Water Supply and Sanitation at Kisnyi Slum, Uganda: A Study on Institutional and Stakeholder Perspectives on the Major Issues

by

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Abstract

Many national and international efforts have been made over the past few decades to improve access to safe water and improved sanitation in developing countries. However, the net outcome is reported to be not proportionate to the efforts made and money spent. The reason could be the perception that water supply and sanitation are purely technical and engineering issues which science and technology solve the whole problem. Such a view ignores, however, the, institutional political and cultural aspects of the problem.

This minor field study has tried to understand multi perspectives of water and sanitation issues by conducting qualitative research at the biggest slum (Kisnyi) in Kampala city. The research methodology used for this study was Soft Systems Methodology (SSM).

According to the stakeholders, water supply issue at Kisnyi is being handled well. It has reached a level that one can obtain water at a distance of no more than 200m from their residences. Hence, this study focused mainly on two highly prioritized sanitation issues: the solid waste management and toilet issues. Though the SULABH toilet introduction to Kisnyi is appearing hopeful undertaken, it is highly recommended at this moment that there should be sensitization work to change the landlords' perspectives at present of no interest in building toilets for tenants. Moreover, behavioral change of those who do not value toilet use is very important. The act of discharging toilet waste direct to drainage when it rains needs serious intervention. Since all sort of solid waste that are blocking drainage canals are disposed recklessly everywhere at Kisnyi, an immediate campaign to collect the waste is recommended.

The problems and issues at Kisnyi that are related with water and sanitation are many and the only way to improve the situation is if and only if a holistic approach is adopted. Hence, a large scale and long term project or network based on system research for intervention that can transform Kisnyi from slum to no slum is recommended.

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List of Acronyms

MFS	Minor Field Study
UN	United Nations
PEAP	Poverty Eradication Action Plan
NGO	None Governmental Organization
NEMA	National Environment Management Authority
NW&SC	National Water and Sewerage Corporation
KCC	Kampala City Council
UBOS	Uganda Bureau of Statistics
UN-HABITAT	United Nations Human Settlement Program
GDP	Gross Domestic Product
USH	Ugandan Shilling
WHO	World Health Organization
WSSC	Water Supply and Sanitation Collaborative Council
ICWE	International Conference on Water and Environment
CSD	Commission for Sustainable Development
UNDP	United Nations Development Program
SA	Stakeholder Analysis
SLIM	Social Learning for Integrated Management
SSM	Soft Systems Methodology
TWOCAGES	Transformation, Worldview, Owner, Customer, Actor, Guardian, Environment, System
IIRR	International Institute for Rural Reconstruction

CRS	Catholic Relief Services
KFW	German Financial Cooperation
DED	German Development Service
SH	Stakeholder
MOWE	Ministry of Water and Environment
SPC	Structure, Process and Climate

Conversions: 1 $= 2000 Ugandan Shillings=8 Swedish Kronors (approximately)

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1. Introduction

The lack of access to safe water and basic sanitation and the associated health risks is a major issue in developing countries including Uganda. Many national and international efforts have been made over the past few decades to improve the situation. However, the net outcome is reported to be not proportionate to the efforts made and money spent (Mehta, et.al 2008). The reason could be the misperception that water supply and sanitation is only a set of technical and engineering issues-that science and technology can solve the whole problem. Such a view ignores, however, the cultural, institutional and political aspects of the problem in particular and human activity systems in general. These aspects tend to be complex especially in slum environments.

According to Mehta, et al. (2008), the issue of slums is very complex. It cuts across many disciplines including water supply and sanitation. It concerns hundreds of slum dwellers directly-

and it indirectly concerns all the local and national economies and societies in which slums exist. It is one of the fundamental global challenges of our times. If interventions are going to be meaningful, there needs to be a genuine effort to appreciate the complexities of slums[1], their communities, and how they interact within and with the broader context in which they exit.

This thesis will discuss the research out-come on Water Supply and Sanitation at one of Africa's complex urban slums called Kisnyi that is located in the city center of Kampala, Uganda. The thesis is arranged into eight chapters: Chapter one is the introduction, chapter two deals with theoretical framework, chapter three is on short information of the country and location of this research interest, chapter four describes the research methodology followed in the remaining four chapters by operating SSM at Kisnyi slum, discussion, conclusions and personal reflections.

1.1. Background

According to Jane (2008), the state of sanitation in Uganda's urban areas is very poor, with only 59% of the people reported to have access to safe sanitation services. The situation is not any different in Kampala city, where the available sanitation facilities both in commercial and residential areas cannot meet the needs of the ever increasing population.

Kampala's population stands at 1.2 millions today. There is an estimate that only 52% of Kampala city dwellers have access to clean water while 48 percent of them use contaminated water. Poor disposal of human waste has left several water sources contaminated. Sanitation and waste water disposal is part of the main contamination sources. It is very common to see empty mineral water bottles and this is correlated to the fact that of a total of 170 tons of plastic waste produced daily in Kampala, only 2% is collected for recycling. It is common to see banana peelings, leaves or potato vines, cartons, airtime cards and pieces of cloth.

This study has taken one of the slums of Kampala city called Kisnyi as basis for understanding the complexities of water supply and sanitation issues from a human activity systems perspective. As slum environments are well known for their high levels of complexity and

[1] A slum is a heavily populated urban area characterized by substandard housing and squalor

uncertainties of human activity systems, the methodology selected for this study is the Soft Systems Methodology (SSM). As Checkland and Scholes (1999) described it, Soft Systems Methodology aims at coping with "soft" problematic situations in which people interpret the world in their own ways and make judgments about it using their individual standards and values. Soft Systems Methodology also leads to the multiple world views of the stakeholders' expression. Therefore, stakeholder participation is core to this research work as the primary interest of the research is finding qualitative information of problematic situations.

1.2. Problem Statement

The characteristics associated with slums vary from place to place. However, slums are usually characterized by urban decay, high rates of poverty, and unemployment. They are commonly seen as "breeding grounds" for social problems such as crime, drug addiction, alcoholism, high rates of mental illness, prostitution and carelessness. In many poor countries, they exhibit high rates of diseases due to unsanitary conditions, malnutrition, and lack of basic health care. A slum combines to various extents the following characteristics: inadequate access to safe water; inadequate access to sanitation and other infrastructure; poor structural quality of housing; overcrowding; and insecure residential status. **This thesis explores holistic view of the perspectives of institutions and stakeholders on water supply and sanitation issues at Kisnyi slum which is the biggest slum located in Kampala city center**.

1.3. Aim and Objective (s)

The study aims to provide knowledge about the complex situation at Kisnyi slum with regard to water supply and sanitation from an institutional and stakeholder perspective and to propose desirable and feasible changes for improving this situation.

The objectives of the study are mainly the following:

1. To understand the perspectives of Institutions and Stakeholders on major issues of water supply and sanitation at Kisnyi slum.

2. To obtain rich picture of human activities at Kisnyi related with water supply and sanitation and to propose desired and feasible changes as part of action plan.

3. To study how institutions dealing with water supply, waste water treatment and sanitation influence each other

4. To understand the roles and responsibilities of different actors in water and sanitation at Kisnyi

5. To practice and critically appraise the use of Soft Systems Methodology in water management context in developing country situation

1.4. Scope and Limitations of the Study

The study encompasses the analysis of stakeholders and institutional perspectives on water supply and sanitation at Kisnyi slum, Kampala city. It was beyond the scope of this study to recommend the most appropriate technology than recommending the feasible and desirable action plan found from stakeholders' interactions and debates. The study underlines the importance of transforming all primary tasks. However it was not possible in the time duration given and MFS support obtained to deal with all, hence the study beginning from stage three and four of the Soft Systems Methodology is based on highly prioritized primary tasks only. The scope of the study was also limited by the necessity to learn the use of Soft Systems Methodology applied to the challenges in a slum environment.

Soft Systems Methodology is not for one time intervention. It demands repetitive process of interacting with stakeholders. However, due to logistical, financial and time constraints, this study is only meager part of the beginning of a repetitive work. The tense social, economic and cultural factors at Kisnyi slum also limited the extent of this short time stakeholder engagement.

2. The Study Site: Country, City and Location

2.1. Uganda

The republic of Uganda (Fig. 1) is a land locked country in East Africa. It is bordered on the east by Kenya, on the North by Sudan on the west by the Democratic Republic of Congo, on the Southwest by Tanzania. It has a population of 30.9 million. English and Kiswahili are the official languages. Uganda has substantial natural resources, including fertile soils, regular rainfall, and sizeable mineral deposits of copper and cobalt. The country has largely untapped reserves of both crude oil and natural gas. Agriculture is the most important sector of the economy, employing over 80%[2].

Figure 1. Map of Uganda

As a whole, Uganda has more than enough fresh water. Estimates indicate about 2,800m^3 per person per year fresh water resources availability. However, the distribution of the resource is uneven both in spatial temporal terms. Furthermore, the fresh water is increasingly exploited through population growth, urbanization, agriculture, and industrialization. According to UN (2006), the rivers, lakes and wetlands cover about 18% of Uganda's total surface, including Lake Victoria, Africa's largest lake and one of the major sources of the Nile River, the longest river of the world. Almost the entire country lies in the Nile Basin. Rainfall contributes most to the country's surface and ground water. The average annual rainfall ranges from 900 mm in the semi-arid areas to 2000 mm around Victoria Lake (UN, 2006).

[2] http://en.wikipedia.org/wiki/Uganda

Despite significant progress, the Ugandan Water Supply and Sanitation still faces a number of challenges. In large towns, coverage as well as operational and commercial performance have improved notably since 1990s (Mugisha et.al., 2006). According to UN (2006), the sector was reformed through several laws since 1995, leading to decentralization and increased public participation. The sector has been recognized as a key area under the 2004 Poverty Eradication Action Plan (PEAP), Uganda's main strategy paper to fight poverty. A comprehensive expenditure framework has been introduced to coordinate financial support by external donors, the National Government and NGOs.

2.2. Kampala

Kampala is the capital city of Uganda and at the same time the social, economical, industrial, cultural and political center of the country. The name Kampala comes from the Lugandan[3] word "Impala" and means "Hill of Impalas". Impalas are varieties of antelopes that roamed the area today known as Old Kampala before it was taken over for human settlement (UNHABITAT 2007: p. 7). Kampala is located 8 kilometers North of Lake Victoria, the second largest fresh water lake in the world and the source of the longest river in the world, The River Nile. The city, which is placed on 24 hills, has an area of 197 Km^2 is considered to be cosmopolitan (NEMA 2001: p. 81). The natural pattern of these 24 flat-topped hills and the wide valleys and wetlands, which surround them, largely determine the structure and shape of the city.

Administratively, Kampala has the status of a district and is divided into 5 divisions (Fig. 2) namely Kawembe, Rubaga, Makindye, Nakawa and Central Division. All Administrative issues concerning Kampala as a whole are in charge of Town Clerk, on division level Assistant Town Clerk and on the Parish Level the Parish Chief or Local Council chief are responsible for all administrative matters (NW & SC 2006: p. 21)

[3]Luganda is the major language of Uganda and mainly spoken in the Buganda region, also including the area of Kampala City. It is estimated that over three million people currently speak Luganda. See: ttp://www.buganda.com/bugintro.htm

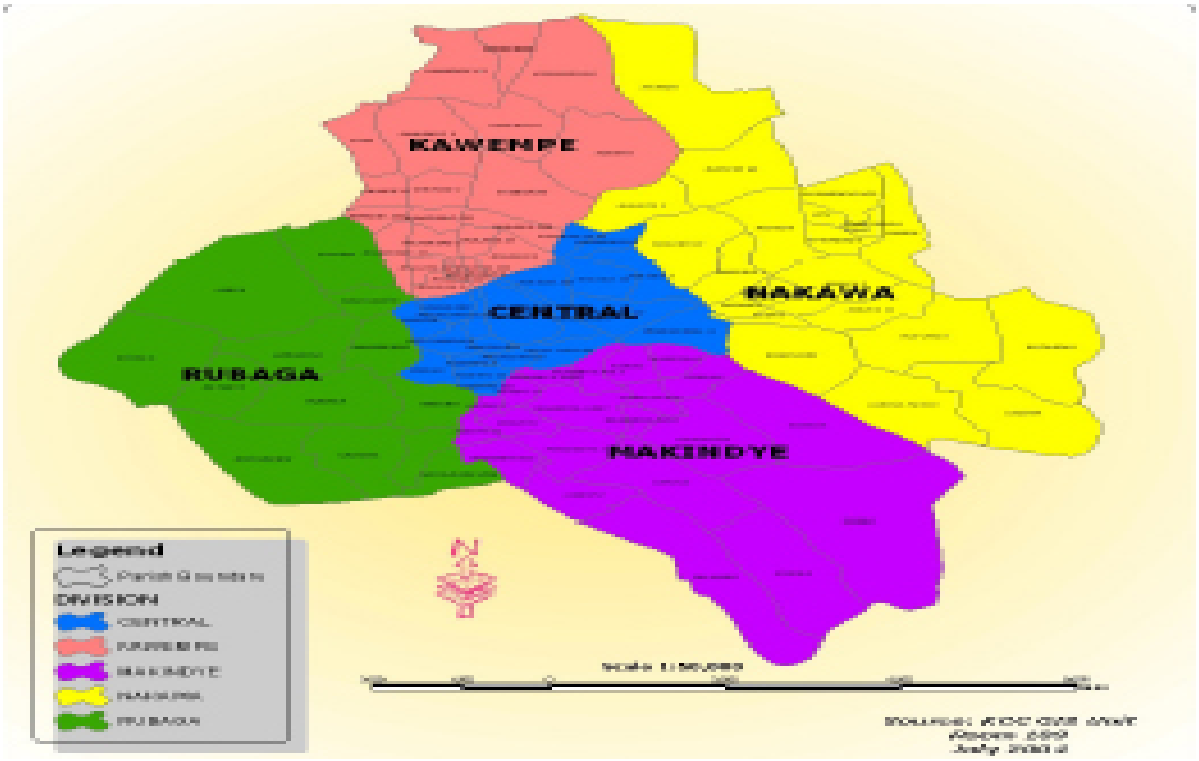

Figure 2. Kampala City Divisions, Source KCC

2.2.1. Population growth and Emergence of slums in Kampala

With 1.2 million residents, Kampala City has the largest population within the whole country and incorporates 41.4% of the national urban population and 5.4% of the national population. The population size varies from about 1.2 during the day to more or less 0.9 million at night (UBOS 2002; p. 5). Currently Kampala's population is growing at an annual average rate of 5.61 %, and the biggest part is due to rural-urban migration and not due to natural growth (Nyakaana J.B. 2006: p. 9). The latter contributes to the growth with only 31%[4]. The speed, at which Kampala is growing, exceeds by far the capacity of the Planning Department of Kampala City Council to plan and to control the city's development. Presently more than 60% of Kampala's residents live in informal settlements (UN-HABITAT 2007: pp. 8 -13) (Figure 3).

