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Vulnerabilities and Urban Flooding in Bwaise Parish III, Kampala, Uganda

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Abstract

This minor field study has explored what factors cause vulnerability to community members living in informal settlements exposed to localized urban flooding. Particularly, the effects of flooding that women living in Bwaise Parish III, Kampala, Uganda have to encounter were studied. Eight weeks were spent in Kampala, Uganda for field work, which included interviews and a workshop with community members from Bwaise Parish III, interviews with scientists at Makerere University and thesis writing.

Generally, small-scale disasters surface because of poor urban management. The results showed that inadequate urban planning was affecting the poor that were living on marginal lands. Bwaise Parish III had emerged on a location that was both hazardous and unhealthy. The analysis showed that poor people were limited in their options of risk limitation because of their lack of basic capabilities.

Women in Bwaise Parish III were affected by flooding directly and indirectly through the loss of livelihoods and belongings and through time spent getting water out of their houses. Women were generally disproportionally affected by flooding because of their vulnerabilities such as lower socioeconomic status and responsibilities that confined them to their homes.

The way forward in order to mitigate localized flooding impacts would entail reducing vulnerabilities, strengthening capabilities and developing infrastructure.

Key words: small-scale disasters, localized flooding, urban informal settlements

Sammanfattning

Denna Minor Field Study har undersökt vilka faktorer som orsakar sårbarheter för samhällsmedlemmar som bor i informella bosättningar som exponeras av småskaliga översvämningar. Det som studerades var effekterna av dessa översvämningar och hur kvinnor i Bwaise Parish III i Kampala, Uganda drabbades. Åtta veckor tillbringades i Kampala för fältarbete som innehöll intervjuer och en workshop med samhällsmedlemmar från Bwaise Parish III, intervjuer med forskare vid Makerere Univeritetet samt uppsatsskrivande.

Generellt sätt så brukar småskaliga katastrofer uppstå på grund av dålig stadsförvaltning. Resultaten visade att bristande stadsplanering påverkade de fattiga som levde på marginella marker och att Bwaise Parish III låg på en plats som var både farlig och ohälsosam. Analysen visade att fattiga människor var begränsade i sina möjligheter att minska sina risker på grund av att de saknade grundläggande förutsättningar.

Kvinnor i Bwaise Parish III påverkades av översvämningar både direkt och indirekt genom förlusten av försörjningsmöjligheter och tillhörigheter och genom att de var tvungna att spendera tid med att få bort vatten från deras hem. I allmänhet drabbas kvinnor oproportionerligt av översvämningar på grund av deras sårbarhet såsom lägre socioekonomisk status och ansvar som begränsar dem till deras hem.

Vägen framåt för att minska småskaliga översvämningar och konsekvenser skulle innebära att minska sårbarheten för samhällsmedlemmarna, öka deras förutsättningar och utveckla en fungerande infrastruktur.

Nyckelord: småskaliga katastrofer, lokala översvämningar, informella bosättningar

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Contents

List of Abbreviations

Antiretroviral	ARV
Community Based Organization	CBO
Local Council	LC
Makerere Women's Development Association	MAWDA
Swedish International Development Cooperation Agency	SIDA
United Nations	UN
United Nations Population Fund	UNFPA

1. Introduction

Modern urbanization is taking place in the low income countries of the world (Satterthwaite, 2009) and it is occurring at a fast rate (Vestbro, 2011). It is expected that the urban population in Sub-Saharan Africa will double in size and reach 760 million by year 2030 which is creating challenges (Ramin, 2009). Today the newly urbanized areas in the low-income countries have to become developed with the improvement of infrastructure, roads and houses, electric power and water and sanitation systems, more rapidly than what was the case during the urbanization of any high income country (United Nations Population Fund, 2007). Urbanization during the nineteenth and twentieth century in Europe was accompanied by the industrial revolution and economic growth (Dyson, 2011), but an important factor in the present-day urbanization of many low-income countries is that it is associated with poverty (Ramin, 2009). Consequently, poverty is increasing in urban areas in low-income countries (Medal L. et al., 2010). Although urbanization has lead to socio-economic improvements of many people's lives through the creation of economic opportunities (Patel R. B. et al., 2009), and better access to education and health care (Vestbro, 2011), the urbanization that is occurring today is disorganized and many people are still poor (Patel R. B. et al., 2009). Unplanned informal settlements known as slums, mushroom in and around thriving cities (The World Bank, 2010). The causes behind the expansion of the slums are numerous, for example rapid urban migration of rural people, lack of proper city planning, land disputes, not enough housing and the concentration of poverty in unplanned urban areas (Medal L. et al., 2010).

According to United Nations (UN) Habitat, a slum household is defined as *"a group of individuals living under the same roof in an urban area who lack one or more of the following: durable housing, sufficient living area, access to improved water, access to sanitation and secure tenure"* (United Nations Population Fund, 2007). A significant part of the development of urban areas occurs without the provision of basic infrastructure and services. Proper water and sanitation services, drainage systems, waste management and durable quality housing are often lacking (Medal L. et al., 2010; Vestbro, 2011). It is estimated that approximately 72 percent of urban residents in Sub-Saharan Africa live in slums (Vestbro, 2011).

By some, unorganized urbanization has been referred to as an emerging humanitarian disaster because of slum formation and the related health hazards that are found in slum settings (Patel R. B. et al., 2009; Zetter R. et al., 2012). Health is one area where it is evident that the urban poor are disadvantaged (Ramin, 2009). Slum dwellers are neglected in their health care needs because health services exist within the formal sector and slum dwellers usually only seek care from there when they are at an acute stage of a disease, for example when they have developed AIDS (Riley L. W. et al., 2007). There are a number of basic factors besides access to health services that interact with one another and determine the health status of a population, such the level of socio-economic development, adequate nutrition, water and sanitation, safe environment, and human behaviours (Lindstrand A. et al., 2006). In slum areas, a considerable amount of infectious diseases are attributed to the lack of proper water and sanitation systems. Without sanitation in place, people turn to open defecation which is a behavioral determinant that can contaminate drinking water that in turn can cause waterborne diseases in the population (Ramin, 2009). The underlying cause of lacking sanitation may be poverty or ignorance, which are socioeconomic determinants of health (Lindstrand A. et al., 2006). Another important determinant of disease is gender which becomes obvious as globally women hold a higher burden of disease than men do (ibid).

There is a relationship between poor urban management of services and infrastructure and the accumulation of hazards that could potentially cause disastrous events (Bull-Kamanga, 2003). According to the Tampere Convention from 1998; a disaster is an event that seriously disrupts the functioning of a society and poses threats to human life, health, property or the environment. Disasters can appear suddenly or have slow and complex onsets and can be caused accidentally, by nature or as a result of human activity (International Federation of Red Cross and Red Crescent Societies, 2007). The criteria that can be used to judge if an event is a disaster may include the number of deaths and seriously injured, the fact that disasters occur infrequently (Bull-Kamanga, 2003) or that external humanitarian assistance is needed because local capacity has become overwhelmed (Gingie K. et al., 2010). However, this thesis has focused on small-scale disasters, which may not even lead to deaths or require external humanitarian assistance.

The rapid onset disasters are the disasters that create headlines, but most people in the world are at risk of the less visible hazards (Enarson E. et al., 1998). There are many small events that

disrupt people lives, but not to the extent that they are labeled as disasters. However, they may very well end up creating impacts on people's lives that are worse than the impacts from large scale disasters (Bull-Kamanga, 2003). Small hazards may not always be defined as disasters but they may be disastrous for individuals (ibid). Declined health after a small-scale disaster can affect a person's ability to ensure their livelihood (Olurunfemi, 2011) and the loss of a livelihood source can have a great impact on the affected household (Bull-Kamanga, 2003). How small-scale disasters affect people's lives has guided this study.

An increasing disastrous phenomenon that is occurring in slums is urban flooding (Douglas I. et al., 2008). As all flooding, small-scale urban flooding can lead to a number of losses for the individual such as loss of possessions, damage to houses, disturbances to transport, power and communication systems and financial stress for the affected persons (Parkinson, 2003) and an increased risk to suffer from infectious waterborne diseases (Olurunfemi, 2011). Urban flooding disproportionally affects women economically through the disruption of their livelihoods and also emotionally because they are often the ones left to deal with death, disease and food shortages that can occur during and after flooding. (Parkinson, 2003)

There are different factors that contribute to incidences of flooding and most of them are connected to how areas develop and how the land is used and managed (Ramin, 2009). Rainfall duration and amount, poor drainage infrastructure, the sealing of ground surfaces through the construction of buildings, roofs and roads that restrict the natural pathways of rainwater can hinder and change natural rainwater run-off patterns (The World Bank, 2010). Also changes in topography all contribute to flooding (Clements, 2009). Urban flooding is therefore not only dependent on heavy rainfall but also on the changing environment of urban areas (The World Bank, 2010). Urban flooding is divided into three different types A-C (Parkinson, 2003):

A. Type A flooding is localized and can occur during every rainfall and is usually the result of inadequate drainage of storm water runoff. This type of flooding is detrimental to environmental health and facilitates the spread of water-related diseases.
B. Type B flooding is less frequent than Type A, but can cause greater damage to infrastructure in a larger area. This type of flooding also facilitates the spread of water-related diseases.

C. Type C flooding is the most severe and the type that makes newspaper headlines because of large-scale inundation that affects a large number of communities.

