

JINJA

Urban Ecological Planning
AAR 4525
Norwegian University of Science and Technology

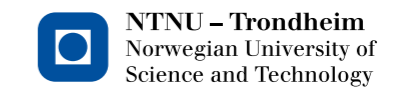


JINJA

URBAN ECOLOGICAL PLANNING
AAR 4525 FALL 2013

HOUSING
SANITATION
BUILDING AND MATERIAL TRAINING CENTER

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[photo: Hans Skotte]

ACKNOWLEDGEMENTS

Our project would not have been possible without the guidance and the help of several individuals who in one way or the other have contributed and extended their valuable assistance in the preparation and completion of this study. First and foremost, we express our utmost gratitude to our Professor Hans Skotte and Asst Prof Elena Archipovaite for their guidance in the course of this learning. We thank our field supervisor, Kasaija Peter, for giving us the motivation and valuable insights throughout our stay in Jinja.

We would like to thank all the officials from different organisations who have helped us in the study of Jinja. We convey our gratitude to the experts from different fields who have taken time for helping us gather valuable data and express their opinions. We would like to give a special mention of the following people-

Tabitha Kakuze (Physical Planner) and also the Town Clerk from JMC
Joseph Sserunjogi, Michael Kasede and Mudamba Umar from NSDFU
Waiswa Kakaire from ACTogether
Nyende Ramathan (TSUPU Engineer) and also TSUPU coordinator Bijja Patrick, Community leader of Kawama

Besides the we would also like to thank all the Savings Group from Kisima, Loco,Walukuba, Kimaka, Masese; the Project Management Committe (PMC) Building Materials Training Centre and NWSC, Jinja. We thank all the Community leaders for their contribution during the field visits. The students from Makerere University have been very helpful whenever it was needed. Last but not the least we would like to thank Mari Sjaastad for her special and invaluable contribution, especially to the group working on Sanitation. Since it is nearly impossible to thank everyone in this limited space we convey our gratitude to all the people in Jinja and Kampala who were linked to our project in anyway possible.

ACRONYMS

AHF	<i>African Housing Fund</i>
BMTC	Building Materials Training Center
CBO	<i>Community Based Organization</i>
CO ²	Carbondioxide
CSEB	<i>Compressed stabilized earth Blocks</i>
DANIDA	Danish International Development Agency
DAPCB	<i>Departed Asian Property Custodian Board</i>
DWD	Directorate of Water Development
ESF	<i>Ecosan Services Foundation</i>
FGD	Focused Group Discussions
FRC	<i>Fibre-Reinforced Cement</i>
HYT	Haileybury Youth Trust
IPCC	<i>International Panel on Climate Control</i>
ISSB	Interlocking Stabilized Soil Block
JMC	<i>Jinja Municipal Council</i>
LC1	Local Chairman 1
LIG	<i>Low Income Groups</i>
MDF	Municipal Development Forum
MLHUD	<i>Ministry of Lands, Housing and Urban Development</i>
MOU	Memorandum of Understanding
NGO	<i>Non-Governmental Organization</i>
NSDFU	National Slum Dwellers Federation of Uganda
NSS	<i>National Shelter Strategy</i>
NWSC	National Water and Sewage Corporation
PMC	<i>Project Management Committee</i>
SDI	Slum/Shack Dwellers International
PU	<i>Transforming the Settlements of the Urban Poor in Uganda</i>
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNECE	<i>United Nations Economic Commission for Europe</i>
UN	United Nations
UNHABITAT	<i>United Nations Human Settlements Programme</i>
VIP	Ventilated Improved Pit Latrine
WHO	<i>World Health Organization</i>
WSP	Water and Sanitation Program
WSUP	<i>Water and Sanitation for the Urban Poor</i>

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URBAN ECOLOGICAL PLANNING

The masters' programme in Urban Ecological Planning is primarily designed to address the real, on-the-ground, urban issues of the developing and industrialising world which is estimated to hold about 85% of world's population by 2050. While the programme evolves constantly to reflect the current challenges of urbanisation, the core is to address and re-analyse different local and contextual urban planning issues in an alternative manner that rests on inclusionary, territorial, and incremental methods of cognition.

The program is primarily focused on the complex interdependencies between people, institutions and the built environment in pursuit of equity, efficiency and sustainability.

THE FIELDWORK

With on-site exercises and extensive field-works in developing countries, over the last decade the programme has addressed various situational topical issues, which are globally and locally significant. While planning remains product oriented, we strive to find out with each new project – How to understand and build local knowledge? And how to link knowledge with real action in planning practice to create positive change? How to inculcate sustainable ideas within the livelihood challenges at the local level?

The first semester's field work is an essential element in the NTNU's MSc Urban Ecological Planning (UEP) Programme and is primarily meant to help the students better understand the dynamics of urban development

in the cities of Global South. The challenges posed by these cities to planners and architects are quite significant. Fieldwork of this nature provides one of the most promising and realistic paths to assist all manner of urban change agents in addressing some of the most pressing concerns facing a fast urbanizing Global South. During the last two years the first semester's fieldwork has taken place in Nepal and Uganda. This fieldwork is carried out in corporation with teachers and students from local Universities, international NGOs and the country's principal research centres. In Uganda additional cooperation is elicited from UN-Habitat, whose partnership with NTNU is providing the framework for the proposed UN-Habitat related projects.

THIS STUDY IS TAILOR-MADE TO HELP STUDENTS TO:

1. Understand the urban asset base and dynamics of a territorially defined area, e.g. neighbourhood, through interacting with its inhabitants, local authorities and other stakeholders.
2. Be able to propose a physical or organizational intervention based on their newly acquired understanding of the dynamics of the community in question and do it in such a way that it will generate subsequent benefits.

(Text taken from UEP website and brochure: <http://www.ntnu.edu/studies/msa1/about>)



HISTORY

Jinja is a major commercial and industrial centre and the second largest city in Uganda (Zoned Economic Development Area). The city is the centre of Jinja district and the capital of the Kingdom of Busoga (Njeru, 2007).

Jinja was originally a fishing village strategically located on trade routes. It was officially started as a township on June 26, 1906 by the British as the administrative hub of the Busoga region. The construction of the Ugandan Railway in the early 1900s linked Jinja with Kisumu, Kenya, facilitating the expansion and international trading of cotton and sugar. A formal street pattern for the city centre was established in 1906. Catholic, English-speaking Indians from the former Portuguese colony of Goa on the west coast of India began to arrive in 1910, changing the social and architectural makeup of Jinja. (Njeru, 2007)

The construction of the Owen Falls (later Nalubaale) Dam and consequent energy subsidies in the middle of the 20th century initiated the town's transition from a trade hub to an industrial centre. Jinja was officially declared a municipality in 1957 (Wagner, 2010). New industries that emerged during this period created jobs for almost 50,000 people and range from textile and plywood manufacturing to copper smelting and steel rolling (Wagner, 2010). Many of these industries were owned by Indians and collectively initiated a period of economic growth from 1954 to 1970 (Njeru, 2007).

Political unrest beginning in the early 1970s with Idi Amin's expulsion of Asians and seizing of foreign companies and Obote's electricity subsidies reversed the preceding economic development. Industrial activity fell by 86 percent and employment by 70 percent by 1985 (Wagner, 2010). The buildings and industries that the Indians abandoned were left to deteriorate. Some of the Indians have returned in later years, many of whom opened businesses and contributed to a new, diversified economy (Njeru, 2007).

The economy and population of Jinja is returning with diversification into other activities, including commerce, service and tourism (Njeru, 2007). Population has grown from 65,000 in 1991 (Wagner, 2010) to more than 200,000 people in 2010. High commuting causes a daily flux of population between 212,00 and 230,000 during the day and 80,000 to 100,000 at night (ACTogether and NSDFU, 2010).



[Owen dam]

<http://static.panoramio.com/photos/large/19783190.jpg>



[Walukuba west]

PHYSICAL SETTING

Jinja is located at 1,143 m above sea level and 87 km east of the capital, Kampala (Jinja City). Jinja Town is the municipal and commercial centre of Jinja District. The climate is warm and humid due to the location on the shores of Lake Victoria, near to the source of the Nile River (Jinja City).

URBAN STRUCTURE

The town layout can be attributed to a variety of European, Indian and African influences. The city center reflects a mixed influence of Western and Indian architecture and consists largely of low density commercial buildings laid out in a grid. Indian areas of the CBD were poorly maintained after Indians were expelled, but in recent years are being replaced with new businesses by the returning Indians. Most businesses are small, one-story shops, complemented by a large, sprawling market at the north end of Main Street. Because of the low density city plan, streets are wide and there are many open spaces around the buildings. (Vanderhoek, Carne and Benham)

The grid overflows into a more organic shape as the city moves towards the Lake and Nile River in the west. The western part of Jinja is predominantly low density residential with a formal planning scheme inspired by European town planning. Residents are mixed between illegally squatters and wealthy residents. Approximately 1000 of these properties are still unclaimed and are under hold of DAPCB (JMC, 2009). The market area to the North of the city center is highly influenced by locals who informally create organic forms that contrast to the strict grid structure of the rest of the city. An industrial area is situated to the east of the railway line and main road. The main industries are metal processing, leather tanning and paper making and coffee processing. There are large, dense residential areas surrounding

industries, home to low income factory workers and fishermen. The issue of housing is eminent in Jinja and there are many large, low-income settlements on the outskirts of the city with poor access to services. The government constructed several public housing estates to alleviate housing shortage for industrial workers in the 1950s including Loco, Walukuba and Mpmudde Housing Estates. Originally intended to temporarily accommodate factory workers, they now house a high density of low income earners and their families. (Vanderhoek, Carne and Benham)

TRANSPORTATION

The main forms for transportation inside Jinja are bicycles and boda bodas (motorbike taxis). Between Jinja and other cities, it is most common to use matatus (a minibus that carries up to 14 people made from rebuilt Hiaces) or small busses. The matutu park next to the current market acts as a transport node to the main highway and railway, facilitating transport of goods and people in and out of Jinja. (Vanderhoek, Carne and Benham)

LAND USE

51 percent of land in Jinja is used agriculture or undeveloped (Kakaire). Fertile soil and plentiful rainfall contributes to successful agricultural activities in surrounding areas (Njeru, 2007). A portion of this undeveloped land is abandoned industries that have the potential to be revitalized and renovated into new industries (Kakaire). Developed land is divided between residences, industries and business, and public, government owned land (Kakaire). JMC owns about 30 percent of the land in Jinja, Uganda Land Commission 10 percent, institutions seven percent, leased public land four percent and private individuals 49 percent (Manyire, 2002).