[4] See KCC-Website 2007,

According to UN-HABITAT (2007), the issue of emerging and growing slum areas has been gradual and sustained over a long time in Kampala's history. Several reasons contributed and are still contributing to the growth of its slum areas. Firstly, unlike any other parts of Uganda, Kampala has a multiple and quite complicated land tenure systems that has influenced and determined considerably the planning, development and control of the urban poor areas. Land is owned either as *Mailo*[5]*, Leasehold, Freehold or Customary Tenure*. As a consequence, Kampala City Council presently does neither own any land nor has any kind of jurisdiction over the land it is supposed to control, to plan and to develop. At the moment, more than half of the city's land (65%) is owned by mailo landowners and about 80% of the area covered by informal settlements permits constantly the private ownership of large areas. This ownership cannot be deprived of the landowners (also called landlords), respective of whether the land is developed or not. In addition to that, many landlords often do not appreciate any transformation or restructuring of their land, as it may not be consistent with their interests. Due to the factors previously mentioned, it makes very difficult for the official authorities to push on with innovations and enforce any clear urban development plans, not to mention the provision of social services like water, sanitation and garbage disposal in these areas (Nyakaana J.B. 2006: pp. 16 -17). Secondly, urban poverty and the low income of many residents also account significantly for the fast growth of Kampala's slum areas. Despite impressive economic national performance figures like a sustained high GDP[6] growth rate of 7.8%, stable exchange rates and low inflation, the number of poor people living in Kampala District has not significantly decreased. In some district suburbs of Kampala District, poverty has even increased (UNHABITAT 2007: p. 12).

[5] "Mailo" means private

[6] Gross domestic product

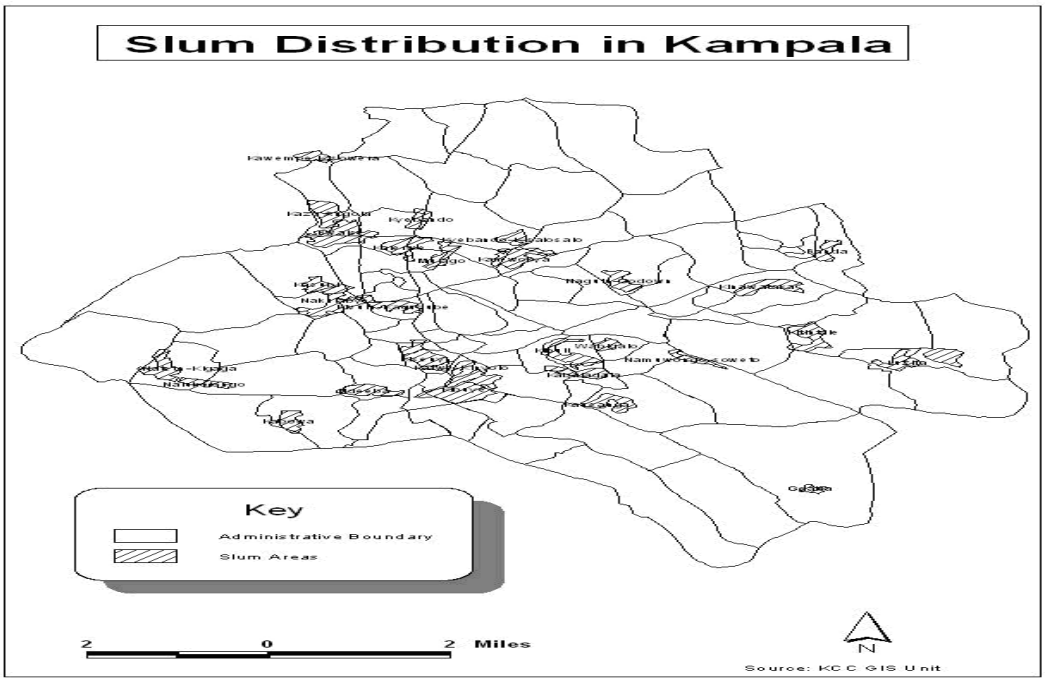

Figure 3. Map of Kampala slums, Source UN.HABITAT (2007):11

2.3. Kisnyi Slum

Kisnyi is densely populated (20,000-30,000 people living) parish and the only ghetto located in the city center of Kampala in the central division. It was named Kisnyi because it is a swampy area and the word "Kisnyi" in lugunda means "swampy." As shown on Photo 1, Kisnyi is also known for black smiths (metal crafting), hard-ware, carpentry workshops, art, small-scale motor repair garages, and sale of legal plant called "chat" known as Mairungi in local dialect. Photos 1 and 2 indicate some of the sanitation issues at Kisnyi.

Photo 1. **A**-Metal work at Kisnyi. **B**-Water Vendor at Kisnyi selling water (100USH/20lt) along metalworkshop and on the top of open drainage

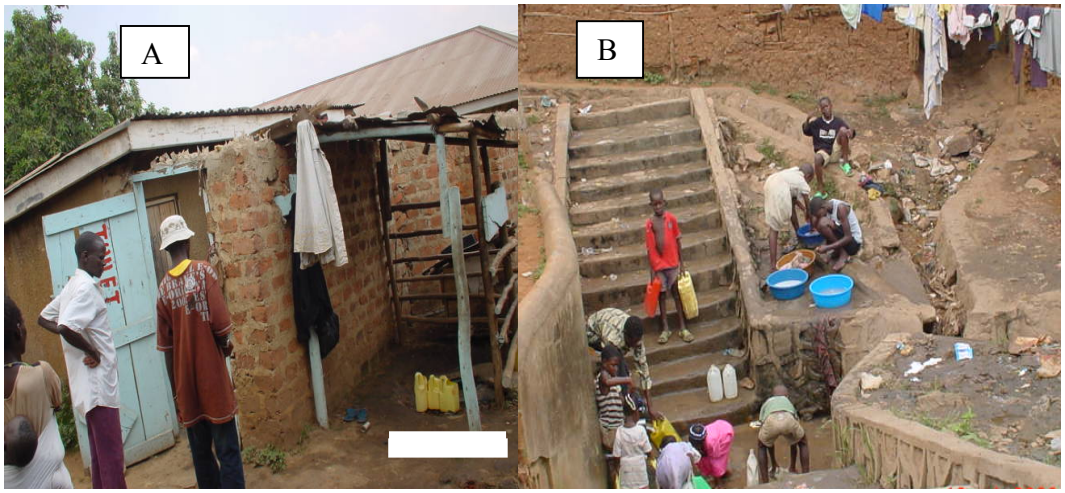

Photo 2. Poor sanitation and water supply at Kisnyi: **A**- toilet, **B**-protected spring water where those who can not afford to pay 100USH/20liters can get water for their livelihood

3. Theoretical Framework

The theoretical framework is helpful to understand the theory behind water and sanitation issues. It helps to reflect on what had been done, what is being done and what level is the water and sanitation work at global level in general and developing countries in particular. This in turn, will guide to get theoretical basis to support the research question and the research methodology adopted for this study. This chapter is divided into four parts: Global Water and Sanitation

Challenges, House Centered Environmental Sanitation and Sanitation Planning; Water and Sanitation Governance; Stake Holding and Stakeholder Participation. As Soft Systems Methodology is a methodology to deal with problem situations in which there is a high social, political and human activity component; the theoretical understanding of stake holding and stakeholder participation plays key role in understanding SSM itself.

3.1. Global Water and Sanitation Challenges

According to Mara (1989), early in the mid 1970s, international agencies and national governments identified alternative low cost sanitation technologies that could be adequately applied in rural and low density urban settlements. There have been developments in modifying the various technologies with the goal of making them simpler in installation, use and maintenance, and in eliminating or reducing the handling of fresh excreta.

According to UN-HABITAT (2003), in developing countries, improvements in practices of disposing of human excreta are crucial to raising levels of public health. An increasing amount of literature suggests that health problems result from the lack of sanitation facilities, especially among the urban poor living in overcrowded informal settlements. Invariably, it is the poor who suffer the most from the absence of safe water and sanitation because they lack not only the means to provide such facilities but also the information on how to minimize the ill-effects of the unsanitary conditions in which they live. As a result, the negative effects of unsanitary living conditions lower the productive potential of the people who can least afford it. Access to safe water and proper disposal of human excreta are basic needs and duly recognized as human rights. All living beings strive to fulfill these needs one way or another. UN Millennium Project (2005) describes that the concern is not merely access to water and excreta disposal, but rather the nature of access, the safety and sustainability of the services, at what cost and to whom. The nature and quality of these parameters determine the quality of life of an individual and status of society at large. Water supply and sanitation are no longer two different areas of work; rather these two are wedded together and have to be treated as such. Improving drinking water quality without improving sanitation and hygiene practices would have little or no positive impact.

Access to safe water and proper disposal of human waste including solid waste have direct and indirect links with human health (Wagner & Lanox, 1958). Further, so-called clean water and disposal of excreta are not enough for disease control, unless the pathogen cycle is broken through wise management for water and excreta (Langergraber & Muelleger, 2005; Howard, 2002). However, until now the main focus has been on water supply and little attention has been paid to sanitation. In nineteenth-century Europe and North America, diarrhea, cholera, and typhoid spreading through poor sanitation was the leading cause of childhood illness and death; today, such deaths are rare in these regions. In developing countries, however, they are all too common, and recent research suggests that poor sanitation and hygiene are either the chief or the underlying cause in over half of the annual 10 million child deaths. Compelling, evidence-based analysis shows that hygiene and sanitation are among the most cost-effective public health interventions to reduce childhood mortality. Access to a toilet alone can reduce child diarrhea deaths by over 30 percent and hand-washing by more than 40 percent[7].

Mara (2003), has found that water-based sanitation may not be appropriate in water-scarce areas. The emphasis on bringing clean water through pipes and flushing it out with human excreta onto the streets or through open drains is neither logical nor wise. According to Reed (1994), the construction of highly technical solutions for sanitation is often politically motivated, costly, yet less helpful in minimizing the suffering of poor. Conventional approaches have thus not been able to solve the problem of water supply and sanitation and in many cases have further aggravated the issues. Similarly the widely used pit latrines have proven to represent a risk for groundwater contamination where the soil is permeable and the groundwater is shallow (Reed, 1994).

Accroding to Middlestadt et al. (2001), the new discourse of ecological sanitation (urine-diverting latrines), while addressing some of the technical and environmental aspects of water and sanitation, is facing challenges. In its classical form, it may not be acceptable to some people, for example in certain Muslim communities, due to religious and cultural taboos. Choosing a technically innovative and culturally acceptable approach is fundamental in achieving the relevant UN goal. Therefore solutions to large-scale implementation should be

[7] http://esa.un.org/iys/

found by combining technological and socio-cultural and behavioral strategies to improve water supply, distribution and sanitation in the world.

Poor water supply and sanitation threaten economic development, healthy living, livelihood, environmental quality and a host of other socio-cultural issues in most developing countries (Scott et al., 2004). Unsafe water, lack of sanitation and poor hygiene account for almost two million deaths a year worldwide (UN Millennium Project, 2005). The factors collectively rank third among the top 20 factors that contribute to high health burden in developing region, with only malnutrition and sexually transmitted diseases preceding them (WHO, 2003).

Realizing this grave situation, various national and international efforts have been made during the last few decades to accelerate access to water supply and sanitation in developing countries. The first effort was the United Nations (UN) proclamation of the 1980s as a decade of "**clean water and sanitation for all**". The next major international development in water sector was formulation of the **Dublin principles**[8]. The experts regarded the emerging global water resources

picture as critical and adopted the following four principles: 1. Fresh water is a finite and vulnerable resource, essential to sustain life, development and environment, 2. Water development and management should be based on participatory approach, involving users, planners and policy-makers at all levels, 3. Women play a central part in the provision, management and safeguarding of water, 4. Water has an economic value in all its competing uses and should be recognized as an economic good.

As a result of the above efforts, some progress in water supply and sanitation coverage has been made, but the World Health Organization (WHO) found that **despite international attention**, **water-related problems have worsened in many areas**. The main reasons have been the adoption of incorrect approaches and the failure of government institutions (WHO, 1996). Similarly, the Water Supply and Sanitation Collaborative Council (WSSCC, 2004) reported that

[8] In Dublin, Ireland, more than five hundred participants, including government-designated experts from about one hundred countries and representatives of about eighty international, intergovernmental and non-governmental organizations attended the International Conference on Water and Environment (ICWE) held in January 1992.

the UN goal of "clean water and sanitation for all" **came and went** without bringing significant improvements to the lives of most of the world's poor. They found that the main reason behind this limited success appears not to be a lack of resources, but an unwillingness to learn from past failure and to adopt new approach.

In 2002 in Johannesburg, the UN set a new **goal of halving the proportion of people without safe water and improved sanitation by the year 2015**. To achieve this goal, different states and governments were making necessary institutional, financial and engineering arrangements to provide safe water and improved sanitation facilities to their populations. However, despite a lapse of four years, the progress, especially with respect to sanitation, is much lower than the satisfactory level in many developing countries in Africa and Asia (UN Millennium Project, 2005). In many countries, the misperception still exists among policy makers that technology and the injection of more money in the water supply and sanitation sector will solve the problem. However, the fact remains that water supply, sanitation and wastewater treatment is less a technical and more asset of institutional, behavioral, cultural and economic issues (Kinly, 1993).

The twelfth session of the United Nations Commission on Sustainable Development **(CSD-12)[9], held in New York in April 2004**, reviewed the state of implementation of the goals and targets in the thematic areas of water, sanitation and human settlements. **CSD-12 identified constraints to, and continuing challenges for, the implementation of these goals, including access to basic sanitation**. On the basis of that review, **CSD-13 in April 2005** recommended policy actions to be implemented by member States in addressing these challenges. The international community reviewed progress towards the implementation of these recommendations during **CSD-16 in May 2008.**

Despite significant efforts by governments, progress on sanitation targets has been slow and uneven. Recognizing the impact of sanitation on public health, poverty reduction, economic and social development, and the environment, the General Assembly decided to ***declare 2008 the International Year of Sanitation***. The General Assembly encouraged member States as well as

[9] http://www.un.org/esa/sustdev/csd/csd12/

the United Nations system, to take advantage of the International Year to increase awareness of the importance of sanitation to promote action at all levels, taking into account the recommendations of CSD-13[10].

