initiated when an art teacher felt there was a need for the community to provide a place where artists could come to, live in and paint. At that time, the idea of ecological environmental interventions was being mooted. A group of people with interest in environment sustaining interventions got together, formed an association and bought land on which they collectively decided upon the criteria to be adopted for the construction of the dwelling houses. Amongst some of the criterion included membership of the association; use of ecological toilets; construction and occupation of own house; and the ratio for construction of the house.⁶¹

Many of those living in that EcoVillage were artists and sculptors, and they sustained their environment. According to the researcher's key informant, approximately 15 families today reside in the village, though they do not live there throughout the year.

⁶⁰ Drangert, J-O. (2004: 24)

⁶¹ This information was provided by a Agneta Ekman Wingates during a study tour in aSkärkall, a small town in the North of Bohuslän, Sweden in October 2008.

The total population is about 38, comprising more adults than children. Schools, shops and health centres are situated close by (within a 10km distance). The community has chosen to live close to and work with nature, in order to harness the alternative resources that it can provide. During a field visit to the area, the key informant (a professional photographer who has lived in the village for the past 20 years) showcased her EcoSan (ecologically sanitized) dry toilet for recycling water and waste. Evidence showed that the community members were self-reliant; growing fruits on their plots, and making their own compost. Despite the fact that they were connected to the central water supply system, the villagers also harvested rain water. The criteria used to accept a new family supported the 4R⁶² mantra (reuse, reduce, recycle and reinvent). From this above interview one could say that the concept of the EcoVillage is pillared upon not only on the first 3 Rs, but also the 4th, closely related to design intervention. Together they have safeguarded the community's involvement and ensured participation individually and collectively. The success of the programme rested on the acceptance and preference by the community to spur the uptake of ecological sanitation and is similar to the design process.

2.8.2 The Case of India

In India, a public toilet is not simply a toilet. Public toilets are community centres where people meet to exchange news about what is happening in the community, or in the family, or what happened the other day or last night. When you go to the toilet, you get all the news about the settlement. In fact, in India today, if you want to mobilize people, you first go to the public toilets.⁶³

The need to use a toilet (pit latrine, EcoSan, flush) is a common uniting factor, especially in the slums in India.⁶⁴ Arputham argues that the seven years spent studying Indian cultural values, and ways of using toilets, did not help the World Bank in building toilets in a slum in Mumbai because they were outsiders and did not understand the Indian way of doing things. For example, the Slum Dwellers International (SDI)—founded in the 1970s—is a voice and vehicle that unites the community in India, and through which the community takes charge and moves away from the 'handout approach' to 'split responsibility'. By locking up a municipality employee in one of the toilets, the SDI changed people's attitudes towards cleanliness in public toilets, and in turn was able

⁶² Dr S.K. Mwendwa as Coordinator, in terms of design in the KISWAMP project added the fourth R 'reinvent', as related to what she called sustainable livelihoods or product design development as environments that educate (refer to Figure 1.6 Chapter 1)

⁶³ Jockin Arputham, excerpt from an interview with Rasna Warah at the first World Urban Forum, UN-HABITAT, Nairobi, Kenya, 2002

⁶⁴ Arputham, J. (2002)

to take responsibility for their own lives by making choices that suited them. In the case of toilets, they asked the government to 'pay the capital costs', and they were responsible for planning, designing and maintaining the toilets. The community in collaboration with the World Bank managed to build 100 toilet blocks (2,200 toilets) within a year. The SDI also constructed a total of 10,000 toilets, translating into 1 toilet for every 50 people.⁶⁵ The change in culture and attitude contributed to the successful take up of the design intervention.

2.8.3 Cases in Africa

"Identifying the right context was a prerequisite to introducing the sanitation initiative that combined local construction practices with ecological approaches to develop, popularize and market a new range of pit toilets (EcoSan) that enables communities to safely use human waste as fertilizer. (WSP-Af, 2005: 4)

Embangweni, a rural area in Malawi showed unprecedented interest in the EcoSan technology. Working in collaboration with WaterAid, an NGO, the *Arborloo* and *Fossa Alterna* types of EcoSan toilets proved popular with the community. The *Arborloo* was popular for its simplicity to construct, (even by women who organized themselves into groups and built their own) and the *Fossa Alterna*, for its durability and availability of materials locally. As a result the construction costs compared well to that of a traditional pit latrine. The WSP-Africa Field Note adds that the generation of compost from the EcoSan toilet added value and allowed for long-term cost recovery for households, hence its popularity. This was identified as a driving force in the uptake of the technology when compared to hygiene or convenience. Pit latrines also exist (in their millions), and in some instances, attempts to introduce the 'urine diversion' toilet have been thwarted by the high cost associated with its construction.

A 2003 report by WSP-Africa indicated that after 18 months of dedicated 'seeing is believing' advocacy and demonstrations by WaterAid and through sanitation clubs, resistance and initial skepticism was greatly reduced. A 2003 baseline survey undertaken by WaterAid also established that the concept of ecological sanitation was not new within the region. Households in Malawi had been planting banana trees on abandoned latrine pits for generations. Repeated demonstrations by WaterAid workers illustrating the composting process (break down of faeces into an odorless, easy to handle substance with the addition of soil and ash), quelled any doubts and uptaking of the toilet design. The

⁶⁵ WSP-Africa (2005)

Malawian communities were experienced in emptying the toilet pits, knowledgeable about the contents, and comfortable with handling the waste. Farmers became the enthusiastic advocates for eco-sanitation, which is now self promoting within the area. Over 12,000 EcoSan toilets have been constructed since 2003 in at least 6 districts in Malawi.⁶⁶ However, now demand is such that there is not the capacity to meet it. Driving factors leading to the incapacity to deliver includes the need to increase soil fertility and the desire to grow fruit trees to derive a small income⁶⁷.

Remarkable success with the uptake of ecological sanitation was particularly noted in Niassa Province of Mozambique with assistance from WaterAid (WSP, 2005). EcoSan was introduced as an alternative to the more conventional system of dome slabs, as government subsidies had ran out. Adverse experience resulting from loss of crops in Lichinga and Mandiba in Niassa Province due to heavy rain, catapulted an attitude change in the community, because, the maize crop grown with EcoSan compost, despite the heavy rain, thrived while the rest of the crop was stunted and inedible, leading to an explosive demand for over 2,500 *Fossa Alternata* toilets. Field trials helped farmers understand the concept of ‘closing the loop’⁶⁸—linking improved sanitation to agriculture. The training translated into i) an increase in demand for ecological sanitation (EcoSan toilets), and ii) dispelling the fear of eating crops grown on EcoSan compost. 330 *Fossa Alternata* toilets had been constructed by the end of 2003 and an additional 100 by 2004. This success can be attributed to, intensive PHAST⁶⁹ community interaction, social marketing, low subsidy approach with above all, satisfied users, used to market the programme in Sofala Province, Mozambique. With three EcoSan technologies⁷⁰ to choose from, the *Fossa Alternata* proved most popular, with adaptation to suit their needs. Both pits being within the one superstructure created room for bathing. The soap and water within the bathing area encouraged hand washing, especially after using bare hands to sprinkle soil and ash after use. In Sofala Province, still in Mozambique, a total of 600 *Skyloos* were constructed with donor subsidy for families resettled after floods stimulated demand in neighbouring towns and some additional 12 *Skyloos* were built. Six farmers were also reported to be using urine in horticulture.⁷¹

⁶⁶ WSP-Africa (2005)

⁶⁷ WSP, 2005

⁶⁸ Closing the Loop’ refers to the vision of using human excreta (processed in some way) as a fertilizer of crops which provide nutrition for humans (Jackson, B. 2005: 2).

⁶⁹ Participatory Hygiene and Sanitation Transformation (PHAST)

⁷⁰ *Arboloo*, *Fossa Alternata* and *Skyloo* EcoSan technologies

⁷¹ WSP, 2005: 10

The recycling of human excreta is also not a new phenomenon in Uganda. Traditionally, banana and fruit trees were also planted on filled pits. The EcoSan technology was introduced in Uganda in 1997. Statistics reveal that by 2004 a total of 506 EcoSan toilets had been constructed in South Western Uganda (437 household, 36 institutional, 33 public).⁷² Reasons given by the people for choosing EcoSan ranged from permanence of the structure to the potential for agricultural productivity and hygiene. Ethnic groups in Uganda, for example, the Baganda, value hygiene highly.

In the South African context, the government initiated efforts to convert/replace 25,000 bucket toilets in poor and remote small towns of the Northern Cape and eThekweni, the most arid province of South Africa. With communities receiving funding (capital and running costs) and information on a range of EcoSan options, resulted in 80 percent of households opting for in-house urine-diversion toilets and up to 15,000 conversions were carried out during 2003-4.⁷³ Success was achieved by marketing the technology around social factors such as, choice between different technologies, demonstrating how innocuous the pit contents are, other than demonstrating the benefits of excreta reuse. Wide scale acceptance was in tandem with household choice and preference satisfying social requirements. Re-use of excreta was carried out by burning as fuel or composting by burying. Having no smell, people had no problem in emptying and burying the contents, which they used to plant food crops.⁷⁴

2.8.4 The Case of Kenya

EcoSan promotion in Kenya

The primary push for ecological sanitation in Kenya comes from international organizations and international development donors. Likewise, on-the-ground implementation of ecological sanitation is mainly implemented by local, national, and international non-governmental organizations (NGOs). The Kenyan government while aware of some of the EcoSan activities in the country, has not taken an active stance to support, promote, or reject ecological sanitation as a viable sanitation option.

⁷² WSP, Field Note, 2005: 6

⁷³ WSP-Africa, 2005: 10

⁷⁴ WSP-Africa, 2005: 11

Non-Governmental Organizations

EcoSan technology was first recognized as a viable modern technology in Sweden in the 1970s and was introduced to Kenya in the late 1990s. The World Bank Water and Sanitation Program (WSP) has been an active promoter of the technology and produced numerous publications on the subject in East and Southern Africa, Asia and the Pacific.⁷⁵ However, despite the aforementioned network supporting the introduction of this new technology in Kenya, the extent of implementation is still quite limited as compared to the NGOs interested. A summary of the number of some EcoSan toilets constructed in the country is provided in Table 3.3. As you will note, more than 75 *Skyloo* toilets have been built in Western Kenya, and as the concept of ecological sanitation takes root, other options such as bio-digesters for communal use are also being implemented.

Table 2.1 Some EcoSan toilets countrywide

Institution	Location	Total no of toilets constructed	Type
GTZ through KWAHO, SMEs, CBOs	Siaya, Wajir, Modovashe, Kiambu (Gachere Girls), Meru, Narok (Maisoya Primary School), Kericho (Unilever Teas Estate), Nandi South, Bungoma, Mumias, Maseno/Kombewa, Butere, Ugunja, Rarieda, Yala, Nyakach, Karachuonyo and Rongo	678, with plans to put up a further 825 For peri urban areas there are plans to put up with funding from SIDA, an additional 400 Biodigesters	<i>Skyloo</i> Bio-digesters
SANA International	Nyakach, Bondo, Homa Bay and Kisumu	A total of 75	<i>Skyloo</i>
Umande Trust	Nairobi, Nyalenda (Kisumu)	A total of 13	Bio-digesters
WSP through partner NGOs	Makueni, Nyakach, Siaya, Kisumu	Approximately 60	<i>Arboloo, Fossa Alterna, Skyloo</i>

Source: The Researcher, 2009

Kenyan Government and sanitation challenges

Overall in Kenya, general sanitation issues fall under the purview of the Ministry of Health (MOH) and that of the Ministry of Water and Irrigation (MWI). The former had a National Health Sector Strategic Plan from 1999-2004, which dealt with sanitation in more

⁷⁵ Some of the organizations promoting ecological sanitation in the country besides SANA International and Umande Trust (the partner organizations in this case study) are, Eu-GTZ, the Regional Land Management Unit (RELMA), Osienala (Friends of Lake Victoria), CARE International, Merlin, Practical Actions (formerly known as the Intermediate Technology Development Group (IDTG)) and the Kenya Water for Health Organization (KWAHO). Many of the NGOs mentioned above are funded, at least in part, by international donor organizations that have an interest in the dissemination of EcoSan technologies. For example, KWAHO's EcoSan program is funded by GTZ and the Austrian Development Agency (ADA), and Osienala's projects were funded by the Swedish International Development Cooperation Agency (SIDA). Similarly, Umande Trust Bio-digester programme is funded by GTZ, SIDA and UNHABITAT, and SANA International by GTZ, SIDA among others. Other international agencies involved in the promotion of EcoSan include the World Bank's Water and Sanitation Program (WSP), the United Nations International Children's Education Fund (UNICEF) and the Consultative Group on International Agriculture Research (CGIAR).

detail. The WSP (2005) reports that in the early phases of this plan, the Government of Kenya focused on building latrines with the idea that as long as the infrastructure was there, people would use it. However, from the various user groups' slow adoption of the latrines, the authorities learnt that the infrastructure had to be accompanied by hygiene education and a basic understanding of why toilets are important in order for people to use the intervention.

The Kenya Government recognizes the importance of safe water and improved hygiene and sanitation towards the improvement of people's health and development, which it is committed to attain by the year 2015. It has set a number of initiatives as enshrined in the major reform activities including policies on water, and on hygiene and environmental sanitation. Some of the major strategies adopted nationally include promotion of hygiene and sanitation using "Community Led Total Sanitation" (CLTS), and advocacy by implementing partners to raise the awareness of policy makers in increasing budget allocations, partnership and capacity building. Kenya now has an Environmental Sanitation and Hygiene Policy which was signed in June 2007 and launched in October 2007. In this policy, the government commits itself to ensure that 90% of households will have access to sanitation by 2015.

In sharp contrast to the government's stated policy and commitment to improving health and providing access to water and sanitation, efforts to realize this are still fraught with challenges. The two ministries responsible for water supply (Ministry of Water) and public health (Ministry of Health) continue to work separately in response to different mandates. The Ministry of Water is concerned with water borne sanitation while the Ministry of Public Health is looking at sanitation related to health (for example food contamination and hygiene issues). Not working in tandem has resulted in the duplication of efforts, and in time lags dealing with contamination of water sources due to the misdiagnosis of the root cause problems. Moreover, there is a disconnect between the visions of the two ministries and implementation on the ground. In order to drive development and improve service provision in this sector, it is paramount that the two ministries work together.

In the 1970s, the Ministry of Health was mainly concerned with the promotion of latrines in homes and schools. As a result, the Public Administrative wing of government used by-laws and the Public Health Act to enforce this requirement and ensure timely construction of latrines countrywide. However, with time, the emphasis died out, resulting

in a complete lack of enforcement of the aforementioned regulations. The situation is further exacerbated by the lack of public health officers and agricultural extension workers (who would be proponents of, and invaluable in marketing the concept of ecological sanitation). Ideally, these technical experts should be instrumental in the promotion of a new paradigm which embraces health, hygiene, ecological sanitation and agriculture. Grassroots' efforts perhaps provide the best entry point to the process because it then encourages and allows the community to own the process.⁷⁶

Types of EcoSan in Kenya

During the late 1990s there were three types of EcoSan toilets introduced in Kenya: the *Arborloo*, the *Fossa alterna* and the *Skyloo*.⁷⁷ These are certainly not the only types of EcoSan that exist, but they seem to be the most popular forms of EcoSan in Sub-Saharan Africa.

The *Arborloo*

The *Arborloo* is an EcoSan latrine in which a simple pit is dug in the ground and a toilet superstructure (the above-ground built structure) is placed on top of it. After defecating, users add a few cups of soil, ash, or dried leaves to the excrement. Figure 2.3 shows a demonstration of how an *Arborloo* pit is lined. When the pit fills up, the superstructure is taken off the pit and it is topped off with dirt. In this dirt, the seed of a tree is planted. As the roots form in the topsoil, the excrement decomposes in the ground.⁷⁸ Over time, the excrement from the toilet supplies the nutrients for the tree's growth as shown in Figure 2.4.

The advantages to the *Arborloo* are that it is simple to use, there is no handling of the excrement, and it is inexpensive. Some families using this sanitation method over the years have created an orchard that is essentially fed by their past excrement.



Figure 2.3 Construction of an *Arborloo* toilet (Source: P. Morgan, WSP-AF, 2005)



Figure 2.4 *Arborloo* superstructure in Malawi (Source: P. Morgan, WSP, 2005)

⁷⁶ Interview with Prof P. Odira, water and sanitation engineer, University of Nairobi, Thursday 22 May 2009

⁷⁷ WSP-Africa (2004)

⁷⁸ Winblad, U. (2004)

However, this style of EcoSan needs a great deal of space to continually fill shallow pits and plant trees, and it also can be problematic in areas with high water tables.

The *Fossa alterna*

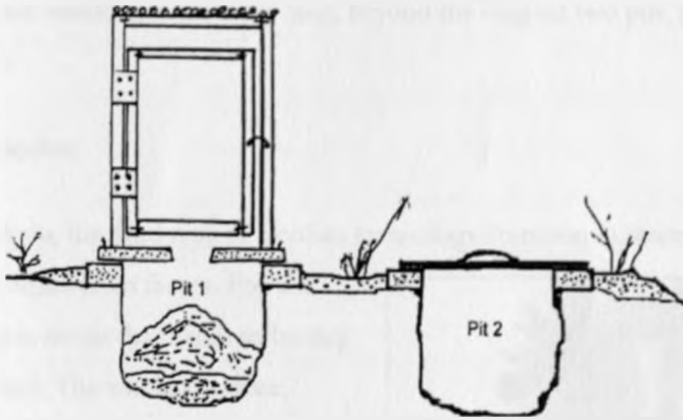


Figure 2.5 An example of *Fossa alterna* toilet from Zimbabwe with processing chambers in the form of shallow pit. During the first year the squatting slab and superstructure are mounted over Pit 1. The following year they are shifted to Pit 2. (Design: Peter Morgan, Harare, Zimbabwe, 1998)



Figure 2.6 An example of *Fossa alterna* in Zimbabwe (Source: P. Morgan, WSP-AF, 2005)

As can be seen from the above diagram (Figure 2.5) and the photograph in Figure 2.6, a *Fossa alterna* type of toilet consists of two permanent pits placed side-by-side. Only one side is used at a time. Similar to the *Arborloo*, ash, soil, or dry leaves are added to the excrement just after it is deposited.