In order to better understand the effects of urban flooding of informal settlement areas of Uganda's capital, and for a deeper understanding of the different vulnerabilities from a female perspective, this thesis has focused on the situation in one of the parishes in Kampala, Bwaise Parish III.

1.2 Study Objective

In general, disasters seriously disrupt systems of society, and a driving force in this thesis has been to study the effect of small-scale disasters in urban areas. Bwaise Parish III is currently facing problems with localized urban flooding because the slum is situated on a low lying wetland. Generally, slum residents do not have the best preconditions to live a hazard-free life. More than half of the population in Bwaise Parish III is living in poverty and the area lacks basic services that could greatly reduce the occurrence of disease and improve the standard of living.

A knowledge-gap on the effects of small-scale flooding, vulnerabilities in urban areas and coping strategies from a female perspective in Bwaise Parish III has been identified through literature reviews. There is however empirical data from research in Bwaise Parish III on climate change impacts, water, sanitation and health issues. This thesis aims at contributing to a broader understanding of flooding in Bwaise Parish III by seeking answers in a theoretical framework that has not yet been applied to the field area.

The main objective of this thesis was to explore the vulnerabilities and coping strategies that female individuals have undertaken to mitigate the effects of localized flooding and to study the opinions and perceptions that women living in Bwaise Parish III have on flooding and improving their situation.

In order to meet the objective, the following research questions were raised:

1. How does urban flooding affect women in Bwaise Parish III and how do they cope with the risk of flooding?
2. What factors are creating community member's vulnerability to flooding in Bwaise Parish III?

3. What can be done to improve localized urban flooding in Bwaise Parish III?

There are numerous threats to safety and health in Bwaise Parish III that affect the quality of life of the local population but this study has not focused on security issues and non-communicable diseases that have no direct link to water, sanitation, drainage, garbage or flooding.

Because of the nature of Bwaise Parish III, this thesis has not focused on flooding due to streams, rivers or coasts but instead focused on type A flooding which is referred to as localized flooding that is usually the result of inadequate drainage.

There are a number of studies on the effects of global warming and climate change on the urban poor in low-income countries but that has not either been the focus of this study.

2. Theoretical Framework

This theoretical framework will present different concepts such as the capability approach, gender as a disaster vulnerability and individual risk prevention to gain a deeper understanding of how different conditions can influence opinions and perceptions about small-scale disasters, flood impacts and different ways to cope with flooding. In the analysis, the theoretical framework will help to explain and strengthen the empirical data gathered from the respondents in Bwaise Parish III and help to answer the research questions.

2.1 The Capability Approach

The opportunities that a person has to do things that are necessary for survival and to avoid poverty are what are referred to as basic capabilities (Sen, 2002) and the focus of the capability approach is to concentrate on how people may achieve capabilities in their lives (Robeyns, 2005). What opportunities do people have to live a worthwhile life? One cannot only take the resources that a person has into account and forget that people have different personal attributes that enable or disable them the use of resources. A disabled person can have a lot of resources but still not be able to live an as good life as a healthy person with fewer resources (Sen, 2002). People also have different values and priorities in life, which makes it difficult to create a universal list of capabilities because what one person may value can conflict with what another person values (Deneulin S. et al., 2009), one person's right to drive a car can impact on another person's right to non-polluted air (Pelling M. et al., 2009).

Political freedom, economic and social opportunities, transparency and security guarantees are part of people's capabilities. For example, an individual has economic opportunities when he or she can engage in economic transactions by using economic resources for consumption, production or through other exchange activities. The resources that a person owns or can access, the relative prices and how well the market system functions determine the economic opportunities (Sen, 2002). Social opportunities have to do with how societies manage social institutions such as education and health care systems because these affect people's ability to live good lives. Furthermore, being healthy means that a person can partake in economic and income generating activities (ibid). Security guarantees are needed to protect vulnerable people. They act as safety-nets and save people from suffering through unemployment or welfare support or through humanitarian interventions after a disaster (ibid). These freedoms and opportunities complement each other and contribute to a person's capability to live a freer life and are closely linked to human rights (Schneider, 2009).

Deprivation of capabilities is a preferable term to the more common one-dimensional definition of poverty (Montgomery, 2009). The standard criterion for defining poverty relies on low income. Poverty should, however, be seen as a loss of basic capabilities or capability deprivation (Sen, 2002). Low income can be the main reason why a person becomes deprived of capabilities but it is not the only cause (ibid). Even people that are able to pay for health care may receive such low quality care that it does not help them (Montgomery, 2009). It is dangerous to view poverty in the narrow sense of lack of income because this would mean that an increase in income alone would solve poverty (ibid).

Although there is a difference between income poverty and capability poverty, the two terms are related and connected. Increased income can improve one's capabilities and vice versa. Expanding a person's freedom by improving their capabilities leads to better preconditions for that person to become more productive and in that way, creates better income-generating opportunities (Sen, 2002). There are also a number of factors that affect the relationship between an individual's income and capabilities. Age will determine whether a person is able to work or has to depend on someone else to bring in income. Elders and children have special needs. Gender and social responsibilities such as motherhood obligations, where a person lives and if the place is subjected to risks such as flooding, drought or other safety risks can also limit a

person's opportunities. These are conditions that an individual has little or no control over (ibid) but may have perceptions about.

2.2 Gender as a disaster vulnerability

A community consists of built, natural, social and economic environments which can become disrupted in the event of a disaster (Norris S. F. et al., 2008). When a community has the ability to anticipate, prevent, prepare for, respond to and recover from disasters, it is resilient (Clements, 2009). Resilience and the capacity to "bounce back" after a disaster is feasible if for example the built environment has been safeguarded by building codes or if people are able to return to business as usual and if individuals and households already have the resources and means to recover (Paton D. et al., 2001). Without resilience, communities and individuals are vulnerable and cannot cope, which can affect their exposure level to the disaster (Jha A. et al., 2011). In communities there can be groups or individuals that have less capacity than others to cope (Gingie K. et al., 2010). Generally, low-income groups that have little political power are disproportionally affected by disasters; whilst more powerful higher income groups are protected (Bull-Kamanga, 2003).

Vulnerabilities are a set of conditions that can affect the resilience of countries, communities and individuals to cope with disasters. The different factors that have been identified as creating vulnerability are among others; gender, disability, age, and socioeconomic status (Gingie K. et al., 2010). These vulnerabilities will determine the extent of how the hazard or disaster will affect that person's health and livelihood because the different factors affect the capacity to respond to and cope with disasters (ibid). Disasters surface when there is a combination of triggering hazards and vulnerabilities in place (ibid). An increase in disasters is therefore either dependent on an increase of hazards or on the vulnerabilities of communities or individuals (Jha A. et al., 2011). By reducing vulnerabilities, communities can become more resilient (Vlahov D. et al., 2010).

It is widely acknowledged that women are one of the most vulnerable groups to be impacted by disasters. By and large; women face different conditions and are more vulnerable in events of disaster (Gingie K. et al., 2010). The more vulnerability a woman has prior to a disaster, the more she and her family will suffer in the aftermath (Enarson E. et al., 1998). There are general reasons for women's vulnerability to disaster, for example, women have different social roles

and responsibilities and therefore have different needs in disaster risk reduction (Gingie K. et al., 2010). Generally activities and responsibilities surrounding the home and family are women's concern. Because of this, women are also more likely to engage in health-related issues than men are (Beall, 1997). In situations of sudden on-set disasters such as flash floods, cyclones, tsunamis and landslides, women suffer implications that relate to their societal restrictions and gender roles. For example, in some cultures females are not encouraged to learn how to swim (which is a life-saving skill) or women are not allowed to leave their homes without a male escort (Parkinson, 2003). Women also tend to take on the responsibility of carrying children and the elderly to safety which could impact their own safety (Gingie K. et al., 2010). This means that women are more vulnerable to disasters than men are because they have different roles and responsibilities in the society (ibid).

However, during slow on-set disasters such as drought, desertification, deforestation and land degradation, the implications that women face are for example increased workload (Gingie K. et al., 2010). Women's domestic workload can increase because they have to work harder to insure food security for their families (ibid). When women's load of unpaid work increases, their opportunities to engage in income generating opportunities become reduced leading to further vulnerabilities (Ibarrarán M. E. et al., 2009). Women are for the most part responsible for domestic duties such as child care and caring for the elderly (Aguilar, 2009). Men are also more likely to migrate in disasters times to look for livelihood opportunities, (Abramovitz, 2001) leaving women as heads of households (Gingie K. et al., 2010).

Differences in the socio-economic status between men and women make a large contribution to women's vulnerabilities in disaster settings (Gingie K. et al., 2010). The socioeconomic status of the individual as well as the community at large affects women's vulnerability to disasters. Women living in low-income countries are more adversely affected by disasters and are more vulnerable (Aguilar, 2009). Women are more likely to be living in poverty than men (Ibarrarán M. E. et al., 2009) and their work opportunities are often limited to part-time, temporary or low-status jobs which mean that they are at greater risk of ending up in poverty (Gingie K. et al., 2010). In general women own less land and assets than men do which limits their control over production and markets (ibid). They also have less income so when disaster strikes, they are left more vulnerable and suffer more from food shortages and crop failure (ibid). In summary,

women have less access to resources which reduces their ability to recover from a disaster (Ibarrarán M. E. et al., 2009).