POLITICAL STRUCTURE

The local government system in Uganda is based on district units consisting of a local Government Council and an Administrative Council. The Government Council is the highest political authority in its area of jurisdiction with both legislative and executive powers. Local governments have powers to make policy, provide services and formulate and implement development plans. Local governments are composed of urban and rural councils and every council is autonomous and defined by its geographical jurisdiction. The Local Government Act of 1997 caused decentralization of functions, powers and services to local governments for good governance and democratic participation. (Bitarabeho, 2008)

Jinja town has four levels of local government: municipality, division, parish and village. There are three divisions inside Jinja Municipality: Central Division, Walukuba Division and Mpumudde Division. Each division is led by a Local Council III (LC III) Chairman who oversees LCIIIs and LCIs who operate on smaller scales (Kakaire). Divisions cooperate with the JMC (LC IV) led by an elected Mayor (Kakaire). There are seven JMC technical departments: administration, public health, engineering, audit, environment, treasury and education (Kakaire). The technical officers and the planning committee are headed by the Town Clerk and the three divisions by the Assistant Town Clerk (Kakaire). In the year 2010, the Municipal Development Forum (MDF) was launched in Jinja as a part of the TSUPU program. The forum organizes regular meetings for all members of the Jinja community to meet and discuss urban development ideas (Keene-Mugerwa, 2011).

SOCIO ECONOMIC SETTING

Jinja's geographic location on Lake Victoria and the River Nile has driven its status as a trading, and later, industrial city. Despite the partial return of industries after the expulsion of Asians, industry is no longer the primary driver of Jinja's economy. Today's economy is expanding and diversifying with tourism and foreigners now have an apparent presence in the city center. (Njeru, 2007) Uganda's national government has initiated local decentralized economic development incentives to stimulate the economy and tax revenue that includes basic infrastructure development, local diversified economic development, increasing local government capacity, creating public private partnerships (Bitarabeho, 2008). Still, 80 percent of Jinja's population is considered poor (JMC, 2009), with the average annual household income estimated at 100 USD (ACTogether and NSDFU, 2010). Jinja Municipality has seven main informal settlements that suffer from inadequate education, housing, sanitation, solid waste management, water access and transportation (ACTogether, 2012).

CHALLENGES TO DEVELOPMENTAL CHANGE

ECONOMIC & JMC CAPACITY

Jinja's economy has still not recovered from the economic downturn in the 1970s and many residents still suffer from unemployment or unstable, low income and many rely on the informal sector (Wagner, 2010). This also means that the municipality is unable to recover taxes and is forced to operate on a small government budget, making operation and maintenance of basic services financially and logistically difficult. (Bitarabeho, 2008)

ACCESS TO SERVICES

Poor settlements lack access to basic services of water, sanitation, electricity and transportation. Only 18 percent of low income earners in Jinja have access to a toilet and only five percent have easy access to water (ACTogether, 2012). Jinja's poorest residents reside in one of informal settlements or squat illegally in abandoned buildings in the city center (Manyire, 2002).

LAND & OWNERSHIP

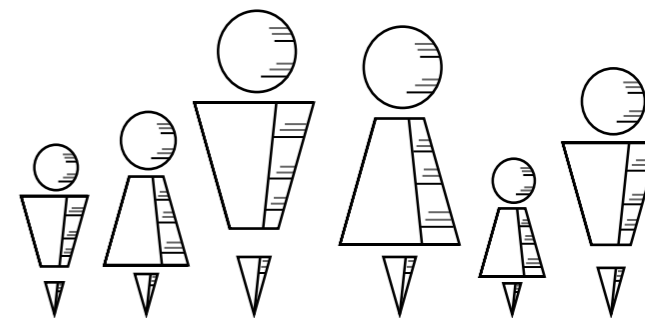
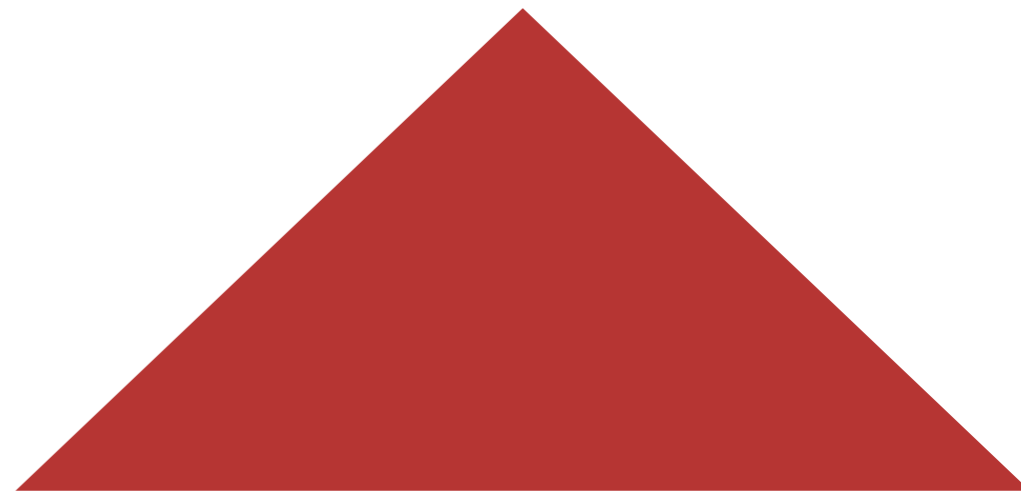
After political conflict in the 1970s, many properties and industries in Jinja were abandoned. Coupled with changing land laws from 1975 to 1995, the lack of proper documentation caused many disputes over land ownership in Jinja. (Manyire, 2002). Land ownership is arguably one of the town's biggest challenges and it is complicated by illegal squatting and local politicians meddling in land disputes for personal gain. A lack of monitoring and oversight permits public land to be sold and developed by division engineers and chairmen without supervision. A Physical Planning Act states that the Divisional Council will work hand in hand with the Municipal Council and any illegal development on the land will be reported to the municipal council. But this act is being grossly violated in Jinja. (Ministry of Land, Housing and Urban Development, 2010)

HOUSING

Because of poor JMC capacity to ensure housing opportunities for low income earners in Jinja, residents have resorted to informal settlements and initiate housing interventions themselves, despite their limited incomes. Most interventions are financed by savings' schemes or external loans, with little support from the local government. Despite many national housing policies, few are focused on low-income households.

CONTRACTING

The majority of building projects today is contracted through the municipality subject to higher labour costs and VAT tax. Structures constructed through municipal contracting have a high cost of delivery compared with similar structures constructed through community contracting (Manyire, 2002). Uganda's PDA laws currently prohibit community contracting in projects costing over 500,000 shillings out of fear of communities mishandling money (Joseph, 2013). The World Bank is advocating for community contracting in TSUPU projects and is currently in negotiations with JMC to override PDA regulations for TSUPU projects (Joseph, 2013).



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Housing for low income earners

A fieldstudy of Kawama

Introduction

80% of the population in Jinja lives in poverty and housing for them is an urgent matter. People try to accommodate themselves and this leads to the creation of informal settlements. As it is impossible to face this challenge on an individual level, already some housing projects are going on. The fieldwork for us was to investigate these low cost housing estates with the focus on one project.

We started by looking into the process of creating new housing estates in Jinja. Where does the unique planning come from? What are the role of the government and the role of the savings groups? Secondly we looked into the existing framework and discovered that there are many national policies, but only a few are focusing on the low-income households. Even on local level the housing for low-income earners doesn't seem a priority. Next we assessed two reference projects. To assess the

housing projects we felt we needed to be out in the field and talk to people. After this assessment we focused on the assigned project Kawama. Many actors are involved. We realized that the stakeholders have very different perspectives on the story and the housing project got stuck because of misunderstandings and conflicts. We tried to give a voice to every stakeholder in the story. Furthermore we tried to take a step back and place our thoughts and findings on affordable housing in a larger context. To do this we made a result chain. Based on the result chain we formulated a few recommendations on housing for low income earners in Jinja and more specific on Kawama. As students we had the chance to work on a real project. We could only hope that things will sort out.

Site selection

Apart from Kawama we studied three other low cost

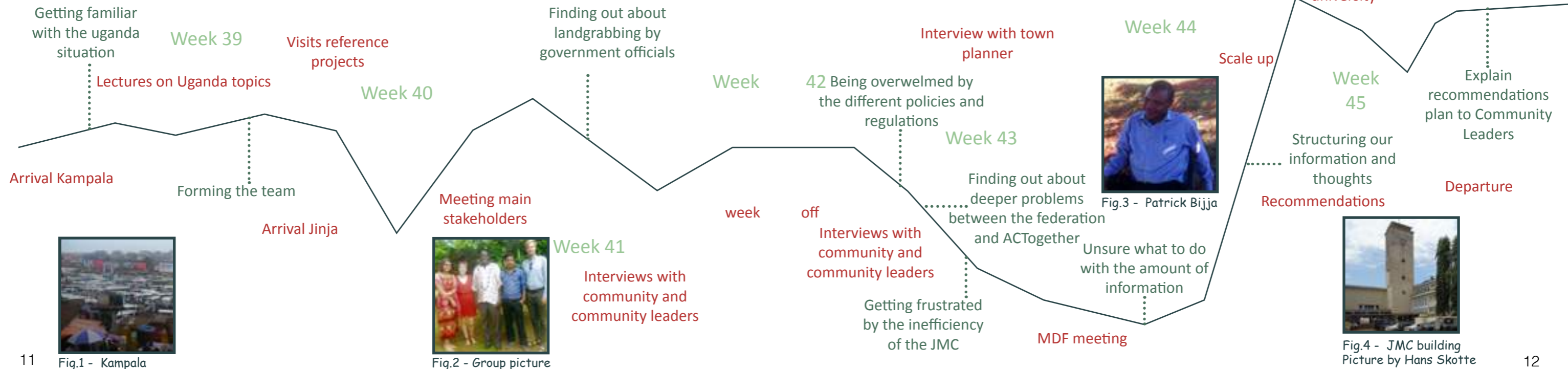
housing projects in Walukuba, Masese and Mpumudde. Out of these Walukuba housing estate was left out because we felt it was less relevant to be studied as a case study for Kawama site. Firstly it was a very old project which started in the 1940s and secondly it was originally built keeping only the industrial workers in mind. The other two projects were built for the community in general which comprised of people who were members of community savings group. But after our research we felt we should have included Walukuba in our assessment too, as it is the only project where the houses are being sold in the private market.