After the active pit is three-fourths full, the superstructure is removed and the

pit is topped off with soil. The household members begin to use the other pit. While the full side is lying fallow, the added soil and ash aids the processing of the material by furthering dehydration and increasing the pH of the system, and thereby increasing the die-off of pathogens.⁷⁹ As long as the time that it takes to fill one pit is approximately six months to one year, the fallow time for the other pit will be sufficient to allow the excrement to become safe. The processed material can then be dug up from the pit and reused elsewhere, just before the pit becomes reactivated for household use again.

⁷⁹ Peasey, A. (2000)

With both the *Arborloo* and the *Fossa alterna*, just as with a pit latrine, it is important that the groundwater is sufficiently deep so that no leachate from the pit can contaminate the groundwater and so that flooding does not interfere with the decomposition process. The advantages of the *Fossa alterna* are that one does not handle unprocessed excrement and the pits are reusable, so no extra land, beyond the original two pits, is needed for continual use.

The *Skyloo*

The *Skyloo*, the third type of EcoSan technology common in western Kenya, separates the urine from faeces. For the *Skyloo*, there is no pit that needs to be dug into the ground. The whole structure, including the storage vault for the urine and the feces, are constructed above ground as can be seen in Figure 2.7. Steps lead up to the toilet and faeces are stored in the vault at ground level, and emptied into a composting bag when the container is about three quarter full where it is put to decompose. It is then left to compost before use as fertilizer.



Figure 2.7 A *Skyloo* in the Obunga settlement (Source: Adede, StAD student, 2007)

The EcoSan technology, introduced in Kenya in the late nineties had seen the construction of about 100 toilets⁸⁰, a number that has since grown to over 826 currently (see Table 2.1). The *Fossa Alterna* toilet has been accepted in some schools and fish landing sites in Nyakach, Kisumu District, resulting in the construction of 15 toilets. In Makeni District (a semi-arid region south east of Nairobi), the *Arborloo* has been received with enthusiasm, resulting in the replication of 57 toilets within a year, up from the 3 demonstration toilets initiated. The community appreciated the health and agricultural benefits the technology brought them, considered the *Arborloo* affordable and easy to use and replicate. Local material was available thus making the construction effective. Women were able to construct their own toilets, and the *Arborloo* is a recommended EcoSan toilet for the climatic conditions.

⁸⁰ WSP-Africa (2005)

In Kisumu, the types of sanitation facilities available are varied. The *Skyloo* has been suggested as the ideal alternative technology to pit latrines in Kisumu region, along Lake Victoria, given that the water table is high, ground condition difficult and communities rely on shallow wells, and hence contamination of water sources frequent. From recollection, growing up in the town in the 1960s, some people defecated in buckets which were collected and emptied weekly by Municipality of Kisumu trucks. Others, mainly in the rural and poorer areas, used pit latrines or 'long drops' or 'drop-and-store' device where you squat and relieve yourself, or the 'Eastern type' toilets, where one also squats to use, with flush facilities. In the more affluent areas the latrines used are the 'western type' where one sits and flushes after use. The 'flush-and-discharge' device which for decades has been regarded globally as the ideal technology, as earlier mentioned by Wynn (page 39), is highly unhygienic, if there is no water, (Kenya is presently still struggling to provide its urban areas with adequate water). Nevertheless, most offices and even residential areas in Kisumu, were originally and still are, zoned and served by mainly the 'Eastern and Western' type toilets, with officers using the 'Western type' toilet and the workers the 'Eastern type' toilet. Today in and around Kisumu, one can still spot areas of open defecation due to inadequate availability of public toilets. Where public toilets are available, they are not clean or welcoming, therefore not used. Toilets available for public use are found at shopping malls like *Tuskys*, *Nakumatt* chain of stores, or at hospitality outlets (hotels, restaurants and guest houses).

In the informal settlements where the poor live, the situation is even more desperate. Given the overcrowding, dense and teeming population, access to water and sanitation facilities is always a challenge. Indiscriminate and haphazardly erected pit latrines and sunken boreholes dot the landscape, and due to the high water table water is often contaminated leading to high prevalence of water-borne diseases such as diarrhoea, cholera and typhoid. With open defecation and high pollution to boot, sewage is mostly discharged into the environment and Lake Victoria without treatment.

Municipal By-Laws and regulations on sewage and garbage disposal have been enacted, but the municipality is greatly hampered by incapacity to provide services commensurate with the needs of the rapidly increasing population, resulting in the implementation and governance lagging behind. According to the Habitat Debate,

'This challenge touches on issues such as decentralization, institutional reform, training and broad-based participatory management that involve all actors with a

stake in sustainable development and who have a contribution to make, including marginalized groups such as women and the poor.⁸¹

For this reason therefore, many governments and agencies in Africa continue to initiate and explore the role of ecological sanitation, or EcoSan, within their environmental sanitation and hygiene improvement programs.⁸² A summary of the development in uptake of ecological sanitation in some countries in Asia, Eastern and Southern Africa is provided in Table 2.2. Choice as summarized in Table 2.2 is determined by need and cultural acceptance of technology, which in turn spurs uptake and replication. Lack of awareness, lack of participation and involvement of users in selection and decision making process negates acceptance of technology options.

2.9 Gender and sanitation

In all cultures communities ascribe different qualities and rights to women and men, regardless of their relative competencies or desires. As Johnsson-Latham (2007) says, today and throughout history, power has generally represented an opportunity—and a privilege—for those holding it to *define both the problem and the solutions*. Gender and gender power disparities are reflected at all levels of society. Women, along with children are often more exposed to environmental risks than men who go out to work. However, more emphasis is placed on economic growth than environmental and sanitation safety related to circumstances of women and children (Bradley, 2006). Lack of or poor access to water and sanitation services impacts negatively on women, children and the aged by undermining their dignity and security, compared to the effect on men.

⁸¹ *Habitat Debate* (June 2002: 3)

⁸² WSP (2005)

Table 2.2 Representation of some case studies of EcoSan toilets

Case studies	Pre-EcoSan situation	Model of introduction	Design, financing, etc	Uptake, strengths, weaknesses, etc	Other pertinent characteristics
1. India	<ul style="list-style-type: none"> Open defecation 	<ul style="list-style-type: none"> Adaptation of Vietnamese double vault toilet Introduced in 1996 	<ul style="list-style-type: none"> Costs 4,500 Indian rupees (US\$100) 	<ul style="list-style-type: none"> Requires very little maintenance Ideal for geographical location Culturally accepted Well maintained, fly and smell free Works well in humid climate 	<ul style="list-style-type: none"> By 1998 had been introduced to about 135 households Built close to the houses due to constrained space
1. Kisumu	<ul style="list-style-type: none"> Defecated in buckets; collection and emptying weekly by Municipality of Kisumu trucks. In the rural and poorer areas, use of pit latrines or 'long drops' or 'drop-and-store' or 'drop and discharge' devices Affluent areas, use of the 'western type' where one sits and flushes after use—'flush-and-discharge' device for decades regarded as the ideal technology. 	<ul style="list-style-type: none"> Introduced in the late 1990s, by WSP through NGOs 	<ul style="list-style-type: none"> <i>Skyloo</i> and <i>Arborloo</i> and <i>Fossa Alterna</i> Donor funded and reliant on subsidies 	<ul style="list-style-type: none"> Lack of awareness of EcoSan technologies and benefits of excreta re-use Cultural mindsets and taboos hindrance to uptake in some regions Reluctance to handle faecal matter hindrance to uptake Lack of participation in planning and implementation hence technology not owned by community Probable gender disparity in decision on sanitation of choice Success with <i>Fossa Alterna</i> in two pilot areas in Kisumu (in schools and fish landing sites) 	<ul style="list-style-type: none"> Less than 100 EcoSan toilets constructed
2. Kenya	<ul style="list-style-type: none"> Bucket toilets Pit latrines Drop-and-store Flush-and discharge (in up market areas) 	<ul style="list-style-type: none"> Introduced in the late 1990s by Water and Sanitation Program (World Bank) through NGOs 	<ul style="list-style-type: none"> <i>Arborloo</i>, <i>Fossa Alterna</i> and <i>Skyloo</i> Donor funded and reliant on subsidy 	<ul style="list-style-type: none"> Considerable acceptance of <i>Arborloo</i> in Makuenu District Replication achieved (from initial 3 to 57 within the year) Health and agricultural benefits clear to community Cost effective and easy to construct <i>Skyloos'</i> high user involvement discouraged users 	
3. Malawi		<ul style="list-style-type: none"> Championed by WaterAid (NGO) representative 	<ul style="list-style-type: none"> Cost sharing (NGO provides finance, community provide unskilled labour, and construct toilet) 	<ul style="list-style-type: none"> Incentive related to increased prestige Uptake successful Demand increased through physical demonstrations Improved soil fertility 	<ul style="list-style-type: none"> Demand driven by desire to grow fruit trees and generate income Status symbol
4. Mozambique		<ul style="list-style-type: none"> Introduced in 2002 by WaterAid Donor funded 	<ul style="list-style-type: none"> <i>Fossa Alterna</i> Low subsidy Community interaction and social marketing using radio and satisfied users Design allows for additional activities e.g., bathing and sprinkling of 	<ul style="list-style-type: none"> Proven success demonstrated in field trials of EcoSan compost spurred uptake of EcoSan toilets Improved understanding of 'closing the loop' concept No fears of eating crops grown on EcoSan compost Challenge of meeting demand 	<ul style="list-style-type: none"> 600 <i>Skyloos</i> built to re-settle flood victims Simulated demand in neighboring towns Six farmers using urine in horticulture

			soil and ash after use encourage hand washing	
5. South Africa	<ul style="list-style-type: none"> • Bucket toilets 	<ul style="list-style-type: none"> • Development partners working with Provincial government to replace 25,000 bucket toilets for the poor 	<ul style="list-style-type: none"> • Construction of and replacement of bucket toilets with part subsidy, replaced with full funding under a 'free services policy • 80 percent of households opted for in-house urine-diversion toilets • Almost 15,000 conversions completed 	<ul style="list-style-type: none"> • Success of urine-diversion toilet rested on marketing the intervention around social factors and not on the benefits of excreta use. • Acceptance based on household choice from availed options, coupled with the ecological sanitation best in satisfying social requirements • Most cost effective given the water, geological and cost constraints • Emergence of new methods of managing waste produced • Overcome phobia of handling composted waste products
6. Uganda		<ul style="list-style-type: none"> • Introduced in 1997 • Development partners involved promote the EcoSan technology • Most popular is <i>Skylol</i> (does not affect groundwater, can be built above ground, enables re-use of urine without minimal health risk) 	<ul style="list-style-type: none"> • Local government initiative • Promoted by government as a means of solving protecting groundwater • Subsidies provided 	<ul style="list-style-type: none"> • Concept not new • Success in uptake, many EcoSan toilets have been constructed • Used by institutions, by the public and households • With proper use is hygienic • Requires no water to operate • Convenient location (close to house)
India	<ul style="list-style-type: none"> • Bucket toilets 	<ul style="list-style-type: none"> • NGO and government involvement 	<ul style="list-style-type: none"> • Construction of and replacement of bucket toilets. • Initially partly subsidized, now fully funded 	<ul style="list-style-type: none"> • Limited knowledge of EcoSan technology • In-house urine-diversion toilets preferred by households • Appropriate marketing technology (through social factors) • Some success with excreta reuse (burning or composting)

Source: WSP-Africa Field Note (January 2006)

As pointed out in the World Bank publication *Engendering Development*, gender differences are greatest among the poorest families.⁸³ Resources are not shared equally within the family but in accordance with the power and influence of the individual. Women are more affected by poverty than men due to gender disparities in sharing economic power. Furthermore, migration and consequent changes in family structures have placed additional burdens on women. The situation is further exacerbated by women's restricted access to land ownership, credit and other productive resources, their limited capabilities due to illiteracy, and social and cultural expectations and norms, thereby confining women to unpaid household work amidst restricted participation in paid production.

The *World Bank Atlas 2006* states that in 2006, about 20 percent of the global population lived on less than one US dollar a day. Of this number, roughly half lived from hand to mouth. Women remain the poorest of the poor, both in financial terms and in terms of their lack of basic rights, such as the right to one's own body, the right of inheritance and the right to property, education, mobility and respect'.⁸⁴ Women work very long hours with little or no facilities to lighten their chores: for example, at night, most women in informal settlements dare not venture outside to use the common toilet, preferring to use a tin container in the house. They are often sidelined, and not consulted in decision-making because they are often not thought worthy to consult over such matters, except with respect to household matters of caregiving and related issues.

2.10 Summary

This chapter has shown how the current global trend of urbanization is placing increasing pressure on water resources, and is subject to critical environmental degradation. Most of the urban areas in major cities across the world, more specifically in developing countries are among the most polluted. Even if the sanitation crisis is communicated and understood by more people, the need to find ecologically-friendly alternatives to conventional technologies for countries like Kenya remains. Additionally, there is a dire need of a holistic approach to the call for hygienic, sustainable and eco-friendly alternatives, and hence the option of ecological sanitation toilets. To that end, more emphasis should be given to understanding the norms, practices and community attitudes towards innovations such as the EcoSan toilets. This enables researchers, designers and practitioners to understand and analyze the major issues and challenges in the development, acceptance and use of EcoSan toilets.

⁸³ World Bank (2006)

⁸⁴ Johnsson-Lathan (2007: 72)

Efforts to provide access to water and sanitation must acknowledge the values and purposes that motivate design for the end user. Given all the potential benefits of utilizing EcoSan toilets, there are variations in the acceptance and adoption rates depending on the local conditions in some areas. The high diversity in culture and cultural practices, and the adoption of EcoSan sanitation facilities is largely influenced by socio-cultural aspects, as seen in the various case studies discussed earlier in this chapter. Social factors might also play a large role in household's adoption of ecological sanitation. In the cases of India and China, culture was the driving force due to the cultural familiarity, while for the cases of Uganda and Mozambique cultural needs were considered alongside income generation. South African as a case indicated the importance of odourless excreta as criteria for acceptance. But overall cultures in Africa are challenged by the idea of reuse of human excreta and hence it is not an accepted practice. However, households can also behave inconsistent relative to the surrounding culture. Sugden mentions that perception maybe more important than practical concerns. He states that,

When it comes to marketing sanitation, promoters need to recognize that marketing sanitation is more about dignity and lifestyle rather than health and hygiene.⁸⁵

Therefore, this thesis will focus on the norms, perceptions and practices of the Obunga community, as it affects the uptake of the EcoSan toilet, and see if the role of dignity and lifestyle are important factors. By doing so, it will provide an insight into the factors that are important to users of ecological sanitation in the study area. Whilst the EcoSan can be a viable and safe technology, with the potential to increase agricultural production, the cultural concerns, specific to the local community may have the potential to outweigh the added value of the waste resource for EcoSan owners, to inform the improvement of the design intervention, and the challenges these concerns pose must be duly considered.

⁸⁵ Steve Sugden, on Best Practice in Sanitation and Hygiene Promotion, at the AfricaSan East Regional Meeting on Sanitation and Hygiene, Addis Ababa, Ethiopia, 1 - 3 February 2005

Chapter 3: EcoSan in Kisumu

3.1 Situation and site analysis



Figure 3.1 Map of Kenya (Source: online)

Kisumu is the third largest city in Kenya, with a population of over 500,000 lies in East Africa, and is bordered by Somalia, Ethiopia, Sudan, Uganda, Tanzania and the Indian Ocean. Kenya is straddled by the equator and has a climate ranging from a tropical to a temperate largely influenced by altitude. Two major water bodies, the Indian Ocean to the east, and Lake Victoria to the west, where Kisumu is situated defines Kenya's borders as illustrated in Figure 3.1. The context of this research took place in the informal settlement of Obunga, which lies in the

western part of Kenya¹ in Nyanza Province, just East of Kisumu near the shores of Lake Victoria.

Kenya's economy is based mostly on the service (62 percent), industrial (19 percent), and agricultural (19 percent) sectors.² Recent demographic trends have revealed a pattern of urban demographic growth which most urban authorities are ill equipped to cope with and Kisumu as a city is no exception. Due to social and economic vantages, migrants and long-standing residents often live in informal settlements, where access to potable supplies and adequate sanitation facilities are limited, and where higher mortality, morbidity, and disease prevail. Or they live in highly vulnerable areas (floodplains and degraded watersheds), where buffering capacity to natural and anthropogenic shocks and disasters are limited. It is worthwhile to consider these urbanization effects in relation to the present

¹ Kenya boasts a population of over 39 million people, and is also a noted tourist destination, in part, due to its varied landscape, including the varying wildlife for which Africa is famous. To the west are the Kenyan highlands, which are defined by land over 900 meters in elevation. The Rift Valley, which runs from Syria southwards to Mozambique, also cuts across the country, running from the north at Lake Turkana and just east of Lake Victoria. Preserving this landscape's environmental quality is essential to sustain the country's economy

² Central Intelligence Agency (2005) accessed online

context and sanitation situation in the country, as well as in the insufficient adaptation of eco-friendly alternatives.

3.2 Demography

Kisumu Municipality hosts some of the largest informal settlements in Kenya – outside of Nairobi and Mombasa. Its position as a regional economic center, lures numerous job seekers from rural areas within 100km radius to informal settlements such as Bandani (aka Kogony), Kaloleni, Obunga (aka Kanyakwar), Manyatta, Nyalenda and Nyamasaria as shown in Figure 3.2 below. According to the 1999 Kenya Housing and Population Census, Kisumu had a population of 322, 734 at the time the census was conducted, and though not censused recently there shows a large increase in informal settlements like Obunga.