2.3 Individual Risk Prevention

In order for survival, human beings and all other living organisms need to be able to sense and avoid harmful situations (Slovic, 1987). People make choices everyday on how to avoid risks (The World Bank, 2010). The acceptance or rejection of a risk is not an isolated matter; it is also dependent on the consequences of not engaging in the risk (Fischoff, 1994). Risks and trade-offs have to be considered together with expected benefits (ibid), for example, the economical benefits from living in a city outweigh most hazard risks for individuals (Lall V. S. et al., 2010). People's choices to accept different levels of risks can depend on different factors such as the probability and severity of the risk, knowledge about the risk, if the risk has been unwillingly imposed, if individuals will be compensated for being exposed to the risk and what advantages exposure to the risk may bring (Fischoff, 1994). Also, assessments of how pressing or detrimental other problems and challenges in life are (Grothman A. et al., 2003). Poor people are often preoccupied with dealing with more acute demands related to survival and are because of that, less able to take action on decreasing their exposure to environmental hazards (Pelling M. et al., 2009). Individuals make choices based upon if there is an acceptable balance between risks and benefits (Fischoff, 1994). Studying people's perception of the risks that they are exposed to can help policy makers in mitigation schemes and risk prevention (Ho C. M. et al., 2008).

Preventative responses prevent damage but are only undertaken when there is a high perceived risk of threat and when people acknowledge their own capacity to deal with the risk (Grothman A. et al., 2003). Maladaptive responses are reluctant to preventative measures and can include denial or wishful thinking of the threat or fatalistic approaches (ibid). In some communities, flooding is so common that slum dwellers accept it as normality and are reluctant of reducing the risks. (Bull-Kamanga, 2003) Individuals can undertake preventative measures such as diversifying livelihoods (Linnerooth-Bayer J. et al., 2009), owning multiple assets, having many different sources of income, investing in maintenance of their assets or by permanently migrating away from the risky area (The World Bank, 2010). Prevention is not the only informed decision that people can undertake to avoid risks; people can also insure themselves as this can offer both protection and compensation if a disaster strikes (ibid).

When neither prevention nor insurance is enough after a disaster, individuals must develop coping strategies to lessen the consequences of flooding on health and the damages it can inflict on properties (Abaya W. S. et al., 2009). Coping strategies include temporal migration, intensification or expansion of household labor, drawing on stocks of social capital such as credit, food, charity or begging, reducing household expenditure and/or utilizing human and physical capital (The World Bank, 2010). The poor usually create informal arrangements as a response to disasters especially if no market institutions or other support mechanisms are in place (Vakis, 2006). For small localized disasters, loaning money from friends and relatives is effective (Linnerooth-Bayer J. et al., 2009).

Coping strategies from a local perspective is a way to look at people's strengths and the resilience they have built upon their own, as opposed to a sole focus on their vulnerabilities (Dekens, 2007). It is crucial to know the coping strategies that vulnerable people have developed in disaster management so that external interventions can stem from local practice (Dewi, 2007). Individuals or communities may develop strategies because an event that has previously occurred is expected to happen again (ibid). Flood proofing houses and buildings is one way of building resistance to future flooding and coping with potential future losses or damage (ibid). Houses can be relocated to higher grounds, houses can be elevated with the help of stilts (Green, 2010) so that flood waters will pass under, flood walls can be built to hinder water from reaching the house, houses can be dry flood proofed meaning that the walls, windows and doors have been made watertight or houses can also be wet flood proofed meaning that alterations are made so that when water enters, damage is minimized (Dewi, 2007). However, not everyone may have the resources or knowledge on how to protect their houses from flooding (Olurunfemi, 2011).

Another coping strategy that requires capital is migration (Tacoli, 2009). Extreme climate events also contribute to people's mobility (ibid) Poor urban dwellers will search for better housing once they can afford to do so, so generally, when incomes improve, they move away (Vestbro, 2011), but the poor and most vulnerable are often unable to move since moving requires economic resources and social support. (Tacoli, 2009). Overall, the desire to move away creates little incentive for individuals and communities to improve their situation (Olurunfemi, 2011). Coping strategies to disasters need a shift away from migration as a solution towards vulnerability reduction (Tacoli, 2009).

3. Methodology

This thesis was done as a minor field study that took place during an eight week period between the middle of November to the middle of January in 2011 but actual field work was carried out up to the beginning of December. The women's CBOs Makerere Women's Development Association (MAWDA) were the official in country coordinators that helped create the link to Tusitukirewamu that helped with the provision of a field assistant (that acted as a guide and interpreter), conducting a workshop and interviews in Bwaise Parish III.

This thesis has used primary data that was collected during field work. The data was collected using a participatory approach through group discussions and vulnerability ranking during a workshop, which was organized with community people. The workshop was held on the 25th of November 2011 with five women living in Bwaise Parish III. Based on results from the workshop, semi structured interviews were conducted with four women living in Bwaise Parish III, followed by interviews with two researchers from Makerere University and an interview with a LC Chairman of an administrative zone in Bwaise Parish III. The four female informants from Bwaise have been referred to as Informant 1-4 in the results section, the researcher informants have been labeled Informant 5-6 and the LC Chairman is referred to as Informant 7.This thesis has also used secondary data and past research on Bwaise Parish III was reviewed in order to gain an understanding of the flooding, drainage, sanitation and water problems in Bwaise Parish III.

There are different approaches to use when conducting research and the two different approaches that are most commonly mentioned are qualitative and quantitative. Qualitative research uses induction as an approach which means that it aims at generating a theory. The collection of data determines the theoretical framework (Bryman, 2009). In qualitative research, it is the perceptions of the informants and not the perception of the researcher which is found interesting. The informant's perspectives and what they perceive as important is the baseline for a qualitative study (ibid). People must be active in the formation of their lives and not be mistaken as passive receivers which is typical for development projects. (Sen, 2002) "Power as a Disability" is the inexorable power that Westerners have when visiting low-income countries. When researchers encounter people who are marginalized in society, it is important that both parts feel comfortable and this can be done through participatory approaches that aim at "handing over the stick" from

the researcher to the informants. The local community that is being studied is also leading the research work and by doing so, attains a more dominant role (Chambers, 2009).

Contrary to induction is deduction which is more common in quantitative research. Instead, the study is derived from existing theories and the aim is to test the theories by either verification or falsification (Bryman, 2009). In reality it is difficult to keep the two methods completely separate and it is common for a mix of both qualitative and quantitative methods to be used (ibid), however, this thesis has been mainly qualitative because the theories were sought after, subsequent to the collection of empirical data with the primary intention of explaining and strengthening the results from the field study.

Because of the nature of the research questions, qualitative methods and participatory methods have been used in this minor field study. Informants living in Bwaise Parish III were identified with the help of Tusitukirewamu. Tusitukirewamu works mainly with HIV sensitization and empowerment of women living with HIV through income generating projects such as mushroom growing and selling. The women that participated in the study were either active members of the organization through the mushroom project or beneficiaries in other ways. To find the women in Bwaise Parish III a snowball sampling method was used. Snowball sampling involves using a primary informant to get connected to a secondary informant and so on (Atkinson, 2001). Without MAWDAs help, the connection with Tusitukirewamu would not have been made possible and lead to interviews with their members. Without the help from the field assistant at Tusitukirewamu, it would have been difficult to find informants and conduct the interviews. The field assistant lead the way to the homes of the women and the interviews were conducted in their living rooms or in their compounds.

The interviewed researchers belonged to the Department of Civil Engineering at Makerere University. Their publications on urban problems in Kampala were found on the internet along with some contact details. Interviews with the researchers helped gain an understanding on the problems and solutions that have already been identified and tested in Bwaise Parish III. One of the researchers was contacted via email and then made the interview with the second researcher possible by introduction.

Tusitukirewamu also helped with the introduction to the LC Chairman and facilitated the interview. The interview with the LC Chairman helped in gaining an understanding of what local initiatives were in place and the best possible way forward for the community. The interview was important to carry through because of decentralization in Uganda.

3.1 Interviews and workshop

Tusitukirewamu were instructed to invite 5-10 women of mixed ages living in Bwaise Parish III that were affected by flooding. The response from Tusitukirewamu was that it would be no problem to find informants because all households in Bwaise Parish III were affected by flooding. No further instructions to influence the selection process were given. Ten women were invited to take part in a workshop at Tusitukirewamu's offices and five women turned up that all were single mothers or widows and an observation was that the ages ranged from 20-50 years. No information was gathered about whom the five women that did not turn up were, and why they did not come.

Three of the women in the workshop owned their homes and two of the women were tenants. They had all lived in Bwaise Parish III for a long time. The women in the workshop managed different small-scale businesses. The different ventures mentioned were selling charcoal, selling sweets on the roadside, urban poultry keeping, selling mushrooms and tomatoes. The workshop consisted of three participatory activities. Firstly, a group discussion was held where different problematic issues were discussed. The group discussion acted as a foundation for this study.

Secondly, the problems were ranked according to their severity and thirdly a problem tree was drawn on a paper on the wall where the causes and effects of the core problem were stated (See Appendix 3). A problem tree can help project designers create activities to tackle the faced challenges. It is the causes of the problem that should act as the foundation for any development project (Örtengren, 2003). It can be argued that a method like making a problem tree is reductionist because when only one problem is discussed, other problems might be left undiscussed (Chambers, 2009), but the study objective of this minor field study had to guide the workshop model. One staff from Tusitukirewamu and the supervisor from MAWDA helped to translate and write the women's messages and draw the problem tree on a paper on the wall for the participants to see (See Appendix 3).