Methodology

During the fieldwork in Jinja we had meetings with community leaders, representatives from JMC, the Federation and ACTogether, but our main source of information came from interviews with community

members. We wanted to do qualitative assessment of the projects based on few interviews, but we focused on the stories and experiences of the members. Based on the objectives we had worked out, we prepared a questionnaire. We used this to interview members, who were mainly selected by the community leaders. We realized that we should delete some parts of the questionnaire and make some additions. After the interviews we also had to reframe some of our objectives to keep only those, which were relevant. After each day we discussed the information within the group and tried to reflect on- the selection of interviewees, quality of information from the interviews, interview- techniques and new sources of information. Considering all the conflicts, we sometimes found it difficult to be neutral but the reflections on our work were important to get the broader perspective.

Our process





Map of Jinja with the location of the studied housing projects

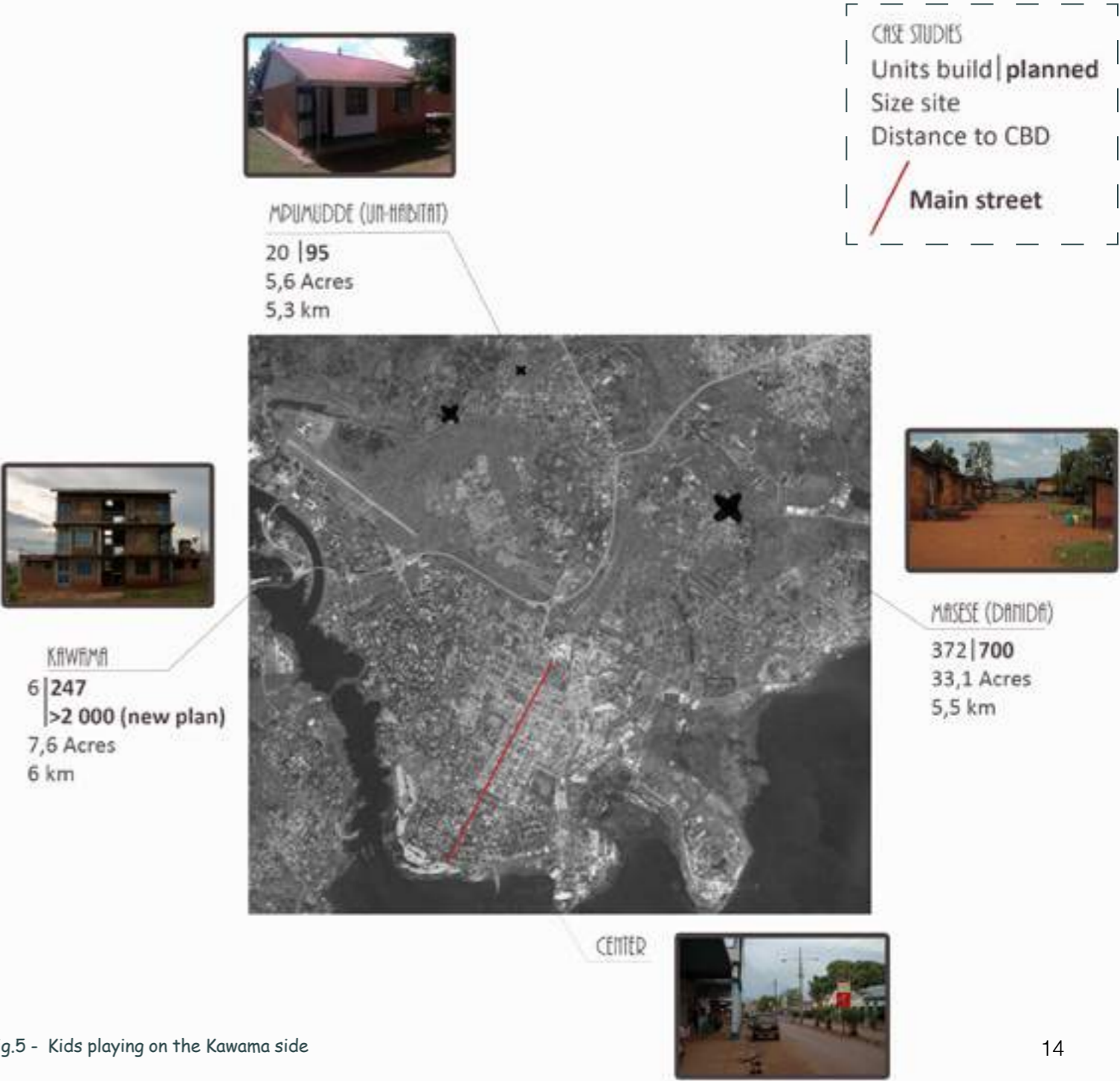


Fig.5 - Kids playing on the Kawama side

Jinja was the industrial and economic hub of Uganda. The political decision to expel Asians from Uganda in 1972, led to economic downfall of the city as most of the industries were owned by them. A large number of industrial workers lost their jobs and were unable to afford housing. The situation led to the economic downfall of the city. The urban poverty prevalent in the city was physically manifested in terms of deteriorating housing conditions and infrastructure which eventually lead to people living in informal settlements.

Most of the housing efforts in Jinja in the colonial era focused on providing accommodation for the public servants and the elite group of Asians and Europeans. The planning activities focused on segregating the residential areas of the Asians, the Europeans and the Ugandans. Basically the initial intervention of government in housing sector was through projects like the ones in Walukuba and Masese, which were meant for industrial workers. As the economy of the city declined, these housing states were also left midway and those which have been built were left in deteriorating condition. Many of the houses in these housing schemes were recently sold in the private market as the local government did not have the resources to maintain them.¹

In Jinja most of the housing interventions for low income earners are initiated by the community themselves. The role of the local government is limited to providing land and technical support for these housing schemes. The communities take initiative to develop their own programmes, depending on the local resources and fund and negotiate with local government, NGOs and CBOs for support. The Savings schemes, formed and run by the community, are one of the most important initiatives today in urban areas of Uganda that addresses urban poverty and helps in achieving housing goals.

1 Kakuze, 2013

This collective management of money does not only build funds but also the trust within the communities. It enhances their ability to work together on housing projects. The funds gathered from the savings scheme are important because they provide a legal base through which donor agencies, government and NGO's/CBO's can directly and effectively support the community driven processes.

These savings groups are part of what begins as a local process and are later integrated into the citywide and national Federation. The financial support from the donor agencies is provided in the form of loans. The NGOs and CBOs act as facilitators in the process. The repayments go into a revolving fund which is used again for investing in other similar projects. The latest housing interventions in Jinja aim on empowering LIG through housing developments and land rights. These strategies seem to focus on small investments that are initiated, managed, monitored and owned by the community themselves. These interventions have the power to mobilize local resources, to reach a large number of needy people, to help make the local governance effective, to invite the LIG to participate in the decision making process and to lower the house costs.

The government's role has been limited to creating an environment that facilitates NGOs and CBOs to operate effectively to provide affordable shelter and improved living conditions. The concept of enabling approach has had limited success in Uganda because of its poor implementation. While the government was supposed to play a leading role in providing affordable housing and improved living conditions, it actually played a passive role leaving the housing sector to develop on its own in an unguided way. The local government is not well equipped with the technical and financial resources to make significant interventions in housing for low income earners in Jinja.

Fig.6 - Transit housing and construction materials on Kawama site

1. Housing for low income earners in Jinja

To understand the Kawama case in its context, we took a look at the general process of creating new housing estates in Jinja. A few important questions popped up: Where did the unique planning of Jinja come from? What's the role of the local and central government in new housing projects? How do the projects get initiated and by who? What is the role of the savings groups in the whole process?



Since 1993 Uganda has been decentralized, meaning that some of the responsibilities, including planning and housing, shifted from the central government to the local ones. Currently, different government levels provide for planning [see appendix], of which Jinja Municipal Council is one. Each level has a physical planning committees that provides development plans that integrate in the development plans of the higher level.² For this reason the lower levels contribute in the development plans of the higher levels through participatory planning processes.

The Ministry for Lands, Housing and Urban Development is the responsible national agency for formulating policies, laws and regulations concerning housing, land and planning related issues. Diagram 1 shows the structure of this ministry. Specific to housing there are many national policies though only a few focus on the low incomes. (In appendix 2, there is a list with all the national laws and policies that had or have an influence on housing) The policies seem to follow the political situation of the day and aren't institutionalized.³ Since the late 1980s, the government is following an 'enabling approach', meaning that they mobilize the resources of other actors and facilitate their deployment for the efficient provision of housing⁴ or with other words, they leave the initiative up to the individual households and the private sector. This approach was specifically stated in the 1992 National Shelter Strategy. However this approach was not very succesful due to the lack of consistency in policies and development ideology.