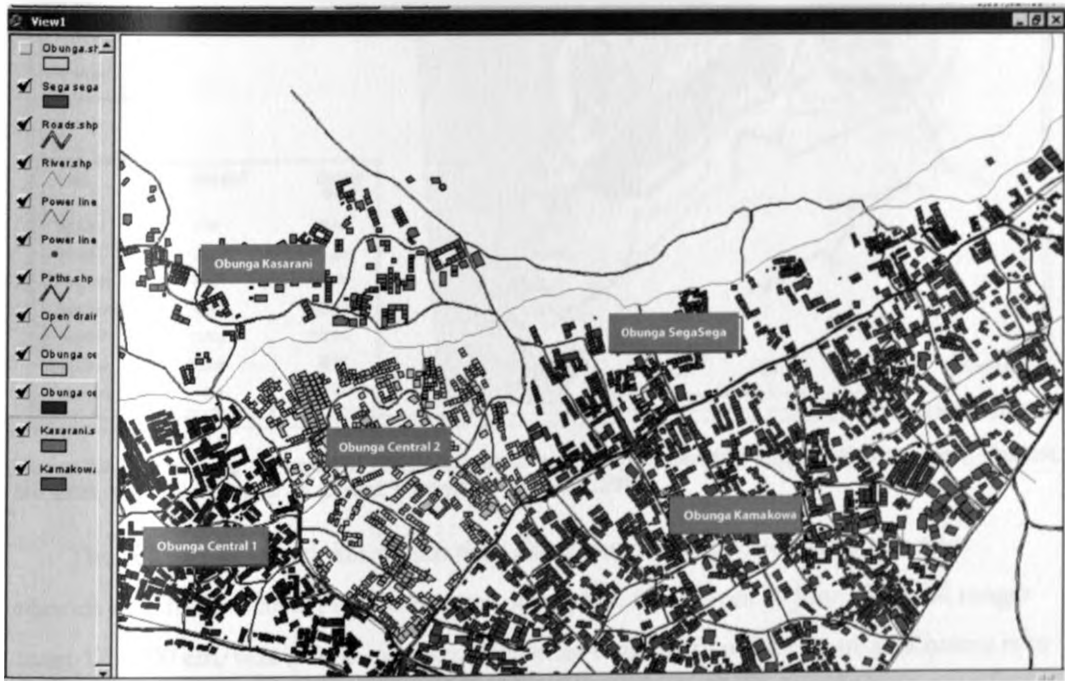


Figure 3.2 Extract showing segments/sections in Obunga settlement (Source: Pamoja Trust/Tuongane wa Wanavijiji, 2005)

This chapter provides an overview of the promotion of ecological sanitation toilets in the local context. It commences with an introduction to the background of Obunga settlement, its people and its present challenges, and highlights the status of Ecosan technology in the case study area.

3.3 Context of the Research

Obunga lies in the flat eastern part of Kisumu Municipal's slum belt. The area is riddled with serious problems in terms of natural drainage, due to a combination of the type of soil, a low gradient and high water table. Figure 3.3 points the locations of the various informal settlements to be found in Kisumu.

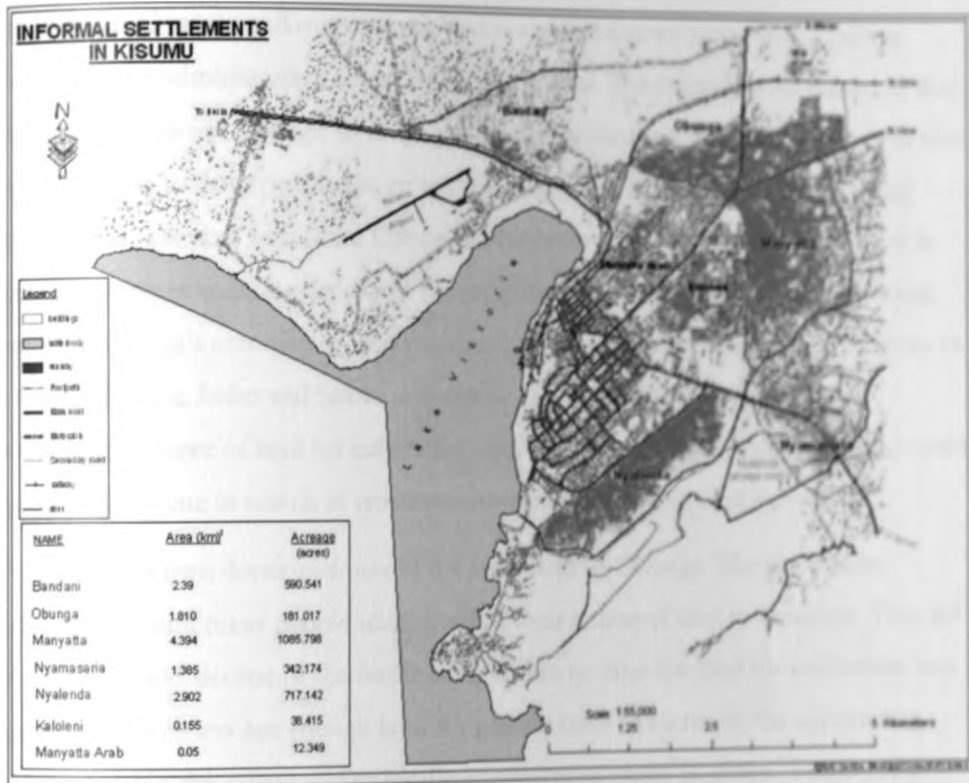


Figure 3.3 Map showing the layout of Kisumu's informal settlements of Bandani, Obunga, Manyatta Arab, Kaloleni, Manyatta, Nyamasaria, Nyalenda (Source: Municipality of Kisumu, 2008)

The settlement, which lies within the Lake Victoria basin, experiences two rainy seasons—one from October to December and another from April to June. Rainfall ranges from 175-200 cm/year (70-80 in/year). Evidence suggests that the climate in Kisumu is in some ways, ideal for anaerobic degradation of faeces. Annual temperatures above 20°C ensures that the material will be exposed to conditions that promote evaporation of moisture from the faeces and conditions which are favorable for pathogen destruction in urine (Peasey, 2000).

An account of the history of Obunga was given by an elderly gentleman by the name of Mzee Wesonga Olewe, who was born in 1928. The *Ayany* stream which flows across Obunga was a source of a blessing. Beautiful flowers were growing and blossoming in *Ayany* River and everyone used to enjoy the site of the flowers. It was the only place in

Nyanza where the flowers were flourishing. The settlement of Obunga derived its name from these flowers.

Historical development

According to Mzee Olewe, the historical development of the area can be traced as far back as 1932, when Kisumu was called *Kisuma*—meaning a place where people could meet and engage in trade. Over time, Kisumu developed as a colonial town to serve as a railway terminus, and the administrative center of Nyanza region. The colonial government at that time thought that it was strategic to settle the local inhabitants of the town somewhere else, therefore decided to drive people out of town settling them in Obunga. Traditionally, Obunga was all forested, with Mzee Olewe and his kinsmen being the first inhabitants in the area. Soon afterwards, the density in the settlement began to increase as people were attracted to Obunga's accessibility, and proximity to Kisumu town. Migrants came from as far as Gem, Ugenya, Imbo and Sakwa and settled in Obunga. At that time, every homestead had a piece of land for cultivation, and the residents took pride in owning cattle. Similarly, others came in search of employment opportunities from the industries.

As Kisumu Town developed, so did the settlement of Obunga. The population increased rapidly and many people started selling their treasured land to outsiders. This led to the shrinking and decline of the fertile land. Within no time the land for cultivation was long gone and there was not enough land for grazing cattle. As a result, the community became engaged in the selling of fish locally referred to as *mbuta*³ in *dholuo*.⁴ Initially, this trade began in Kampala, Uganda at a place called *Kasheshe*. It soon gained popularity in Kisumu from the Ugandans who enjoyed this delicacy, as well as the principle of free trade between the two countries.

Soon afterwards, a factory for processing fish was built close to Obunga. The processed fish was transported to Nairobi, and then overseas, as the commodity was too expensive for the local people to purchase. Nevertheless, in order to accommodate the locals, some traders began to purchase the by-products (*mgongo wazizi*) of *mbuta* from the factory, and re-sold them to *JoLuo*.⁵ Very soon, the business began to flourish, attracting and winning markets from as far as Kitale, Bungoma, Kakamega and Luanda. In the beginning, the business commenced with about 300 traders, however, the figures declined

³ Mbuta is the Luo name given to the Nile perch fish

⁴ Dholuo is the indigenous language spoken by the Luo people

⁵ *JoLuo* are Nilotic speakers and *dholuo* is their local dialect

to 250 due to economic hardships, the deaths of the traders, including the effects of the invasion of the Water Hyacinth weed, which rocked Lake Victoria in 1998.

3.3.1 Education and access to health facilities

Educating the community of Obunga on health related issues is often an afterthought in water, sanitation and health programmes, with low priority and little or no claim on management of time and programme resources.⁶ Kroger cautions that the top-down approach to programmes, have not succeeded partly because of lack of good techniques for finding out what people know, do and want. The KAP (Knowledge, Attitudes, Practices) study⁷ show that respondents in KAP surveys often tell the interviewer what they think one wants to hear, or what they think will bring the greatest benefits.

The residents of informal settlements such as Obunga lack adequate access to basic education services, mainly because there are few public schools relative to the number of school-age children. Only 45 percent of both men and women continued schooling after primary school in Nyanza Province (CBS, 2004). This is among the lowest in Kenya, second only to the Western Province. As a result, the overall education level of the community is generally low.⁸

There is only one health clinic in Obunga Central, and an HIV testing, guidance and counseling centre in Obunga Kamakowa for youths supported by Impact RDO (Tuungane Centre). The residents' medical needs are only met when they visit Moscow Dispensary (a municipal dispensary) which is 2 km away from Obunga, or for medical emergencies at the Nyanza Provincial Hospital (known to the locals as Russia, after the Russians who built it) or Nyanza General Hospital which is approximately 10 km away.

3.3.2 General infrastructure

The general physical infrastructure in this area is also lacking, with Obunga's road network characterized by informal pathways (michochoros), which do not allow for the provision of sewerage systems. In many cases the inhabitants of the slum have built on road reserves. As a result, a large part of Obunga cannot be accessed by road.

⁶ Burgers, L., Boot, M. and Van Wijk, C. (1988)

⁷ Kroger, A. (1983: 465-481)

⁸ Since the introduction of free primary education in Kenya in 2003, the demand for education in Kisumu has surged, with greater parity between boys and girls at the primary school level. However, the city as a whole still faces several challenges that threaten to undermine the attainment of the MDGs in education, as escalating poverty has contributed to high drop-out and low completion rates (Kosgei, K.C., 2006).

Water and electricity are made available to those individuals who can afford them. Evidence suggests that some residents of Obunga enjoy access to basic facilities, such as electricity, depending on the proximity of the property to other developed areas. This has led to high incidences of illegal tapping of private service lines. Table 3.1 highlights the distribution of infrastructure and services in Obunga which projects the dismal access to service. A mere 0.023 percent of households have access to clean water, 0.12 percent to a toilet and a paltry 0.01 percent to electricity.

Table 3.1 Obunga infrastructure and services analysis

Infrastructure	Households with	Households without	Total Households
Clean water	155	6445	6600
Toilet	813	5787	6600
Electricity	130	6470	6600

Source: Pamoja Trust/Tuongane wa Wanavijiji, 2005

3.3.3 Housing



Figure 3.4 Cloth for the door

Obunga exhibits the highest density of housing structures, with more than 80 percent of plots constructed largely with mud walls and old reused corrugated iron sheets as illustrated in Figure 3.4. Like the majority of the floors of the houses in Nyanza, Obunga are dirt (74 percent), different to the urban areas where more than 70 percent of the homes have cement floors.⁹ About 30 percent of the households in the region use grass or thatch as a roofing material. There are a few rental units in the area, which have been

built from cheap material and very little consideration for spacing concerns (see Figure 3.5). Rents in these settlements range from KShs 300 to 800 for a single room unit with communal facilities¹⁰.

Attitude plays a determining factor in the community's priorities. From the research it was evident priorities are varied based on tribe, religion, sex, age, culture and economic



Figure 3.5 Proximity of houses

⁹ In all rural areas of Kenya, the statistics are similar to those in Nyanza. In urban areas, however, virtually no one uses grass or thatch and corrugated iron and cement dominate (CBS, 2004)

¹⁰ UN-HABITAT (2005: 19)

power. Most houses have a net curtain over the door for privacy as the door is kept open to circulate air and ventilate the room. A television, big sofa sets and display cabinet in one's house are status symbols, even though the sofa takes up most of the space in a room. Interestingly enough, at night time, the sofas are stacked up to make room for sleeping mats on the floor.

3.3.4 Livelihood

Obunga does not reflect the tendency of Nyanza women working in agriculture, as the highest in Kenya. Almost 60 percent of the women who work in Nyanza participate in agriculture, while throughout Kenya the average figure is less than 50 percent. The percentage of men in agriculture in Nyanza, however, is only slightly higher than the national average at 47 percent, compared to 42 percent nationally (CBS, 2004). The main source of income in Obunga is self employment in petty trade, such as;

- Small scale businessmen/women run kiosks, vegetable sellers, maize roasters, and fish mongers
- Illegal brewing of *Busaa*¹¹ is rampant.
- Provison of casual labour (farmhands, domestic and factory workers)

According to UN-Habitat¹² the monthly income for the bulk of the population in Kisumu informal settlements ranges from Kshs 3,000 to 4,000. In addition to this, the phenomenal growth of *boda boda* has created employment for the youth in Obunga, providing cheaper and more flexible transport during both day and night.

3.3.5 Water and Sanitation

Access to safe water

In the Nyanza Province, where this research was conducted, only 14 percent of people receive their drinking water from a pipe. The percentage of people using open water sources such as springs, streams, and rivers amounts to nearly 58 percent (Central Bureau of Statistics, 2004). In such open water systems, the likelihood of contamination is significantly higher than for piped and treated water systems. The estimated median time that households spend accessing a water source in Nyanza province is about 20 minutes (Central Bureau of Statistics, 2004).

¹¹ *Busaa* is a native brew that is popular with locals

¹² UN-HABITAT (2005: 20)

There is one spring serving residents of Obunga as their only source of fresh water. This is the only clean water they have access to and everyone in the larger Obunga area treks to get water for bathing and general household chores from this spring. As shown in Figure 3.6 children use the water source to wash their hands and some even drink the water. To exacerbate the needs of informal settlements such as Obunga, the Municipality of Kisumu as a whole is faced with acute water shortages, as only 40 percent of the population



Figure 3.6 Children at the Ayany spring (Source: Researcher, 2007)

has access to piped water supply from Kisumu Water and Sanitation Company (KIWASCO), the sole water utility in town.¹³ Some of the residents depend on a UNICEF sponsored borehole, whose water is salient, and pay Ksh.1 for a 20 litre jerrycan (Figure 3.6). Those without access to piped water get their supplies from vendors who sell at KShs. 5 per 20 litre jerry can. Some vendors sell at a price as high as KShs. 10 per 20 litre jerry can. This indicates some of the cost Obunga habitants have to bear. Table 3.2 below gives a summary of the types of water sources available in Obunga, and the number of residents with access to the various water sources. Even though piped water from KIWASCO is the highest noted number in Table 3.2, connection to water pipes is there but running piped water from KIWASCO is unavailable and so most residents rely on river and spring water.

Table 3.2 Access to water

Type of water source	Total users
Borehole	247
*Piped water (KIWASCO)	3741
Rain water	44
River	22
Spring	113
Well	117
Total	6600

Source: Pamoja Trust/Tuongane wa Wanavijiji, 2005

Access to improved sanitation

In Nyanza Province, 66 percent of the people use a traditional, unimproved pit latrine, only 2 percent have a flush toilet and over 26 percent have no facilities at all.¹⁴ Over half of

¹³ UN-Habitat 2005: 20

¹⁴ WHO estimates that in 2002, 52 percent of Kenyans did not have access to improved sanitation. In rural areas, 57 percent of people lacked proper sanitation coverage (2004). About 11 percent of all Kenyans use

the people that have access to a toilet, share it with other households¹⁵. Figure 3.7 illustrates the unimproved state of pit latrines prevalent in the settlement.



Figure 3.7 Examples of some toilet facilities to be found in Obunga Kasarani (Source: Adede, StAD student, 2008)

In the study area of Obunga Kasarani, most people use pit latrines or practice open defecation. A privileged few (landlords/home owners considered well-off) use VIP pit latrines which cost approximately Ksh 70,000 to build. According to UN-HABITAT¹⁶,

Almost 40 percent of the residents in Obunga informal settlement lack access to proper latrines. This is due to the loose soils and high water tables; the black cotton soils affect the drainage and toilet construction. Sewerage remains a major problem, due to the small size of the plots, and the poor road network.

The situation is further exacerbated by the seeping drains where children often play in, giving rise to high degrees of contamination, as well as a high prevalence of water and sanitation-related morbidity. Furthermore, the neighborhood is littered with waste such as organics, plastic, metals and old batteries as shown in Figure 3.8.



Figure 3.8 Uncollected garbage outside dwelling houses in Obunga (Source: Adede, StAD Student, 2008)

This exposes the community to further risks from lead contamination and disease outbreaks.

flush toilets, which often discharge to sewerage systems that may or may not have treatment facilities. The most common form of sanitation facility is a pit latrine, which is used by nearly 64 percent of the population, while more than 16% have no facility and defecate in the brush, a field or in the open. Of those that do use a latrine or toilets, 49 percent share their facility with other households (CBS, 2004)

¹⁵ CBS, 2004

¹⁶ UN-HABITAT 2005: 20

During the rainy season, the Obunga is vulnerable to flooding, which often displaces people from their homes. The nearby *Awaya* stream sometimes bursts its banks during the rainy season and overflows to neighboring villages as shown in Figure 3.9.



Photo 3.9 Waterlogged ways in Obunga (Source: The researcher, 2008)

The situation on the ground with respect to provision or access to sanitation, in particular the construction and use of an intervention such as EcoSan toilets in Kisumu is thus conflicting. There are varying statistics in the information provided by some of the NGOs involved in sensitizing and scaling up provision of sanitation services to communities.¹⁷ Obunga settlement is one such example of the conflicting information to introduce EcoSan toilets noted in this study.

3.3.6 Diarrheal prevalence and treatment

An indicator of health as it relates to sanitation practices is diarrheal prevalence and hygiene practices. In Nyanza, only 5.5 percent of children always use a toilet or latrine. More than 17 percent of children in Nyanza had diarrhea in the two weeks preceding a survey in 2003.¹⁸ Oral rehydration salts are an effective way to replenish the liquids and nutrients that diarrhea take away from one's body. In Nyanza, over 78 percent of mothers were at least aware of oral rehydration therapy. However, only 36 percent actively practiced oral rehydration therapy or increased a child's intake of fluids during a diarrheal incident¹⁹, showing little motivation or financial capacity to address the symptoms of diarrhea. During my visits to Obunga it was common to see children's excreta left lying in puddles all over the ground passage. The smell of excreta also pervaded the air as I walked along pathways.

¹⁷ Some of the NGOs in Obunga are SANA international, Umande Trust, Kisumu Social Rights Association

¹⁸ Central Bureau of Statistics, 2004

¹⁹ Central Bureau of Statistics, 2004

Arguably, the prevention of diarrheal diseases (i.e. with adequate sanitation), as opposed to treatment, might be a more effective way to reduce diarrheal incidence in Obunga, clearly plagued with poor provision of sanitation facilities.