The interviews with the women living in Bwaise Parish III and the researchers from Makerere University were semi-structured to allow flexibility. During the interviews in Bwaise Parish III, an interview guide was used but not all questions were asked to all women and sometimes additional questions were asked (See Appendix 1). A female member from Tusitukirewamu acted as both a guide through Bwaise Parish III and as a Luganda-English translator as the women had limited skills in the English language. The interviews with the researchers and the LC chairman were conducted without a translator and a different interview guide was used (See Appendix 2). A notepad was used to write down the answers.

3.2 A critical review of the methods used in this study

The use of a translator during the interviews can be criticized because of the fact that the translator is an intermediary. Assumptions and opinions can surface in the process of interpretation (Temple, 2001). Although not intentionally, the use of a translator may have affected the results reached in this study.

Three of the sources used during the introduction and discussion chapters in this thesis have not been peer-reviewed which could mean that the facts are biased. The sources are The World Bank, International Federation of Red Cross and Red Crescent Societies and United Nations Population Fund (UNFPA).

It is difficult to know how representative the interviewed women in Bwaise Parish III were because such a small number were interviewed and also they were all tied to Tusitukirewamu. Snowball sampling as a method reduces generalization because all the respondents have been identified by a primary subject or informant and the sampling of informants is dependent on the social network of that primary subject or informant (Atkinson, 2001). In this case, the network of the organization Tusitukirewamu was utilized which could lead to a bias in the results. But this is also the reason why the theoretical framework has been used inductively to enhance the results from this study.

The women in this study were all single-mothers or widows and the outcome may have been different if the women had been married or in a relationship. Another important point of consideration that could have lead to biased results is that the outcome would have been different if an organization with a different focus would have been the in-country coordinators. The

members of Tusitukirewamu were familiar with topics that had to do with female empowerment and this became particularly apparent in the workshop where topics such as the inequality between men and women and unpaid workload in the home were raised. What other CBOs based in Bwaise Parish III choose to focus on was not identified, but it must be acknowledged that interviewing members from another organization could have lead to different results.

Different informal settlements have different risks. Low income areas are difficult to generalize because of the diversity in living environments and the different reasons that people have for living there (Bull-Kamanga, 2003). The results, analysis and conclusions reached during this thesis have to be understood in conjunction with a gender perspective and the environmental hazards and challenges that are found in Bwaise Parish III.

4. Study Area

The minor field study was conducted during an eight week period in Bwaise Parish III, Kampala, Uganda with the help from two community based organizations (CBOs). *Makerere Women's Development Association (MAWDA)* works primarily with women in Makerere Division and *Tusitukirewamu* works primarily with women in the Bwaise Parishes in Kawempe Division. This section gives a brief presentation of urbanization in Uganda and the risks and challenges that are posed upon some of the residents in Bwaise Parish III. There are a number of studies about Bwaise Parish III and other slum areas in Kampala that have dealt with water, sanitation, housing and climate change impacts that were reviewed prior to starting this study.

Uganda is one of the least urbanized countries in Africa with most of the urban population residing in the capital city, Kampala (Mukwaya I. P. et al., 2010). Kampala's topography is hilly and surrounding the hills are wet valleys of papyrus swamps (Matagi, 2001). The way Kampala has been built has been referred to as altitudinal stratification whereby the rich live at the top of the hills and the poor live on the bottom of the hills (Mukwaya I. P. et al., 2010). On the top of the hills important institutions are found, the slopes are used for residences and offices and the wet valleys are where the slums are found (Matagi, 2001).

Urban growth in Uganda is increasing by 6.4 percent annually (Makara, 2010) due to natural increase of the population and high rural to urban migration (ibid). In year 2002, 41 percent of

Uganda's urban population lived in Kampala but the number of urban dwellers in the whole country is expected to triple by 2025 (Mukwaya I. P. et al., 2010).

The slum areas in Kampala cover about 10 percent of the city area (Birabi, 2007). Informal settlements are popping up in geographically low-lying areas that have high water-tables. These areas are expanding over natural wetlands that are prone to localized flooding (Lwasa S. , 2010a). Some of the recognized informal settlements are Katanga, Nakulabye, Kalerwe, Kamwokya, Katwe, Mulago Nsooba, Kiswa, Kinawataka, Banda, Kivulu, Kisenyi, Ndeeba, Wabigalo and Bwaise (Kulabako, 2010). The slums in Kampala are home to 60 percent of the population in Kampala (Birabi, 2007). The provision of services such as garbage collection, drainage installation and road maintenance in Uganda is decentralized and the mandate falls upon the local councils (LC) (Lwasa S. et al., 2010b), but the residents are not adequately enough offered basic services such as water provision, electricity, garbage collection, sewage disposal and sanitation (Kulabako, 2010). Urban areas in Uganda also fail to provide residents with adequate employment opportunities, affordable housing with secure tenure, efficient public transport, pedestrian sidewalks that are safe (Mukwaya I. P. et al., 2010) and health care (Mukiibi, 2011).

Kampala is divided into five divisions in which Kawempe Division is the poorest (Golooba-Mutebi, 2003). Bwaise Parish III is a peri-urban area in northern Kampala located within Kawempe Division. It is located approximately 4 km from the city centre. (Kulabako, 2010) Bwaise Parish III is home to a significant part of the urban poor, 56 percent of the population are defined as poor and live on less than $1 a day (Birabi, 2007). In the 2002 population census, Bwaise Parish III had a population of about 15 000 people and the annual population growth was estimated at 9.6 percent which is above the national average (Katukiza, 2010).

Bwaise Parish III is located in a low-lying area (Lwasa, 2005). It is a reclaimed wetland with a high water table (Kulabako, 2010). Bwaise Parish III was chosen as the study area for this thesis because it is an area that is urbanizing fast and the area suffers frequent localized flooding (Kulabako, 2010). The focus on female informants was chosen because water, sanitation and health problems generally affect women more than men after a disaster has occurred (Gingie K. et al., 2010).

In vulnerability assessments, it has been found that the urban poor in Kampala are at high risk of flooding because they often live on low-lying lands where there is high population density and where roughly 60 percent of garbage remains uncollected (Lwasa S. , 2010a). Around 1500 tons of solid waste is produced in Kampala every day (Kulabako, 2010). Collection and disposal of garbage in the city is mainly privatized. Kampala City Council (KCC) has leased contracts to private firms (Katusiimeh I. T. et al., 2011) but collection of garbage in Kampala is not meeting standards and solid waste accumulates along roads and in drainage channels (Katusiimeh I. T. et al., 2011). Drainages become blocked with garbage and quickly fill up with water (Balk D. et al., 2009). In an earlier study from Bwaise Parish III a female resident linked the population growth in the area and the accumulation of garbage in the drainages to the increased incidences of flooding. The drainage channel which used to be two metres deep had become clogged with garbage and silt and was now only 30 centimetres deep. Every small rainfall seemed to lead to flooding. As the population increases in the area, more waste is produced and since no garbage management system has been in place the flooding has become exacerbated (Douglas I. et al., 2008).

Lack of proper sanitation and water, combined with flooding, can worsen health situations. During flooding, when storm water runoff is mixed with excreta people are put at an increased risk of infectious water-borne diseases (Olurunfemi, 2011). The polluted runoff can infiltrate the poorly functioning water supply systems (Parkinson, 2003) or fecal and other unsafe matter can contaminate the flood waters that spill into open wells (Balk D. et al., 2009). Also, wet soils in poorly drained areas are ideal breeding sites for parasitic worms that can cause intestinal infections (Parkinson, 2003) and stagnant water are ideal breeding sites for the anopheles mosquito that transmits malaria (ibid). This makes flooding both a direct and indirect cause of disease outbreaks in Kampala (Lwasa S. , 2010a). Stagnant water, lack of safe drinking water and damaged sanitation systems can cause problems after heavy rain and flood events and incidences of diaharreal diseases, malaria, respiratory infections and skin diseases become high (Jha A. et al., 2011). Improving water and sanitation systems would alleviate some of the present health challenges (Lwasa S. , 2010a). Cholera, dysentery and malaria outbreaks have recently been occurring every year during the rainy seasons in Kampala (ibid).

5. Results

Results of this minor field study are based on information from the first hand sources, such as interviews with female respondents, researchers and the LC Chairman. As mentioned in the introduction, Bwaise Parish III is facing a lot of challenges typical to slum areas and therefore it was necessary to see what problems were affecting the daily lives of the informants most severely. In the workshop, the challenges were narrowed down to four issues which were ranked according to their severity. Flooding was mentioned as the number one problem in Bwaise Parish III, followed by the high prevalence of HIV/AIDS, poverty and inaccessible roads (Workshop, 2011). Topics such as urban planning, water and sanitation, drainage and garbage management were identified as relevant topics because they were both direct and indirect causes and effects of the flooding in Bwaise Parish III (See appendix 3). The informants were able to give accounts of how they were affected by flooding as well how they themselves and others coped.

However, the challenges faced were multidimensional. One female informant in this minor field study claimed that she was more bothered by the lack of space in her house than the flooding. Although flooding disturbed her, she said she could bear it. She had owned and lived in her house for over 20 years and the biggest problem was that there was not enough space for the 12 people that were living in the one room house. She wished that she had the finances to build another room to increase the living area (Informant 1, 2011).