In 2005 a new National Housing Policy was formulated, based on the ideology and principles of the National Shelter Strategy. The goal of this draft is a *well integrated sustainable human settlements, where all have*

2 Physical Planning Act 2010, 2010

3 Mukiibi

4 UN-HABITAT, 2005, p. 1

*adequate shelter with secure tenure, enjoy a healthy and safe environment with basic infrastructure services.*⁵

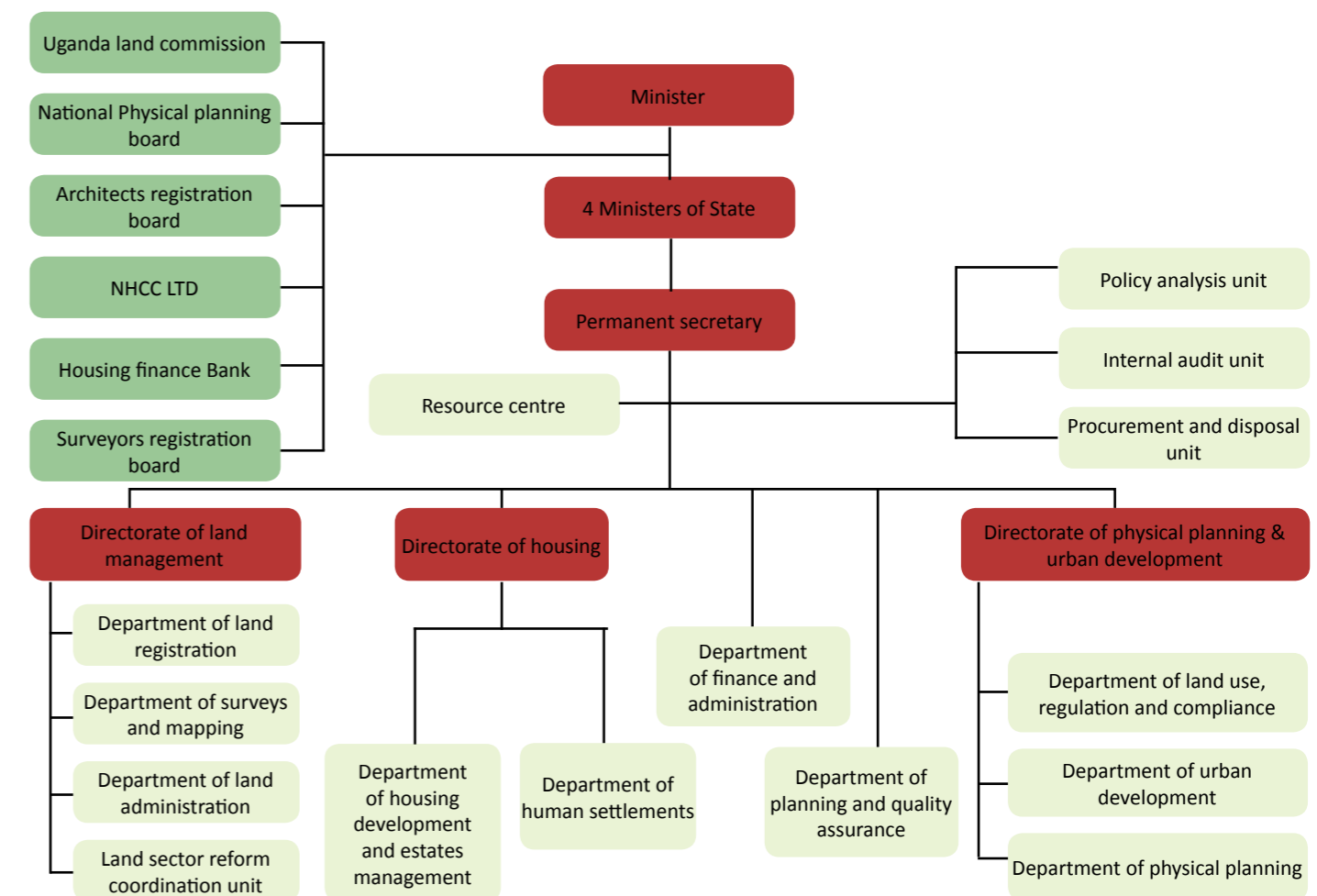
Some new challenges were faced in the National Housing Policy draft, like the recognition of slum areas, the

5 The National Housing Policy for Uganda, Final Draft, 2013

private nature of housing and the idea that improving living conditions of the urban poor could increase the economic development. Besides the need for new housing, there is also a focus on the improvement of the existing housing stock.

Eight years later, this document remains a draft as it is still not approved by the parliament. As the NSS, the policy suffered from low priority after development,

Diagram 1: Structure of Ministry of Land, Housing and Urban Development



2. Legal, institutional and policy framework

The government has to play an important role in the process for low income housing to become succesfull. Both central and local government have their say through many different policies and laws. In this chapter we will try to give the reader an understanding from this existing framework.

weak implementation and dependency of external donors. Furthermore only a small group of urban poor benefitted, mostly the most affluent ones.⁶

In 2008, the Ministry of Lands, Housing and Urban Development launched a new policy framework in addressing the issue of slums in the form of the National Slum Upgrading Strategy and Action Plan. The document was created on incentive of UNDP. Next to overview of the current situation in Kampala and other cities through the country it provides a strategy on how to address slum upgrading and an action plan on how to implement this strategy. This strategy ensures all Ugandans the right to own and access affordable adequate houses with secure tenure in sustainable human settlements.

As the strategy plan started out of the existing situation, it wants to reduce the strict planning and building standards to reduce the construction costs and increase affordability, e.g. by relating standards of plot sizes to the ones found in informal settlements. The idea is to provide basic standards as well as services for all that can upgrade in an incremental way, rather than providing high standards for few. Last but not least, the strategy plan focusses on a participative process.

The Slum Upgrading Strategy states that the bulk of the financing should be mobilized locally under the form of savings, micro finances, bi- and multi-lateral arrangements and external donors.

6 Brown, 2013

Studying the Jinja municipality structure plan, housing for low incomes doesn't seem a priority at all. When we spoke to the town planner, Tabita Kakuze and the town clerk, David Kyasanku, they do seem to realize that housing is an important issue in the further development of the municipality, though they lack the resources to force a real break through.

JMC follows the 'enabling approach' as stated in NSS; they support initiatives by communities by giving them land when possible and technical advice. They do seem to struggle to take up the role as a true facilitator in the process.

The eyes of the community⁷

Different urban stakeholders in Jinja are represented through MDF, where representatives of different communities and sectors discuss urban development issues.⁸ The goal of the discussions are participation, communication and collaboration around urban development. Their outcomes and recommendations are handed over to the council for consideration in the decision making process. In Jinja, Michael Kasede, the head of the Federation in Jinja, is the chairman of MDF.

Jinja has no local building codes or bylaws, they use the national standards and regulations as stated in the National Physical Planning Standards and Guidelines in 2011.

7 Kyasanku, 2013

8 Municipal Development Forums



Fig.7 - Some members of Masese Women's Savings Group



Fig.8 - Masese Women's Housing Project



Fig.9 - UN-HABITAT Housing Estate

Masese Women's Housing Project

Masese is one of the slum area of Jinja. This area was occupied by people who squatted as a result of the civil disorder during the Idi Amin rule (1971–1978). Most of them were single mothers, widows and orphans. They lived there in terrible conditions without any access to jobs. Liquor brewing and casual labor in the construction industry was their main occupation. In order to improve their living conditions, a self help housing project was initiated in the partnership of Masese Women's Association, government (central & local), African Housing Fund and DANIDA. This self help housing project aimed at upgrading housing and settlement by enabling women to acquire secure land tenure and by providing trainings in construction techniques and production of building materials.

The Ministry of Lands, Housing and Urban Development was involved in planning, designing and supervision of the project. JMC opened the road network and provided land for the project. The DANIDA provided the fund for equipments, materials and training. The AHF coordinated construction activities on site. This project trained women in construction skills like carpentry, roofing and masonry. They were also trained in production of building materials like Interlocking Stabilized Soil Blocks, roofing tiles and hardware materials such as san plats, culverts and blocks. The building materials were to be used in the construction of their own houses, where as the hardware materials were supposed to be sold at open market. Twelve selected members of the Savings Scheme were sent to Kenya for training and to visit similar housing projects.

This project initially targeted to build 700 houses of which only 372 houses were actually built. The individual floor plans and master plan were prepared by the African Housing Fund. The houses shared pit

latrines. They had stand pipes for water supply. Though the design of the buildings were good for people at that time, later they found that it was not adequate. It has been realized now that there should have been provision for extension as most of them will add rooms when they can afford it. Similarly detailing for tiles in the roof was not good enough and the roofs leak in many of those houses.

The project enabled 372 household to live in permanent houses with proper sanitation, roads and drainage. Women were responsible for both the construction and production of materials of these houses. They also built infrastructure for health and education facilities. Some of them went to other parts of Uganda and abroad to provide trainings to implement similar kind of project. The Masese women constructed and operate a concrete building products factory, which also supplies commercial markets. They opened carpentry workshops to produce doors, windows and furniture. The building material production and the carpentry workshops are a valuable source of income and have already generated more than 200 million Uganda shillings (US\$200,000). Construction firms have hired some of the women.⁹

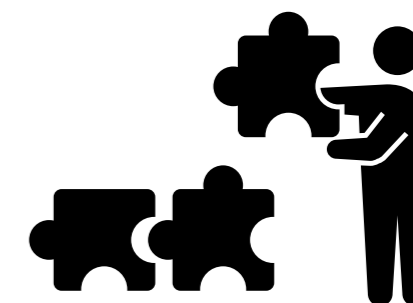
The project did not work out as planned. First some of the materials they produced, e.g. the stabilized soil blocks, were more expensive than the readymade bricks at that time. Similarly even though they had local raw materials, they imported it from Tanzania. It increased the cost per unit.¹⁰ Secondly, the women trained in construction and production of building materials could not realize their full potential because of the limited market. After the completion of the project, many of them had no employment while the still had to pay monthly house installments. Some of the people there still didn't manage to pay the loan back after 23 years.

⁹ HABITAT, 2001

¹⁰ Atim, 2013

DANIDA woman: *They don't give work to women in the city.*

The main outcome of this project is that it changed the perception of people on the ability of women. It showed that when women have access to resources, they can bear responsibility of the entire construction. They displayed that they can be good managers and decision makers. This display of women ability is particularly important because it has inspired many other housing projects, initiated and managed by women in Jinja.



The UN-HABITAT Housing Estate-Mpumudde

The UN-HABITAT funded Housing project aimed at providing housing solutions for a group of low income earners of Mpumudde. The project focused on empowering female entrepreneurs by providing land right and housing developments. The first phase of the project was realized in partnership with UN-HABITAT, JMC, the building company Akright and Mpumudde Jinja Women Savings Group. Twenty families received homes in the first phase and seventy five families will benefit in the next phase. UN-HABITAT provided the fund in coordination with JMC, where as Akright provided the technical services. Fifty plots of land with a total area of 5.6 acres were provided by JMC.

The Mpumudde Women Savings group started saving

3. Case studies

The framework featured in the former chapter is the theoretical side of low cost housing. A proper understanding of this theme demands an assessment of reference projects. We studied two: the Masese Women's Housing Project and the UN-HABITAT housing estate in Mpumudde. Each project starts with with an overview of the assessment and continues with a critical view and some recommendations on the project.