3.4. House Centered Environmental Sanitation (HCES) and Sanitation Planning

According to Ecological Sanitation Symposium report (2000), in 1999, at a workshop in Hilterfingen, Switzerland, a sub-group of the Environmental Sanitation Working Group (ESWG) of the Water Supply and Sanitation Collaborative Council (WSSCC) conceived of a new approach to overcome the serious lack of sanitation services, causing illnesses and slowing the economic progress of hundreds of millions of people in developing countries: the Household Centered Environmental Sanitation (HCES)[11] Approach. The group concluded that this approach offered the best hope of achieving the goal of "water and sanitation for all within a framework which balances the needs of people with those of the environment to support a healthy life on earth"

Swiss Federal Institute of Aquatic Science and Technology (2005) describes that the HCES approach is a radical departure from past central planning approaches as it places the household and its neighborhood or the community at the core of the planning process. This approach was subsequently adopted and synthesized. The HCES approach attempts to avoid the problems resulting from either 'top-down' or 'bottom-up' approaches, by employing elements of both in an integrated framework.

[10] http://dacess-ods.un.org/access.nsf/Get?

[11] Environmental Sanitation (ES) has been defined as: "Interventions to reduce peoples' exposure to disease by providing a clean environment in which to live, with measures to break the cycle of disease. This usually includes disposal of or hygienic management of human and animal excreta, refuse and wastewater, the control of disease vectors, and the provision of washing facilities for personal and domestic hygiene. ES involves both behaviours and facilities which work together to form a hygienic environment." The Hilterfingen Group added to these components stormwater management, and water to the extent that water influences the method of waste disposal

The HCES model is based on the following principles[12]:

- Stakeholders are members of a "zone", and act as members of that zone ("zones" range from households to the nation). Participation is in accordance with the manner in which those zones are organized (for example, communities and neighborhoods consist of households, towns consist of communities, etc.). Zones may be defined by political boundaries (for example, city wards and towns) or reflect common interests (for example, watersheds or river basins).

- Decisions are reached through consultation with all stakeholders affected by the decision, in accordance with the methods selected by the zone in question (for example, votes at national level in a democratic system, town hall meetings at local level, or informal discussions at neighborhood level).

- Problems should be solved as close to their source as possible (for example, where feasible, a community should provide services to households within it; common wastewater treatment facilities for several communities should be provided by a consortium of the communities). Only if the affected zone is unable to solve the problem should the problem be "exported", that is, referred to the zone at the next level.

- Decisions, and the responsibility for implementing them, flow from the household to the community to the city and finally to the central government (there may also be intervening zones that need to be considered; for example, wards within the city, districts within a province; or provinces within the nation). Thus, individual households determine what on-site sanitation they want; together with other households, they decide on the piped water system they want for their community, together with other communities, they determine how the city should treat and

[12]http://www2.gtz.de/ecosan/download/EAWAG-household-centred.pdf

dispose of its wastewater. Policies and regulations are determined by central government, with implementation delegated to the appropriate levels flowing towards the household (thus national standards define storm water disposal requirements, but the city issues local building codes).

When it comes to sanitation planning, the EAWAG, department of Water and Sanitation in Developing Countries (2007) the HCES is a novel approach to environmental sanitation. It is a radical departure from the centralized planning approaches of the past which puts the household and the neighborhood at the core of the planning and the decision making process. The planning process is currently being field tested in Africa, Asia, and Latin America in the following spatial contexts: 1.Densely populated urban formal and informal settlements, 2. City-fringe periurban settlement patterns 3. Small and medium size towns lacking infrastructure and services

To be grounded in the existing sanitation situation, a sanitation plan or program must[13]:

1. *Take account of what already exists*, recognizing that existing facilities, including those provided by individual householders, community groups and the private sector, represent a considerable investment

2. *Respond to actual problems and deficiencies*, recognizing that sanitation problems are as likely to stem from management deficiencies, inadequate operation and maintenance and poor coordination between stakeholders as from an absolute lack of facilities. Unless plans are grounded in this way they risk finding solutions to problems that do not exist while failing to address real problems and needs.

3.3. Water and Sanitation Governance

Kooiman et al. (2005) perceive governance as the whole of public as well as private interaction taken to solve societal problems and create societal opportunities. It includes the formulation and

[13]http://www.ghkint.com/products/downloads/Publications/Strategic%20planning%20for%20urban%20sanitation

application of principles guiding those interactions and care for institutions that enable them. Governing as governance will therefore be principled, interactive and multi-stakeholder driven, whereas the alternative and more traditional view regards governance as unitary, single-minded, top-down and instrumental; it reduces governance to governing. The water and sanitation crisis that many parts of the world are facing is with multi dimensions, but one of the most important and neglected is: ***the governance aspect*** (UNDP)[14]. The water and sanitation crisis that humankind is facing today is largely of our own making. It has resulted chiefly not from the natural limitations of the water supply or the lack of financing and appropriate technologies (though these are serious constraints), but rather from profound failures in governance, i.e., the ways in which individuals and societies have assigned value to, made decisions about, and managed the water resources available to them.

The mission of sustainable development is in several respects an especially demanding form of societal change (Bressers & Rosenbaum 2000). This is one reason that in social science studies of sustainable development, the concept of 'government policy' often is replaced by the broader term '***governance***'. There is growing recognition that government alone does not determine the future development of sectors in society; these are shaped through the interaction of many actors. Within such networks of actors, the government can adopt a position that is more or less central and dominant. This change in view represents a shift in accent from government policy, or 'government', to 'governance'. The governance pattern consists of all the consequences of the interplay among all the actors involved (Kooiman 1993) in interventions to promote sustainability.

Peters and Pierre (1989) described that recognition is increasing that water and sanitation sectors in society are not governed on one level, or on a number of separate levels, but through interaction between these levels. These levels often reflect the various tiers of government, but not necessarily; other powerful actors may provide direction at a certain level where no government authority is active. In the same way, actors may also operate on more than one level.

[14] UNDP (2004). *Water Governance for Poverty Reduction:* Key Issues and the UNDP Response to Millennium Development Goals, p.2.

Water supply and water-based technology driven excreta and sanitation management needs strong institutions and effective instruments for implementation. Institutions are the framework within which human behavior, the environment, and resource use patterns are structured through mutual interactions. Institutions establish the "rules of the game" (North 1990), in which people resolve conflicts, peruse their objectives (Commons, 1970) and structure relationships between people in various units of policy and economy (Hall, 1986).

In 1999, at a workshop in Hilterfingen, Switzerland, a sub-group of the Environmental Sanitation Working Group (ESWG) of the Water Supply and Sanitation Collaborative Council (WSSCC) conceived of a new approach to overcome the serious lack of sanitation services, causing illnesses and slowing the economic progress of hundreds of millions of people in developing countries: the Household Centered Environmental Sanitation (HCES)[15] Approach. The group concluded that this approach offered the best hope of achieving the goal of "Water and Sanitation for All within a Framework which balances the Needs of People with those of the Environment to support a Healthy Life on Earth"[16]

3.4. Stake Holding and Stakeholder Participation

Deverre et al. (2000) describe stake-holding as new stakes that can emerge from social interactions and can lead to the emergence of new stakeholders. Bauanes, et al. (2005) have written that at a general level, stakeholders are simply those who have something to win or lose in the governing process. You are a stakeholder because of who you are, what you have and what you represent. It is not what you do that determines whether or not you are a stakeholder. You may be a stakeholder without knowing it, or without understanding how you are one. They

[15] Environmental Sanitation (ES) has been defined as: "Interventions to reduce peoples' exposure to disease by providing a clean environment in which to live, with measures to break the cycle of disease. This usually includes disposal of or hygienic management of human and animal excreta, refuse and wastewater, the control of disease vectors, and the provision of washing facilities for personal and domestic hygiene. ES involves both behaviours and facilities which work together to form a hygienic environment." The Hilterfingen Group added to these components stormwater management, and water to the extent that water influences the method of waste disposal

[16] Ecological sanitation symposium- October 2000

further wrote that Stakeholders may be identified by the urgency of their concerns, the legitimacy of their interests or the power they hold.

Kaza (1988) eloquently portrayed the need for stakeholder involvement as with involvement comes understanding, with understanding comes public support and commitment. Participation by parties with a stake in the resource not only increases the level of understanding and support on the resources, but also reduces potential conflicts and the need for heavy enforcement (Gilman 1997). It is argued that compliance and involvement are interrelated phenomena, and that involvement contributes to compliance through the participation process. Participation also leads to increased legitimacy. If participants feel the process was fair and their inputs were used, it will ultimately enhance their compliance. In fact, it has been demonstrated that the perception of legitimacy is linked to the participants' views of the fairness of the process (Sutinen and Kuperan 1999).

Furthermore, participants who view the process as legitimate generally feel a strong obligation to comply with the results, even if the mandates contradict their self-interests (Sutinen and Kuperan 1999). Clearly, an essential aspect of the participation process is that stakeholders view their involvement as meaningful and as making a difference (Pirk 2002). Meaningful participation occurs when people see that their contributions to the process have helped shape a decision. Such participation can be fostered by enhancing stakeholders' participation in the generation and application of information, providing opportunities to increase their sense of worth, and strengthening their ability to meet concerns and deal with changes throughout the process. Brody (2003) suggested that information empowers the public to become involved in and make an impact on the planning process.

Stakeholder analysis (SA) (SLIM, 2004) often is used as an analytical tool in the start-up phases of collaborative stakeholder processes, in order to map stakeholders and the stakes they defend. According to Groot and Maarleveld (2000), SA is the skills, activities and tools used to support and guide participation among multiple interdependent stakeholders facilitation. Its main role is to bring about systemic change in complex situations for achieving concerted action. It is about the management of deliberative processes and social interactions that help the stakeholders involved to better understand 'what they are and 'why they are doing what they are doing.

4. Research Methodology

This chapter will discuss the research methodology used for this study. The methodology used for this study is Soft Systems Methodology. Understanding a system is important to understand systems thinking that is described on Subchapter 4.1. A system[17] is organized collection of parts (or subsystems) that are highly integrated to accomplish an over all goal. The system has various inputs, which go through certain processes to produce certain outputs, which together, accomplish the overall desired goal for the system. So a system is usually made up of many smaller systems, or subsystems.

Chapter four is divided into three subchapters: What is Soft Systems Thinking and Social Learning?, Checkland's Soft Systems Methodology; and Methods and some of the Tools Used to Implement this SSM Based Study.

4.1. What is Soft Systems Thinking and Social Learning?

According to Wilson & Morren (1990), Soft system thinking is an approach for bringing to surface the rationale of seeing the world as a system of problematic situations. These are believed to be complex webs of problems, not only arising from the biophysical background, but including societal implications as well, when people have contrasting views of the same situation. Within this frame, the desired result is not an optimal solution, but rather the desirable improvement of the situation. In order to reach improvements, it is assumed that problems are moving targets, ready to be re-identified. In this way of dealing with problem situations, the preferred path is one of developing a methodology actively rather than applying a set of prescribed methods. This therefore becomes also a learning process for all participating.

Checkland (1981) when first proposing his Soft Systems approach argued that reality was not a given but socially constructed. Exploration leads to new insights and promotes learning,

[17] http://www.managementhelp.org/aboutfml/copyright.htm

therefore action. Learning is motivated by tensions and conflicts and could be supported when made as participative as possible and including all interested parties. Social learning refers to the collective process that can take place through interactions among interdependent stakeholders - given proper facilitation, institutional support and a conducive policy environment (SLIM, 2004). As Steyaert & Jiggins (2007) have pointed out, people have to bring up their ‘‘felt and lived’’ experiences which in turn challenge the existing forms of knowledge and values. If the unfolding dynamic of the interaction can be constituted in processes of shared learning, then practices and understanding, and sometimes also values evolve.

4.2. Checkland's Soft Systems Methodology

The research methodology used to conduct this study is **Soft Systems Methodology (SSM)**. It is a way of dealing with problem situations in which there is a high social, political and human activity component. This distinguishes SSM from other methodologies which deal with problems that are more prescribed, quantifiable and technology oriented referred to as "hard" systems problem by Checkland. SSM is the product of a long term action research program that inquired into the real world, striving to improve ill-defined, so-called "soft" problem situations by making systems ideas[18]. That, SSM, its theory and its practice evoke interest and stimulates debate in the situation is a sign of its relevance. SSM is usually considered a methodology for analyzing ill-structured problem situations which managers of all kinds and at all levels have to face (Checkland and Holwell 1998).

Soft systems according to Checkland and Holwell (1998) has a number of strengths to examine the real world situations including:

- SSM recognizes that in any situation the participants will have different perceptions of the situation, and it is likely they will also have different preferable outcomes. SSM explicitly attempts to take these into account from the outset to ensure that the results of the analysis are acceptable to all parties concerned.

[18] www.jstor.org/stable/258385

- The structure of SSM facilitates the addressing of "messy" problems that occur when objectives are unclear, multiple objectives exist, and where there may be several different perceptions of the problem.

- SSM does not attempt to define a single perspective, method or action. Rather, through an interactive process of systems thinking and debate, an acceptable set of improvements is agreed between stakeholders.

Soft systems methodology was developed with the specific intention of addressing complex issues associated with human activity systems. It has been applied with success in a number of areas: public utilities, health services, industry and education (Watson and Smith 1988, Checkland and Scholes 1990) and more recently in natural resource management institutions (eg: Bunch 2003). A key feature of SSM is that it enables the analyst to embark on a process of learning about the domain under scrutiny and seek ways of improving the problem situation. It is a methodology for dealing with complex, unstructured problematic situations. SSM evolved in response to the failure of systems analysis to adequately address "messy" problems involving human activity. SSM provides techniques and general guidelines for expression of situations that are considered to be problematic. Out of this expression, key themes can be identified and modeled as systems of purposeful human activity that are relevant to debate about the situation. Comparison of these conceptual models to the expression of real-world situation is intended to stimulate debate about systemically desirable and culturally feasible change. Action in the real-world, informed by such debate, changes the situation, which is intended to be iterative and ongoing. Thus, SSM formally operates a learning cycle, employing learning from the experience of applying the methodology to further information in real-world situation (Checkland and Scholes 1990, Checkland 1999).