Although it rained a lot in Kampala during the course of this minor field study, the flooding was not witnessed by the author because of the difficulties moving around in an area where water can reach waist level. Observations that were made one day after water had cleared from the area were that some abandoned homes had not been drained, the ground was very muddy and the furniture in the homes of the interviewed women was damp.

5.1 Causes of flooding

In the workshop, the informants were asked to discuss the causes of flooding as the participants had ranked it as the main problem in the area. Poor garbage disposal, narrow drainages and unplanned construction of buildings were said to be the root causes of flooding in the area.

5.1.1 Poor garbage disposal and narrow drainages

A personal observation of Bwaise Parish III was that the environment was dirty (Figure 1 and 2). Few trash cans and disposal sites were seen and therefore, it was interesting to learn how the women living in Bwaise disposed their garbage. It was also noted that the garbage problems in Bwaise Parish III did not only stem from poor management in Bwaise. Garbage from other up gradient areas could accumulate in Bwaise (Informant 5, 2011). When it rained, floods could bring garbage from other places in Kampala (Workshop, 2011).

Individuals in Bwaise Parish III usually collected and stored their garbage on their compounds. Garbage could be made useful by making manure out of it, but according to one informant there were some difficulties storing garbage during the rainy season because it could get washed away. Garbage was supposed to be picked up by Kampala City Council (KCC) trucks once a week but

Figure 1. The dirty environment in Bwaise Parish III. Photo:Solange Berleen Musoke, 2011

Figure 2. Blocked drainage channel in Bwaise Parish III. Photo:Solange Berleen Musoke, 2011

at times the trucks did not turn up. When complaints were made to the KCC, they would respond that they could not afford to pay for fuel (Workshop, 2011). One informant explained that when the pick-up trucks did not come, she would burn her garbage or when she had $0.2 to spare, she would give the garbage to women that moved around with wheelbarrows and that took the garbage to disposal sites. The fact that it cost money to dispose garbage was problematic and it was questioned whether garbage really was managed properly when it was given away to be disposed of, or if it was just dumped in a hidden place (Workshop, 2011).

One informant mentioned that the KCC had recently started focusing more attention on garbage collection in slum areas since the middle-income and high-income areas could afford to pay for their own private services. In slums, the problem was that people did not live near roads and the trucks that would pick up garbage could not access the households because there were no roads (Informant 6, 2011).

When one of the informants was conducting research in Bwaise Parish III, it was found that the slum residents were aware of the causes of the challenges that they were facing (Informant 5, 2011). It was agreed in the workshop that when people just threw their garbage anywhere, it ended up blocking the drainage system and when water could not flow away during rainfall, the area would flood. Another informant stated that flooding was not exclusively found in Bwaise Parish III, it was a city-wide problem that was caused by the general incapacity of the drainage channels in Kampala.

5.1.2 Unplanned development of the area

One informant explained that Bwaise was a natural wetland located in a big water catchment and that the water table was high (Figure 3). Ideally people should not live in Bwaise, but the enforcement of laws was weak and it was complicated to evict people (Informant 5, 2011). Because Bwaise was located in a low-lying area, it did not even have to rain in Bwaise for the inhabitants to get affected by flooding. The Nsooba channel that traverses through Bwaise comes from up gradient areas. However, before the Nsooba Channel even reaches Bwaise Parish III, the channel has passed through many peri-urban areas that are similar to that of Bwaise. One of the researchers mentioned in their interview that water runoff from the channel was increasing (Informant 5, 2011).

Bwaise used to be a nice place to live said one of the informants that had lived in the area for over 30 years (Informant 2, 2011). Another of the female informants said that if her parents had known what Bwaise was going to become like, her parents would never had bought land there (Informant 3, 2011). Flooding was described as a recent occurrence that had started in 2008-2009 and had gradually intensified for each year with 2011 being described as the worst (Informant 4, 2011). There have typically been two wet seasons in Uganda between March- May and September-November (Informant 5, 2011) but distinct seasons in Kampala were said to be hard to distinguish. During the past year, occasional heavy rain in Kampala had occurred even during the dry seasons. January and February of 2011 were described as dry months, but since then it had been raining throughout the year and every time it had rained water had entered the houses of people living in Bwaise Parish III (Workshop, 2011).

The recent construction of the northern bypass in Kampala had increased flooding in some areas in Bwaise (Informant 5, 2011). One informant showed concern for people living near the northern bypass because she was aware that they were facing the worst problems (Informant 3, 2011).

The informants guessed that bribed corrupted local leaders were allowing constructions of

Figure 3. Swampy area in Bwaise Parish III. Photo: Solange Berleen Musoke, 2011

buildings and houses and meant that this was creating the unplanned setting of Bwaise Parish III which also was a cause of the flooding because buildings were blocking the natural pathways of storm water runoff (Workshop, 2011).

5.2 Effects of flooding

Flooding in Bwaise Parish III was described as a community-wide problem. Whether people rented or were home owners, all houses were described as being flooded. The women described that when it rained, water could come all the way up to their hips and at times it had come all the way up to their chests. The water washed over beddings, furniture and clothes and it brought in snakes. It also caused people to lose their belongings. The women in the workshop worried for people living with HIV having their hospital cards and Antiretroviral (ARV) Therapy washed away. Disruptions to people's daily activities included the closing of schools because when it rained children were not able to walk to school and also the school buildings were too flooded to be used (Workshop, 2011).

In Bwaise Parish III, disabled people and children were identified during the workshop as being at most risk of dying in the floods. None of the informants knew of a relative that had died in the floods, but some had heard stories of children drowning. In the past during heavy rains, young children had drowned by accidentally falling in drainage ditches because water was in the way and they could not see the ground. Disabled people were identified as being at risk because they became immobilized during rain and flooding. (Workshop, 2011)

After a continuous rainfall in Bwaise it could take between two days to one week before houses were free from water (Workshop, 2011). Emptying the house of water was said to increase women's load of unpaid work. Men supposedly had the ability to run away from their homes during flooding. They could go stay with other women and thus leave their wives to handle emptying the house of water. Flooding disproportionally affected women and was said to lead to the separation of homes (Workshop, 2011).

5.2.1 Effects of flooding on livelihoods

In the market area along a main road in Bwaise Parish III (Nabweru road) there were a lot of traders selling items off the ground. The field assistant explained that when it rained and flooded, people could not work.

The informants in this study made their living through engaging in petty trade. The floods had previously washed away businesses and have hindered people's daily activities according to the workshop participants. One female informant had been keeping 100 chickens but in October 2011, when the flooding was bad, she had to start to sell them. Many of her chickens drowned and she lost money. At the time of the interview she was relying on the mushroom project that Tusitukirewmu had introduced her to and she had also opened a restaurant where she made $0.8-$1.2 profit each day (Informant 4, 2011).

Food security in Bwaise Parish III was also being threatened by flooding. When the flooding was bad, the informants said that they had nowhere to cook since they were used to cooking outdoors. Some days they did not eat (Workshop, 2011). One female informant mentioned that she was growing greens and beetroot in her garden, which she said were good for her blood because she was anemic, but at times they would get destroyed by the rain (Informant 1, 2011). Another female informant said that her parents used to grow bananas in the compound but that was no longer possible (Informant 3, 2011).

5.2.2 Other factors that exacerbate the effects of flooding

Whenever there was rain, the residents would empty their latrines. The link between this behavior and the incidence of diseases was well understood. Water would get contaminated by feces from the latrines and enter people's houses (Workshop, 2011). The communities often failed to raise money for the latrines to be emptied properly (Informant 6, 2011). One female respondent claimed that illness was the worst consequence of flooding. Diseases such as malaria, diarrhea, vomiting, cholera and typhoid fever were said to be common in the area (Workshop, 2011). All household members had suffered from diarrhea and typhoid fever according to one informant. The people living in the slums have a lot of knowledge about sanitation and they know how diseases are spread (Informant 5, 2011).

Lack of sanitation in Bwaise had also lead to behaviors that could impact people's health. Defecating in polythene bags and throwing them on the ground or defecating openly was sometimes the only option that people had (Informant 6, 2011). Thus flooding brought diseases because the area was very dirty and when it rained contaminated water flooded the area (Workshop, 2011). One of the researchers had observed during work that the issue of open defecation was stigmatized and in order to understand people's behaviors, indirect questions had to be asked (Informant 6, 2011). Hence during this minor field study, it was interesting to learn about the sanitation practices of the female informants, without having to go into detail about open defecation.

The available facilities in Bwaise Parish III were public latrines which cost $0.08 to use. Some people could not afford to pay that amount. (Workshop, 2011) If there were 6 people in one household that needed to use a the latrine two times in one day, the cost for the whole household could amount to $0.96 which was even more than some people could earn in one day (Informant 6, 2011).

One informant had several minutes walk to the nearest latrine. At night the household members had to move in a group because of insecurity (Informant 3, 2011). Public toilets were not easily accessed at night because of safety reasons. People usually eased themselves between 7-8pm and women and children did not go out past that time. They used containers, buckets and basins. It was not uncommon to see people emptying buckets with urine in the mornings (Informant 6, 2011). Gum boots were said to be a necessity because of all of the mud in the area. Gum boots were however described as being expensive and not everyone could afford to own a pair (Workshop, 2011). One informant had a 10 minute walk to the nearest latrine and claimed gum boots were necessary to access it (Informant 3, 2011).