500 UGX per week in 1998. Their motto was *Coming Together, Working Together and Sharing Knowledge for upliftment of livelihoods*.¹¹ Later they increased their weekly savings to 1000 UGX per week. Initially they expected to buy their own land from their savings. At that time, UN-HABITAT came to fund housing for a savings group that had enough savings and a piece of land. After negotiation with JMC for land, UN-HABITAT decided to provide them with loan. The land title will be in the name of women, once they pay off the loan. UN-HABITAT also provided micro finance to boost their businesses. Due to that help, many inhabitants there have managed to earn living by starting up small businesses like rearing goats, agriculture, second hand cloth business etc. Most of them make enough income to pay the housing loan, run the family and pay the school fees of the children.

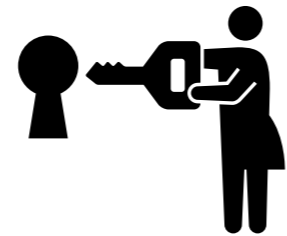
Secretary of the Community: *And then God sent us UN-HABITAT in 2008*

The houses are single storeyed, detached houses. They have a living room, a toilet with shower, 2 bedrooms and an outdoor kitchen. The plot size is relatively big, providing them with ample spaces in front and back. The people were involved in the design process and they were satisfied with the design. They have provisions in the design to add two more rooms when they can afford it. All the twenty households are connected to a common septic tank and soak pit. They are supplied with municipal water and there is a container for solid waste collection. The materials used in the constructions are concrete, burnt bricks and iron sheets for roofing. The cost per unit was 10 million UGX. With interest, they are paying back 15 million UGX in total over a period of 10 years.¹²

The project is well received by the beneficiaries. After

11 Kibumba, 2013
12 Kibumba, 2013

the payment of loan, the land title and housing right will be in the name of women. The provision of a loan, not only for housing but also for starting up some businesses, works. The large plots with enough space on back and front has provided them with some spaces that can be used to cultivate something or as a working space. The design of the house is good enough to meet the present need of the family and has provision to increment two rooms. It allows the family to add rooms according to their financial ability which they could rent out to generate some income if necessary.



For the housing estate like Mpumudde, meant for low income earners, the focus should be on bringing down the cost of the houses itself. For a single storey building, load bearing structure instead of a frame structure would have been more suitable. Similarly elements like false ceiling could have been left to the people themselves to construct afterwards. And in the projects like this, where the local government is supplying land for free, the land should have been used efficiently so that they will have land available for other similar housing projects. In Mpumudde, the plot size is large and could have been used to accommodate more people. In the second phase of the project, three families will be accommodated on the same plot that accommodated only one family in the first phase. Through our interviews we found out that some of the households have an average monthly income as low as 300000 UGX.¹³ The monthly installment of 132000 UGX is above the desired 30% of the household income.¹⁴

13 Monic, 2013
14 UN-HABITAT, 2012

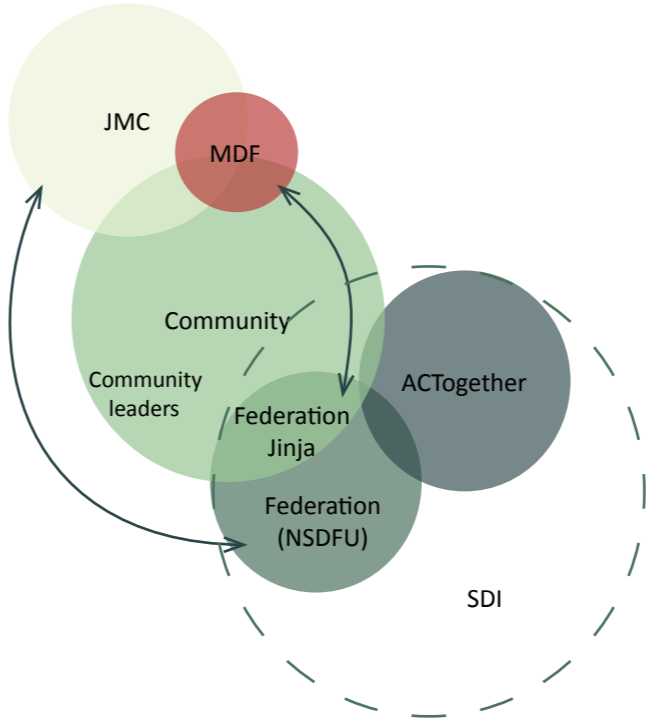


Diagram 2 - Stakeholders diagram

4. Kawama. Different stakeholders. Different stories.

The past of Kawama is a troubled one: the project got stuck because of misunderstandings and conflict. The stakeholders have very different perspectives on the story. Our assignment was to collect these stories and find a common ground on which the project can continue. In this chapter we document the different sides of the story.

Kawama project was started after the people organised themselves in a savings group in 2002. It was carried forward by JMC after they provided 7.6 acres of land for the project. The grant for the project was provided by SELAVIP which is a private foundation working on housing for the LIG. The Community obtained a deed plan and surveyed the land, in order to initiate the project. They held discussions amongst themselves regarding housing expectations and subsequently met with government actors, urban planners, and housing professionals and elicit support from critical stakeholders. This event was attended by NSDFU members from across the country, and project plans were unveiled and discussed widely.¹⁵ The project progressed, but after a while the initial design had to be revised due to affordability issues. The original design did little to work towards the density and accommodating more people on site. Currently 6 housing units have been built using the initial design. Some more household are living in temporary structures, waiting for their houses that would be covered under the new house design. One of the challenges that have counteracted this progress is disagreement on land rights. The community in Kawama believes the Kawama land belongs to the 247 members of Kawama Savings Group. In contrast to this the Federation and JMC claim that the site should be available to all the community savers in Jinja. It is because of this confusion that a need for a clear MoU was eventually felt by everyone. Currently, they are trying to resolve all the issues and the project will soon gain momentum.

Our assignment

As students our role has basically been to look at the project from a fresh perspective and to look at the progress of the project so far, taking a neutral stand. As we don't belong to any agency involved in the project, we had the chance of not taking sides in the project or get carried away by people's stories. As academicians

15 Sharp, 2013, p. 7

Fig.10 - One of the Savings Group members in front of the transit housing on the Kawama site



our work has majorly been to carry our research and analysis in order to understand the concept of affordable housing keeping the dynamics of Kawama Housing Project in mind. At the same time we shall be giving recommendations to JMC to help them achieve affordable housing without actually compromising with the quality of housing or the living conditions of the residents. Our framework and recommendations are not mandatory to be implemented by JMC as it is only an outcome of our understanding of affordable housing. Though these recommendations can help the Municipality carry forward the project in a better way than before, as they have been made considering the different perspectives.

JMC

JMC claims to have a neutral approach towards the whole project and firmly believes that no NGO or community can work without getting JMC's support. The Federation and ACTogether don't have administrative power unlike JMC and thus JMC feels that people have unrealistic expectations from them. People detached themselves from the municipality after getting land and thus JMC has difficulties in getting inside information. They feel that some guidelines or standard framework for housing could have been helpful in carrying the project forward. The Municipality feels that there is shortage of land in general and they are in no condition to offer more land though they are willing to develop other services.

JMC clarified that the land in Kawama originally belonged not only to the people of Kawama but also to the other people in Jinja. JMC feels that ACTogether has become a 'powerful' organisation which is sometimes difficult to deal with. The other challenge for JMC is that land is not in hands of JMC now, hence it is difficult to regulate it in the absence of by laws. Their first and foremost lesson that they have learnt from the Kawama project is that there should be an MoU before the start

of any project with clear terms and conditions, stating each agencies' roles and responsibilities. JMC claims that one of the negative consequences of not having a MoU is that people are taking undue advantage by not paying back the loan saying that they were not told that the money was a loan instead of a grant. Currently, empowering low income groups is not included in JMC's strategy and there is no housing policy which bounds them to do so.

NSDFU (The Federation)

The Federation was established after visitors from SDI in Kenya, South Africa and India met with Jinja slum dwellers in 2002. Since Kawama is the first major housing project undertaken by the Federation, this was intended to work as a model project for social housing in Uganda. Negotiation with JMC was their first major activity to obtain a parcel of land.

Michael Kasede is the chairman of the Federation and he worked as our guide in Jinja, the first two weeks. He had contacts in the different settlements and helped us set up meetings with JMC and the communities. In the beginning Michael was very involved in our work, but afterwards we tried to work more independently to be less biased. The information we have on Federation's perspective is mostly based on interviews with Michael Kasede.

The Federation provided loans as revolving funds for the project. This money is supposed to go back to the Urban Poor Fund and again invested in similar housing projects in Jinja. As a result from poor work relations between JMC, ACTogether and the Community, currently some of the members who live in Kawama refuse to pay back the loan before a new contract is made. Another reason for non-repayment of loan is that the Community feels that they were misinformed about the fund being grant instead of loan. Until the problems are solved the money is locked in the Kawama project. The Federation is in a

neutral position in this conflict. From their point of view the problems occurred between the Community and ACTogether and the issues between the Federation and the Community is within the leadership in ACTogether and the Federation.

For the Federation, the first step to restart the project is to rework and sign a new MOU between JMC and the Kawama Savings Group, to secure the land ownership. The original agreement is unclear and the stakeholders have different views on what it says. Secondly the community leaders need to identify the low-income earners in Kawama. The Federation claims that among the 32 families living in the transit houses today, 5 families aren't part of the Savings Group and were picked out by the leaders themselves. This condition leads on to a belief that leaders have their own agenda and that they influence the members in this way. Thirdly, the Steering Committee that was established for the project is not functioning well. According to the Federation, JMC only had two meetings with Steering Committee.

ACTogether

ACTogether as an NGO started working as a facilitator for the Federation and in collaboration with JMC, in the project. Their role was to support the saving group with technical competence and administer the construction works.

Even though it was ACTogether who gave us the task on investigating the Kawama Housing Project, we had hardly any input from them during the two months we worked on field. During two short meetings with their engineer, we found out some technical details (or the lack of). Because of this, it was difficult to write down their side of the story. The following is mostly based on what we heard from other actors.