SSM offers a methodological approach and toolbox to deal with human activity in complex problematic situations. It is human activity that so often makes environmental problem situations complex and intractable. Declaration of world views and accompanying bundles of values, intentions, and norms that derive the expression and evaluation of such situations is promising route to deal with complexity in urban and environmental management (Bunch 2003).

The methodology is described schematically in Figure 4 which is followed by explanation of each stage.

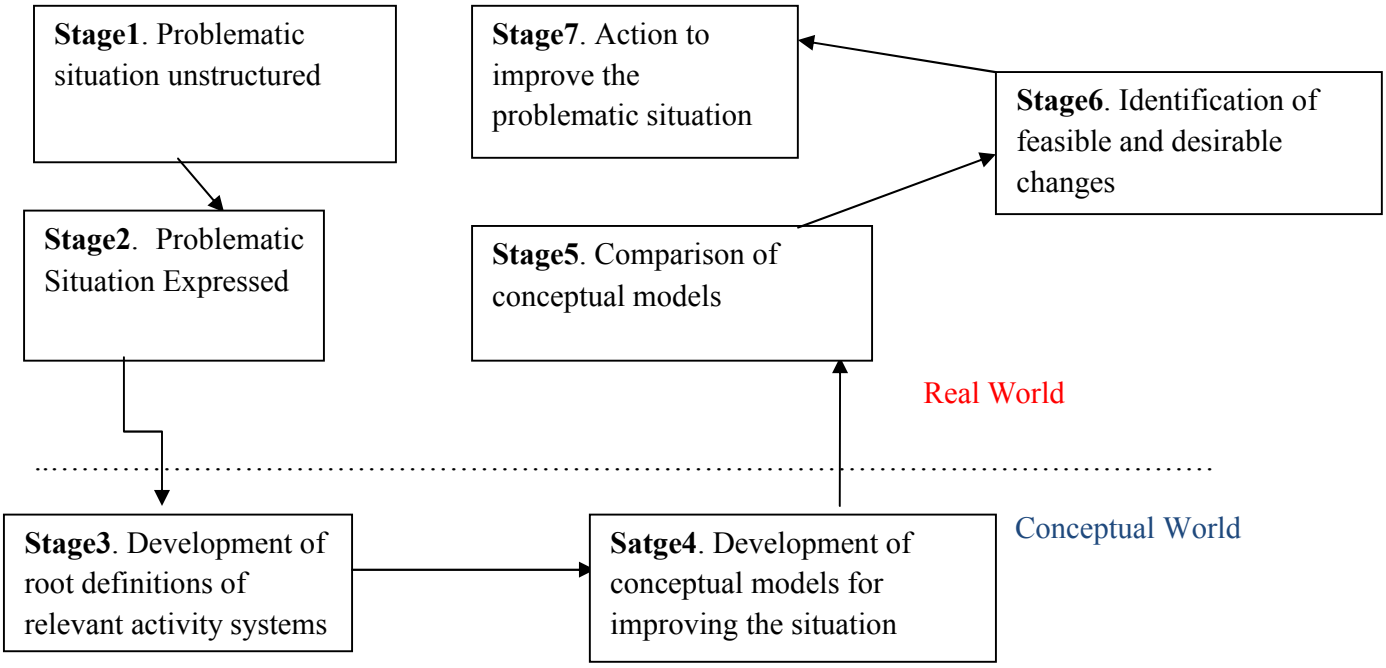

Figure 4. Checkland's seven-step process in Soft Systems Methodology

Stage 1. As analyst, I reach for meaning by moving into the situation to talk with people who have different perspectives and by suspending own biases about the situation. It helps the analyst create a platform to reflectively observe the situation by seeing people interact with each other and the environment and watching for patterns to emerge. Analyst makes sense out of the situation and encounter with the concrete experience of people in their context. In this stage, related documentary materials are collected. This stage focuses on identifying and describing the situation in all its **richness** and complexity rather than defining the problem.

Stage 2. I emphasize on assimilating what has been found into useful alternative conceptualizations of the meaning of the situation and expressing them in words meaningful to participants. As analyst I help participants display the situation so as to reveal a range of possible

and relevant choices for improvement, fully describe the present and necessary structures and processes of a situation and the climate resulting from their interactions, fully describes the principal themes of concern or issues and the primary tasks associated with the situation.

Stages 3 and 4. Here the objective shifts from the open description, analysis, and synthesis of the present state of affairs to using systems thinking to design and describe proposed future improvements. I made transformation statements that designate basic features of improved situation related to the themes of concern and primary tasks identified in steps 1 and 2. Then each transformation statement is expanded, using a tool referred to as TWOCAGES (Table 1) to create a system definition, a blue print for a conceptual model of the critical human activities envisioned to be in operation in an improved future state. An important outcome of these two stages is the formulation of "conceptual models" of imagined human activity systems which would help address the issues of concern identified earlier.

Stage 5. After the conceptual models have been developed, the desired activities that make up the modeled system are compared with the problem situation in the real world as determined in stage 2. Here, any activities identified as necessary for the conceptual system to function but missing in reality can be brought out for further discussion.

Stage 6. This is an important stage in such a way that it engages the people who have been participating from the beginning in a wide ranging debate about the desirability and feasibility of specific changes that have emerged from the analysis this far.

Stage 7. The most feasible and desirable changes are finally selected, and implemented. Any actions initiated to help improve the problem situation will lead to a new 'improved' situation. It is important to realize that completion of Step 7 does not mean the end of the process but the beginning of a new situation offering new possibilities for further work and the subject of enquiry in a new process. In turn, this new problematic situation may be the subject of enquiry in a new seven-step process. The overall goal is gradual improvement in the situation, through a process of adaptive management. This process implies that monitoring is required to determine if any actions have been implemented properly and have actually an effect on the problem situation (Röling and Wagemakers 1998).

4.3. Methods and Tools Used to Implement this SSM Based Study

Basically participatory methods were used to obtain qualitative information in implementing the study. The following tools were mainly used to facilitate stakeholder interaction to understand the situation and in order to identify issues and plan desired and feasible action: Interviews (open ended, closed, structured, semi structured and focus group), Direct and Indirect Observations, Timeline, Venn diagram, Rich Pictures, TWOCAGES and Conceptual Models building.

Photo 2. Interview to officer at National Water and Sewerage Corporation headquarter, Kampala

4.3.1. TWOCAGES

TWOCAGES is an extension of the mnemonic CATWOE which originally developed as part of the SSM (Smyth and Checkland 1976). The extension came as out of the work by Richard Bawden and his colleagues at the Systemic Development Institute in Australia (Midgley G., et.al. 2001). It stands for: ***Transformation (T)***, ***World View(W)***, ***Owners (O)***, ***Clients(C)***, ***Actors (A)***, ***Guardians(G)***, ***Environment (E)*** and ***System (S)***. These words help to structure and organize any planned improvements to a system, and the stakeholders involved. Essentially, in applying this tool, a definition of an appropriate transformation process is chosen first – that is a process that will help to change the current system into a new, hopefully improved system. Next, the system of interest (a human activity system) is identified that should be in place to help achieve

the transformation. Once the transformation and system have been identified the other categories can be developed.

Table 1. Description of the terms in the mnemonic TWOCAGES.

Transformation: The activities that are required to convert the system from the present state into a new and hopefully improved state.
Worldviews: The picture of the world and beliefs that make the chosen transformation process meaningful to each of the stakeholders.
Owners: Those who have the authority to stop the transformation.
Clients: The potential beneficiaries or victims of the transformation.
Actors: Those who will implement the transformation.
Guardians: Those who will ensure that the voices of the unrepresented are heard during the whole process.
Environment: The factors in the physical and social environment that affect the transformation and are fixed – i.e. they cannot be changed.
System: The activities that must be initiated and coordinated to achieve the desired transformation visualized in the form of a "formal system" of interest.

5. Operating SSM at Kisnyi Slum

This research operated a participatory process in which stakeholders identified and expressed major issues related with water and sanitation at Kisnyi. After the stakeholders described the problem situation, they further played a key role in conceptual modeling, comparison, debates, and design of action plan.

5.1. Making Sense of the Situation

This is where the soft system approach commences the real world activities. Here is where the concrete experience of people in their context encountered (Checkland 1981).

5.1.1. Stages 1 and 2 of the Soft Systems Approach

The hosting organization, IIRR (International Institute for Rural Reconstruction) was wise in selecting Mariam Foundation, a local NGO that is active operating at Kisnyi as partner for this project. After getting an in-depth explanation of the situation at Kisnyi from Mariam Foundation and IIRR points of view, direct observation of the biophysical, economic and social environments was conducted. It was walking around and getting direct observations: a sort of sensing the biophysical situation without talking to people. I tried to reflectively observe without drawing conclusions on the biophysical environment. As much photos as possible were taken during this one day observation tour at Kisnyi.

The next step was to identify or map the stakeholders the study should engage. In collaboration with Mariam Foundation and IIRR, we came to agree to engage business people, local council, residents, landlords, National Water and Sewerage Corporation, Kampala City Council, The Swedish Embassy, African Development Bank, KFW (German Financial Cooperation), Catholic Relief Service (CRS), DED, FICHNDER, Urban Pro poor project, CARE International, OXFAM England, Water AID. Though few of the NGOs were hard to reach even after continuous call for appointments, most of the SHs listed above were participating in the overall process. Summary of the SHs classified into major groups is indicated in Table 2.

Table 2. The stakeholders clustered into groups

SH Group	Number
Residents	8
Landlords	3
Business owners	3
NGOs	7
Government offices	4
Embassy	1
Consultant	1
Private Company	1
Bank	1
Total	**29**

By interviewing the stakeholders, I tried to find as rich information as possible of the situations in which people expressed their sense of unease. After each interaction with stakeholders,

Mariam Foundation and my self were developing rich pictures first and then presented the rich pictures to the SHs for validation and modification. This stage was mainly used to identify problems. To the best of the capacity of the research, I tried to understand the Structure (physical, Biological, Social Pattern and Organization), Process and Climate of the overall situation. Details of the SPC (Structure, Process and Climate) are given below:

5.1.2. Structure of Situation at Kisnyi

Structure of a situation consists of the relatively durable physical, biological, and social patterns and organizations associated with a situation in particular place and time (Wilson& Morren 1990).

Table 3. Structure

Social Patterns	***Physical***	**Organizational**	**Economic**	**Biological**
Chatting in Coffee shops	*Narrow roads*	*NW & SC*	*Metal work*	*Chicken*
Playing billiard	*Blocked drainages*	*Administrative office*	*Restaurants*	*Men and women*
Alcohol drinking in bars	*Boreholes*	*Churches*	*Bars*	*Children*
Chewing chat	*Un functional ecosan*	*Mosques*	*Prostitution*	*Some plants including cannabis*
Using drugs	*Functioning and non*	*Schools*	*Wood work*	
	functioning water stand pips	*NGOs*	*Blacksmith*	
	Toilets,		*Shops*	
	Solid wastes			
	Ghetto houses			
	Pre-paid water meters			
	Spring water			
	Cars			
	Wetland			
	Leakage			
	Clinics			
	Pharmacies			

5.1.3. Process of Situation at Kisnyi

Process is how things are actually done and by whom within the constraints of structure. Features of process are changeable (Wilson& Morren 1990).

Table 4. Process

Administrative	Business	Toilets	Water Management	Garbage Collection
Local Council	*Business men and women*	*Community*	*Private water venders*	*NABUGABO*
Kampala City Council		*Private land lords*	*NW & SC*	*KCC*
		Individual tenants	*Land lords*	
		Kampala city-council	*Mosque for some of boreholes*	
			Community for spring water	

5.1.4. Climate of Situation at Kisnyi

Climate is the quality of relationship between structure and process, how well things work together, and the resulting emotional response (Wilson& Morren 1990).

In this study, the quality of relationship between the structure and process at Kisnyi according to the feed back found from the stakeholders is poor in such a way that the process cannot influence the structure the way it should to be. The process cannot enforce rules and regulation that people cast solid waste on drainage canals in front of their doors, some defecate out, some water venders do not pay bills and generally lack of human discipline creates hindrance to people who want to work to improve the situation. This hinders the application of more development activities at Kisnyi.

The making sense out of situations part helped in identifying and definition of various actors, components, interactions and relationships within the situation. According to Checkland (1979), this exploration is an analysis phase designed to answer questions of "what" as opposed to "how?" Checkland and Scholes (1990) indicate that it has been found most useful to make the initial expression a building up of the rich possible picture of the situation being studied. Such a picture then enables selection to be made of a view point (or view points) from which to study further the problem situation. Figure 5 shows one of the rich pictures of the interviews while Figure 6 is a time line of events at Kisnyi as understood from the local council.