3.4 EcoSan in Western Kenya

Lake Victoria has been the subject of much attention in the past few years due to the rapid growth of water hyacinth that is choking the lake. The growth of this exotic species has been fueled by high nutrient loads, (untreated sewage discharged), to the lake from the compounded impact of population growth as well as increased fertilizer use in the area.²⁰ Residents of the Lake Victoria region are highly dependent on the lake for the local economy and, for this reason, ecological sanitation has been promoted more heavily here than Kenya's middle or western ends. "Promotion of EcoSan" is even sited as a development strategy of the Kisumu City as a way to reduce pollution into Lake Victoria.²¹ RELMA, SANA, Umande Trust, Osienala and KWAHO are some of the ecological sanitation promoters that have been identified in the Lake Victoria basin.

Sustainable Aid in Africa International (SANA)—a non-profit organization, based in Kisumu is involved in the Kisumu City Slums and Peri-Urban Poverty Alleviation Project, aimed at improving quality of life of informal settlement residents of Obunga, in



Figure 3.10 EcoSan toilet samples at SANA International. The squat plate sample is the green one to the right (Source: Researcher, 2008)

Kisumu, among others. The organization's main activities center round scaling up provision of safe water and environmental sanitation; enhancing solid waste management; sanitation development and hygiene education. Their target was to construct 50 latrines, for use by the residents of Obunga along with Manyatta 'A', another informal settlement. Currently, they have constructed 40 such toilets in the wider Kisumu region. However,

²⁰ Mailu, 2001

²¹ UN-HABITAT, 2003

research reveals that only four such toilets have been constructed in the study area of Obunga Kasarani.

In 2007, the organization constructed two of the four community toilets in the settlement, comprising of a block of four lined communal pit latrines and four bathrooms to cater for both men and women, with additional water tanks to residents. However, construction was abandoned before completion (the residents did not know why the project was stopped), and vandalized during Kenya's post-election violence in the year 2007. As a result, the residents are unable to use it for its intended purpose.

3.5 Summary

In summary the people of Obunga earn between Ksh 3,000-4,000 a month. Nevertheless, there is a possible indication that they desire to lead a dignified life where they can provide for themselves and sustain their livelihoods. The government together with stakeholders, and implementing partners, working towards improving the lifestyles of the community must inject ideas that are both acceptable, dignified, income generating activities and sustainable interventions for a better livelihood. Action is one of necessity and of utmost urgency because inaction will result in the already dismal situation regressing further. Therefore, considering the present context and specifically the sanitation situation in the country, a holistic approach to call for hygienic, sustainable and eco-friendly alternatives, such as ecological sanitation toilets may be a way forward. In the process there is a need to understand cultural practices when these initiatives are encouraged for a chance at success. Such an undertaking calls for community involvement and partnerships of technical and relevant knowledgeable expertise, to develop acceptable and sustainable design interventions for them. As noted from the Fourth Year student projects, of the School of the Arts and Design, there is also a need to look at the question of whether to proceed through incremental steps as an intervention, or new designs.²²

²² Mwendwa, S.K.K. (2008)

Chapter 4: Methodology

4.1 Overview

This case study seeks to investigate the socio-cultural acceptability of EcoSan toilets, also referred to as urine diversion toilets as an ecological sanitation initiative. As described in the previous chapters the research was conducted in Kisumu peri-urban area of Obunga, an informal settlement on the outskirts of Kisumu City. The objective of the study was to understand the individual's immediate experience with their situation and how they relate to their physical environments in Obunga. In other words, what works and what does not work for them in so far as new interventions are concerned. Rooted in this approach is the theoretical understanding that people's individual and collective understanding, choices and actions is a major force in shaping his/her environment.⁸⁵ Using a socio-cultural approach the study specifically interrogated the cultural issues that help or hinder the acceptance of the EcoSan technology on the site. Oral narratives garnered from within and without Obunga, some projects of the 4th year UON StAD undergraduate students,⁸⁶ provided a profiling of solid waste concerns of the Obunga community. Additional methods used to collect data for this case study were a focus group discussion, and household surveys, using an interview guide (developed and pretested before setting out to the field), key informant responses, and secondary data collection. Both quantitative and qualitative methods were used with a keen bias towards qualitative analysis due to the need to know the why's of the context. The latter provided more of an understanding of how a community makes sense of, and responds to design processes and interventions, of the EcoSan toilet, as the focus.

In the context of the EcoSan toilets, awareness of its' existence, use and success in providing access to sanitation services in the densely populated informal settlement of peri-urban Obunga, in Kisumu City is a recent intervention, and has faced challenges with respect to health education. Using Loevinsohn as a framework concerning health education, I tend to take note of its re-naming as health promotion as a standard approach in developing countries.⁸⁷ Its complexity was discussed earlier in Chapter 3. From the study, discrepancies were noted in the answers respondents provided with what was observed on the ground. For example, many

⁸⁵ Whyte, A. (1977: 5)

⁸⁶ Jacinta Serem in her project titled 'Revitalizing learning environments in schools in informal settlements: using the 4Rs (recycle, reuse, reduce, revitalize)'

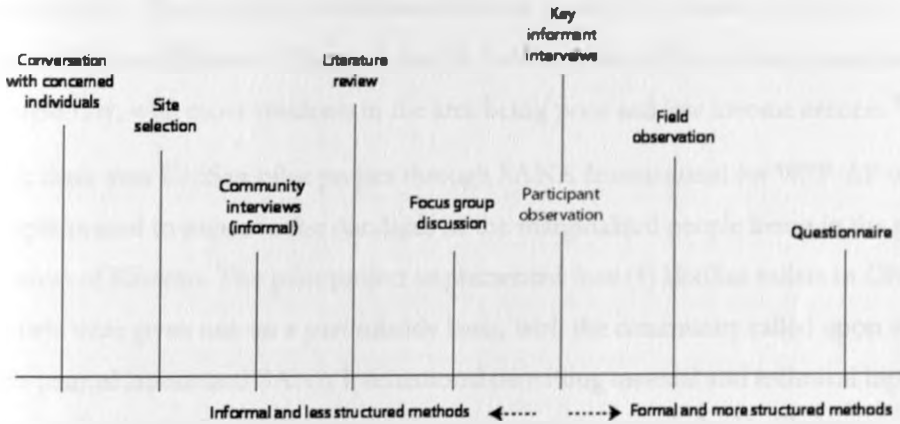
⁸⁷ Loevinsohn, B.P. (1990: 788-794)

respondents answered they were aware of the EcoSan toilet, but on the ground very few had used such a toilet, and many did not even have access to a toilet.

Description of Methodology

The study adapted the line chart which details the sequence for actual data collection as shown in Figure 4.1. The figure describes and gives a run through of the sequence that the research and data collection adopted. It provides a preview into the qualitative nature of most of the information gathered. The informal interviews and discussions with key discussants and the community members opened up a way to sincere and open dialogue which was critical in getting the real situation on the ground as and where the research began.

Figure 4.1 Data collection process (Source: Adapted from Marchant 2000)



The actual schedule designed for the study data collection is described in Table 4.2 below, giving details of the activity that took place and when. The research was conducted over a period of two years with data being collected intermittently but throughout.

Figure 4.2 Data collection methodology

Data collection methods used	2007	2008	2009
• Secondary data	Throughout, but intermittently		
• Key informant interviews	Approximately 1-2 hr session with each informant		
• Focus group discussion			21-23 May (3 days)
• Field observation	3-7 February (5 days), 7-11 March (5 days)	26-31 March (6 days), 7 May (1 day), 12-17 May (6 days), 19-24 July (6 days), 19-23 August (5 days)	21-23 May (3 days)
• Notes, photography, sketches	Throughout, but intermittently		
• Data analysis			25 May -15 June 21 (days)

Source: Researcher (2009)

4.2 Site selection

The site was identified in March 2007, after a period of two weeks. It was chosen because Kisumu industrial area provides the main source of livelihood for Obunga's residents. Acceleration in land use change from agriculture to housing from the mid-1990s has further fragmented land and thus increased congestion, which has



Figure 4.1 Obunga site depicting the congestion of housing

implications on sanitation. Obunga is divided into three sections (Kasarani, Central and Segu Segu) with a population of approximately 14,000 and each household having an average of between 3 and 10 members (see Figure 4.1). It lies in a low lying area with a high water table. The residents come from different parts of the country and are of different religious affiliation. Obunga is said to be the poorest of the informal settlements in Kisumu City, with most residents in the area being poor and low income earners.⁸⁸

A three-year EcoSan pilot project through SANA International for WSP-AF was first implemented to improve the standards of the marginalized people living in the peri-urban areas of Kisumu. The pilot project implemented four (4) EcoSan toilets in Obunga. The toilets were given out on a part subsidy basis, with the community called upon to provide manual labour and SANA International providing material and technical input.⁸⁹ During the Reality Studio 2007 household survey carried out with StAD, Chalmers University students (Sweden), and UNHABITAT, the researcher came across unused and incomplete EcoSan toilets constructed for use by the Obunga Kasarani households, prompting and igniting curiosity and raising the need to know why this was the case.

4.3 Sample size

For statistical validity of the results, the research interviewed 91 households, and 21 focus group discussants, in Obunga's estimated population of 1,500 households.⁹⁰ The sample for this research comprised households of community members residing in Obunga, who were interviewed using semi-structured questions for the household survey. The questions focused on Ecosan toilets and their construction, where they have and have

⁸⁸ Joshua Odindo, Umande Trust, 2008

⁸⁹ From a discussion with Joseph Ochieng, SANA international (Thursday, 28 May 2009)

⁹⁰ (KNBS, 2008; Mugenda & Mugenda, 2003)

not been done (see Appendix I, page 130). A focus group discussion of women (11) and men (9) was done separately. Furthermore, 7 key informants were interviewed informally (i.e. engineers, public health workers, other health workers, local area leaders, MOK workers, and community based organization representatives).⁹¹ Profiling of the site came from some final year research projects undertaken by 4th year undergraduate students from StAD⁹², and from a narrative provided by one of the oldest resident of Obunga.⁹³ Data collection (site selection, informal interviews, surveys, focus group discussion and observation) took a period of 4 weeks (interspersed), 1 week in March 2007, 2 weeks in March 2008, 1 week in August 2008 and 2 days in May 2009. Notes, sketches, photographs, illustrations, a diary, reference from journals, publications (both print and electronic) and exhibitions were part of collecting and documentation of the process.

Qualitative interviews, carried out over a period of one month, and focus group discussions were aimed at discussing attitudes and perceptions on the design of the EcoSan toilet, in an attempt to 1) find out the communities suggestions on how to improve overall sanitation situation in Obunga, and 2) popularize the use of EcoSan toilet as the alternative sanitation technology of choice.

The approach of qualitative interviews of ‘interweaving looking and listening’⁹⁴ and participant observation employed in this study allowed a more descriptive, sensory and cognitive account of individual and group beliefs, inclinations, actions and decisions regarding environmental perception from the inside-out. This approach required total participation and objectivity of the observed reality, for a true representation of information or the context within which situations, values, inferences and interventions were analyzed. This allowed for distinct and clear background information on which results were based.

4.4 Data collection

Secondary data

Electronic and print media in addition to journals and publications⁹⁵, of stakeholders involved in efforts to provide, improve access to sanitation services, manage

⁹¹ Joshua Odindo, Joseph Ochieng, Sundae Erickson, Rashid Mwakiwiwi, Lawrence Okong’o, James Orod, Prof Patts Odira

⁹² The main supervisor and coordinator was Dr Suki K. K. Mwendwa, the then Director and Senior Lecturer

⁹³ Mzee Wesonga Olewe, born in 1928

⁹⁴ Shatzman & Strauss, 1973: Ch 4 and 5

⁹⁵ UN-HABITAT, WHO, WSP-The World Bank, Ministries of Local Government, Health, Environment, Department of Civil Engineering (UoN), Municipality of Kisumu and libraries

and recycle wastes were used to review past studies and projects carried in this area. The information gathered was used to elucidate people's behaviour and biases towards new products, for example, acceptance or rejection of ecological sanitation as an alternative intervention, and compare the information so gathered to the context of Obunga. The extensive literature review dealt with perception and understanding of design, aspects of community dialogue with design, as well as how design and development affects and infects communities, and how to drive development. The chapter looked at previous studies carried out on sanitation, and in particular, the evolution and uptake of EcoSan toilets. It sought to find out and highlight similar as well as different practices or methods employed for successful uptake of the design.

4.5 Interviews

Face to face interviews with professionals (engineers, health workers, and implementing partners) in the areas of solid waste management were carried out to gain an insight into the culture of the Luo in the past and at present, and the experts' perspectives on public health and topical issues related to sanitation. Municipality of Kisumu workers in the early post-independence Kenya were sought to give a comparative insight on how things (sanitation related) were handled then. Some NGOs working in the area of sanitation provision, and a few randomly selected community members (women, men) were interviewed (approximately 30 minutes to 1 hour) to provide a sense of their interaction with design (EcoSan toilet).

Direct interviewing resulted in rich, detailed information from key informants and provided for getting a glimpse of what was in the mind of the other person. It allowed free discussions in the attempt to look at the reasons perceived as why communities accepted or rejected some designs. Face to face interaction necessitated and provided immediate response of another person, and in essence allowed one to 'take the role of the other' in order to acquire social knowledge. Generally, it is often difficult to know what local or specific knowledge is. It is a good method or way of getting deep into a situation under study, and provides an opportunity to meet and discuss with people who are normally left out e.g., children and women. In addition, face to face interaction is an objective, candid and varied portrayal of a situation as seen and understood from different views and opinion points.

Key informant interviews

Key informant interviews with individuals representing decision-making institutions, and professionals working in water and sanitation were carried out using semi-structured and open-ended questions, with a view to eliciting unprejudiced responses from the respondents. Informants were selected through contacts with organizations involved in water and sanitation. In addition some interviewees were identified and recommended as experts in the area of sanitation. The interviewees were affiliated to the following institutions:

- Local authority
- Neighbourhood association
- Non-governmental organization
- Donor/Implementing partner
- Academic institution

Prospective participants were contacted by telephone. Interviews were face to face and lasted approximately one hour. The format of the interview revolved around semi-structured open-ended, exploratory questions which allowed for the collection of qualitative data. Participants expressed views on the mandate, objectives, the role, challenges and lessons learnt by their respective institutions in the provision of sanitation. A transcription of data followed each interview. Impressions, new and contradictory perspectives were noted and highlighted for further discussion. Quotes were occasionally used in presenting the findings from key informants where they best capture existing situations, experiences and beliefs of the interviewees.

Some interviews were carried out over the telephone where it was not possible to physically get the respondent. Even though the telephone was devoid of physical contact, it was useful in that it was possible to engage the respondent(s) and access the information they held immediately. However, the drawback was the inability to talk for long, or jot down all that was discussed and instead a summary of the discussion is what is expressed. This may have obscured some points or issues that perhaps a face to face interview would have illuminated.⁹⁶ Excerpts from selected student Kisumu Reality Studio project papers focusing on and laying emphasis on community-design dialogue were used to highlight

⁹⁶ There is also the risk of misrepresenting information due to clarity of voice over (sound quality).

how a product (a concept or idea) can be successfully marketed (sold) to a community or accepted by the community.

4.6 Focus group discussion and selection of members

A focus group discussion on attitude and perception on the EcoSan toilet by the adult community, from within Obunga Kasarani was conducted. The interviews sought to find out whether a 'good' design is necessarily a good intervention? How or what qualifies a design to be 'good'? Was it the product's acceptability by the community or its functionality? Did this have a bearing on the activities, social cultural perception, attitude(s) or community's interaction with design(s)?

Selection of focus group members was carried out with the assistance of the coordinator of the Kisumu Social Rights Association (KISORA)—a community based organization that works closely with the Obunga community—their knowledge of the community members and trust from the community made the exercise possible. The sample population was random. 20 interviewees out of an approximate population of 3,000 (Obunga Kasarani) showed up for the discussion representing 0.66 percent. Two sessions were held, one with 11 women, in the morning and another session with 5 men (4 left before the morning discussion could begin, on the note that they would come back for their group session) in the afternoon of the same day.

The interview format was explained to the group, to put them at ease before the recorder was switched on. English, Kiswahili and *Dholuo* languages were used in the discussion to allow for active participation by group members. Majority of the discussants had lived in Obunga for more than 4 years with the longest having lived there for 55 years (all his life); the youngest had lived for 1 year. The interview guide was divided into three sections, namely, the respondents' history; their experiences; and their perceptions and suggestions. Different themes were focused upon with the two groups, (with a gender and role perspective). For the women, the discussion sought to emphasize the EcoSan toilet with respect to provision of dignity, security, income generation and uptake; for the men, the focus was more on convenience, cost, resource, dignity and uptake. The discussions were audio taped for factual representation in the presentation of the findings. 'Probing' and 'informal chatting' were employed with care and sensitivity to dig deeper and produce insights into the social, economic and health problems as the community understood and

perceived their sanitation situation, noting that *'[direct] interviewing about hygiene is of little use because of the sensitivity of the subject.'*⁹⁷

Though the group perceived the discussion positively, they however yearned for a definite feedback on what positive and or (financial) gain they would receive for abandoning their chores to avail themselves for the discussion... *'how is it going to put food on the table?'*. After some tactful explanation from the community representative, the group members accepted that coming from a university, the researcher's interest in them stemmed more from a desire to share in their knowledge in an attempt to understand and collectively seek to propose ways to alleviate their dire constraints concerning sanitation provision. The host where the group discussion was held was very hospitable and the group shared very animatedly on the use and uptake of the EcoSan toilet. They were very frank and open in providing information on their sanitation habits, more so expressed in their wish for improved access to sanitation provision. This open engagement was useful towards participatory identification of problems.

4.7 Field observation

'Field observation', also known as 'qualitative observation' requires one to establish and sustain a many-sided and long-term relationship with a community in order to understand that association.⁹⁸ By immersing oneself in the subject being studied, over a long period of time, the research is presumed to gain a deeper understanding. Hence, this approach emphasizes participation as an opportunity for in-depth systematic study of a particular group or activity. It is reliant on first-hand information and high face-validity of data. Field observation is particularly appropriate to studies of interpersonal group processes. However, as a data-gathering technique, subjectivity poses an increased threat to the objectivity of the researcher; unsystematic gathering of data, reliance on subjective measurement, and possible observer effects (observation) may distort the observed behavior. By taking care not to impose one's expectations on observations, it provides an avenue to interact with the community and get the personal, inside story that would otherwise remain obscure.