After a while the construction stopped because the working responsibilities were not clear. Afterwards

ACTogether started working on its own, without the support of the Federation. It started managing the whole project on its own and JMC provided only technical support. Subsequently, there were consistent doubts in the ways of working of ACTogether because of lack of accountability and mistrust. The Community claims that ACTogether started to put their profits above the interest of the Community and started deviating from the original objectives of the project. They have been accused of discretely holding the land titles associated with the project. Their work relations with other actors/agencies were poor, which also reflected on the work relations between us and them. Furthermore they sent out status reports to the Federation, which did not give a true picture of the ground situation. It even seems that they are no longer welcomed on site. In short, ACTogether's contribution to the project is questionable as it overpowered the Community and failed to meet the project objectives.

Community leaders

Patrick Bijja is the leader of Kawama savings group in Mpumudde. The members elected him in 2002 and he has followed the development process of the houses since the beginning of the project. He works in the Kawama project, on a daily basis, administering the Savings Group and the construction work on site. Patrick was once the chairman of the Federation in Jinja and after the split in the Federation, Michael Kasede took over his position. Later, Patrick became the community leader of Kawama.

Currently the biggest challenge for Kawama Savings Group is to make housing affordable for all the members and further complete the housing project. The most critical challenge is to finish the building for the members who live in the temporary structures today. One of the challenges that have counteracted this progress is disagreement on land rights. The group of leaders

explained that the Community considers that the land belongs to 247 members of Kawama only. In contrast to this JMC claims that the site should be available to all the community savers in Jinja. The leaders claim that the plan for Kawama is supposed to be done by the people themselves, not the Federation, ACTogether or JMC. Ideally, issues on land rights are solved and contracted in a MoU long before a project like Kawama starts. The different stakeholders know that there exists an MOU for the project. The problem is different understanding, by different people; of terms in the contract. In the last meeting that the Municipal development forum (MDF) had with representatives from Kawama Savings Group, Federation and ACTogether, they agreed on having a new MoU with clearer terms.

Patrick claimed that 92% of the members voted for him in the last elections, and the last years they have insisted on him to continue in the position as leader. His words were; *the leader cannot have a house in the first project. The leader should have the last house to remain fighting for the project to be finished.* This implies that he has a long-term perspective for Kawama but he has a personal interest there as well. It can be seen as a result of the split that the leaders only relate the project to the Kawama Savings Group and not to the other savings groups in Jinja. Another explanation is in the following words from Patrick; *it is difficult to bring a member from Masese to Kawama who has not contributed from the beginning. How would you convince the members of Kawama to invite others then?*

The Community

The majority of Community members living on site, are residing in temporary structures. These members are supposed to be "the Poorest of the Poor" and were selected for temporary shelter based on the criteria that they were unable to afford the rent of their previous houses. They feel living conditions are hard

and most of the family members who are able to earn a living on their own, reside elsewhere. The women headed households in particular find it difficult to work in the city as there is no day care facility to take care of their children when they are at work. The members save for housing in proportion to their income but feel difficulties to generate financial resources and expect external support. The residents of the houses that have already been built, feel the size of the house is small but they can not afford a bigger house. The water supply is insufficient because many people are using just one standpipe and the water pressure is low. Furthermore, the water in general is unpotable and hence requires boiling before it is fit for consumption. Besides some even have to compromise with the amount of water as they cannot afford it at current prices on site, which is currently 7000 UGX/week/household (\$2.77). The solid waste is not managed by the Municipality as was the plan initially and the structural stability of houses is questionable. Though seemingly unrelated, education has direct correlation to affordability in case of Kawama because many households spend most of their income on school fees.

The residents have neutral views on the work of JMC and expect more to be done by them like providing better infrastructure facilities and plans for the projects. Earlier, there has been poor communications between JMC and the Community which led to mistrust. In addition to the above mentioned issues there are certain aspects of the project that the residents are particularly happy about. The residents of the transit house are happy that they don't have to pay the house rent anymore, instead they can save the same amount of money now. They are trying to reignite the project using the leaders by reorganising themselves and have utmost faith in the leadership. They feel that the leadership has given them voice, this can actually backfire the project if the leadership fails or they decide to walk out someday.



Fig.11 - Schoolkids on the Kawama site



Out of the interviews we managed to group our information into 4 branches: physical infrastructure, social infrastructure, economics and governance. Those branches or categories are the basic resources that will define sets of activities that will lead to 'affordable housing' (= direct output). This output will benefit the residents directly through the outcome. On a larger scale, not only the direct beneficiaries but also the larger community will benefit (=indirect beneficiaries) through the impact.

Input

We discovered 4 branches of input resources; **Physical infrastructure** includes both the geographical aspects of the site as well as the architecture and techniques. The **Social infrastructure** contains education, health, recreation and the interaction within the community. **Economics** is the branch that contains all financial resources and relations. The last branch, **Governance** brings together all the different actors involved in the process of housing for low income earners and how they relate to each other. The actors we defined as significant are: JMC, the Federation and SDI, ACTogether, of course the Community itself, and in some case other external agencies or donors and CBO's.

Activities

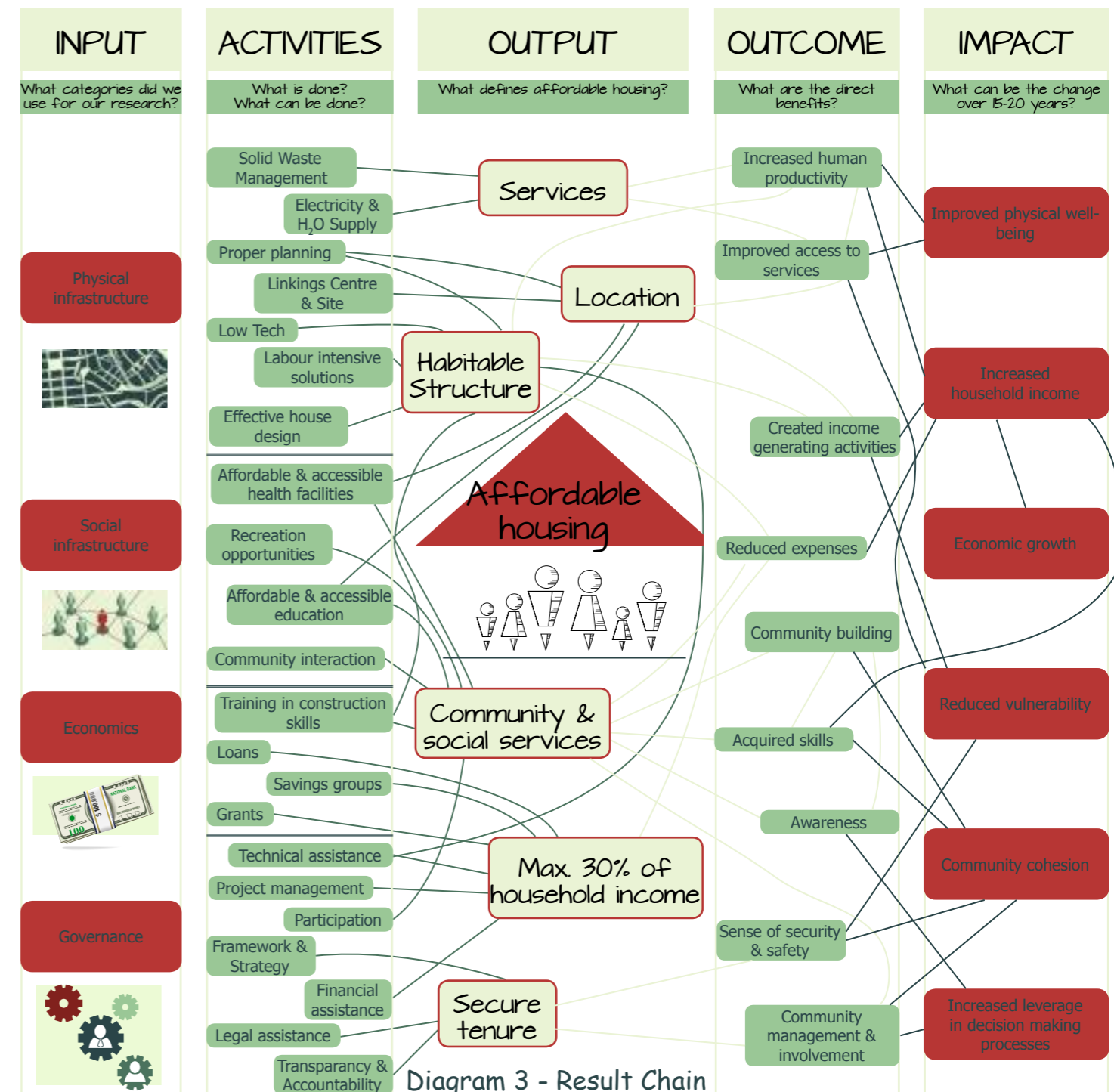
Out of each category, sets of actions or activities were derived. Those activities can be done to work towards affordable housing.

Output

Those activities form the basis of affordable housing. We defined affordable housing by 6 main characteristics. The first one is **access to basic services** like water supply, waste management, electricity etc. An affordable house needs to give an adequate protection against external threats, provide enough space for its inhabitants and needs to be of a proper

5. Scaling up; result chain.

Housing for low income earners is a worldwide issue that goes beyond the boundaries of Jinja. During our assessment on the case studies in Jinja and our research on Kawama, we tried to take a step back from time to time to place our thoughts in a larger context. In an attempt to structure and scale up our findings, we designed a framework on affordable housing based on a result chain.



quality so it is easy and affordable to maintain. All these points fall under **habitable structure**. A house needs to maintain a basic quality level for its users.

The next important feature that defines affordable housing is its **location**. First aspect in location is the physical location, related to geography, soil, climate etc. Next, the location should provide enough opportunities for livelihood and social integration. Shops need enough people passing by and workshops need a good connectivity. Furthermore the proximity and accessibility of schools, hospitals, shops, religious centers etc. *is important*. Although a mix of uses is important, some land uses are incompatible with residential use, for example polluting industry.

The fourth characteristic of affordable housing is the **community and access to social services**. The inhabitants of the housing estate should be part of the community on grassroots level and should feel integrated in the larger community. Education and health services should be easily accessible.

The **relative household expense on housing** is an indicator of the affordability of a house. According to UN-HABITAT¹⁶, a household -regardless of the overall income- shouldn't spend more than 30% of its gross income on housing, in the form of rent or mortgage, to have enough left for food and other necessary expenses. Keeping the monthly housing budget within this limit, can be done by reducing the expenses (e.g. under the form of self construction, efficient house design and material use) or increasing the income.