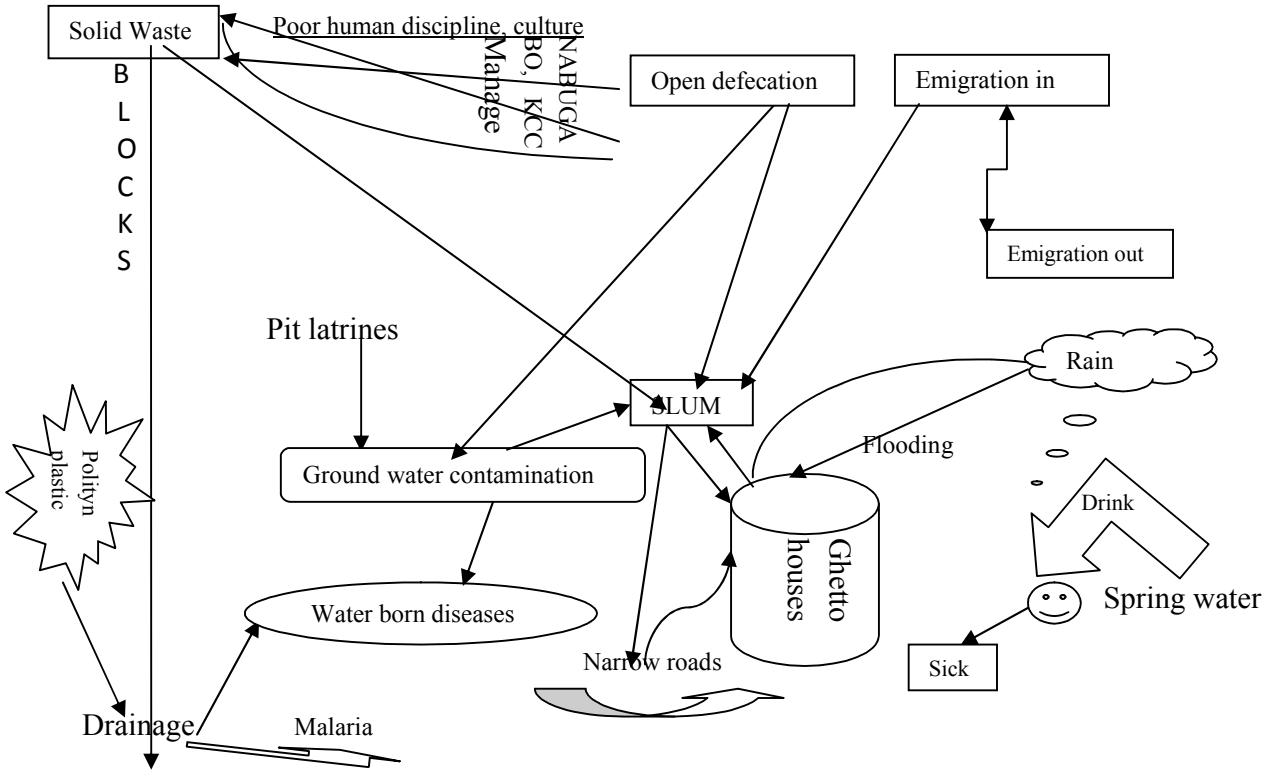

Figure 5. Part of a rich picture of Kisnyi problem situation. KCC stands for Kampala City Council while NABUGABO is the private company dealing with solid waste collection

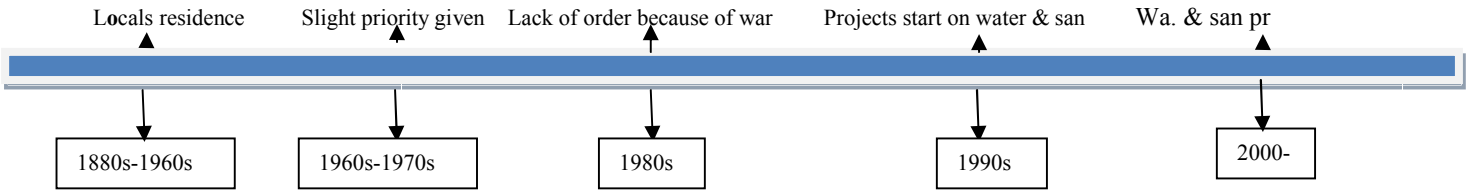

Figure 6. Time Line of Events at Kisnyi, adopted from interview at the Local Council.

According to the time line, in colonial era, Kisnyi was reserved to residence to only poor local people and it was marginalized from getting improvement. After Uganda's independence on 9 October, 1962, it started to get attention though the consecutive civil wars hindered development activities. Later in the 1990s and since 2000 the water and sanitation component has been handled relatively in sound projects, hence there has been improvement of situations.

The institutional analysis (Figure 7) came up with the feed back that the Ministry of Water and Environment plays the highest role in water supply and sanitation issues followed by the National Water and Sewerage Corporation. Kampala City Council and the Local council do play key roles under the over all MOWE policies. Mariam Foundation is more related at the grass root level being connected with local council. KFW and FICHINDER are involved as donors and consultant respectively.

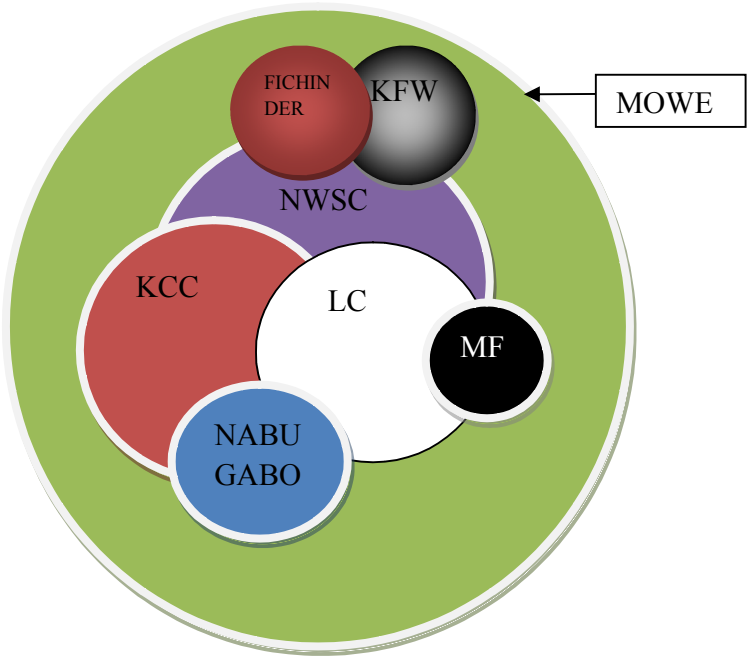

Figure 7. Influences of Institutions on Water Supply and Sanitation issues at Kisnyi. Ministry of Water and Environment (MOWE), National Water and Sewerage Corporation (NWSC), Kampala City Council (KCC), NABUGABO, Local Council (LC), Mariam Foundation (MF), German Financial Cooperation (KFW) and the German consultancy office (FICHINDER). The bigger the circle, the higher the influence and the more the circles are interrelated the more they influence to each other.

5.1.5. Identification of Major Tasks/ Major Concerns

This was one of the parts of the work that demanded long time preparation and energy because all those stakeholders who have been interviewed should come together and debate. I called to all stakeholders I was interacting with to come to one meeting place (kind resident woman at Kisnyi offered her home for meetings I wanted to have through out this study). I did not get all of those who were invited for several reasons such as need for payment and they had some thing else to do for their livelihoods. However, with those who showed up, we discussed on the list of issues I identified (Photo 3). Then we came up with the major issues listed in Table 6 to work on further.

Table 5. Major issues identified

High solid waste, pollution of water and environment due to solid waste, open defecation, drainage blockage by solid waste, not enough number of toilets available, toilet use cost is expensive, water cost is expensive, high population number, emigration in, emigration out, environment is not good to have pit latrines because of high water level, people discharge human excreta to drainage canals, ghetto housing, Drugs, alcohol, chat, diseases (malaria, cholera, diarrhea, typhoid, skin infection, worm infection), less interest of people to work in the slum environment, transit population, less NGOs interest on slum, pollution of Lake Victoria, low rule enforcement, lack of human discipline, gang involvement, poor land lords' interest, contaminated spring water, high economic activities, high population growth, big family size in small houses, not good will of administrators, different culture, different religions, different tribes, poor awareness, leakage from broken sewage pips, leakage from high water level, broken pipes, neglected water taps, none functional ecological sanitation (ecosan) toilets, flying toilets and bad smell, less government input, land lords do not live in slum so do not care much, cultural or attitude problems to use toilet, corruption by administrative bodies.

Photo 3. Debate on rich pictures and issues

Right away after identifying the main issues, the following step was to discuss on if we can identify primary tasks. We agreed to do so and we listed the following primary tasks:

- Reducing the new emigrants inflow
- Reducing trained emigrants outflow
- **Proper solid waste disposing and collection is required**[19]
- **More feasible, culturally acceptable and affordable toilet supply is required**
- Intensive sensitization so that there will be good awareness
- More government involvement
- Fixing and managing broken toilets, sewerage pips, stand water pips and drainage canals
- **Improving water supply system is required**
- Increasing the interest of NGOs presence in Kisnyi slum
- Proper (effective) law enforcement is important
- Creating slum dwellers initiative
- Reducing corruption on government level
- Making landlords willing to build toilets and water supply facilities
- Encouraging the on going pre-paid water meter system
- Avoiding gang influences

5.2. Developing Models of Human Activity Systems

The objective in this part shifts from open description, analysis, and synthesis of the present state of affairs to using systems thinking to design and describe proposed future improvement (Wilson, K., et. al. 1990).

5.2.1. Stage 3 and 4 of the Soft Systems Approach

Here we worked on three key inquiry activities (Transformation statements, using TWOCAGES, formulation of conceptual models of human activity systems).

[19] Lists on bold are for further transformation

After identification of primary tasks in a small group of stakeholders, we discussed possibilities and capacities to formulate transformation statements. The idea of creating a transformation statement for each listed primary task seems perfect but due to over lapping of many of them, the interactive feed back was that we should further work on only three highly prioritized transformation statements which are listed down:

1. A system to proper garbage management so that garbage is disposed properly for further collection and drainage canals blockage prevention

2. A system to enough toilet access so that there will be affordable and accessible toilet use

3. A system to have improved clean and safe water supply so that there will be access to affordable clean water both for sanitation and drinking. This transformation process was rejected later during a bigger group workshop. After intensive debate, it was not considered as priority from stakeholders perspectives because the perception is that water supply issues are well handled by NW&SC to an extent of introducing pre-paid water meter (refer the discussion part on page 50). The perception of NW&SC and KFW as institutions playing key role on urban water supply and sewerage in Uganda is that people are getting clean water every 200 m and the price per 20 liters is coming down from 100 USH of water vendors to 18 USH because of the prepaid water meter supply system (Fig. 13). The Swedish embassy also is phasing out its water related financial support by the year 2010 because it is not any more a priority to Uganda.

Photo 4. Pre-paid water meter at Kisnyi slum. This brings the cost of water to NW&SC recommendation (18 USH/jerry can). The meter also can be installed near to bath area.

The next step was to start working on using the rest of system terms on the transformation statements. Here, we began to figure out the W, O, C, A, G, E and S of the mnemonic TWOCAGES. This part of the work was done by going around to the stakeholders. Each of the issues and the systems of interest defined with the transformation statement are given below:

5.2.2.1. Transformation Statement I: A system to undertake solid waste management so that garbage is disposed properly for further collection and prevents drainage canals blockage.

Worldviews (W)

The presence of high solid waste does not give time to wait

Solid waste is source of diseases and bad smell

Solid waste blocks drainage canals and mosquitoes reproduce in the waste water

Solid waste pollutes the environment and water

Solid waste can be used for economic activities such as compost or humus, animal feed as well

Lack of solid waste proper management is waste of resources

Government does not support communities' initiatives in providing the necessary support and policy direction

Change of attitude and culture is important

Use banana peelings, leaves or potato vines into organic manure instead of dumping and pollution to environment

Corruption and gang influences are affecting initiatives

The situation is as bad as you see

Experts should come to our world

We can clean our environment by ourselves, but we need material and financial support

Owners (O): Local Council, Kampala City Council, Ministry of Water and Environment

Residents and Business owners, Land lords

Customers (C): Residents, Business people

Actors (A): Local and non local NGOs, Government of Uganda, Local Council, Kampala City Council, Ministry of Water and Environment, Private sectors such as NABAGABO

G: Community, Local council

S: All the activities mentioned in the conceptual I and inputs

- ***Conceptual Model of Transformation Statement I***

Modeling is an approach to what is referred to in the learning cycle as abstract conceptualization, the mental process used to make sense out of events. It is a mental construction or reconstruction of the way we organize our collective or individual views of things. In its conventional usage, however, modeling usually refers to how we make tangible what is in our minds (Wilson, K., et. al. 1990).

This part was developed in collaboration with Mariam Foundation and some residents at Kisnyi who showed great interest in the work. Then, it was presented to a bigger workshop for feed back and suggestions along with discussion on comparison with reality and inputs identification. Figure 5 is the final version of the CP (Conceptual Model). Figure 6 shows hand drown model for debate during a workshop.

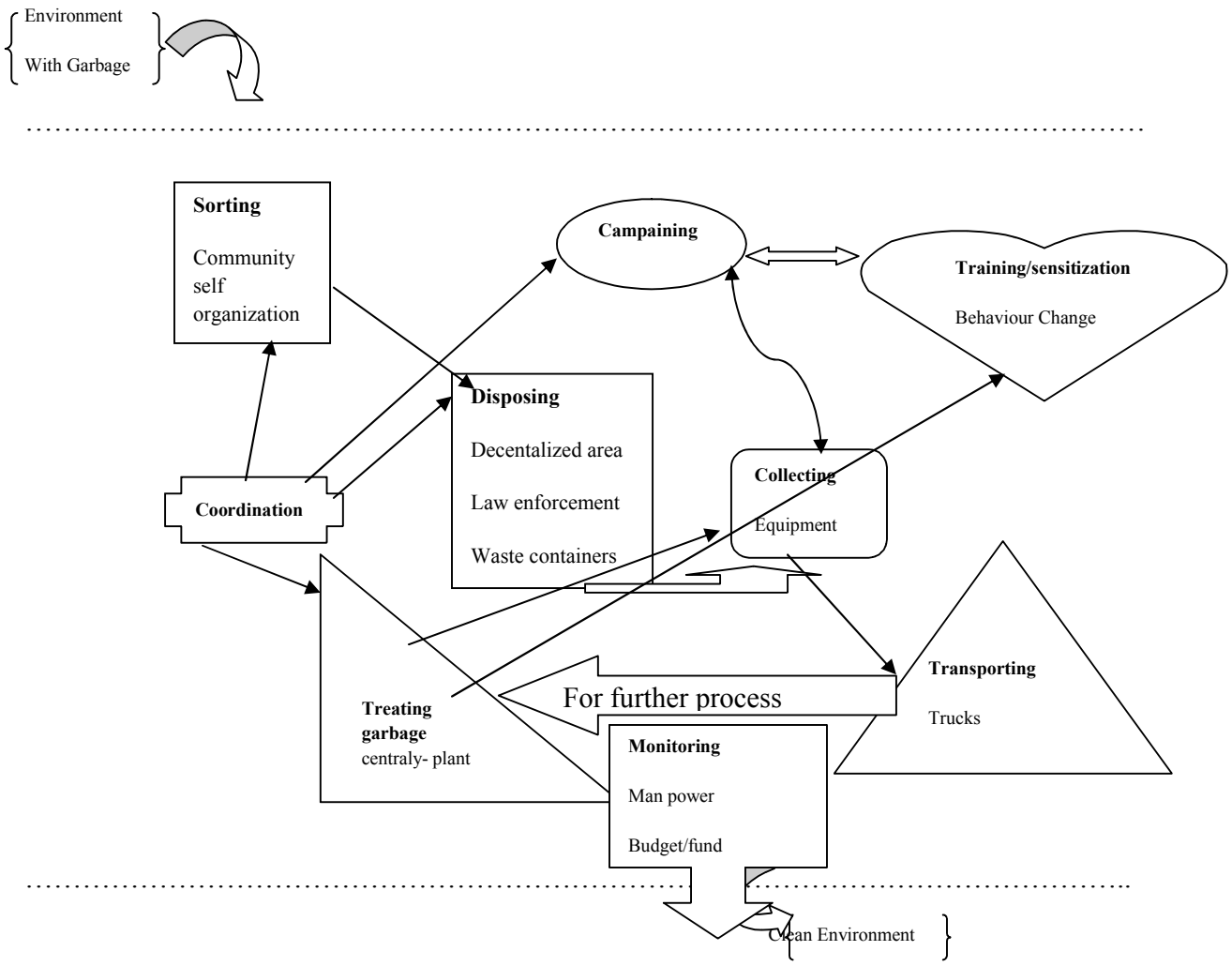

Figure 5. Conceptual Model

Photo 5. Debate on one of the Conceptual Models

- ***Comparison of the Conceptual Model with Reality***

The comparison part has two essential goals. The first is to come down from the highly abstract model-building phase by self-consciously returning to complex real world as originally recorded in the situation summary, composite mind maps, cartoons, or other materials developed in stage 2. The second objective is forward –looking, to get the human activity system models ready to be communicated in the next phase of the approach, when the proposals for change are debated by the people involved (Wilson, K., et. al. 1990).