There have been different opinions on the reason for lacking sanitation. Men, who are usually decision-makers in a family, were rarely found at home. They had sanitation facilities in their work places and were not affected by poor sanitation to the same extent as women were (Informant 6, 2011). Landlords did not want to give up land to construct latrines; they would rather construct houses to get money (Workshop, 2011). Landlords were supposed to first build sanitation and then houses, however KCC did not adequately enforce the law (Informant 6, 2011).

5.3 Coping strategies

A flooded house was described as inevitable during rainfall. The informants from Bwaise Parish III in this minor field study had similar courses of action to mitigate the effects. They would move belongings up on tables or on top of other furniture. Chairs were hardly ever used for sitting but for keeping things on. Beds were raised with the help of blocks or bricks. Some people constructed beds so high that they had to use ladders to climb onto them (Workshop, 2011). Small children had to be tied onto the backs of adults using cloths so that they were safe according to one of the informants. When the rain would calm down, basins and buckets were used to move water out of the houses (ibid).

5.3.1 Mobility as a coping strategy

People move a lot in slums. On average people stay 3-5 years before shifting. The people feel that they are in transition and are not motivated to improve their situation (Informant 6, 2011). One female informant said moving away was the only way to avoid her home from being flooded (Informant 2, 2011).

Figure 4. Holes in the roof of an informants' home. Photo: Solange Berleen Musoke, 2011

The flooding situation in Bwaise Parish III had forced people to shift away from the community to other locations (Workshop, 2011). One informant had a house that was located on a compound owned by her parents, but, she was forced to live in her parents' house because her own house flooded too much. She wanted to move away but that would leave no one to take care of her mother and she could not leave her (Informant 4, 2011). All of the female informants expressed a will to move away. Staying in Bwaise Parish III was only conditionally and the most common answer was that if they had money they would move away. Yet all of the women in this study also had ideas on how to improve the flooding situation in their houses and said that if they did not have enough money to move away they could embark on some structural changes such as raising floors and roofs and mending old roofs that had holes (Figure 4).

Figure 5. Unfinished exterior flood proofing of house. Photo: Solange Berleen Musoke, 2011

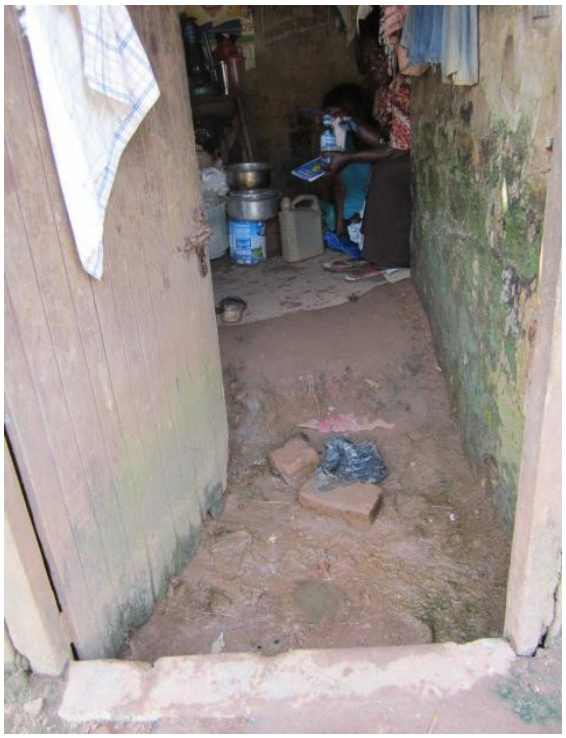

Figure 6. Raised muddy floor after rain has entered house. Photo: Solange Berleen Musoke, 2011

5.3.2 Flood proofing as a coping strategy

Three out of nine that were interviewed in this study were their own landlords and one of them had attempted structural adjustments to flood proof her house. The particular female informant that had attempted structural adjustments was an HIV positive single-mother of seven that had lost her job selling shoes a couple of months ago when the market where she used to work burnt down. She relied on assistance from her brothers and nutritional support from Tusitukirewamu since she had not yet acquired the capital to start up a new business. She had started to thicken her exterior walls by building a second wall out of bricks but the construction had become too expensive and she had not been able to finish it (Figure 5). When asked about selling her house, she said that the land was worth too little and any money she would get out of it would not be enough to buy her a new piece of land or a house, and renting was not an option because she did not have an income. She had also raised her floor with the help of mud but her house still flooded (Figure 6) (Informant 3, 2011).

Figure 7. Elevated restaurant. Photo: Solange Berleen Musoke, 2011

When walking around in Bwaise Parish III, different flood proofing strategies were witnessed. Some of the observed flood proofing strategies were elevated buildings. One of the in-depth interviews was conducted in the informant's restaurant which had been raised on stilts approximately 80 cm above the ground (Figure 7) (Informant 4, 2011). Some people in Bwaise Parish III had used sand and mud to flood proof openings such as windows and doors (Figure 8).

Other preventative measures in Bwaise were that people packed mud in sacks and put it on the ground to prevent floods from entering their houses and some people dug ditches to drain water away from their compounds. When households or individuals took on such flood prevention, a good question to ask was where does the water empty or disappear to? Into the neighbors

compound? It was difficult to know if all coping strategies improved the community's situation (Informant 5, 2011).

One of the informants in this study had just recently shifted to a new one-roomed house located in the same compound as the previous one because it used to flood too much. The new house was not located on higher grounds but the floors of the old house were made out of compressed mud and it was difficult for her to get rid of water. It did not even have to rain that much for the house to get flooded because the water was coming from the ground. Her new house had a cemented floor which made it much easier for her to get water out of the house. Those that could afford it usually opted for cement (Informant 2, 2011).

5.4 Reducing vulnerabilities to urban flooding in Bwaise Parish III

One informant mentioned that the NGO Plan International-Uganda had been helping communities in Bwaise by handing out equipments such as wheelbarrows, hose and spades so that the area could be cleaned up (Informant 7, 2011). There have also been a number of slum upgrading projects. The KCC led a project where they built drainages and even improved sanitation, but the results were not needful according to one of the researcher informants. The gradients were poor and instead of water flowing away, it stagnated. There were no big impacts from the project. They also put in place public sewered toilets but when a visit was paid to the sites, the toilets were locked and there was no water in them so they could not be used (Informant 5, 2011).

Figure 8. Flood proofed windows Photo: Solange Berleen Musoke, 2011

Two researcher informants in this minor field study reasoned that the slum upgrading projects that had been done so far in Bwaise Parish III had not been sustainable and had ended when the projects had run their courses. The slum upgrading projects had not been integrated. They had targeted specific problems and general needs assessments had not been performed properly. What was needed was an integrated solution to improve slum areas and that did not only focus on improving sanitation, solid waste disposal, drainage or water supply but involved all.

At the community level in Bwaise Parish III, the LC had been working towards improving the flooding by trying to sensitize people on how not to violate the environment and this had been done through the encouragement of behavior change. The LC had worked by informing people that the garbage that they threw on the ground ended up blocking the drainages so that when it rained, the water back flowed into their houses. They also taught people to keep their garbage in sacks and hand over their trash to the KCC pick-up trucks. There were community watch groups leading this work and they aimed at mobilizing community volunteers to move around in Bwaise and pick up garbage. It was a challenging task to engage and involve people because after sensitization they could not be forced to volunteer. In Bwaise a lot of people were renting temporarily and then they would move away. Continuous training of the community on flooding and garbage management was required (Informant 7, 2011).

One informant expressed that the only hope in combating the flooding was the reconstruction of the Luigi Channel which was being funded by the World Bank and would be implemented by Kidip Infrastructure in 2012. The big channel was supposed to help the area to collect water and direct it to Lake Victoria. Compensation and relocation of people living close to the channel had already been carried out (Informant 7, 2011).

6. Analysis

This analysis will draw examples from the empirical data and turn to the theoretical framework in order to strengthen the findings from the field study.

There is a link between poorly managed urban development in low-income countries that can lead to hazards (Patel R. B. et al., 2009) and end up complicating the lives of people that already are in a vulnerable situation. Urbanization and the congestion of people and buildings is a

possible reason for why the flooding in Bwaise Parish III was described as occurring more frequently.

Localized urban flooding was affecting livelihoods, properties, assets and the health of the population in Bwaise Parish III both directly and indirectly. The informants were affected in the same way as slow-onset disasters usually affect vulnerable groups. The women had to endure increased load of unpaid work getting rid of water from their houses and although none of the informants had spouses their opinion was that men would migrate during flooding. The theory on gender as a disaster vulnerability explained that during slow-onset disasters, men are more likely to migrate to look for opportunities so that they can secure their livelihood (Abramovitz, 2001), leaving women as heads of household (Gingie K. et al., 2010).

An example of a direct effect of flooding was the damage to possessions that the women suffered because of dampness and the time that they had to spend draining their homes of flood waters. The indirect effects were less obvious but still as important. The theory on gender as a disaster vulnerability showed that spending time emptying the house of water after heavy rainfall and flooding, limited the time that women could have spent engaging in paid work. Hypothetically, not being able to secure a livelihood or financial resources can have adverse effects in other areas of life such as not being able to achieve food security for all household members or not being able to pay for school fees for children. The links between flooding and the indirect effects did not follow an obvious pattern in this thesis, however, the theory on gender as disaster vulnerability has helped generalize and strengthen claims and elaborate potential indirect effects. What this thesis has shown is that the women and their families were food insecure and unable to pay school fees for their children since they were receiving support from the CBO Tusitukirewamu. The women in this study were deprived of basic capabilities and this was limiting them in their life opportunities. Additionally, the capability approach and the theory on gender as a disaster vulnerability showed that flooding could further worsen people's life situations (Sen, 2002; Gingie K. et al., 2010). All deprived capabilities could not be derived to flooding events but needless to say, flooding was not making any of the other problems go away; rather it was contributing and creating more capability deprivation and vulnerabilities.