The researcher made some observations from a walk in Obunga and in subsequent informal discussions with individual members of the community. Photographs, sketches

⁹⁷ Loevinsohn, B.P. (1990)

⁹⁸ Lofland J., Lofland, L.H. (1984: 12)

and notes were taken to capture and document the study site, to take note of activities and to observe general land use, buildings and facilities.

The free and open-ended format of discussions with 3 members⁹⁹ of the community encouraged and elicited free, unrestrained comments and thus provided knowledge of the local context. However, some of the statements or facts presented could not be verified without corroboration from the NGOs on the ground. Attitude were seen to play a determining factor in the community's priorities, but found to vary according to tribe, religion, sex, age, gender, culture and economic power. For instance, most houses had a net curtain over the door for privacy; the door was kept open to circulate air and ventilate the room, in answer to the lack of adequate ventilation. Many of the households came up with alternative sanitation contraptions such as small plastic or tin containers for ease of use within their tiny room for want of security from venturing outside the house. Decision making on location of toilets was the preserve of men. Those of Muslim faith had a problem with the EcoSan because it did not provide water for hand washing inside the toilet; little children were afraid of using the EcoSan for fear of falling into the toilet due to the large opening; women were not provided with disposable bags for sanitary pads; and old people found it difficult to climb the steep steps leading to the toilet.

4.8 Quantitative data analysis

Quantitative data collected was analyzed using Microsoft Excel spreadsheet and translated into visuals in the form of illustrations (pie chart, histograms or bar graphs). Focus group discussion, key informant interviews, and household survey were presented by studying and interpreting thematic areas using discussants' responses to interview guide, transcribed and cross-checked against referenced literature using tables, photographs and sketches to illuminate and highlight or augment an idea, situation or issue under discussion, as part of the research method. Literature review, project reports, related literature from online publications of others who have carried out research on related study area around the world provide a framework for data analysis.

In summary the methods used to collect data and analyze were successful, reasonably successful or unsuccessful in achieving the study objectives. The findings are documented in the next chapter.

⁹⁹ Introductions were facilitated through Lawrence Okong'o, a community leader, Erickson Sundae the coordinator of Kisumu Social Rights Association and Joshua Odindo of Umamde Trust

Chapter 5: Findings and analysis of results

The goal of this chapter is to present and analyze the results of the empirical investigation concerning community perceptions on sanitation provision and EcoSan toilets as a design intervention for improving and sustaining lifestyles in Obunga. In addition, this chapter discusses the challenges the community faces in attempts to access or understand development programmes initiated, as well as strategies to improve service acquisition, management and sustenance. Findings are described and analyzed by progressively focusing on the self-descriptions of the study subjects (narratives and quotes).

5.1 Household characteristics

In order to gain entry into the settlement, to conduct the household survey and focus group discussions, assistance was provided by the coordinator of the Kisumu Social Rights Association (KISORA) who provided guides for the household survey interviews. This was useful in breaking ground and provided credibility to the discussions with the individuals given they were familiar with the coordinator having worked with him prior to this survey. As a result respondents were not reluctant to talk about conditions of their toilets, faecal matter, or general sanitation. Lilian... *"I have lived here for 31 years, that is, from the time I was born. I like cleanliness."* Manyasi... *"I have lived here for 55 years, from birth to date and many people use the 'bush' as their toilets."*

A total of 91 heads of household were surveyed, with household size averaging between 4 to 5 persons per household. A typical household consists of a nuclear family, in addition to relatives and friends on short stays. Of the 91 respondents interviewed the highest number noted in a household was 11 and the lowest was 1. Further analysis revealed that at least 42 percent (n=38) of those interviewed were below 25 years of age; 40 percent (n=36) were between the ages of 25 - 35; 12 percent (n=11) between 35-44 years and 6 percent (n=6) were 45 years and above. The relative youthful composition of the households could be indicative, and a reflection of the rural to urban migration in search of employment. Likewise, the presence of women tends to be more common than men, with at least 58 percent (n=53) of females interviewed against 42 percent (n=38) of the males. This can be attributed to the fact that a majority of women work within or near their homes, whilst men go out of the settlement in search of work. These findings suggest that gender responsibilities and societal roles often provide for women as social

and care-providers, hence they are responsible for ensuring that the house is kept clean, and food is prepared for the family. In response to questions regarding their marital status, 67 percent (n=61) were married; 32 percent (n=29) were single, and only 1 percent (n=1) were divorced.

5.2 Sanitation characteristics

Questions regarding general sanitation, faecal matter, including the conditions of their toilets, were well received by the respondents. The first research question asked about provision of sanitation facilities. 81 percent (n=74) of the respondents had facilities, whereas 19 percent (n=17) said they had no facility. The facilities were in deplorable state and were therefore not being used. When asked what types of sanitation facilities were used, the majority of households in Obunga (n=60) used the pit latrine (66%) whilst others (n=21) used the bush (23%). At least 9 percent (n=8) of those interviewed used the EcoSan toilets, whilst only 1 percent (n=1) each used the flush and discharge, or the squat and flush facilities. Accordingly, many of those interviewed expressed the need for increased access to toilet facilities. Findings revealed that 48 percent of households interviewed (n=46) found the toilet in place when they moved into the neighbourhood, whilst 31 percent (n=28) built it on their own; of the other 21 percent (n=19) 17 used the bush and 2 did not provide an answer. Awino... *I have my own plot but no money to put up a toilet so we go to the bush or use the neighbour's toilet, which is not very clean.* Benter *we don't have a toilet, and so many of us go to the bush, however, I use my neighbour's EcoSan toilet.* Accounts from respondents showed that the number of users far outstripped the toilets available, thus many people resorted to using 'the bush' or 'open defecation'. When asked about the reasons for the location of the toilet, an overwhelming 70 percent (n=64) of those interviewed equated it to being hygienic, 22 percent (n=20) had no toilet, whereas 5 percent (n=5) stated that it was for use by many and 3 percent did not know. The figures below illustrate the type, access to and reason for the location of toilet facilities in Obunga.

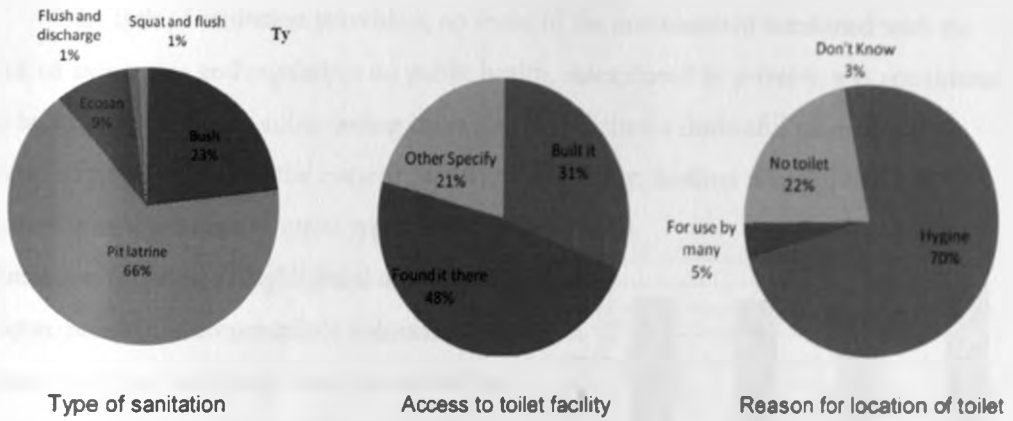


Figure 5.1 Pie charts depicting type, access to and reason for location of toilet facility in Obunga

On average over 15 additional households (33 percent) were found to share one toilet facility with those residing in a plot. Further analysis revealed that in some situations, landlord families shared sanitation facilities with several other households, depending on the number of houses the landlord owned. This situation gave rise to the dirty state of most of the toilets in the settlement, due to lack of collective responsibility of tenants to keep the toilets clean. Furthermore, the focus group discussion with both women and men revealed that often tenants had no say regarding the type of sanitation provided, where the facilities were to be located, nor how or who was to manage them. Similarly, residents were not clear on their responsibilities, including general maintenance of the facilities. As a result, it was impossible to hold any person accountable for their actions (Figure 5.2).

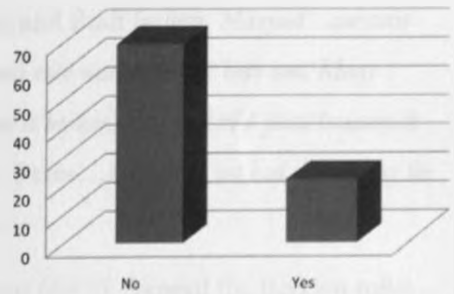


Figure 5.2 Provision of other means of relieving themselves

Members of the community were concerned about the unsanitary conditions of communal latrines, including the distance of the facilities from some households. Manyasi describes how *people dash in and out of the toilet and do not want or care to know the what, the where or the how...* They wished to see an improvement in waste management and sanitation in general. Peres...*I used to see people dig holes and bury their faeces in the hole they had dug. Nowadays people use the bush, when I go to my little shamba at the back of my house I find fresh mounds of faeces left around by people.*

The lack of sanitation provision, no sense of the environment combined with the lack of awareness and regulation on public health, exacerbated by poverty, was considered to be driving people to unbecoming behavior. This elicited a disdainful attitude and a sense of hopelessness to the current sanitation. Generally, findings revealed that the community was aware of other types of sanitation facilities, as highlighted in Figure 5.3. Nevertheless, the community's vulnerability was evident in their incapacity to advocate for the provision of acceptable sanitation facilities. They either settled for the communal toilets which their landlords provided, or resorted to relieving themselves by other means indicated in and discussed intensively throughout the research.

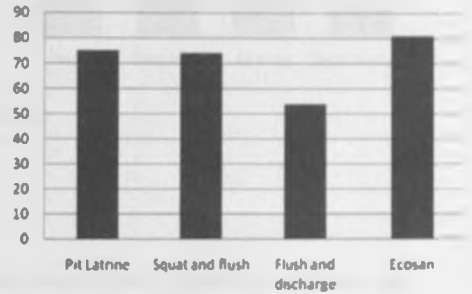


Figure 5.3 Awareness of other toilet facilities in use

When asked about their toilets of preference, findings revealed that 36 percent (n=33) preferred and were continuing to use ‘drop and store’ sanitation (i.e. pit latrine). An equal number of respondents gave preference for the squat and flush facility. *Manyasi...we have not had a toilet because every time one is put up it collapses, and even now we do not have one. Many people use it, even when you put a padlock you wake up to find it broken. You find in 4 plots households have no toilet meaning these people all come to this one facility. Peres...EcoSan is not bad. Because of the big number of our families, carrying the excreta is the problem.*

Overall, of the 91 households surveyed 22 percent (n=20) favored the EcoSan toilet. Similarly, around 12 percent of the respondents reported that they used the bush for defecation and urination, whereas some 4 percent opted for disposing of their faeces using ‘flying toilets’.¹ Figure 5.4 gives representations of the community's preferences for toilets, as well as the other forms of toilets used is demonstrated, and EcoSan toilets is just less than a third in terms of preference.

¹ A flying toilet is a facetious name for the use of plastic bags for defecation, which are then thrown into ditches, on the roadside, or simply as far away as possible.

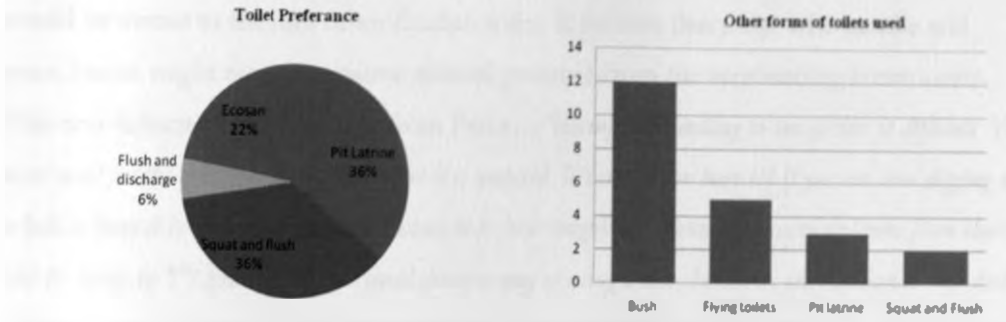


Figure 5.4 Toilet preference and other forms of toilet used

5.3 Awareness of EcoSan toilets

Manyasi... As a farmer one can use the compost from EcoSan toilet to fertilize your farm, say to make your cabbages grow bigger. However it is the lack of knowledge on how to use it properly that makes it difficult to use.

Beatrice...EcoSan is good, when used correctly. When used properly there is no smell which people find offensive. You can use the product as fertilizer...we advertized it.

As Manyasi rightly explained in his statement above, the lack of knowledge on the proper and correct use of the EcoSan toilet for effective composting hinders ease of use. The level of awareness and the knowledge of the importance and benefits of the EcoSan toilet amongst those interviewed were high, with 96 percent ($n=87$) of the respondents being aware of the existence of the eco-friendly alternative toilets. Accounts from residents revealed that information on the promotion of EcoSan toilets was often broadcasted on radio, and many had also seen one at the neighbours. However, not many people were aware of the importance of use of faeces and urine (i.e. containment, sanitization, and recycling), thus the application of the technology was not practiced as much as expected. Accordingly, the media plays a huge role in the community's acceptance of the technology, and had the potential to create an environment to persuade replication of the intervention, considering its benefits to agricultural production, water and environmental conservation. The Malawi case cited in chapter two is an example in point, where the *Abarloo* and *Fossa Altern* proved more popular than the *Skyloo* due to cost and value of added fertility to soil, and limited or no contact with contents. It also did not conflict with cultural norms or practices. Furthermore, their contents looked harmless and did not smell.

When asked whether or not respondents used the EcoSan toilet, only 24 percent ($n=26$) of the 91 households surveyed gave an affirmative response. Given the generally innate human repulsion to faeces, could perhaps be a contributing factor to why people

would be averse to the idea of an EcoSan toilet. It follows that those who handle and reuse faeces might receive negative cultural pressure from the surrounding community. This was reflected in a statement from Peres... *“leaving the handling to one person is difficult. You must wait for the container to get full before it is emptied. Where do you bury it? If you are seen digging up a hole to bury it in becomes a problem because then your neighbours know X is carrying faeces from their plot to dump in Y’s shamba. If one could devise a way of using water. However, the EcoSan is safe and children cannot fall through.”* This perception has the potential to play a role in a person’s use or disuse of the system. A majority of those interviewed stated that they were not using EcoSan toilets simply because they were not available in the area. Awino... *“If I had the means, the flush toilet is the best to build. I have used pit latrines, squat and have seen the EcoSan. I would prefer the flush toilet because you do not have to worry about handling excreta.”* Some of the toilets were not working because they were found to be incomplete. If available some respondents were willing to use the facility and participate in its management. Figure 5.5 gives a summary of other reasons cited by the respondents for not using EcoSan toilets.

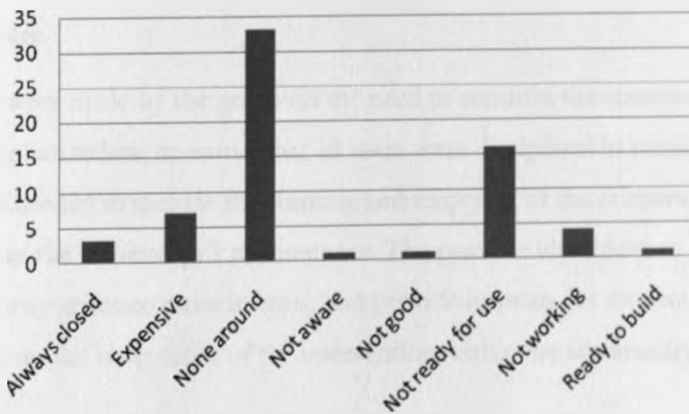


Figure 5.5 Respondents reasons for not using the EcoSan toilets

In responses to questions on the ownership of the EcoSan toilets in Obunga settlement, 54 percent (n=59) of those interviewed reported that these facilities were owned by groups of households, and 39 percent (n=43) said they

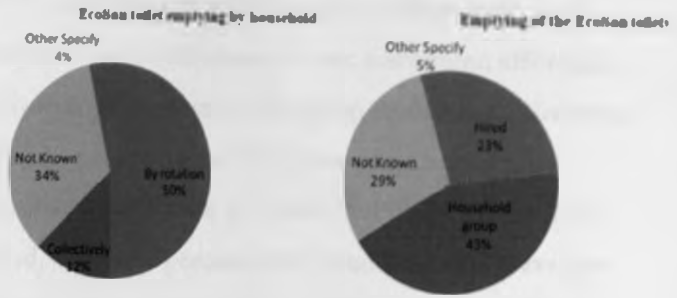


Figure 5.6 Emptying of EcoSan toilet containers

were owned by individuals (see Figure 5.6). Interviewees were asked how they organized the emptying of the EcoSan facility. Findings revealed that 50 percent (n=46) of the respondents with EcoSan toilets emptied the facility in turns, whilst others hired someone to empty the containers, indicating another means of income generation and also reaffirming earlier expressed predisposition to having someone else handle faecal matter. A focus group discussion confirmed the aforementioned response as an attribute of local customs of the community, as noted earlier, which influence the community's perceptions of the EcoSan toilet.

Suggestions were made by the group on the need to sensitize the community on the correct use of EcoSan toilets, to ensure that all users were disciplined in terms of the use. The sensitization needed to include the cleaning and emptying of the containerized contents, as well as the technology's maintenance. The possible identification of a market for the compost may generate more interest, and provide impetus for the required attitude change, and scale up the acceptance of the intervention within the community.

5.4 Household perceptions of the EcoSan toilet

Manyasi: *"handling the faeces is not a problem because it is already in a container, all you need is to knot the end and all you do then is to bury it for a time, then you can use it as fertilizer in the farm."*

Millicent: *"I find EcoSan good because, I handle it myself, and I can use the compost on my shamba, so the resultant compost is useful."*

Benter: *"I find EcoSan a bit difficult. The other day one of my neighbours threw her container, with its contents outside and the smell from it was very bad! I think EcoSan is good for those with a bit of education and not for old people."*

The residents of Obunga were asked to describe the things they liked and disliked about the EcoSan toilet. The general perceptions of the households on EcoSan were found encouraging, with a majority of the respondents rating the technology as generally

good, 63 percent (n=69) thought so on the basis of its convenience, design, cost, safety and dignity. Most respondents found the intervention easy to use; convenient; affordable; safe and provided dignity (especially from the women in the group discussions). However, 'land ownership' and 'tenants' question made it difficult to initiate any intervention without due consideration to the implications. Figure 5.7 shows that 2 percent (n=2) of the respondents rated EcoSan as bad, another 2 percent (n=2) found the facility average, and a rating of good and very good was equal at 34 percent (n= 37) each respectively. In terms of convenience, design, cost, safety and dignity Figure 5.8 projects a very good perception rating convenience at 58 percent (n=64), followed by safety at 55 percent (n=60), design and dignity tied at 50 percent (n=46) each and cost last at 42 percent (n=46).