Table 6. Comparison of Conceptual Model I with Present Situation

Sub System	Present Status	Desirability	Feasibility
Sensitizing	Needs improvement	Highly desirable	Highly feasible
Sorting	Required	Desirable	Less feasible
Decentralized disposing	Required	Highly desirable	Feasible with law enforcement
Coordination	Needs improvement	Highly desirable	Feasible
Collection	Needs improvement	Highly desirable	Feasible (as means of income)
Transporting	Needs improvement	Highly desirable	Feasible
Treatment	Required	Highly desirable	Feasible

- ***Inputs to Get the Sub Systems Function***

Sensitization: *Skilled man power, Radios, films, videos and fund*

Sorting: *Know how, different containers or pieces of land for different waste disposal, willingness of household*

Decentralized disposing: *Garbage containers, individuals willing to collect and get wedges, free land availability, willingness of landlords to give land*

Coordination: *Commitment of coordinators, community self organization, law and fine enforcement, fine on use of plastic bags*

Collection: *Equipment such as: rakes, spades, wheelbarrow; willing to work on collection and generate income, recycling factories*

Transporting: *Trucks, central area for waste treatment*

Treatment: *Technique, landfill site availability, turning rubbish into resource*

5.2.2.1. Transformation Statement II: A system to have enough toilet access so that there will be affordable and accessible toilet use

World View (W)

Human unprotected defecation and urine contaminate environment and water

There will be fewer incidences of diseases

Toilets can be connected with sewerage system

Culture and long term behavior change is important

Some private owned toilets dispose their waste (faces and urine) on drainage when it rains

Pit latrines contaminate the under ground water that is livelihood of many people

Ground water with fecal bacteria has led to the outbreak of waterborne diseases (diarrhea and typhoid)

Toilet is human right

Gang groups affect initiatives

Make toilet services commercial in respect to Kampala's way of life

SULABH toilets are appropriate both for land lords and tenants

Some people discharge their toilet human waste in drainage canals when it rains

There will be less or no flying toilets

Owners (O): National water and Sewerage Corporation, Kampala City Council, Ministry of Water and Environment, Residents and Business owners, Land lords

Customers (C): Residents, Business people

Actors (A): Local and none local NGOs, Government of Uganda, Local Council, Kampala City Council, Ministry of Water and Environment, Beller Consult

E: Lack of discipline, population increase, emigration in, low interest of landlords, culture

G: Community, Local council

S: All the activities mentioned in the conceptual model II and inputs

- ***Conceptual Model II***

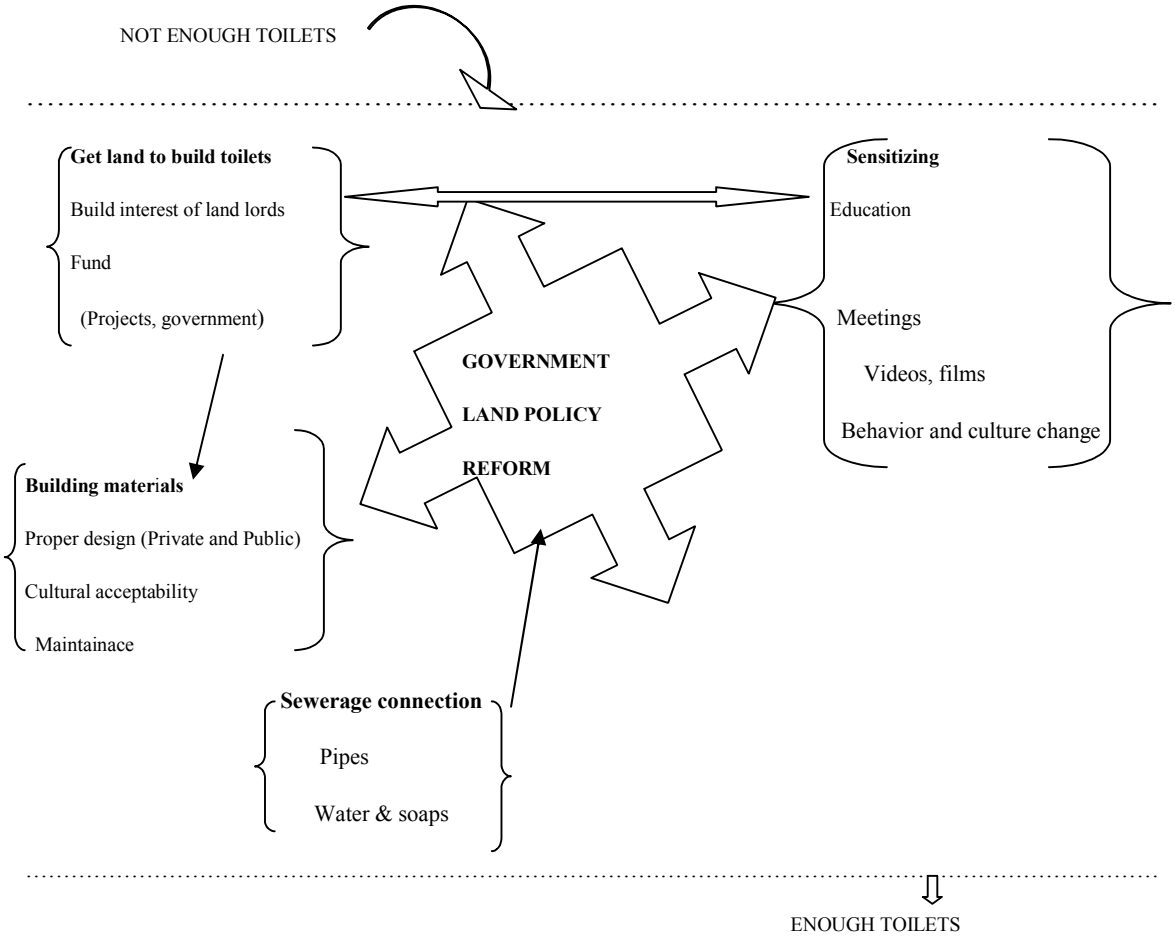

Figure 6. Conceptual Model (CM) II

- ***Comparison of the Conceptual Model II with Reality***

Table 7. Comparison of Conceptual Model II with Present Situation

Sub System	Present Status	Desirability	Feasibility
Sensitization	Needs improvement	Highly desirable	Highly feasible
Getting land to build toilets	Required	Highly desirable	Less feasible
Proper design and building toilets	Needs improvement	Highly desirable	Feasible
Sewerage connection	Needs improvement	Highly desirable	Feasible
Soaps and Water supply	Needs improvement	Highly desirable	Highly feasible
Government Land Policy Reform	Required	Highly desirable	Less feasible

- ***Inputs for the Subsystems to Function***

Sensitization: *Skilled man power, agitation, Videos, Films, Radios, news papers*

Getting land to build toilets: *Will of landlords, rent or lease, fund*

Proper design and building toilets: *Feasibility study, building materials, fund*

Sewage connection: Water p*ipes, continuous maintenance, good design*

Soaps and water supply: *Fund, will to use, affordability*

Government land policy reform: *Research, rule and law enforcement, make landlords*

Beneficiary

5.3. Action Plan

This part was finalized after intensive discussion or interaction with the stakeholders. Mariam Foundation and IIRR played key role as institutions. The final action plans for the activities to perform both transformation statements in sustainable way is presented Tables 7 and 8. The answers of why, how, when and who were given by the participating stakeholders during the workshop to develop the action plan.

Mean while the issue of who will make sure that the action plan is implemented was discussed in detail. Further, we discussed if I will be in the implementation and what will be my role in this case? The stakeholders were briefly briefed about my interest in Kisnyi that I am doing the job as learning process and that I do not have project money to follow up on the implementation. We came to agree that I look for further project funding in such away that Mariam Foundation will play a role of coordination from local point of view.

After taking the views of the stakeholders, the action plan was presented to Dr. Kennedy, Country Director of IIRR for suggestion before it gets its final shape. Dr. Kennedy brought a very important idea that the monitoring and evaluation component should be included. Hence, a

short meeting with the stakeholders was called to get feedback of the monitoring and evaluation aspect of the action plan considering that it will be implemented. Tables 7 and 8 include both monitoring and evaluation information.

1. A system to proper solid waste management so that solid waste is disposed properly for further collection and drainage canals blockage prevention

Table 8. Action Plan for Proper Solid Waste Management

Activity	Why	How	When	Who
Mobilization	To much solid waste creating drainage blockage and health hazard	Community driven Locals self organization NGOs KCC intervention Local council intervention using wheal borrows, spades, hoes and rakes	Immediately	LC, KCC, NGOs, MWE, Residents Business people
Sensitization	To internalize the situation To create awareness/increase awareness, Information dissemination, behavior change of people	Meetings, drums, music, leaflets, videos, films, seminars, mass media (radio, TV, news papers), incentive supply, community Driven	Immediately	LC, KCC, NGOs, MWE, Residents Business people
Sorting	For recycling, for income, decomposition and manure production, pollution reduction	Employing workers, house holds, by putting different waste in different containers	Immediately	LC, KCC, NGOs, MWE, Residents Business people
Decentralized disposing	Accessible and comfortable	Get containers near to residence	Immediately	Locals, LC MWE
Collecting and Transporting	Recycling, Treating, decomposing Clean environment	Loading on trucks	Immediately	NGOs, KCC, Private com
Monitoring	To have job organized well and see if there is something missing or not	By observation, interview	From beginning of job implementation till accomplishment	LC, Projects, KCC MWE, Locals KCC
Evaluation	To see if the job is being done well	Observation, interview	From beginning of job till accomplishment	LC, Projects, KCC MWE, locals

LC (Local Council), KCC (Kampala City Council),MEW (Ministry of Water and Environment)

Table 8. Action Plan to Have Adequate Access to Toilets

Activity	Why	How	When	Who
Acquiring Land	To build toilets	Dealing with land lords Buying land from land lords	Immediately	NWSC, NGOs, MEW, KCC, LC
Building more desired toilets	To increase access To improve sanitation and hygiene To control disease	Identifying appropriate design, Use good building materials	Immediately	NGOs, LC, MEW, NWSC, KCC
Sensitization	Increase (create awareness), Create responsibility, changing attitude, create ownership feeling, Increase interest of land lords to build toilets	Training, videos, films, IEC	Immediately	NGOs, LC, MEW, NWSC, KCC
Operation and maintenance	To have effectively working toilets	Selecting user committees, training	Immediately	NGOs, LC, MEW, NWSC, KCC
Sewage	To connect toilets so that human waste flows to central treatment plant	By having pipes connecting each toilet to the sewage system	Immediately to those toilets that are newly being build	NGOs, LC, MEW, NWSC, KCC
Monitoring	To have job organized well and see if there is something missing or not	By observation, interview	From beginning of job implementation till accomplishment	LC, projects, MEW, locals, KCC
Evaluation	To see if the job is being done well	Observation, interview	From beginning of job till accomplishment	LC, projects, MEW, locals, KCC

LC (Local Council), KCC (Kampala City Council), NWSC (National Water and Sewerage Corporation),MWE (Ministry of Water and Environment)

In both cases, the action plan is left for immediate implementation with Mariam Foundation and Local Council as grass root institutions, residents and business people as stakeholders and Kampala city Council and the National Water and Sewerage Corporation on higher level. What

ever action is taken will not be sustainable if proper coordination lacks. The situation at Kisnyi is so alarming that all issues should be immediately taken into consideration according to feed backs from the SHs. Evaluation and monitoring of the implementation of the action plan is crucial.

6. Discussion

Although poverty in Uganda has a rural face, the urban poor in Kampala are much more disadvantaged[20]: they live in very poor and shanty housing conditions, lack access to a supportive social network and most of the population live in one roomed houses. Rural to urban migration has been a principal factor in population growth in Kampala and most of the people migrating to Kampala end up in slums with ensuing sanitary and environment problems.

In Kampala, access[21] to safe water is at 70%[22] but for the informal settlements, this figure is believed to be a dismal 17%. The main reasons for this are the absence of water distribution networks in these areas, or if present, the high costs charged by yard tap owners and kiosk operators. Thus, the slum-dwellers resort to alternative and unsafe sources of water, which include springs (both protected and unprotected) and shallow wells. Recent studies by Kampala City Council (KCC) show that: (i) the number of households using alternative sources is significant; and (ii) more than 90% of the water samples from these alternative[23] sources are contaminated by E-Coli bacteria (from near by latrines, leaking sewers and solid waste that carries significant fecal matter), putting the users at risk of disease. Cholera epidemics are common, and the most recent outbreak in Kampala was during November 2006. The sanitation situation in these areas is appalling.