Measuring impacts of disasters and how communities cope can be done by looking at the resilience and the ability of individuals and communities to recover. It was difficult to measure

the resilience of Bwaise Parish III because of the many indirect consequences of flooding. Bwaise Parish III was continuously being exposed to regularly occurring events that were gradually weakening built environments and economic and social systems. Findings from this study imply that Bwaise Parish III and the informants in this study had a low resilience towards flooding.

The causes of flooding were fully understood and discussed in the workshop of this study. Although, garbage management may not be a problem for individuals per se, because what one person throws on the ground may not affect that person directly, it becomes a problem on a community level because it can affect people indirectly. The importance of knowing the causes of flooding cannot be undermined because by following the problem tree method employed, reducing or eliminating the causes will affect the flooding problem. Therefore the LC and the communities target on garbage sensitization and community volunteers to clean up the area made sense because garbage was identified as a cause. However, the interviews in this study showed that individuals were knowledgeable on the links between garbage, drainage and flooding but that other things were leading to the environmentally unfriendly behavior. Garbage collection was too expensive and there were not enough areas for garbage disposal.

Although Bwaise Parish III was not an optimal place to live, the urbanization process helped explain how a slum like Bwaise Parish III could come into being. Generally, people migrate in search for better prospects. The theory on individual risk prevention affirmed that people can knowingly accept trade-offs such as living in an area that floods for potential economic opportunities (Lall V. S. et al., 2010). Choosing to live in a house that is located in a risky location may not be a sustainable solution, but if it means that the land is cheap and is located in a city where there are job opportunities, the benefits for an individual may be weighted higher than the disaster risks. But, this did not seem to be the case for the informants in this study. Instead, it seemed that the informants were just unable to move. Since the women in this study had lived in Bwaise Parish III for a long time, it can be safe to say that they may not have made the decision to move to the area and if they had, the conditions during the time they moved there may have been different. The concept of choice and trade-offs was outside their command. Rather, by turning to the capability approach instead of the theory on individual risk prevention and trade-offs, it can be explained why the informants were experiencing challenges living in

Bwaise. By understanding that, it becomes apparent that by working on the improvement of people's capabilities and vulnerabilities, people's lives will also be improved in the process.

Flooding was said to affect all households in Bwaise Parish III. By turning to the results from this study and the two theories on capabilities and vulnerability it can be safe to say that the whole area was vulnerable, but that women were more severely affected. The fact that Bwaise was located in a wetland that floods and that people living there could not afford to move away or protect themselves put all of them in a vulnerable position, also, the livelihoods of the poor were said to be more vulnerable to events of flooding. Making structural changes to flood proof properties was costly and poor people could not afford to insure their properties and their assets. Poor people also faced greater difficulties resuming their businesses in the aftermath of flooding if their livelihoods had been washed away. This thesis has however looked more closely at what factors were creating vulnerability in Bwaise Parish III and why women were disproportionally affected by flooding.

The lower socio-economic status that women have in societies and the poverty that results is a vulnerability that the women in this study had to bear. However, they were not only suffering from income poverty but were also deprived of other basic capabilities. One of the female informants asserted that she was not engaging in any income-generating activity, she was a single-mother of seven, HIV positive and relied on hand-outs from her brothers and from Tusitukirewamu. She had tried to flood proof her house which was her way of strengthening her resilience, but it was to no avail because she did not have enough money to finish the job and her house still flooded. The house that she lived in had belonged to her deceased parents so she did not have to pay rent. The fact that she owned her house is a factor that could strengthen her resilience, but when it came to her desire to move away from the flooding, owning property did little because she felt that the money she would get from selling the land would not be enough to buy herself another house, and since she had no income she could not rent. Although she had her property as a resource, she could still not utilize its potential benefits to make her life better. Her lack of economic resources and opportunities was keeping her in Bwaise Parish III. Her freedom was limited and her deprivation of capabilities was contributing to her vulnerability. The capability approach shows the multidimensional vulnerabilities (Sen, 2002) that the woman had

to deal with. Any scheme to improve her life would have to be holistic and not only focus on income generation but try to develop all her aspects of vulnerability.

There seemed to be a lack of functioning community wide prevention against flooding, most of the approaches fell on the individual. The responses such as emptying water and lifting belongings up to higher surfaces were reactive to the ongoing situation. It was important to understand how the women perceived flooding because it could have determined their courses of action to mitigate effects. Undertaking preventative measures could build resilience against risks but, flooding was not the only problem in Bwaise Parish III. For example, one woman was more troubled by overcrowding. Flooding in Bwaise Parish III had to be considered in the same light as the other challenges that the inhabitants had to deal with such as poverty, HIV/AIDs, inaccessible roads, overcrowding and lack of water and sanitation. Having to deal with these may affect how much preventative action individuals could afford and have the time to do so. Generally, the women stated the cost issue of undergoing structural adjustments to their homes, so even though they perceived flooding as severe, they were limited in their capabilities to act. Poverty can make people prioritize more urgent needs such as feeding their families than undertaking preventative measures.

The women in Bwaise Parish III had tried to adapt to flooding through shifting to more flood proof houses, for example a house with a concrete floor or through flood proofing properties by making structural adjustments. Just because their attempts had failed does not mean that the women were passive or that they were reluctant to individual risk prevention. Rather their capabilities to mitigate flooding were lacking. All of the women had the intention of having flood-free homes, but the reason for this not yet being achieved was the lack of economic resources.

Further the capability approach can go on to explain why individuals may be lacking economic resources (Schneider, 2009; Sen, 2002). In this case, all interviewees were widowed or single mothers that had duties such as caring for their parents or their children which disfavors them in income opportunities. Two of the interviewed women also admitted to being HIV-positive and because it is an infection which leads to immunodeficiency, it can make them more subject to infectious diseases and one hypothesis is that being ill can also lead to that one cannot work and loses out on acquiring economic resources.

The informants to this study saw themselves as only living in Bwaise Parish III conditionally, but no one was new to the area. The LC Chairman expressed that it was difficult to mobilize people to engage in community activities because of the continuous mobility in the area. It is difficult to develop an area when nobody wants to live there.

This thesis has compiled knowledge through field work. The theoretical framework has helped explain and strengthen the empirical data. To sum up, there are many consequences of flooding, both direct and indirect and the theory on gender as disaster vulnerability and the capability approach has helped with the analysis of the indirect effects that flooding has afflicted upon women in Bwaise Parish III. Because flooding has lead to a number of losses such as livelihoods, possessions, health, crops and food security, flooding has deprived the women of capabilities and women are severely affected by flooding because of their vulnerabilities.

7. Discussion

7.1 The way forward - Reducing vulnerabilities

This discussion will present findings from other studies on vulnerabilities in Bwaise Parish III and give advice on the way forward both in building resilience towards localized urban flooding and recommendations for further research. Specifically, the discussion will help to answer the third research question.

Designated garbage disposal sites need to be made accessible to people, also, although, garbage cleanups are taking place in Bwaise Parish III, the scale that it is being done on is too small. If roads could be built so that pick-up trucks could also enter Bwaise, then solid waste management would have been made easier. If the solid waste could be made useful, for example through recycling, the buildup of garbage in the environment could reduce, but recycling would be required on a continuous basis, in order to bring upon an effect. What is needed is a sustainable city-wide solution.

The lack of basic infrastructure in Kampala is weakening the resilience of communities and individuals (Lwasa S. , 2010a). Generally in densely populated areas that lack proper water and sanitation provision, there is a higher risk of transmission of infectious disease (Patel R. B. et al., 2009). Since diseases generally affect women more than men, it is important to listen to their

needs and demands. Including local women in decision-making processes regarding urban planning will cater to their needs. For example, a woman might prioritize sanitation more than a man because she is more confined to the home during the day, whereas he can use the toilet at his work place.

If capabilities could be strengthened it could also lead to the reduction of environmentally hazardous behaviors such as emptying latrines during rainfall and flooding or open defecation. The reason for those habits were said to be lack of money both at community and individual level. Bwaise Parish III needs more sanitation facilities that community members can afford to use and access and if the community could grow economically, latrines could be maintained and emptied properly. A shift away from public latrines to latrines that are shared by few households is a recommendation that would lead to improved sanitation.

How can vulnerabilities be improved? As the capability approach states, income is not the sole solution to improving people's lives, but it is a means along the way. A lot of slum dwellers depend on small-scale businesses. Some shops can be built out of materials that cannot resist heavy rains or floods and thus their livelihoods become affected (Douglas I. et al., 2008). When their income generating activities are affected, so are their abilities to pay for food, health care and school fees for their children (Douglas I. et al., 2008). When homes get damaged during flooding, it places an extra strain on the already limited resources of the poor both directly and indirectly. Directly through the need for reparation or replacement of items and indirectly through the loss of working hours that are spent on fixing damages or the reallocation of resources to buy medication to treat water-related illnesses (Parkinson, 2003).