Figure 5.7 Respondents rating of EcoSan toilets

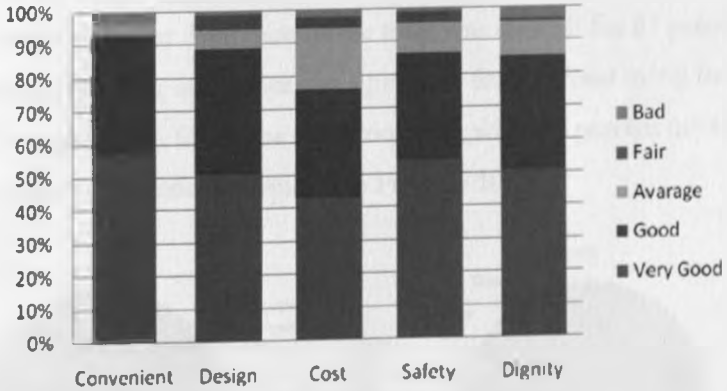


Figure 5.8 Respondents perception of EcoSan toilets

5.5 Factors which influence the acceptance of the EcoSan toilet

Joan: "I feel if you must use water, it would complicate the water situation even further. As it is we do not have enough water, then you have to use it in the toilet as well... no, no!"

Beatrice: *“Mobilization and networking with farmers is missing. This would go a long way in alleviating myths and misconception about EcoSan would be a thing of the past.”*

From these two statements, lack of water is clearly a problem that makes the EcoSan intervention attractive, with the additional focus on mobilization and networking with farmers. Focus group discussants cited the benefit of the economical use of space, as the intervention minimized the need for consistent movement to new sites to put up new latrines when existing ones collapsed, due to floods or filled up as was frequently the case with pit latrines in Obunga. Those who did not like the intervention cited cost, and that it was not convenient nor user friendly.

Oyugi: *“Cost too expensive. The cost of putting up one EcoSan toilet is equivalent cost of three rooms!”*

Lilian: *“it is average. The problem with EcoSan is the correct use. Some people use it badly and then it smells. Perhaps the design can be amended to take into consideration how the faeces and urine mix to come out together, but without the smell.”*

The design of the stairs was found to be too steep. As a result, elderly members of the community as well as the disabled experienced difficulty in using the steps to access the raised toilets. Designing a gentle ramp was suggested instead or in addition to the steps. Furthermore, emptying and handling of the facility was found to be a big issue and considered to be a deterrent from embracing the initiative. Figure 5.9 shows that 53 percent (n=58) found EcoSan to be too expensive; 10 percent (n=11) did not like the way the toilet is used and 6 percent (n= 6) found the toilet inconvenient; 11 percent (n=12) did not know about the toilet. Emptying of the toilet was difficult for 67 percent (n=74) of the respondents; handling and odour was a problem for 3 percent (n=3) for each respectively. 1 percent (n=1) found the toilet too open, while 16 percent (n=18) did not know what to make of the toilet as depicted in Figure 5.10.

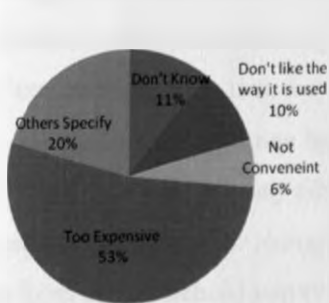


Figure 5.9 What respondents did not like about Ecosan toilets

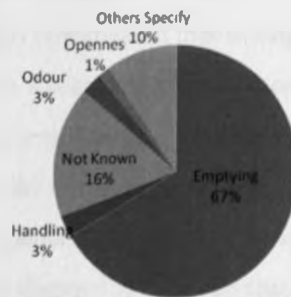


Figure 5.10 Difficulties experienced with Ecosan toilets

From these answers, general factors that influence the acceptance or non-acceptance of the eco-friendly alternatives were suggested. The following is a summary of issues that emerged as factors that influenced users' acceptability of the EcoSan toilet:

- Operational factors regarding the recycling process and maintenance of toilet
- Physical characteristics of the toilet and structure (i.e. design)
- Financial factors (inability to afford one)
- Communication on the correct use of the toilet

5.5.1 Operational factors

Operational factors such as usability, training and management issues are important, because the use and maintenance of the EcoSan toilet varies in comparison to other locally available sanitation options such as the pit latrine. Respondents reported that the EcoSan was easy to manage and use, and noted that the process of adding ash to faeces after defecation eliminated bad smell. Many of them expressed their willingness to use such a facility were

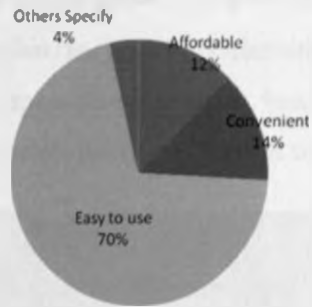


Figure 5.11 What respondents liked most about EcoSan toilet

it to be available. Figure 5.11 gives a summary of the household's responses on what they liked most about EcoSan toilets. 70 percent (n=77) cited easy usage, for 14 percent (n=15) it was convenient. 12 percent (n=13) of the respondents found it affordable while 4 percent (n=4) did not specify their reasons for liking the EcoSan toilets.

Conversely, others cited the consequences of improper training being stinking toilets, and dangerous health issues. One noteworthy comment regarding the general usability of EcoSan toilets, was made by a man who commented that during menstruation women are 'not free', meaning that they cannot use a recycling toilet because they have nowhere to dispose of their feminine hygiene products. Mary... *"EcoSan is good, it is clean, it has no smell. We pay an amount of money with each use. This money is used to buy tissue paper and pay the person to empty the container. Cost sharing helps us maintain the cleanliness of the facility."* Some respondents from the household survey and group discussion believed that community members should pay for use of toilet facilities in a bid to keep them clean.

At the nearby Manyatta 'A' Primary School, a double vault *Skyloo* was constructed in partnership with SANA International (Figure 5.12). It aimed at being child friendly and

gender sensitive. Children were aware of the EcoSan toilet though they were unable to use it because of 'fear that they would fall through'. The study also revealed other difficulties associated with use of EcoSan toilets. Whilst the toilet provided privacy and dignity to girls, proper use of the technology required discipline. It was a major challenge for the students to keep the facility clean, handle ash, soil and remember to wash their hands after use, especially boys who were very playful and cheeky (they often did not check where they urinated)! Water entered the toilet vault when cleaning the toilet floor, and there was no provision for anal cleansing for Muslims. SANA International suggested that the 5 litre plastic jerrycan be used as urinals for boys to provide easy collection of urine for reuse for agricultural purposes. Findings acknowledged orientation on the use of the facility was yet to be carried out. Lawrence...*"design of the toilet is a problem for little children. The hole is too big and they may fall. The carrying of the bag and having to handle the faeces is a problem."* Orientation was carried out at the outset of implementation, with no repeat demonstrations, hence, the community do not have adequate knowledge on the correct use of the EcoSan toilet.



Figure 5.12 Sanitation facilities at Manyatta 'A' Primary School, to the right is the double vault EcoSan toilet facility (Source: Adede, StAD student, 2008)

5.5.2 Physical characteristics (design)

Physical characteristics of the EcoSan toilet included construction/design and aesthetics. These factors influenced the user's daily interaction with the facility and dominated their physical experience with the toilet. It is also interesting to note that the physical features can manifest themselves in human sentiment in ways such as aesthetic appreciation for the structure or pride in ownership, as was frequently expressed by users.

In general the community was not averse to the design of EcoSan toilets. The issues raised by the interviewees regarding the EcoSan's physical characteristics included ease of disposal of waste; the color of the squatting pan and the facility in general; and the

handling of the disposal container. Figure 5.13 shows a finished individual household EcoSan toilet in Obunga Kasarani, and highlights the type and design of the squatting pan and container being used in the area. Accounts from a female landlord, Jane Aulo Wesonga, and one of the first adopters of the EcoSan pilot project in the area, described the benefits of the technology as—being near. It was hers and it gave her the security she needed to use the intervention. She did not need to go far, so there is an element of security. In comparison to a pit latrine, in which the superstructure was often made of mud walls or plastic paper bags, the EcoSan toilets were very pleasing to the eye. Similarly, whereas the floor of most pit latrines were made of mud, the EcoSan toilet’s cement floor slab maked cleaning, mopping and sweeping easier.



Figure 5.13 A household Ecosan facility showing the squat pan and emptying chamber situated at the rear of the facility (Source: Researcher, 2009)

A majority of the households interviewed (86 percent) were strongly interested in the EcoSan toilet, and expressed their appreciation for the technology. Respondents were willing to recommend the intervention to others on the basis of its good design; the fact that it was hygienic and cost effective in comparison to pit latrines. It also provided dignity (a sense of worth) and security for users. The women in particular cited the sanitizing aspect of composting faecal matter as good; besides the ensured safety of the facility. Mary said “*even if my identity card drops into the toilet, retrieving it is not difficult, not like the pit latrines. I am scared when the children go to pit latrines.*” Most of the households interviewed reported that the users of EcoSan toilets in Obunga were respected, showing that the intervention elevated one’s status. A summary of suggestions on ways to improve the design of EcoSan toilets is represented in Figure 5.14. From the chart the ease of disposal ranked highly, followed by it being raised, and then direct waste to the farm. It is clear the handling of the waste is an issue and as predicted it maybe a cultural one. Beatrice, on improvement of

... says "we need education and marketing! The product is something that brings money... even that of handling faeces being taboo that people harp on, would disappear!"

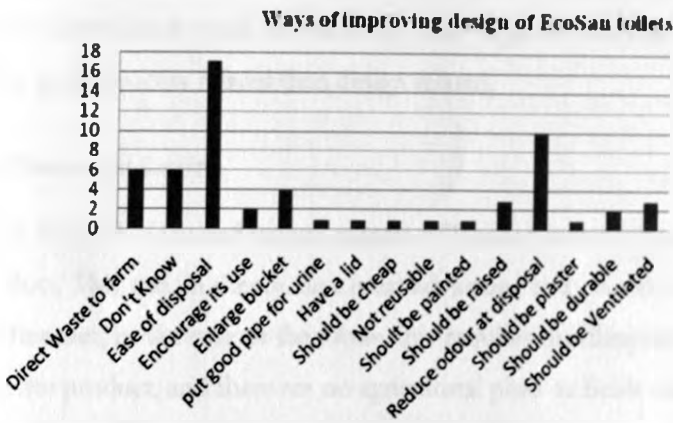


Figure 5.14 Suggested ways of improving design of EcoSan toilets

5.5.3 Financial factors

Household financial issues are fundamentally important to the acceptance or rejection of the EcoSan toilets due to the low income levels of most of the users in this area. Users will compare the cost of the *Skyloo* to the cost of other toilets commonly used. In this case study, the cost of the eco-friendly alternative toilet is compared to the cost of the pit latrine. Pit latrines are generally considered to be a cheap and affordable option for many Kenyans, including most of the households that were interviewed. Notwithstanding, perhaps acceptance could be pillared and mirrored on the long-term benefits in addition of the EcoSan intervention once the community is engaged in purposeful dialogue with the intervention advocates and promoters. The response from the focus group discussion concurs with the thought on the long term benefits of the intervention. With proper education, advocacy and marketing. The group argued that pit latrines have to be reconstructed anew once they fill up, get flooded or collapsed, whereas the *Skyloo* does not take up much space and is built above the ground, and is more permanent.

5.5.4 Communication

Findings from the focus group discussion revealed that a majority of the residents in Mungu expressed the need for increased awareness while promoting the upscale of the technology in new areas. They complained that the provision of information remained a problem, as it was often incomplete, and residents were not given sufficient sensitization

prior to and following the installation of an intervention. As a result, this led to the improper use, as in the case of the EcoSan toilet, and the abandonment of otherwise useful designs. With adequate information, the attitude and perceptions, including the take up of the EcoSan intervention could be scaled up. This suggests therefore, that the problem appears more process related than design related.

5.6 Reuse of faeces and urine

One of the most obvious and unique aspects of EcoSan is that it produces an agricultural product. This can, in theory, be a great advantage to a household that is active in agriculture. However, in the case of the *Skyloo*, this requires handling one's own faeces and urine to get the product, and there are no agricultural plots or fields nearby where the product can be taken to. The potential for an important relationship between sanitation and agriculture though acknowledged is not appreciated in Obunga. This is evidenced by the fact that the reuse of faeces and urine is not widespread. When asked to explain how they handled urine and human waste from the containers, 25 percent (n=22) of respondents surveyed reported that they disposed of it; 14 percent (n=13) recycled the urine; 4 percent (n=4) poured out the urine; 4 percent (n=4) used it as a fertilizer; and 35 percent (n=32) had no idea what happened to the urine as is shown in Figure 5.15)

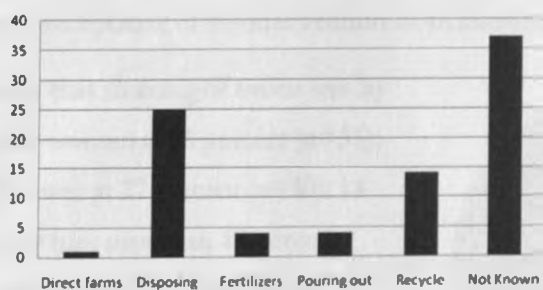


Figure 5.15 Handling of urine and waste

While not a rigorous method of judging the actual impact of the reuse of urine and human waste, questions on how users perceive the impact of human manure on their gardens, does give an indication of how much people value urine. When asked if they mixed food remains with human waste from their toilet vaults, 51 respondents said no, 26 respondents affirmed that they did, whilst 10 respondents did not know about mixing (see Figures 5.16 and 5.17). Further analysis revealed that the compost from the compost pit

was used as fertilizer or disposed of. Similarly, urine was also used as fertilizer, although a majority of respondents used it as a pesticide.

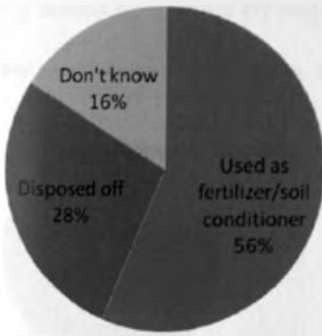


Figure 5.16 Where compost matter from the pit is taken

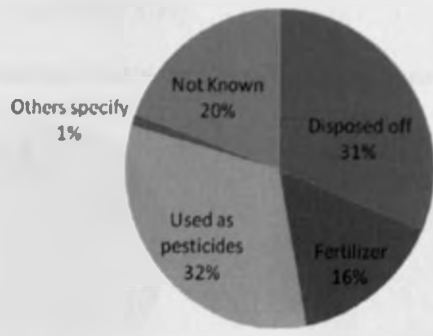


Figure 5.17 How urine mixture is used

50 percent (n=46) of the respondents said the community was aware of past and current use of urine in their community and in other communities, while 48 percent (n=53) were not aware; the remaining 2 percent (n=2) did not know. When asked the same question but with respect to human faeces 58 percent (n=64) of respondents were aware of human waste reuse, while 37 percent (n=41) were not aware; 5 percent (n=6) did not know. Respondents' knowledge of reuse of human waste as fertilizer was 61 percent (n=67); reuse on farms 7 percent (n=7); and 32 percent (n=35) did not know. However, it is worth noting that knowledge and awareness of reuse of urine and human waste did not translate into automatic acceptance of the intervention as an alternative sanitation practice.

Figure 5.18 shows that cleaning of toilets was by far and large handled by women at 28 percent (n=31); men stood marginally lower at 27 percent (n=30); 14 percent (n=15) said they hire someone; 10 percent (n=11) said both men and women cleaned the toilets; 20 percent (n=22) did not know who cleaned the toilet; and 1 percent (n=1) said children cleaned the toilet. Management of the facility is difficult given the high number of users per toilet. Women were more affected by the lack of toilets as they were responsible for looking after children and the elderly, who themselves would be challenged by these toilets.

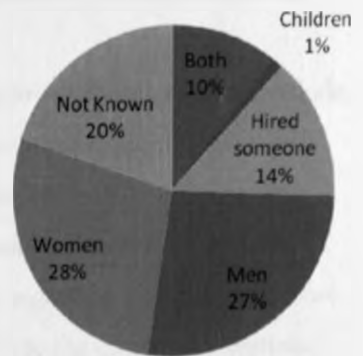


Figure 5.18 Toilet cleaning

Reuse of human waste and urine was perceived to be good by majority of respondents; and eating of food from a garden fertilized by human waste or urine was generally found acceptable by respondents (see Figure 5.19).

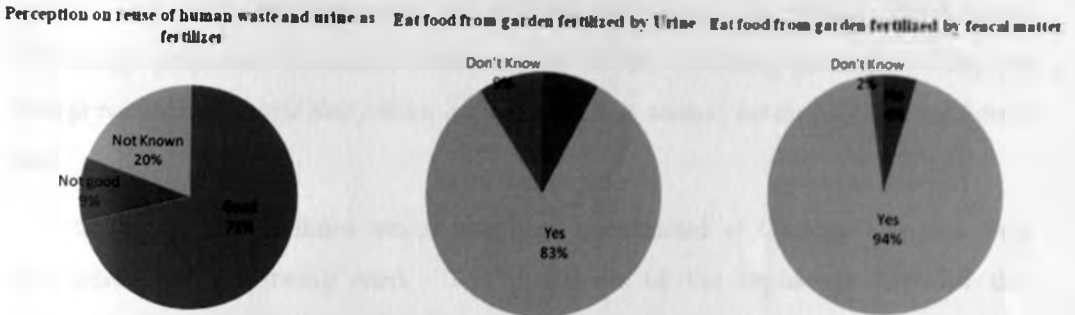


Figure 5.9 Perception on reuse of human waste and urine as fertilizer

5.7 Challenges facing sanitation provision in Obunga

Beatrice. *“It conserves the soil, and is very good.”*

Peres: *“My grandmother used to harvest very big maize from her shamba. I used to think that the soil was just fertile, but now looking back to the habit of digging holes and burying our faeces in the ground, what the faeces was actually doing was fertilizing the soil. No wonder the maize was so big!”*

Manyasi: *“We can form groups, and have a center where we collect all the compost. However, due to lack of education on how to prepare the compost and no market has hindered the uptake. We have however tried composting and used the compost on cabbages and it works.”*

Lilian: *“Many of our people use animal manure, and not compost from excreta, but I think with more education and awareness creation, more people would use compost from human excreta.”*

The challenges facing sanitation provision in Obunga are wide-ranging, and include, but are not limited to lack of sanitation facilities to serve the population, education on hygiene and sanitation related issues, advocacy on the correct use and benefits of the EcoSan toilets, as well as sourcing a market for the end product. From the statements above, it can be added that practices of older generations regarding recycling and reuse of human excreta for composting has not been passed down to the current generation. Community members need to be involved in all aspects of planning, design and implementation of interventions.