[20] http://www.kcc.go.ug/downloads/district_profile.pdf

[21] Coverage/access defined as people with piped water supplies within a distance of less than 200m (for urban areas)

[22] Source: 2006 Water and Sanitation Sector Performance Report

[23] Other than NWSC tap water

To address the water and sanitation situation in Uganda in general and urban Uganda in particular, the government of Uganda has taken the following major initiatives[24]: in 1998, the government demonstrated its commitment to alleviate poverty by beginning the reform of water and sanitation sector. The stated aims of the sector reform were to ensure that water supply and sanitation services were provided with increased performance and cost effectiveness; and to reduce the government's financial burden without compromising the provision of equitable and sustainable services. The first step in the reform process was to strengthen the regulatory framework, and provide a basis for cost recovery (the National Water Policy directs that users contribute 2-5% capital cost, and 100% of operation and maintenance cots), through the introduction of the 1999 National Water Policy. Next came the development of a comprehensive sector strategy, based on subsector studies in the following areas: Rural Water Supply and Sanitation, Urban Water Supply and Sanitation, Water for Production and Water Resources Management. The reform on urban water supply and sanitation was centered on introducing commercialized operations, chiefly through increased private sector participation. This urban water supply and sanitation recommended public-private partnership, whereby the public sector retains ownership of urban water supply and sanitation assets, but operators carry out service delivery.

This study looked at institutional and stakeholder perspectives of water supply and sanitation issues at Kisnyi. The problems and issues at Kisnyi that are at least related with water and sanitation are a lot and it seemed that the only way to improve the situation was if and only if a holistic approach is adopted. Water and sanitation improvement with out improving other factors, will not be sustainable. Though SSM relies on holistic information gathering and analysis, this thesis could not give answers to quantitative information such as cost and benefits of solid waste recycling, different types of toilet building, water pipes, drainage canals, maintenance costs, wage for laborers, water and waste water treatments, sewerage connections, cost of installing pre-paid water meter. However, some quantitative data gathered are: the cost of using toilets once ranges from 100-200USH, cost of water from vendors is 100USH/20lt while it

[24] Directorate of Water Development, Framework for sector wide approach to planning: Water supply and sanitation sector. Draft Ministry of Lands, Water and Environment Issue Paper. Kampala: Government of Uganda, 2001.

is 18USH/20lt from the pre-paid water meter, one room rent reaches to 40,000USH/month, one truck garbage collection cost is 80,000USH, total donor based fund available for urban sanitation improvement in Uganda including Kampala is 61 million Euros (38millions from ADB, 7million from EU and 16million from KFW) including for SULABH toilets.

The cultural perception of emigrants from Karamoja to defecate openly was interesting to work in detail. The general sense of non Karamojanas is to blame Karamojans (a sort of tension between tribes because of sanitation question). The understanding could have been richer if I could have been able to get the answer why they practice that from those practicing it (Karamojans), but unfortunately, the Karamojans I met did not like to discuss in their words other than say that it was their culture and they respected it. This study therefore discovered this as an extremely risky tradition health wise, but could not answer the motivation how it came to be a norm.

6.1. SSM in Relation to Kisnyi Slum

Soft Systems Methodology at Kisnyi in relation to water supply and sanitation became very relevant because Kisnyi is an environment with different conflicts of interest in relation to applying water supply and sanitation projects. The systems approach helped in understanding these different messy situations that without considering them, a change program or project can hardly be applicable successfully. One good example is the understanding of the perspectives of landlords compared to the perspectives of need to have toilets by tenants. The other relevant example is the understanding of conflict of interest by local council office and the initiatives of people at the bottom level to clean their surrounding from garbage. The need of the local office to impose its interest from top down only blocks the initiative that comes from bottom.

6.1.1. Making Sense of Situation

This part of the study was allocated two weeks including identification of the Institutions and Stakeholders. After each interview or engagement with a given institution or stakeholder (s), rich pictures were made by myself and Mariam Foundation. Then, the rich pictures were presented to each interviewee (s) for further discussion. Several tools of facilitation that are mentioned in the

methodological part were very helpful in terms of facilitating the interactions. This helped to get the rich picture of the over all situation. After having all the rich pictures organized, first workshop was called to discuss all the rich pictures. The feed back was taken into consideration. The stakeholders shared their perspectives among each other during this workshop.

6.1.2. Developing Models of Human Activity Systems

After having the information on making sense of situation, the development of model of human activity systems preceded by engaging the stakeholders who were participating in the previous activities. A workshop (Photo 6) with a list of major issues, primary tasks and transformation statements was called and the SHs gave their perspectives. The third transformation statement that was supposed to transform water supply was rejected by the participants because they perceive supply is already changed. Hence the remaining part of the human activity systems development was based on solid waste and toilets.

Photo 6. Posters in one of the workshops

6.1.3. Action Plan

The action plan for both transformation statements was prepared in consultation with the stakeholders. The action plan for both statements prioritizes sensitization as without the will and

awareness of the users a sustainable change is not achievable. Desired and feasible projects that are well coordinated among institutions and stakeholders remain corner stone for both. The action plans emphasize the need for efficient projects with domestic and external financial support. Developing skilled man-power in relation to solid waste and toilet issues is relevant. Most of the activities in the action should be done as soon as possible as already the issues are at the highest climax level.

6.2. Major Findings of this Study

6.2.1. Cultural Change

Along with technical issues, sanitation has social and cultural dimensions, which are often ignored during engineering work. For example this study found that the ecological sanitation engineering introduction to Kisnyi (Photo 7) failed for reasons that some people do not accept it for religious purposes while most have no discipline of carrying ash while using toilets. Moreover, people have very low interest to hear to use human excreta for economic activities which needs an intensive sensitization. This is very clear evidence that a technology misses adoption if it does not come from bottom up.

Tribes who come from Karamoja, North East Uganda to Kisnyi do have a culture that values open defecation rather than using toilets. These people need high sensitization so that they can change their practices the information from stakeholders so that they will not keep on defecating out doors. One of the most interesting outcomes of the work is that there should be an intensive and continuous sensitization to create awareness. This sensitization can be done through meetings, posters, seminars, videos, etc.

Kisnyi is inhabited by a "sort of transit population." Many people, who are newly immigrating to Kampala from different parts of Uganda and different countries of Africa, stay at Kisnyi. This is because of cheap accommodation, cheap food stuff and connections with friends or family members. Kisnyi is inhabited by people of different religions, tribes and culture. Hence, it came up that all these social complexities should be taken well to propose any action for change.

Photo 7.Nonfunctional Ecological Sanitation Facility at Kisnyi. Imposed technology is waste of resources.

6.2.2. Toilets and Toilet Use

This is one of the most interesting outcomes of the over all interaction. Both from institutions and individuals perspectives, the issue of toilet was discussed very well. The available number of public toilets is not enough for all, so one can see long queue to use public toilets. When it comes to cost, it is still expensive: one visit only costs 200 USH. Hence, those who cannot afford to have no alternative than to use open air or flying toilets. It came during the discussion also that some toilet owners discharge the waste into the drainage canals when it rains so that the human excreta and urine flows down to the delta (Lake Victoria in this case).

The interest of landlords to build toilets is low. In most informal settlements like Kisnyi, up to 90% of residents are tenants, meaning they do not own the land on which they live and have no right to develop it (including building toilet), even if they were willing and had the resources. Instead, they must rely on the land lord to provide a sanitation facility. Kampala City Council described that the task of dealing with landlords is not an easy one, for the following factors: Landlords are reluctant to invest in sanitation as they see it as a non essential additional expense, landlords rarely live in the informal settlements (slums) where they own houses, hence they are

difficult to locate and communicate with. Interviewed KCC officer said “We have tried to enforce the law on sanitation but we can’t get them-we often have to deal with tenants, who have no rights.” Moreover, land is a sensitive issue in Uganda right now. Any attempt to develop any facility on it is suspected as land grabbing, making such developments impossible for tenants to undertake. There should be law enforcement. It was described during interviews that many tenants are willing and able to pay a little more money in rent in exchange for improved sanitation facilities and welfare for themselves and their families. For a landlord with good business sense, this is an opportunity for increased income that should not be missed. One of the landlords described that because he gets more money from services he is giving to the people by adopting SULABH toilets that he is building new apartments to rent to tenants. The KFW funded project on SULABH toilets was found to be encouraging by both the landlords and the stakeholders this student talked to. The land lords tend to be happy of SULABH toilets because of the following advantages: hygienically and technically appropriate; socio-culturally acceptable, low cost and easy to construct with locally available materials, design and specifications can be modified to suit the user's needs and affordability, it eliminates mosquito, insect and fly nuisance; can be constructed in different physical, geological and hydro geological conditions; free from health hazards and does not pollute surface or ground water, if proper precautions and safeguards are taken during construction, it can be located within the house as it is free from foul smell and fly/ mosquito nuisance; can be constructed on upper floors of houses also, pits are generally designed for 3 years dislodging interval, but if desired they can be designed for longer periods or it can be reduced to even 2 years, the maintenance of SULABH is easy and simple and it costs very little, it needs only 1.5 to 2 liters of water for flushing compared to 12 - 15 liters required by conventional flush toilets, less space than is required for septic tank latrine, it does not need scavengers for cleaning pits or disposal of sludge; This can be done by the householders themselves or by a laborers; makes available rich fertilizer and soil conditioner, it can be easily connected to sewers; no vent pipe is required in as gases disperse into the soil thereby removing the nuisance of foul smell spreading in the neighborhood.

As support to the above arguments, [25]without access to safe toilet facilities, many slum residents are forced to use public areas, most often drainage routes, to relieve themselves. **These drainage waste channels are unprotected and it is common for people, especially children, to come in contact with the waste as it travels out of the slum.** Once a person has come in contact with the Cholera or Typhoid infected waste, it is unlikely they will be able to wash their hands with clean water before cooking or eating, and therefore the bacteria spreads into their body, and the cycle begins again.

6.2.3. Solid Waste

The issue of solid waste was found to be extremely alarming. Almost every stakeholder and institution participated in this study acknowledged that solid waste is one the major issues. All sorts of solid waste are disposed recklessly everywhere. Some of the senses of unease were that solid waste blocks drainage canals, pollutes the environment, and creates diseases. This study came up with first the need for change in people's attitude and responsibilities. The work of Kampala City Council and NABUGABO private company seemed not efficient because residents and business people at Kisnyi are required to dispose their daily waste in several central locations from where the trucks of KCC and NABUGABO collect and dump it at Kiteezi. People do not have the patience and interest to carry their solid waste to these central areas and hence they dump them everywhere around their residence. It is to the extent that some people pretend to be evening shoppers and once there are no watchful eyes, they drop the waste and rush back to their homes. The impassable roads then get more impassable. Sensitization again comes first because even if decentralized waste containers will be delivered in accessible locations, the containers will get stolen by the people and will be used for other reasons. The knowhow and interest of sorting waste needs intensive sensitization in the long run. Having decentralized dumping locations that are accessible to households is an option. Creating a link between waste and agriculture was proposed as means to help clean the environment: Hardly a day passes by without politicians saying Uganda's backbone is agriculture, but the soils are starved of nutrients. There should be efforts to harness cheap organic manure from the freely abundant waste to benefit millions of farmers. For example, banana peelings, leaves or potato vines could

[25] http://www.kslum.org/aboutkibera.htm

be used (recycled) into organic manure instead of being dumped and polluting environment and blocking drainage. This intervention learnt that the government in Kampala through KCC has always taken a back seat when it comes to addressing waste management. It is commonly understood that there should be a paradigm shift that communities should get organized and come up with their initiatives. This paradigm shift to work well; however, should be supported by necessary material inputs and policy directions from the government. Plastic recycling industries should employ people to collect the plastic bottles every day before the waste sorters have to go to the Kiteezi waste dumping site to collect them.

In relation to solid waste, one of the outcomes was the recognition of need for an immediate large scale campaign to clean Kisnyi. This should be done in coordination to responsible government offices such as the KCC and the local council; NGOs, landlords, tenants and business people as immediate as possible.

According to the EAWAG, Department of Water and Sanitation in Developing Countries (2007), the socio-economic, cultural and institutional context in the developing world requires special consideration of appropriately adapted technologies, capacity building, including improvement of skills and know-how at local government level. Innovative and integrated collection, recycling and disposal systems of municipal solid waste management, involving community participation, public-private partnerships, micro-enterprises, and scavenger cooperatives, are steps in the right direction. Management of Municipal Solid Waste is one of the major challenges worldwide. Inadequate collection, recycling or treatment and uncontrolled disposal of waste in dumps lead to severe hazards, such as health risks and environmental pollution. This situation is especially serious in low and mid-income countries.

Municipal solid waste management constitutes one of the most crucial health and environmental problems facing governments of African cities. This is because even though these cities are using 20-50 percent of their budget in solid waste management, only 20-80 percent of the waste is collected. The uncollected or illegally dumped wastes constitute a disaster for human health and the environmental degradation. Not only the are quantities increasing but also the variety, both a consequence of increasing urbanization, incomes, and changing consumption habits fuelled by globalization. This scenario places the already-desperate urban councils in a difficult situation

especially as they have to develop new strategies to deal with increasing volumes as well as strange varieties of wastes (Barise 2001).

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According to Asomani-Boateng *et al.* (1999:1) The traditional approach where municipal authorities monopolise waste management, ignoring other stakeholders, using command-and-rule strategies, and ill-adapted imported technology is common in African cities. This approach does not improve much the waste management situation in most African cities.

6.2.4. High Emigration Rate to Kisnyi and Emigration out

Due to rural poverty, conflict and related risks in rural Uganda, many people are emigrating to Kampala city. Moreover, many people from several countries in Africa (Somalia, Eritrea, Congo, Ethiopia, Rwanda, Burundi, Kenya and Tanzania) are immigrating to Kampala. These new emigrants get affordable accommodation and things they need for their daily livelihood at Kisnyi. Moreover, due to connections (knowing some body who lives at Kisnyi), they prefer to stay at Kisnyi. This creates a very dense situation. The emigrants also come with their own culture, religion and attitude of sanitation. The outcome of this study in relation to emigration is to think in holistic terms: to understand why people are emigrating and address the causes of emigration. One of the most interesting information gathered from the interaction with stakeholders is that those who get awareness training on sanitation issues, once they improve their living standard, they move out from Kisnyi and then the new comers should get awareness. Hence, sensitization should be done on regular bases.

6.2.5. Water Supply

The quantity of water availability at Kisnyi is not questionable. However, stakeholders complained on the cost/20 liter which is 100USH. Those who cannot afford to pay this, use spring water and shallow wells. Most of the spring and well water is polluted from solid waste and pit latrines. Hence, the rate of water borne sickness is high especially among children. To address this problem, the National Water and Sewerage Corporation (NW & SC) in Collaboration with KFW (German Financial Cooperation) have introduced the pre-paid water meter system which is widely being accepted by both institutions and stakeholders. The feedbacks of the interactions shows that the pre-paid water meter has the following advantages: It is personalized (uses token), it is cheaper (each 20 liters of water costs UGSH 18 only, no bills or meter reading, no disconnections, no need for water accounts, efficient (24-hour water access), pay as you drink, rechargeable ranging from UGSH 1000. The water supply issue at Kisnyi seems to be history in the near future so this study did not spend much time on this.