The last aspect that defines affordable housing is **secure tenure**. The *effective protection by the State against forced eviction*¹⁷ leads to self esteem and human dignity. This will give the inhabitants the urge to take responsibility and get involved, what will lead to better maintained houses, investments and savings and

involvement.

Outcome

Affordable housing as defined by the six features above, has many benefits for its inhabitants. They are closely connected, as shown in the diagram.

Better living conditions will lead to **increased human productivity**. This, together with the improved location will lead to **income generating activities**, as housing can be seen as an income generating asset. **A sense of safety and security** is derived from secure tenure and community integration. By self construction, the inhabitants can **acquire skills** that they can use later on to generate an income. Furthermore by living in and building a community, both **awareness and community involvement and the community management** will increase. An affordable house will furthermore **reduce expenses**, e.g. by reducing costs on maintenance. Finally, by creating housing estates, groups will benefit from **improved access to services**.

IMPACT

The impact are the long term expected changes for direct and indirect beneficiaries. In the affordable housing chain we would say these are the desired effects after 15 to 20 years. One of the first effects will be the **improved physical well-being** of the inhabitants, which will lead to **decreased cost on health services** for the government.¹⁸ The **increased household income** will benefit the **local economy** as well as the residents. **Reduced vulnerability** is another important impact, both against social as physical threats. Next, the **improved community cohesion**, resulting from the community building, management and involvement, will have an impact on the local government. The low income residents will have an **increased leverage in the decision making process**.

¹⁸ Amaral, Herrin, & Balihuta, 2013

¹⁶ UN-HABITAT, 2012

¹⁷ UN-HABITAT, 2012

Fig.12 - Some of the members of the Kawama Savings Group working on site

















Fig.13 - Townplanner of Jinja in front of the 6 constructed housing units in Kawama

6. Recommendations

It is clear that Jinja faces major challenges in addressing accommodation for low income households. The conflicts on Kawama project has caused major delays in the construction process. In this chapter, we formulated some general issues that need to be kept in mind in these type of projects. Furthermore we formulated some recommendations specific for the site and the plans, based on the findings from the result chain.

General recommendations

National subsidies are essential  They can come under the form of land or financial support on a demand driven base.	Services & infrastructure need to be designed to  Electricity, sanitation, roads, water, schools and health centers	Water should be a resource, not a hazard  Rainwater can be used to harvest or for irrigation
People need to own their house and the land  <i>When it's their private property, they want to take care of it..</i> M.T. Diniz (Informal Toolbox)	Let people participate in the design of public space  This will lead to higher awareness & commitment	Garbage for life  Waste management can become livelihood
Clear contracts  MoU signed before anything starts Documented secure tenure → human dignity	Housing doesn't stop when it's built  Lack of maintenance and management can put the project to risk	Grow local  On site, small scale agriculture can lead to a diversity of crops and provide jobs and income
Open knowledge  Access to information can lead to selbuild and can stimulate initiative	Collect information  Good planning requires accurate information on the site (boundaries, topology,...)	Importance of location  Location defines market opportunities. Transportation means & proximity to services, jobs and shops.

Training in construction skills

When the residents are trained, the skills could be used for cutting down project costs and increasing their livelihood opportunities. Following are few recommendations to achieve it

- Once trained, They should be registered in the municipality as trained labor to provide recognition to their skills and make it easier for them to find jobs. These trained labor should be employed in different construction projects later. The government contracts should mention in their tenders that at least 10% of these trained labor SHOULD be employed in any project. This will ensure a basic level of employment to the trained labor¹⁹
- If they don't have good scope in private market they should be engaged in other government housing projects.
- The knowledge of construction can be exchanged between communities and innovative ideas can be discussed using experiences. This way time and money would be saved on the part of JMC.(reference)
- If women are not seen as construction labor then they should at least be allowed to supervise construction (good example-DANIDA project).

Critique on the siteplan

The plan is made according to 'zones' (commercial zone, residential zone etc) and is not according to the choices of the people, whether they want those 'zones' or just do things where they want. This can be degrading for the project as it also doesn't allow for common spaces or public spaces.

The existing site plan of Kawama is very rigid. Besides technical problems, even a visual impression of it suggests monotony and congested buildings. It is repetitive in nature.

It doesn't seem to cater to the needs of a mixed population (of different ages, income etc). There are proposed high rise buildings, which may be difficult for aged people to deal with.

There is no scope for incremental housing.

There is same kind of house design for ALL households, not matter what their household size or income level is.

Sanitation services are not spread evenly on site.

In general the site plan doesn't respect the dignity of inhabitants and doesn't allow for efficient use of plots. At least 30% of the site should be reserved for open spaces (includes roads, open spaces, electric poles, roadside plantation etc)

There has been no consideration of slope in the plan. This may lead to drainage problems later, which will require investments on the part of JMC.

Fig.14 - Original Kawama siteplan
Source: ACTogether

We would have recommended a more detailed site plan if we had topographical details, ownership details, exact boundaries and exact dimensions of the site (even the North of the map is different in different maps...)

Solid waste

Priority points for waste disposal

Desirable for inhabitants' convenience

ideal movement path for waste truck

Water

Priority points

Desired for equal access to water for the whole site*

*Walkable distance = 30m approx.

Priority points for different services are kept close together to provide easy access and to serve as a community center.

Fig.15 - Recommendations for Kawama siteplan

Waste management: Waste for life

In Jinja only 12% of the solid waste is collected.²⁰ For Kawama, JMC originally provided a container for waste disposal. This container was later removed and the Community was forced to start their own composting project.²¹ Currently they are dumping the garbage on site.²² People can turn this problem into an opportunity, as the waste can be collected and some of it can be used to generate livelihood. There are different options. here are some examples.

Charcoal

Communities in Kisenyi, Kivulu and other settlements in Kampala are making Biomass briquettes out of banana peels. This is a rather easy process that can generate an income. *These briquettes can replace fossil fuels, charcoal and firewood for domestic and institutional cooking and industrial heating process.*²³

Biogas toilets and composting

For Kawama there could be a local system to make use of human waste. Human waste can be composted into fertilizer or used to produce biogas for electricity. The process is explained in the sanitation chapter.

This way they become less dependant on JMC for those services.



Fig.16- Making biomass briquettes

Water shed

A watershed is the area of land where all of the water that is under it or drains off of it goes into the same place.²⁴ The site is perfect for a watershed. It is downward sloping with a hill nearby thus forming a perfect watershed. This feature could be used for the good for increasing the groundwater table, so that water is available for people all through the year and with a scope for farming, which the residents already seem to be interested in. The following can be done for watershed development-

- Constructing a low cost road which allows for water infiltration: The soil in Kawama is fertile but allows for less infiltration. Hence a low cost road, made up out of 35 cm of compacted granular sub base will prevent storm water from running off. If not the roads inside the site, at least the approach road should be made like this as that road is almost perpendicular to the flow of water from the nearby hill and will help in preventing water run offs.
- Planting crops along the road and plots: This will help achieve soil stability and the plants will help in holding water and its infiltration.²⁵ This feature of watershed can also contribute to generate income. They can choose the place for cropping at their own convenience, and everyone can have it closer to their own houses.
- Innovative Low cost rain water harvesting systems can be integrated by learning from the success stories in Uganda itself.²⁶