5.7.1 Community participation in construction of EcoSan toilets

Involving stakeholders in the community in the planning and implementation of programmes, it was observed to be fraught with challenge. First, to identify development conscious members of the settlement or champions to serve the interests of the

community indiscriminately without politicizing issues, or being taken out of context or personalized was difficult. Most of those selected were often hand-picked without adequate consultations with neighborhood associations (NA), and often had a self seeking agenda. As a result, the community felt sidelined and taken to be foolish. The Obunga Orphanage proprietor Lawrence elaborates this in the following statement—“*they (the Obunga residents) understand their problem and also know their solutions, but the NGOs do not listen to them.*”

Currently, two facilities which had been constructed at Obunga Kasarani were incomplete and not being used. The proprietor of the orphanage revealed that construction of the facility in his plot started in 2005. This included training the community on the use of the EcoSan toilet, advantages and dynamics of value addition of composting the faecal matter for production of manure. However, the community was not actively involved in selection of sites, proposed intervention, or the actual construction of the toilet and water point adjacent to the facility. As a result, some issues of communication, i.e., low level of awareness and knowledge on the importance and management of urine, its nutrient potential and subsequent impact on agricultural production came up. Despite the fact that the construction of the toilets was curtailed, the proprietor stated that SANA informed them that their contract with the orphanage was complete, as a result, it had been left to the community to install the EcoSan toilets on their own. Whether this was initially understood by the community is still to be explored.

5.7.2 Community perception and behaviour

During the course of promoting the EcoSan toilet in Obunga, one of the main challenges faced was changing the community’s perceptions and behavior. Evidence adduced from the discussion with the respondent indicated that the community did not use the facility (see Figure 5.20). They were and still are not comfortable with the idea of handling



Figure 5.20 Incomplete communal EcoSan toilets put up at the Obunga Orphanage, located in Obunga Kasarani (Source: Researcher, March 2007)

faecal matter, deeming it to be culturally unacceptable. Animal waste on the other hand was readily accepted and is recycled for biofuel or for manure. Besides, community members' perception of the toilet as the proprietor's and not theirs underpins the absence of collective ownership. Lawrence further cited lack of consultation or awareness creation before implementation or intervention is mooted. Instead the residents of Obunga were 'told' or 'instructed' on what was going to happen instead of 'working together' to ride through challenges that may present themselves, which gave rise to 'an aloof' or 'wait and see' attitude.

According to Joshua Odindo from Umande Trust, the German Technical Co-operation (GTZ) and Water Trust Fund (WTF) had expressed their interest in jointly funding a proposed Bio-tower project for Obunga. However, an assessment of sanitation facilities in the settlement revealed that most of the toilets were either incomplete or not working. As a result, NGOs involved in working with the communities in the affected areas had been asked to go back to the drawing board to resolve this status. This outcome may lend credence to the Neighborhood Association's sentiments of exclusivity in the planning stages of proposed or upcoming projects.

The following are cross cutting issues that emerged from the focus group discussions:

- Respondents concurred that the EcoSan principle and technology was very good. However as 'tenants', the community were 'voiceless' and could neither articulate issues concerning and affecting sanitation provision and management, nor effect sustainable change in the prevailing situation in the Obunga settlement.
- Spatial constraints and land ownership issues was perceived to be the greatest impediment prohibiting positive development. Absentee 'landlords' were unconcerned with provision or improving facilities for 'tenants'. In addition, the perceived lack of protection from the government and municipal administration (the area chief, and municipality officers) on the land ownership and tenancy issue was seen as an obstacle to development.
- Plot sizes were too small to allow for subsistence farming, hence there was an urgent need for a central depository and a ready market for the compost from human waste to sell the value added benefit of the resource.

- The necessity for resource mapping of community leaders, health providers, and traditional birth attendants. They could be used to positively influence attitude and behavioral change, and thus lead to the acceptance and replication of interventions.
- There was an urgent need to for hygiene education, and advocacy on the importance, and the correct use of the EcoSan intervention to improve sanitation, alongside the benefits of urine and faecal matter in agricultural production.
- NGOs need to consolidate their collaborative efforts, for further reach and for positive impact. There is a willingness by the community to adopt the EcoSan design as a sustainable intervention, but efforts of implementing partners need to be well coordinated and all inclusive of intended users of the design intervention.
- Government needs to recommit to providing basic services to all, planning, enforcing by-laws and regulations enacted to govern health, water and sanitation provision to bring about order in informal settlements such as Obunga. Chiefs who were previously the custodians of enforcing this have had these powers withdrawn hence assistance is channeled through municipality workers, which was often not forthcoming. Community structures therefore need to be strengthened with government support.
- Tenants need to be educated on their responsibility to provide and sustain a clean and healthy environment.
- Users of intervention must be made to understand why the intervention is there and how to correctly use the intervention, for sustainability to be realized.

5.8 Summary

In summary the household survey and focus group discussions revealed that a 'good' design is only a good intervention in so far as the principles underscoring correct use of the intervention are clearly understood by the user and value addition element of the design intervention emphasized through repeated demonstrations. Cultural biases, as in the case of Obunga was a factor that did not seem to be inhibiting uptake, nor was it a deterrent in the face of the more opulent opportunity of income generation the compost offered. A design was therefore deemed to be seemingly 'good' if it had something in return to offer, in this case, an opportunity to be used as fertilizer, a barter product, as well as a possible source of generating income. 'Good' design therefore requires an action-oriented approach for acceptability, sustenance and accountability. As Peres capitulates, *"these people who empty the containers, they are lying low, and fleecing us! They know they are getting*

money twice! And from Mary, now that we know...the people emptying the containers will not be able to come here to take our compost and make us pay for it! Wacha! We will sell it to them!"

Chapter 6: Discussion, Conclusions and Recommendations

6.1 Discussion

This research set out to find out the norms, perceptions and practices of the Obunga community, as it affects the uptake of the EcoSan toilet; and to provide an insight into factors that are important to users of ecological sanitation in the study area. Results from the field survey prove that the EcoSan is a safe and viable option for excreta management for some households. It has tangible benefits which are especially relevant to households who practice agriculture and are in need of basic sanitation; has potential to generate income; and support many regional, governmental and municipal goals common to developing nations, associated with protection of water and widespread sanitation coverage. This study has shown that cultural concerns specific to the local community have the potential to outweigh the value of the intervention for EcoSan toilet owners. However, with the right approach in introducing EcoSan toilets, that is, sensitization through hygiene education, proper organization, motivation and increased participation in planning and implementation of design interventions, and a marketing strategy in place, demand would outweigh cultural prejudices. Demand and resultant uptake would then make EcoSan toilets self sustaining and therefore a 'good' design intervention.

Given the time constraints and sample size of the population surveyed, the research results point to a need to pursue further investigations on key factors and areas that can stimulate and inject demand in the uptake of EcoSan toilets. Research targeting the micro scale entrepreneur to document available skills could be a starting point. There is a rich repository of untapped, latent knowledge and skills, that engaged and developed effectively, could revolutionize and jumpstart a sustainable EcoSan industry of its own.

Is a 'good' design necessarily a good intervention, and what qualifies a design to be good? In trying to unravel the implications of the aforementioned questions, it is worth noting that the challenges informal settlements pose are similar across the world. Paradoxically, inhabitants of the informal settlements are in themselves rich repositories of indigenous and traditional knowledge on causes and solutions to problems afflicting them, for example, how they can provide sanitation facilities for themselves, but majority are too poor to afford design interventions meant to improve their lifestyles. Often, their

thoughts and opinions are also not engaged, leading to unsustainable or failure of design interventions, such as that of the EcoSan toilet. Efforts geared towards making positive change should therefore provide systems and processes that engage and listen to people, and is relationship oriented. As a result, getting to know the people of Obunga more through interaction could provide the necessary insight and highlight the characteristics, processes and methods of community/design intervention dialogue (rejection or acceptance) as a means to a more sustainable livelihood. Winston Churchill once said *“without listening there is no future”*. Skills and crafts thus become more important and practical, and allow for an understanding of how people adapt and manipulate ideas, activities and characteristics to resolve problems.

Political, social and economic processes that governments use to counter challenges of the poor in informal settlements differ and depend on strategies employed; to drive or stifle political and social freedoms that engage the process of development. For example, Sen argues that development is a process of expanding the real freedoms that people enjoy, directing attention to the ends that make development important, rather than merely to some of the means that, among other things, play a prominent part in the process. Therefore political, social and economic freedoms call for a holistic, coordinated, comprehensive, consultative and demand-driven approach to solving problems. Dialogue is one way to make this happen; it requires sustained interaction (of thoughts, ideas, activities, designs and processes) and design interventions can be translated as a kind of dialogue on the material culture plan.

The Kenya National Environmental Sanitation and Hygiene Policy¹ reflects the government’s responsibility to *‘create and enhance an enabling environment in which all Kenyans will be motivated to improve their hygiene behavior and environmental sanitation, and which gives people access to the necessary support to achieve this’*. The vision statement recognizes the right of every person to *‘enjoy a dignified quality of life in a hygienic and sanitary environment, free from suffering any ill health caused by poor sanitation’*. However, the situation on the ground differs from the espoused vision as has been seen in investigating EcoSan toilets in Obunga. The passive role of government in Obunga settlement exemplifies the lack of political will to provide this basic right; in an effort to realize the MDG 7 on health, water and sanitation. This is reflected in the resident’s vulnerability in their attempts to secure service provision. The inhabitants of Obunga have no protection from the exploits by landlords and other land

¹ Kenya National Environmental Sanitation and Hygiene Policy (2007)

developers. Landlords put up anything in the name of a house, with or without sanitation, leading to a large number of people resort to defecating in the open. Lack of infrastructure (electricity, water and sanitation, roads) compromises the security of Obunga residents. The study findings indicate a laxity on the part of government to enforce rules and regulations that provide for equitable distribution of public resources.

From the field survey, it is evident that Obunga community members desperately yearn for improved access to basic service provision. A majority of the residents are aware of the existence of alternative sanitation interventions like EcoSan; some have it and even those who do not have one are willing to have one. That they can ill afford the various interventions required for an average and comfortable sanitation facility is beside the point. The point of concern however, is with the approach employed in bringing about this development. There is lack of sustained engagement and dialogue (communication) between NGOs working in the settlement and the community leading to abandonment and non-use of an otherwise useful intervention. For example, processes of engagement need to recognize the delicate balance required for power play and gender roles as seen in the care and maintenance of the toilets.

In all cultures communities ascribe different qualities and rights to women and men regardless of their relative competencies or desires. As Johnsson-Latham (2007) says, today and throughout history, power has represented an opportunity—and a privilege—whereby those holding it are able to *define both the problem and the solutions*. Gender and gender power are reflected at all levels of society, where women are often responsible for health and social care provision (at home and at the workplace), and men have a greater opportunity to pursue choice careers/work and to participate in decision-making at all levels of public life, for instance, in the choice of water and sanitation (whether there is a toilet or not). In informal settlements, as in Obunga, women, children and the elderly live and play from day to day close to waste facilities, transport routes and contaminated land areas. They are often more exposed to environmental risks than men who go out to work or in search of work. However, more emphasis is placed on economic growth than environmental and sanitation problems related to circumstances of women and children (Bradley, 2006). Lack of or poor access to water and sanitation services impacts negatively on women, children and the aged by undermining their dignity and security, compared to the effect on men, as found from the results of the field survey. Women respondents of the focus group discussion suggest education, sensitization and identifying markets as ways of adding value and a means by which some

of the problems relating to improving lifestyles can be addressed. Women work very long hours with little or no facilities to lighten their chores: for example, at night, in Obunga, most women dare not venture outside to use the common toilet, preferring to use a tin container in the house. Results of the field survey show that they are often sidelined, and not consulted in decision-making because they are often not thought worthy to consult over such matters, except with respect to household matters of care-giving and related issues.

For design interventions like EcoSan in Obunga informal settlement, a comprehensive, planned and coordinated infrastructural scheme as a pre-requisite could make them effective, with dialogue sewn into them. However, the current planning, design and implementation process is not coordinated, consultative or demand-driven. Furthermore, it does not consider household composition, needs, culture, or activities. Whereas, project implementation, timeline, and funding are the principle guidelines driving the development agenda, they have failed to recognize the aforementioned contextual issues in order to interact proactively with them. Prof Miriam Were sums up the situation very aptly in her statement

‘Donors, and we Africans ourselves, must recognize the local context and realize that this context may not be in support of the long-term benefits anticipated from the project we have designed our way. Plans need to be in tandem with community profile (composition, needs and demands for a given intervention) failure to which can lead up to the rejection or non-use of interventions designed to improve lifestyles particularly those in informal settlements.’

The benefits of water supply and sanitation improvements are often, from a health perspective, equated to reduction of diseases such as diarrhea, malaria and intestinal worm infestations. Hygiene education coupled with water supply and sanitation reduces disease further. However insufficient education on health and sanitation poses a major challenge in Obunga, inadequate water supply and sanitation the reason why the 1993 World Development Report (WDR) states that *‘the lack of water supply and sanitation is the primary reason why diseases transmitted via faeces are so common in developing countries’*.

Residents of Obunga have expressed what they like and do not like about the EcoSan toilets; what they are willing to pay for and what they see as stumbling blocks or obstacles to improved sanitation. Evidently, the community knows exactly what it needs. However, their involvement in order to articulate these needs and choices are sidelined or not considered at the project profiling, planning, implementation, or monitoring

stages. The sanitation profiling of Obunga must therefore take centre stage in development strategies earmarked for the area; identify prime drivers of an intervention, which in turn, must be demand-driven and context relevant, if sustenance and up-scaling of design interventions is to succeed. The poor and vulnerable need to participate in social, economic and political consensus building in order to promote good governance whose building blocks are characterized by transparency, accountability, the rule of law, effectiveness and equity.

There is no one fit for all, and EcoSan as an alternative to traditional sanitation intervention in Obunga needs to consider factors such as the number of users per toilet for ease of management, difficulty of use by children and the aged or disabled, due to the steep steps, proper ventilation, colour of the toilet bowl, odour, and demonstration on correct use of the toilet. Success and sustenance of design interventions for improving lifestyles have been achieved in other cases through processes that respect and provide dignity for people; identify, recognize, adapt and manage characteristics, culture and skills to resolve problems. Lessons learned from interactions and interventions yield a rich background and resource pool on designs for the future.

For example, in Malawi, success of the low cost ecological sanitation programme has led to building over 11,000 compost producing toilets since 2003². Popularization of the intervention was achieved through a diverse range of methods; advocacy campaigns and the use of media. However, word of mouth and physical demonstrations of the technology were found to be the most effective forms of promotion. 'The fact that EcoSan toilets generate valuable compost allows for the possibility of cost recovery for households in the long term and has proved to be a more important driver than either hygiene or convenience' a sentiment that was echoed by a woman respondent from Obunga who said *'if we have a ready market for the compost from EcoSan toilet, I can assure you not even culture is going to stop people from recycling their faeces*. Yet another woman respondent, *'I shall not pay the exhausters a cent. All this time I am just buying back what I have paid them to collect from my latrine!* In Embagwani, Malawi, women found the *Arboloo* technology easy to construct, and formed groups to construct one for each group member. The acquisition of a toilet provided for power (possibility of income generation), cleanliness, convenience, respect, dignity and security. The ability to put up a toilet boosted their confidence and a sense of ownership was also realized. As in the Malawi case, in

² WSP (2005)

Makueni, Ukambani, Kenya, once women knew how to construct the *Arborloo* toilet, they formed groups and built toilets for each other, and were not only proud to own their own toilet, but were also provided with the additional privacy, dignity and security that owning a toilet provided them. Their status in the community changed to a respectful one, as they now had a toilet they could offer visitors³.