In communities that have weak resilience, development programs that have focused on poverty alleviation, health, housing, sanitation and livelihood have been the most successful in improving vulnerabilities to climate change in Kampala (Lwasa S. , 2010a). Any development objective should focus on improving people's capabilities to live their best life (Sen, 2002)

Urban infrastructure needs to be worked on for the slums in Kampala to be able to build resilience against the negative impacts of flooding and other events caused by climate change (Lwasa S. , 2010a). For example, the drainages need to be widened and deepened (ibid). Roads, culverts, bridges, drainage systems, water and sewerage networks need to be improved (ibid).

However, the built-up environment of informal settlements may not allow conventional infrastructure because of the unplanned nature of slums. Urban drainage systems may be difficult to plan (Parkinson, 2003).

Individuals and households cannot tackle the upgrading of their slum area on their own (Dodman, 2009). It would be cheaper to make investments on a community level than for each household to invest in flood proofing (Green, 2010). Community-based organizations and government agencies should be involved in improving infrastructure (Dodman, 2009).

Local councils have the most potential to reduce disaster risk because they are accustomed to local knowledge and because they can influence the national government (Pelling M. et al., 2009). Decentralization can benefit small administrative zones because decision-making becomes more localized but it requires that local councils have enough resources to handle the demands (Pelling M. et al., 2009).

Disaster management entails both reducing hazard risks and reducing vulnerabilities that individuals, households, and communities have.

7.2 Recommended further research

This thesis has shown that there are different definitions of a disaster and ultimately, this could affect the way that events and hazards are managed. Is the flooding in Bwaise labeled a disaster? Interesting to know because it could change the way that the issue is dealt with and it could lead to that more action is undertaken to mitigate the effects. Literature on urban flooding in low-income countries has mostly referred to such events as everyday hazards. What viewpoint do important stakeholders such as governments, local councils, development agencies and NGO's have on the definition of urban flooding in Bwaise Parish III? The appropriate definition could explain action and inaction to response.

Further research to explore the informal arrangements that people engage in, in times of crises is also recommended and also to explore NGO's work in mitigating small-scale disasters in urban areas. Tusitukirewamu and MAWDA for example, were acting as a security guarantees for their members but to look into what impact they are creating for their members is a recommendation for further research.

The effects of climate change in urban areas are also recommended for further research. The question is, how will slums that are densely populated suffer consequences from small-scale disasters due to climate change?

Once the reconstruction of Lubigi Channel is done, further studies need to research the efficiency. No papers have been found about the objective behind the project, but according to an informant, the reconstruction would have an impact on the flooding situation.

8. Conclusion

Flooding was ranked the number one problem in Bwaise Parish III by the informants in this study. Flooding in Bwaise Parish III leads to the gradual deterioration of life quality. The causes of the localized flooding were said to be poor garbage disposal, narrow drainages and unplanned construction of buildings.

This study has shown that there are different degrees of being affected and impacted by floods, even within the poorest of communities. Women are especially vulnerable because generally they have a lower socio-economic status. The concept of gender as a vulnerability has helped explain that women are more adversely affected by events such as urban flooding.

The women living in Bwaise were suffering from several vulnerabilities because of their gender, poverty and to some extent, disease. Although they received support, their vulnerabilities were depriving them of basic capabilities to be self-reliant and secure their livelihoods, nutrition, and to educate their children. The theoretical framework of this study has helped explained what type of risk prevention that individuals can undertake and how deprived capabilities and vulnerabilities can lead to more suffering for a person in the event of a small-scale disaster. The vulnerabilities allowed them to become affected by flooding and in turn, flooding was creating further vulnerabilities. Flooding impacts the women in this study both directly through the loss of livelihoods and possessions and indirectly because the time that the women spent getting water out of their houses could have been spent engaging in an income generating activity.

A solution to reduce the effects of localized urban flooding would have to entail strengthening capabilities and reducing vulnerabilities for both women and men in Bwaise Parish III.

Community slum upgrading efforts regarding garbage disposal the drainage system also need to be embarked upon.

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Appendix 1

Interview guide, Bwaise Parish III female informants

Name

Occupation

Number of household members

How many girls

Tenant/landlord?

Biggest problem in your house?

How long does it take to access the latrine?

How many households share the latrine?

What do you do at night?

Why do you choose to live here?

Do you like it here?

Does your home feel safe?

What do you want to improve?

If you had the choice, would you move?

Has your house been flooded?

What do you do when it rains?

How do you dispose garbage?

What does it cost to dispose garbage?

What diseases do you and your children suffer from?

Appendix 2

Interview guide, researchers and local council chairman

Rain season?

What are the obstacles that hinder the development of proper sanitation facilities in slums in Kampala?

Which stakeholders are cooperative in slum upgrading projects? For example, local council chairmen or other community leaders? Tenants? Landlords?

Is it hard to involve the civil society in slum upgrading projects?

How should gender inequality in water and sanitation systems be fought?

What are the main problems that women face today regarding water and sanitation?

Do you believe that people are lacking basic hygiene knowledge?

In Bwaise Parish III, where should work on slum upgrade start? Improving sanitation, removing waste or fixing the drainage system?

Are households usually interested in the upgrade of their homes?

Is the sanitation issue important in people's lives? Do decision-makers prioritize sanitation?

Can a wetland be transformed into a safe living area or should people move away?

Are there any garbage interventions in the area?

Whose task is sanitation improvement?

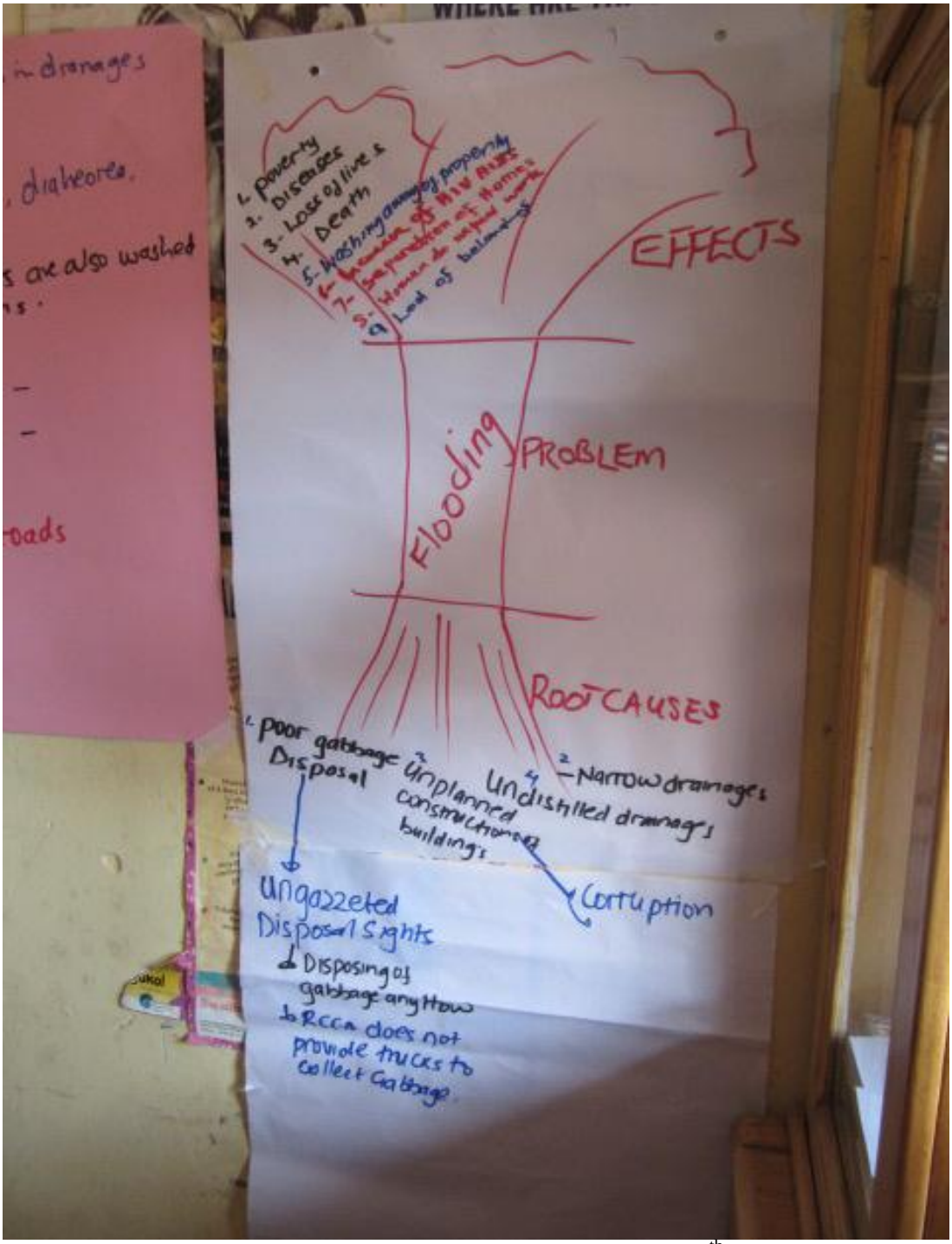
Is flooding increasing or getting better?

Which adaptation strategies do individuals and the community undertake?

What should be done to stop flooding?

Appendix 3

Sketch of problem tree presented at workshop



This problem tree was sketched during the workshop on November 25th at Tusitukirewamu's offices in Bwaise.