6.2.6. Lack of Rule Enforcement

Kisnyi being slum is full of gang involvement. The gang leaders have high power to an extent to block development projects that can help them and their family to improve their livelihoods. No power can enforce them than bribing them to implement projects for the benefit of their communities. Scaring development workers and researchers is very common. This in turn turns down the interests of NGOs and development programs from physically being at Kisnyi. One example given by the stakeholders is the petrol sneezing individuals act against a German development worker that they stepped over on her car and requested money so that she can take her car. She said “thanks I am safe today but this is the last time I will work at Kisnyi because of this kind of illegal act.” While I was trying to take pictures, some gangsters tried to take my camera because they thought I am doing that to make money out of the photos though I was getting permission from different individuals to take photos. Moreover, it is not possible to enforce people to not throw polythene plastics and garbage everywhere. To have people disciplined, sensitization plays a very key role.

6.2.7. Drainage and Sewerage

Generally those toilets handled by NW&SC are connected with a sewage system according to NW&SC. The sewage flows to centralized treatment plant. The stakeholders at Kisnyi complained that when sewerage pipes are broken, the time that takes to get them fixed is long if it happens at all. The bad smell and gas that comes out from the waste in the pipes is affecting all the surrounding. This can be easily handled if NW&SC uses it resources properly.

The drainage canals are mostly unprotected Photo 9. The canals pass in front of ghetto houses where people live and where people have economic activities. Mosquitoes reproduce in the waste water that drains or being blocked in the drainage canals. This creates serious health risk, especially to children. The extreme deep analysis of the stakeholders is the frustration of the drainage waste flowing direct to Lake Victoria. Several of the institutions this study talked too have deep frustration of Lake Victoria being polluted. The drainages were used to pass through wetland delta which is being occupied by settlers and economic activities now. Hence, the previous service of the wetland as means of filtering the waste before it reaches the lake is not any more applicable. Hence there should be a mechanism in such a way that the canals being directed to central waste treatment plan or recovery of the wetlands before the waste reach the lake.

Photo 9. One of the main open drainage canals at Kisnyi. Many small drainages in between ghetto houses drain to this kind of bigger size drainages that flow to Lake Victoria. Note that on both sides of the drainage many economic activities take place.

6.3. Did I meet the five objectives?

The objectives are developed to address the main title and aim of the study. The objectives are interrelated, supplementary and complementary to each other. Short explanation of the reasoning behind each objective, what was discovered in relation to each objective and what remains to be done are given below:

6.3.1. Multiple Perspectives on Water Supply and Sanitation

As Systems approach is meant to address "messy"[26] situations, experiencing these situations comes first. Checkland (19981) wrote his view that this is where the soft system approach commences the real world activities. Here is where the concrete experience of people in their context encountered.

By engaging 29 different stakeholders, different perspectives were collected and expanded to richer picture for further analysis and discussions. What remains to be done is possibly to come back with big project the near future and get more perspectives by engaging more stakeholders.

6.3.2. Proposing Desirable and Feasible Change

Desirability lies on the ground that the changes being proposed must be desired by someone in relation to features of his or worldview (W) while feasibility refers to the environmental (E) and internal constraints to change. Feasible means according to Wilson, et.al (1990) two specific things: 1. A change can only be implemented with the resources, staff, accessible technology, structures, capabilities, and so on at hand. 2. A change is feasible only when it is environmentally appropriate, in terms of avoiding unacceptable, especially irreversible, costs and in terms of involving factors over which people have control. The watchword for feasibility is "You cannot get blood out of a stone.

[26] Messy in systems means presence of different perspectives

As one important method to understand and analyze complexities, the rich picture was used and every rich picture was discussed and debated very well. Then, this was used as one of the basis or references to propose desirability and feasibility of change.

6.3.3. Influences of Institutions

Institutions relate to and are often dependent on each other. Institutions other than state can play key role in development work. Hence, to meet this objective, identification of institutions that are related with water and sanitation was done first. The institutions that are dealing with water supply and sanitation issues at Kisnyi lie within the policies of the Ministry of Water and Environment, Uganda. More work on understanding on how institutions related with human health are interrelated with those that work on water supply and sanitation remains for further study.

6.3.4. Roles and Responsibilities of Actors

According to Wilson, et.al (1990), actors are those who would manage and be responsible for the improved operation as summarized in the transformation statement. Having the two transformation statements (the solid waste and toilet), the responsibilities of the actors varies. Actors such as Kampala City Council and NABUGABO private company should work in close collaboration with actors such as residents and business owners at Kisnyi. One of the discoveries is the interest of residents to take responsibility of cleaning drainage canals from solid waste if they could get equipment supply to carry out the job.

6.3.5. Appraisal of Soft Systems Methodology

The appraisal of Soft Systems Methodology from Uganda as nation point of view would have been interesting. But the time allowed was too short to proceed for implementation after developing the action plan. Stage 7 of Checkland's Soft Systems Methodology is left for the actors. Within Kampala and Kisnyi, considering the institutions and stakeholders that participated in this study in the context of water and sanitation management, the appraisal of SSM was done successfully. Most of the institutions including Mariam Foundation were impressed to hear the use of systems methodology as first time. The stakeholders were quite happy because SSM allowed sharing the unease issues they have in mind in relation to water and sanitation management. They think that approaches that take their views into consideration are most likely to come up with adoptable change projects. Continuous update about the

methodology was been given to IIRR and Mariam Foundation about SSM. This study belives the methodology will be disseminated by the participants.

Mariam Foundation that is active at Kisnyi level has described the role of the methodology as:

"It was ideal to bring together people from different areas of concern, SSM was a good approach, SSM was different from other approaches we have experienced, it gave locals hope for attaining improvement in the future."

Some descriptions by participating stakeholders were:

"It was participatory, workshops encouraged participants, we were listened to and respected, and we felt ownership of what is going to come up."

To summarize Chapter six: the over all water supply and sanitation situation globally followed by the situation in Uganda, Kampala. It then continued to methodological part and findings. The findings presented are only the major ones. The findings are reflected in relation to the objectives.

7. Conclusions

This study shows that the over all Kisnyi slum situations are alarming. Almost every thing and way of life at Kisnyi seems to be an issue that is interrelated with all other issues. There is an extremely complex interrelation of issues. There is very high conflict of interest of the stakeholders on improving water and sanitation. In addition to water and sanitation, the only approach to improve Kisnyi is if and only if there will be large scale multi dimensional intervention that can base itself on holism and integration. The holistic understanding to why Kisnyi is slum and how to change slum to non slum environment is the only way to bring change. Though water and sanitation may improve, if peoples' responsibility does not improve, it is difficult to find what is required. Beliefs, cultures and religion should be well considered in any sort of interventions.

Water is critical resource any living thing should get for daily survival. Though the quantity of water available for Kisnyi is out of question, the quality part still needs more work. According to the stakeholders interviews and direct observations, there are people who can not afford to pay for treated water; hence they depend on polluted spring water. The water level at Kisnyi is so high that the pit latrines' waste and solid waste pollute the spring water though generally the study came up with an understanding of stakeholders that water supply issue is well handled. The introduction of pre-paid water meter is inspiring hope.

It is highly recommended that solid waste issue gets serious consideration. Residents and business individuals at Kisnyi slum blamed KCC and the private company (NABUGABO) for poor performance. Hence, the value of coordination and responsibility is important. Currently, the solid waste of all sorts is blocking drainage canals that in turn are creating water borne disease at Kisnyi. The open drainage that is flowing direct to Lake Victoria because the wetlands are being informal settlements was critical concern of some of the institutions. The core responsibility lies however on the understanding of the stakeholders by disposing solid waste everywhere in their environment, they are only acting against their own wellbeing. The overall contested agreement of the stakeholders to begin with campaign of cleaning solid waste as immediately as possible should be encouraged by government agents that are missing at the moment.

The argument of consulting/engaging stakeholders before imposing any sort of technology or approach is found to be practical during this study. Stakeholders mentioned that technologies like ecological sanitation seem to be fine, but do not work in areas like Kisnyi where people do not take responsibility and lack discipline. On the contrary, the SULABH approach was being praised by the stakeholders during this study.

Those stakeholders, who have been asked for evaluation about the Soft Systems Methodology this study used, described that this is one of the most relevant approaches that has interest to see their world the way they see their world by being in their world. They said that they want to see policymakers, scientists, experts, practitioners and journalists to come down to them by adopting this type of approaches.

7.1. Recommendations from this Study

Based on this study, the following recommendations are made for follow up action:

1. An immediate community driven campaign to clean Kisnyi from hills of solid waste. The solid wastes are blocking drainage canals, hence should be cleaned immediately by Kampala City Council and residents joint campaign. The initiatives of the communities to clean their environment should be encouraged by authorities and NGOs by supplying necessary equipment to facilitate the work. After the large scale campaign, collection and recycling should be done on daily basis and a mechanism to make use of garbage for economic purposes should be taken into serious consideration.

2. Though water supply is improving through the introduction of pre-paid water meter, it is very important to agitate frequently about the risk of water borne diseases from unclean water containers. This can be done through consecutive sensitizing programmes.

3. The issue of lack of interest of landlords to improve sanitation questions at Kisnyi should be dealt very well. Though some landlords are accepting to build SULABH toilets, the maintenance of the toilets in the long run is relevant. The interest of NGOs and experts to work on more toilet issues as they do on water supply should increase though toilet issues are not sexy.

4. The lack of rule enforcement at Kisnyi is one complicating factor. Hence, to have sanitation issues addressed very well, government authorities should work closely with stakeholders and if necessary there should be some kind of fine imposed for negligence of sanitation and disrupting development jobs.

5. Whatever development work on water supply and sanitation is to be done at Kisnyi, it should be able to take the different uncertainties, dilemmas, conflicts of interest and worldviews into consideration.

8. Personal Reflections

After joining the IWRM, M.Sc program, one of the major courses that inspired me to work on understanding different stakeholder perspectives in relation to natural resources management is the Stake Holding and Social Learning. The major methodology the course adopted was Soft Systems Methodology (SSM). Though I had limited experience of practicing SSM on Lake Tämnaren in Sweden, the experience was during very short time of stakeholder engagement and it was done as group of students supported by instructors. After this time, I was thinking of practicing SSM alone in an environment where I thought it would be complex. Finally, I decided to learn SSM further at Kisnyi slum with an intension of understanding water supply and sanitation issues that can be helpful to the contribution of change processes at this particular slum.

Though I had some secondary information about uncertainties and complexities of Kisnyi slum, my expectation was that it would be easy to get people participating in the study; hence I was expecting I could bring most of stakeholders to be part of the study. However, shortly after beginning the work, I practically realized that this could not work well for reasons that people have some other burning priorities for their livelihood than attending workshops and interviews. Hence, at the initial stage of the work, I was forced to talk on random basis to those who could be available except for the institutions. The institutions were approached by first making telephone calls for appointment or physically being in their offices and ask if they have time for interview.

Later in the stakeholder engagement, I was able to make a strong friendship with one of the tenants at Kisnyi who helped with offering her home for consecutive workshops. Renting a hall for workshops was beyond the financial capacity of the study. This person also helped in terms of calling and encouraging stakeholders for participation. One of the good impressions I have about SSM is its power to open link with people. The more one talks to people, one gets wider horizon and interest to listen and digest what is being explained.

The SSM at Kisnyi slum helped in understanding different perspectives of stakeholders. It brought people of different interests to sit together and debate about what they think is right. The two extreme scenarios one can think of having different stakeholders of different perspectives of different interests to sit together are when landlords and tenants debate on sanitation issues.

Landlords say “building toilet is extra cost for us” while the tenants say “we are renting your houses, so how do you expect us to build toilet when we do not own the house.”

SSM being centered on engaging people to find change to their problematic situations, an analyst should be as frequent as possible to the environment where these people are available. However, the social atmosphere at Kisnyi is so tense that an outsider alone finds it hard to be there to talk to the people. I perceived also that there are key figures including the gangs who would make a living out of unimproved water and sanitation services at Kisnyi. Hence the conflict of interest in relation to water supply and sanitation is high. It takes long time to figure out the different interests.

The ritual killing culture, robbery, theft, alcoholism, drugs, several addictions, etc are some of the factors that were limiting an intensive engagement. I was having Mariam Foundation to accompany me every time I wanted to be at Kisnyi and this created an extra cost of paying Mariam Foundation 5 $ every three days.

Though SSM was helping to get the perspectives of SHs, I have found it demanding as well. It demands to talk and re-talk stakeholders as many times as possible. In this case, my understanding is that it is costly because one should pay for transportation, telephone, snacks, interpretation, in some cases lunch and dinner to have the SHs be compensated for their time. Hence, I would say SSM could be more practical if one gets Minor Field Study Support (MFS) and works in an ongoing project or networks. Working in relation to ongoing projects, helps a SSM student to benefit from getting practical logistical support. The input of the student can help the ongoing project while the student makes advantage of intensive work on the basis of the project.

Two months time for real SSM based study in a completely new environment and no ongoing work link is so short. My short time engagement has brought a feeling that mission is not accomplished as the job was done only to stage six (Action plan) of Soft Systems Methodology Having spent 60 days in an extremely complex environment and coming back only leaving the implementation process to others creates a feeling that it would have been better if I could be there to see the implementation work.

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Appendix

Appendix I. Some of the Main Questions for the Stakeholders Interviews and Interactions

1. What feelings do you have on water and sanitation issues at Kisnyi?

2. How do you get water? What price?

3. What is the problem if there is any problem?

4. What do you think should be done to find improvement?

5. What would the problem look like if it were improved/changed

6. Whose problem is it? Who owns it?

7. Where is it a problem? Is it localized and isolated, or is it widespread?

8. When is it a problem?

9. How long has it been a problem?

10. What would happen if nobody did anything to solve the problem?

11. What do you think should be done to improve the problem?

Appendix II. Photo of biophysical complexity and uncertainty at Kisnyi

I try to cross an open narrow drainage canal at Kisnyi where a drug plant (cannabis) that is locally called "enjaga" grows being protected by a man lying over a hip of solid waste. This photo intends to reflect the complexities and uncertainties of biophysical environment at Kisnyi slum.

Appendix III. Part of the rich picture of an interview at KCC head quarter