6.2 Conclusions

This research commenced with a description of the sanitation situation in Kenya, using the local context of Obunga as a case study. It highlighted acceptance and use related issues, and the challenges experienced in scaling up ecological sanitation toilets as a design intervention. It would be prudent to recommend ways that could promote and market the *Skyloo* since Obunga residents recognize its value. This may also be a basis to see how to prompt and market other design interventions. This study provides evidence that apart from fulfilling the sanitation purpose, the EcoSan toilets are good design interventions with tremendous benefits ranging from pollution minimisation, environmental soundness and increasing food production. Findings explain that whilst the residents of Obunga hold a strong interest and appreciation of the technology, and expressed their willingness to install EcoSan toilets, the adoption rate has been rather slow. Adoption and replication need to be scaled up. To realize this, factors driving demand need to be identified, highlighted and engaged with commitment. It is important that the community in Obunga be sensitized and engaged in dialogue to document indigenous knowledge and skills necessary to build the impetus required to scale up sanitation interventions. Some of the factors that are hindering adoption of the EcoSan toilet are:-

- The initial capital costs of the EcoSan toilet is relatively high compared to the more traditional sanitation alternatives. As a result, communities normally expect and demand subsidies to enable them to adopt the intervention. However subsidy is nothing more than a promotional tool. Unfortunately, this feeds the existing misconception that ownership and management of the facility rests with the provider. One of the major challenges will be to change the perceptions and attitudes of the community. Likewise, one needs to understand that EcoSan is more than a toilet; it is actually a toilet, a treatment or recycling system and a money generator. In this context, the cost of this intervention is significantly less

³ WSP (2005)

than other toilets and treatment systems. **Therefore, increase access to, scale up education of sanitation and hygiene choices, and demand for sanitation facilities will improve with correct use in time.**

- Incomplete structures make it difficult for users to appreciate the benefits of the intervention, and deny them the experience to make informed choices. Advocates of EcoSan toilets need to increase awareness regarding the benefits associated with the intervention. Follow-up training events could be a way to encourage users to interact with other EcoSan owners and share experiences. Such events would help reinforce the methods of safe disposal, reuse or application. **An action-oriented approach should be employed at the individual, household and community level to promote action-based health messages for behavioural change leading to healthy practices and uptake of ecological sanitation systems.**
- There is no existing collection or resource centre in Obunga where all the waste can be sent, to allow for composting and sale to buyers. Some residents suggested that having one would eliminate the stigma associated with handling faeces and prove to be a driving factor in the acceptance of the intervention. Similarly, the process involving the transfer of compost from product to the ready market was problematic. Setting up local groups to organize for transportation of the compost when ready, would assist in scaling up the demand for EcoSan toilets. **Provide a central depository and build capacity to improve sense of responsibility and for sustainability.**
- Lack of enforcement of municipal bylaws and regulations relating to land use, infrastructure development, and construction of rental houses and toilets. Landlords should be required by law to provide sufficient and acceptable sanitation facilities. In turn, tenants should be trained on the use and management of the facilities, in order to ensure their cleanliness. Instruction posters could be left in the EcoSan toilets, to help new users understand how the toilet works. This would provide ongoing users with a simple checklist to make sure they are continually using the facility correctly. Any such poster should be based on pictures (visual) also carefully chosen, using a few words as possible, so as not to marginalize illiterate users or be misunderstood. **Political commitment matters. Educate community on bylaws and regulations and enforce the same.**

- One issue that was often mentioned by the residents in Obunga was the absence of agricultural extension workers, who would be instrumental in creating an environment to persuade people to replicate the EcoSan toilet, considering its potential to add value to their agricultural production. For potential EcoSan owners who are sceptical about the agricultural value of faeces and urine, the study recommends that a field experiment site be set up. Such demonstrations are seemingly common among some organizations, and have been well documented in the past few years. It is a relatively simple task to show the positive impact on vegetables that are grown with the products of the EcoSan toilet, in comparison to those that are grown without. **Practical action-oriented approaches, for example, provision of an Environment Pedagogy Centre, where demonstrations on the correct use of the EcoSan toilet, and reuse possibilities can be set up, are required to build consensus on good practices.**

6.3 Recommendations

The following are some of the recommendations arising from the research findings and analysis. Effort should be made to:

- **Create awareness about EcoSan latrines among users, activists and at the political level. At present level of awareness is insufficient to enhance sanitation coverage.** Sensitization and advocacy campaigns for promoting ecological sanitation through workshops and seminars, and the creative arts (skits, drama, song, and dance) which involve all stakeholders is recommended. Children are very effective in influencing parents with their rhymes. Use of audiovisual materials such as print and electronic media (posters, brochures and advertisements) to provide facts, demonstrate correct use and benefits of the EcoSan toilet (convenience, security, dignity, and income generation) should be encouraged and stepped up to bring about attitude and behavioural change. Furthermore, the government should be actively engaged to foster and build trust in its relationship with the community.
- **Sustain dialogue between the community and all stakeholders involved in initiatives for improving livelihoods. Researchers should share their findings with the community and work together more cohesively to build a credible resource pool of local knowledge and good practices that can be tapped**

into. Lessons learned can be replicated and used. Community scepticism stems in part from the fact that at times researchers go into the settlement to get information, but do not go back to inform the people what they have used the information for, or how it can benefit the community they are sourcing the information from. As was in the case of this study, focus group discussants wanted to be compensated financially for their time, even before the discussion started. This evidenced the need to build trust in the intervention build up process, if it is geared towards development of any sort, otherwise it becomes a money making venture.

- **Use local knowledge and skills to extensively implement technology.** Sourcing locally available materials for use in the construction of EcoSan is one way to drive down cost. However, knowing and using the skills available within the settlement will yield solutions (in the form of ideas, materials and workmanship), crafted by and for the people themselves, and will anchor the principle and process of designing ecological sanitation of choice. This approach can generate interest in the youth, provide a resource pool, create employment, and be a long term sustainable solution.
- **Educate the community on hygiene, public health issues relating to water and sanitation to increase awareness and reduce water-borne and sanitation related disease prevalence in the community.** The government through the Ministry of Health and Ministry of Water and Sanitation, must improve hygiene and sanitation efforts; **spearhead and support policies and institutions entrusted to handle sanitation at different levels and in different areas.** Human and environmental health is crucial to sustainable development. Current indicators in human health statistics give worrying trends as evidenced by increasing child and maternal mortality, decreasing life expectancy and population decimation by HIV/AIDS⁴ (NEMA, 2003).
- **Strong political will, backed by incentives and awareness campaigns are needed to ensure the achievement of sufficient sanitation coverage.** Similarly, politicians also need to be educated on the benefits of ecological sanitation such as EcoSan toilets, as a viable option, and asked to market the intervention at political gatherings and meetings. This will assist in the

⁴ National Environmental Management Authority (2003)

scaling up, acceptance and replication of eco-friendly alternatives. The sanitation sector needs to 'think ecologically' to limit the negative impact of traditional solutions, and broaden the options of sanitation technologies to include the re-use of excreta nutrients.⁵

- **Introduce ecological sanitation as part of the curriculum in schools as another avenue through which successful marketing of EcoSan toilets can be achieved.** Young children are known to internalize and adopt learned behaviour. Children in this respect are active change agents and can be used to successfully bring about behaviour change, thus, scale up adoption of ecological sanitation.
- Construction issues were noted as part of what the users of the EcoSan toilet disliked about the intervention. Many of these complaints can be easily fixed with design modifications to the structure of the toilet. Train masons to customize toilets within limits, to meet individual household specifications, and to cater for the elderly as well as the disabled. Follow-up and evaluate user satisfaction. Provide feedback to system designers and builders to increase the community's acceptability of the *Skyloo*.

6.4 The way forward

6.4.1 Policy considerations

Three main policy considerations follow from this research. First, ecological sanitation works toward achieving the Millennium Development Goal, as set forth by the United Nations, of providing sanitation cover in areas where other low-technology sanitation options are not feasible. The EcoSan toilet fills a special niche in developing countries that are trying to provide sanitation to its populace while maintaining the ecological integrity of its water resources. Therefore, a second consideration is the potential for EcoSan to play a valuable role in regional integrated water resource management plans. While it is true households are not likely to be as concerned about such regional issues, this is a major challenge for national governments, municipalities and communities of informal settlements like Obunga. Government institutions should enforce laws for ecological sanitation at a national or municipal level and create income

⁵ WSP (2004)

generating activities as well, through partnerships with institutions of learning, local and international NGOs.

In conclusion, as mentioned earlier, ecological sanitation is attractive to international development experts for three main reasons: it provides sanitation coverage, is a potential agricultural resource, and prevents pollution of water resources. Ecological sanitation, on a regional level, works toward both Target 9 (reversing the loss of environmental resources) and Target 10 (halving the proportion of the world without access to basic sanitation) of the Millennium Development Goals (MDGs) by protecting environmental resources and providing access to basic sanitation, respectively.

Realistically, the EcoSan toilet has the potential to have a limited, but valuable, contribution to the MDGs. The social hurdles associated with the reuse aspects of the toilet make adoption slow with a toilet such as the *Skyloo*. However, it is evident from literature and this research that the toilet's design has a unique application in certain environmental conditions with a high water table or rocky ground where the more common pit latrines will work with constraints. The toilet might be able to provide valuable agricultural resources to the poor, or provide some cost savings to those who regularly purchase fertilizer, as has been tried in Mozambique and some parts of Kenya. Nevertheless, it remains to be seen if adoption will be sustained without NGO support, or communities will begin to voluntarily adopt EcoSan toilets in Kenya, as has been shown to happen in Ethiopia.⁶

In rural Kenya, 57 percent of the population lacks access to proper sanitation facilities (WHO, 2004). For part of this population, a pit latrine, which is perhaps the only affordable household sanitation option, is not a viable option due to a high water table or rocky ground conditions, and health implications. An above-ground toilet, which must deal with the faeces in a way other than deposition into the ground, is the only feasible improved sanitation option available. The *Skyloo* is an above-ground toilet that is an appropriate, affordable option for people in this situation. It is therefore concluded that household-level EcoSan fills a special niche as a method of sanitation provision in developing countries such as Kenya. This niche is most loosely defined by households that practice agriculture, with more certain adoption among communities that are faecophilic, people to whom the economic value of the processed faeces and urine can

⁶ Drangert, J-O. (2004)

have an impact on a household's finances; places that have a high water table or difficult terrains, or those that are particularly conscious of environmental issues.

6.4.2 Integrated water resource management

Ninety percent of the wastewater discharged in developing countries is discharged directly into water resources without any treatment.⁷ Lake Victoria has gained world-wide attention for its problems with the water hyacinth in the past decade, the cause of which is at least in part due to eutrophication of the Lake's waters.⁸ Ecological sanitation addresses this environmental issue by dealing with nutrient-rich excrement on-site and not sending it "away" to other destinations like Lake Victoria or Kenya's Tana River. The environmental case for ecological sanitation as a part of integrated water resource management is important, and many developed-world examples of EcoSan are founded on this or such principles. Industrialized and developing countries alike face harsh nutrient pollution problems that result in eutrophication of lakes and a depletion of aquatic natural resources. EcoSan is an exciting prospect to many experts because it has the potential to alleviate water resource problems in developing countries, and this research shows its potential despite the prevailing issues interfering with the dialogue and initiative. Lesser developed nations have the opportunity to "leapfrog" developed countries and adopt more appropriate, environmentally sustainable technologies. Indeed, the environmental argument may be one of the strongest reasons for governments to consider ecological sanitation as a long-term large-scale option in some areas.

6.4.3 Guidelines for ecological sanitation programs

General sanitation policy guidelines have been developed by several authors (see GTZ 2003). However, sanitation policies specific to EcoSan have not been attempted. Developing regulations for the specific details of the technology may prove to be difficult due to the variety of ecological sanitation technologies. One of the challenges emanating from this study is the need for governments and municipalities who want to incorporate alternative sanitation practices to frame legislation in a way that will allow for experimentation with alternative technologies, and also manage the associated risk.

Any country or municipality that is considering developing policy guidelines regarding ecological sanitation technologies should first consider the question of safe

⁷ Esrey, S.A. (2001)

⁸ Mailu, A.M. (2001)

reuse. EcoSanRes produced *Guidelines on the Safe Use of Urine and Faeces in Ecological Sanitation Systems*⁹ which provides a complete review of the health risks associated with excrement and ways that excrement could be reused properly. One way for policymakers to try to deal with the safe processing of excrement could be to explore setting common guidelines for organizations that promote EcoSan to ensure the safe promotion of the reuse of faeces.

While it is not reasonable to expect most governments in developing countries to have the capacity to regulate households, it might be feasible for organizations that promote EcoSan to register with the government. The government could work with organizations to develop appropriate guidelines that ensure safety of reuse. One danger in government regulation is that it may stifle organizations' ability to experiment in finding more efficient methods of EcoSan promotion, excreta processing, and excreta reuse. Therefore, adequate flexibility should be included in any policy. All in all, governments should also consider the economic ramifications of ecological sanitation for communities, especially in relation to the economic value of labour and time. As Ron Sawyer notes, "We simply don't have the experience to work out the full costs to collect, transport, store, process, and apply the liquid and solid fractions from the toilets" (McCann, 2005), and therefore this would be a good source for further research.

⁹ Schonning, C. and Thor, A. S (2004)

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Appendix I: Interview guide

Name of respondent..... Sex (M/F).....
Age..... Date..... Marital status (s/m/d).....
Physical address..... Owner/landlord/tenant.....
Phone and e-mail address..... No of persons in household.....

A: Sanitation profile

1. How long have you lived here?
2. Do you have any sanitation facility for you and your family use? Yes No . If yes, what type?
3. How do you access the toilet facility? Built it Found it here Other.....
4. Why is the toilet located where it is?
5. Apart from your family how many other households use the toilet? 5 10 15
Above 15
 - a) Are you aware of other toilet facilities? Pit latrine Squat and flush
Flush and discharge Urine diversion toilets (EcoSan)
 - b) Which of the following toilet type do you prefer? Pit latrine Squat and flush
Flush and discharge Urine diversion toilets (EcoSan)
 - c) Do you or any family member use other means to relieve themselves? Yes No .
If yes, where.....

B: Household perceptions

6. a) Have you heard about EcoSan toilets? Yes No . If yes, from where?
b) What do you think about them?

Convenient	i) Very good <input type="checkbox"/>	ii) Good <input type="checkbox"/>	iii) Average <input type="checkbox"/>	iv) Fair <input type="checkbox"/>	v) Bad <input type="checkbox"/>
Design	i) Very good <input type="checkbox"/>	ii) Good <input type="checkbox"/>	iii) Average <input type="checkbox"/>	iv) Fair <input type="checkbox"/>	v) Bad <input type="checkbox"/>
Cost	i) Very good <input type="checkbox"/>	ii) Good <input type="checkbox"/>	iii) Average <input type="checkbox"/>	iv) Fair <input type="checkbox"/>	v) Bad <input type="checkbox"/>
Safety	i) Very good <input type="checkbox"/>	ii) Good <input type="checkbox"/>	iii) Average <input type="checkbox"/>	iv) Fair <input type="checkbox"/>	v) Bad <input type="checkbox"/>
Dignity	i) Very good <input type="checkbox"/>	ii) Good <input type="checkbox"/>	iii) Average <input type="checkbox"/>	iv) Fair <input type="checkbox"/>	v) Bad <input type="checkbox"/>
 7. a) Do you use the EcoSan toilet? Yes No . If no, why not?
 - b) Who owns the EcoSan toilet? Groups of household Individual household
 - c) How do you organize for emptying of the EcoSan facility? Household group
Hired Other (specify).....
 - d) If emptying is undertaken by household group, how is it organized? By rotation
Collectively Other (specify).....
8. a) If you use the EcoSan toilet, how do you rate it?
i) V. Good ii) Good iii) Average iv) Fair v) Bad
 - b) If the answer falls under iii), iv) and v) how can it be improved?
10. What do other members of the community say about the EcoSan toilet?

11. What can you tell others about the EcoSan toilet?
12. a) What do you like most about the EcoSan toilet? It is affordable It is convenient
It is easy to use it Other
- b) What do you dislike most about the EcoSan?
It is too expensive It is not convenient Don't know how to use it
Don't like the way it is used Other (specify).....
- c) What difficulties do you experience with the EcoSan facility? Emptying Handling
Odour Openness Other (specify).....
13. Suggest ways of improving the design of the EconSan
14. a) Would you recommend the EcoSan toilet to others? i) YES ii) NO
- b) Give reasons for your answer in a) above?
- d) What do other community members think of users of EcoSan toilets?
i) Respected ii) Despised iii) other specify.....

C: Re use of urine and human waste

15. How do you normally handle urine and human waste from the containers? Explain?
16. a) Do you mix food remains with human waste from your toilet vault?
i) Yes ii) No
- b) Where is the compost matter from the compost pit/vault taken?
i) Used as fertilizer/soil conditioner ii) Disposed off iii) Other?
Specify.....
- c) How do you use the urine mixture?
i) Used as Pesticide ii) Fertilizer iii) Disposed off iv) Other? Specify.....
17. a) Who cleans the toilet? i) Men ii) Women iii) Children iv) Hire someone
- b) What is your perception about reuse of human waste matter and urine as fertilizer?
- c) Are there cultural beliefs in your community associated with re use?
i) Compost/sanitized human waste matter.....
ii) Urine as fertilizer.....
- d) What about religious beliefs associated with reuse?
18. Is there any known use of human waste and or urine either in your community or elsewhere, in the past or currently? Urine: YES () NO () Human waste: YES () NO ()
If YES for urine and/or human waste,
Please specify:
Human waste
- Urine
19. Would you eat food from a garden fertilised using human waste or urine?
Faecal matter: YES () NO () Urine: YES () NO ()
If NO for human waste and/or urine,
Please specify:
Human waste
- Urine.....

Appendix II: Focus group discussion guide

1. How long have you lived here?
2. How have sanitation conditions in this community been for the past few years up to today?
3. What different kinds of toilets facilities are used in this community?
4. What is your general view about ecosan toilet? How would you grade/rank ecosan toilet?
5. What reasons did you consider to choose and construct ecosan toilets? Do you consider you have adequate information on how to use the toilet and share it with others?
6. In your opinion, what are some of the expectations from a toilet you would be satisfied with i.e. rarely emptied, odourless etc? Do you have suggestions for improvement?
7. How do the people in the community view ecosan toilets and the people who have them?
8. Who cleans the toilet, empty the vault and urine container?
9. What do you think about reuse of sanitized urine and faecal matter as fertilizers? Would you eat/buy food from a garden fertilized by urine or faecal matter?
10. Are there some cultural or religious views that might not be willing to handle and reuse sanitized urine and faecal matter?

Appendix III: Questions to Key informants

Erickson Sundae, Kisumu Social Rights Association (KISORA)

1. Can I call you up to hear from you what you see as the main challenges facing the Obunga community in terms of water and sanitation?
2. How are the neighborhood associations organised?
3. What do you think is the problem re: Ecosan toilets in Obunga.
4. Who do those interested in getting one go to?
5. How much does a Skyloo ecosan toilet cost?
6. In addition to the above, how many people have access to clean water?
7. What percentage of the population?
8. What are the most common illnesses that are prevalent in Obunga due to the poor infrastructure?
9. How much does a 20 ltr jerrycan of water cost?
10. How many NGOs are working with the Obunga community on sanitation matters and who are they?

Joshua Odindo, Umande Trust

1. What do you see as the main challenges facing the Obunga community in terms of water and sanitation?
2. How are the neighborhood associations organised? What do they say they want most? What contribution do they make towards the interventions?
3. Who do you find responds consistently and follows up on initiatives? Men? Women? Youth?
4. What do you think is the problem re: Ecosan toilets in Obunga?
5. What is Umande Trust doing to advocate for and market the acceptance of ecological sanitation?
6. Where are you presently working, and what are the lessons you have learnt, working with the Obunga community?
7. Who do those interested in getting one go to?
8. How much does a *Skyloo* EcoSan toilet cost?

Johannes Orodí, MWI/GTZ EcoSan Promotion Project

1. How are you tackling the ecological sanitation philosophy with the communities you work with or in?
2. Where are you working and with who?

3. **What is the community's reaction and response?**
4. **What approach are you employing to reach the community?**
5. **Do you enjoy what you are doing? Do you believe in it?**