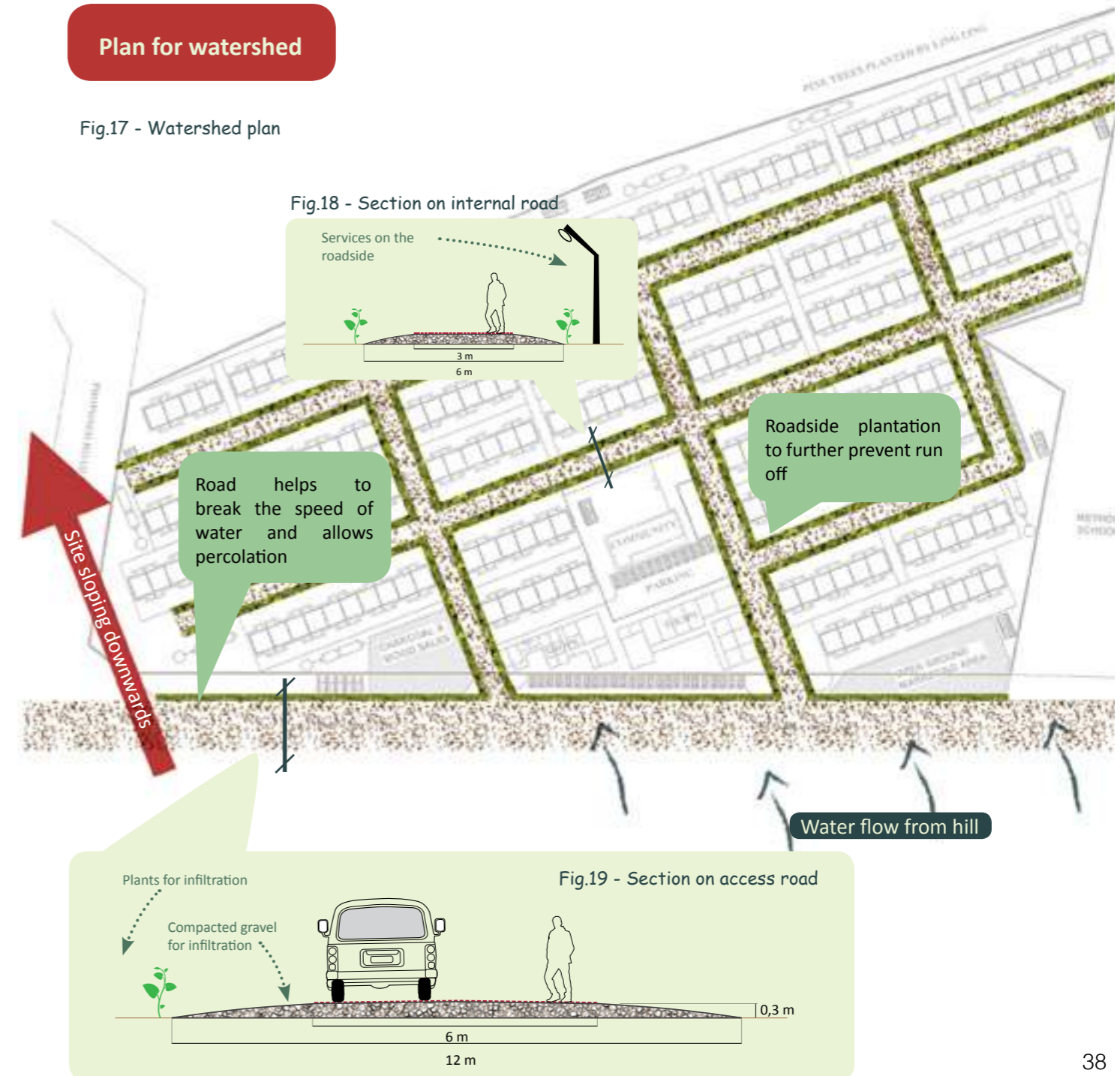
24 What is water shed?, 2012

25 Perez and Tschinkel, 2003.

26 Low cost rainwater Storage System, 2008

Plan for watershed

Fig.17 - Watershed plan



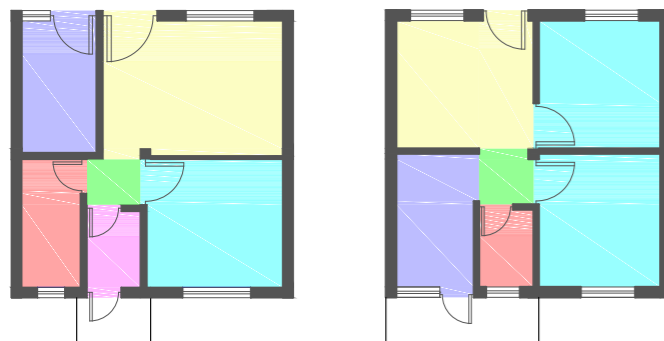


Fig.20a - Existing 1 bedroom unit

Fig.20b - Proposed 2 bedroom unit



Fig.21 - Partially constructed block for the lowest incomes on the Kawama site

Rework of the existing plans

The existing plans are problematic. They are not adapted to the different family types and make inefficient use of space. Although we advise not to go on with the existing plans, we tried to formulate a few comments on the U-shaped block that is currently under construction. Some small adjustments could improve the quality of the units.

On the Kawama Housing Project, one building is under construction for the lowest income group. It has four blocks arranged around a courtyard. Three blocks around the courtyard have been constructed up to sill level of the ground floor. Due to the differences between the Community, ACTogether and the Federation, the construction has been stopped. Now there is no funding from any donor and the Community is trying to construct on their own.

For the lowest income group, the family size varies between 1 and 12 members.²⁷ The residential units designed for this group contain one bedroom only. Irrespective of the size of the family, area and number of rooms in the unit is same. According to UN-HABITAT, a house is considered to provide a sufficient living space for household, if not more than 3 people share the same room.²⁸ Based on this definition, the housing units there cannot provide sufficient living space for some of the families. This results in overcrowding. The house design should vary according to the size of the family. Basically, for maximum occupancy and minimum area (to keep the costs limited) two types of housing units, which can fit in the existing structure are proposed.

- 1 bedroom units: for families with up to 6 members
- 2 bedroom units: for families with 6-12 members

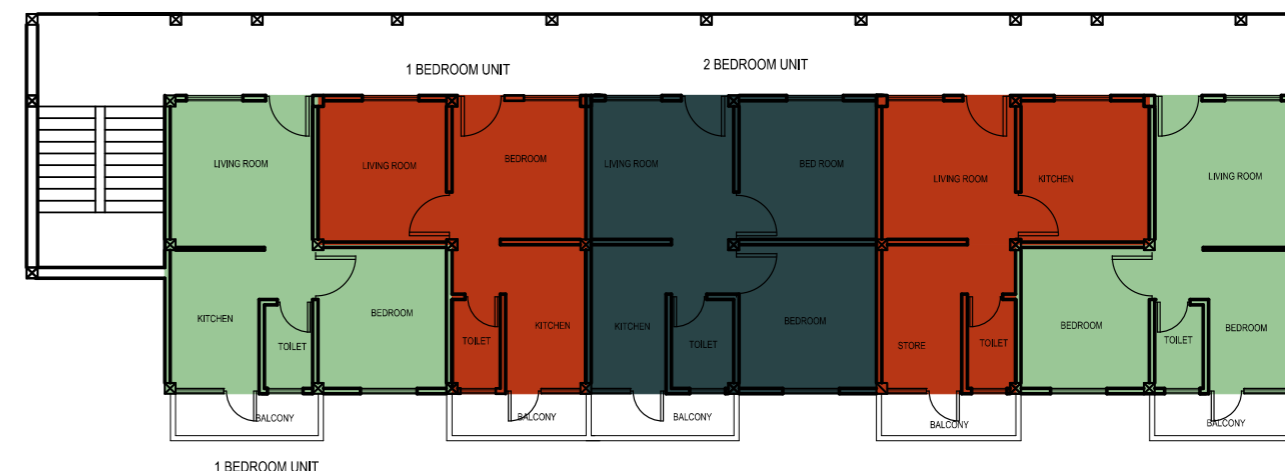
But increasing the number of rooms in a unit does not necessarily mean increasing total floor area, hence the cost. With the same area, the plans can be reworked to accommodate more rooms without losing quality of space.

The area designated for a 1 bedroom unit can be reworked to accommodate 2 bedrooms

²⁷ Sharp, 2013, p. 12

²⁸ UN-HABITAT, 2012, p.19

Fig.22 - A combination of 1 bedroom unit and 2 bedroom units can be achieved.



This way it is possible to accommodate 4 more families in the same floor area. This will help to bring down the cost per household and accommodate more families on the site.

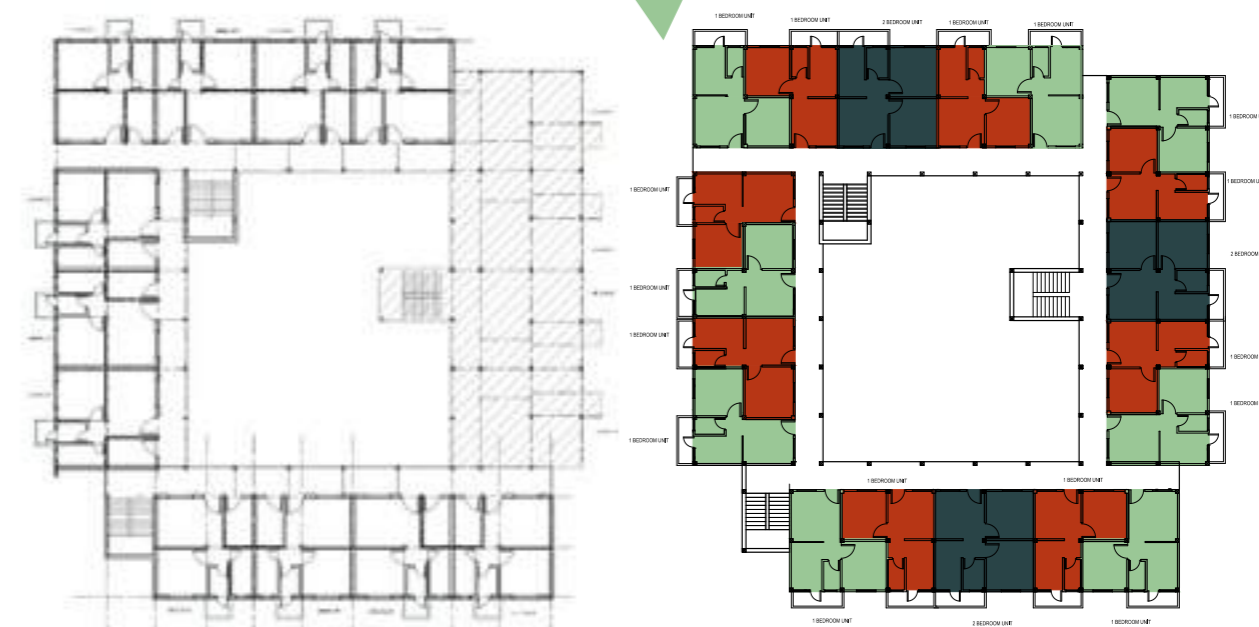


Fig.23a - Floor plan in existing design

Fig.23b - Floor plan in proposed design

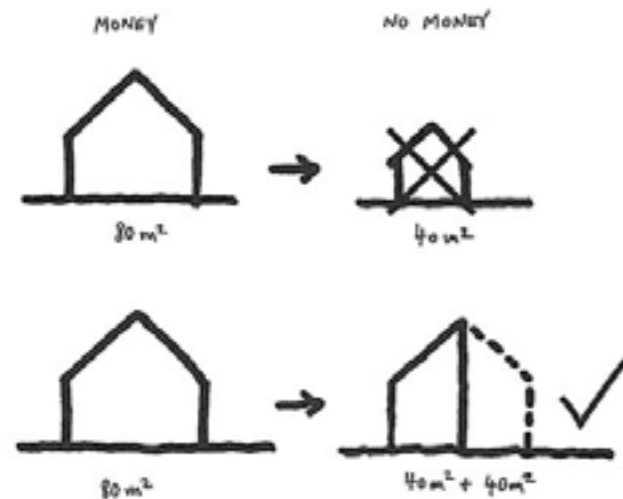


Fig.24 - "Half a good house ≠ one small house".
Source: Elemental, Incremental housing and participatory Design Manual

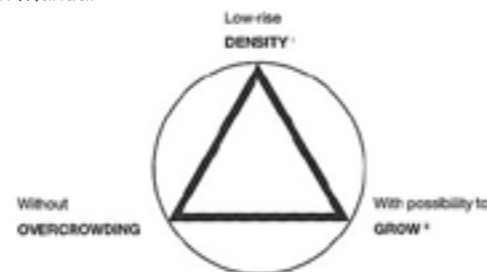


Fig.25 - Equation on social housing
Source: Idem

Incremental housing

The Chile based Do-tank Elemental did a lot of research in large scale low cost housing. As low income household has no financial capital to build a whole qualitative house from scratch, the idea of incremental housing is to build the elementary basis with subsidies. The rest of the construction is left unfinished (but framed) for later times, when money for materials is present. The Elemental projects formed an inspiration for this recommendation.

The first 6 units building on Kawama site has not achieved expansion as it was intended to do. On the ground floor the extension of the units is finished on both sides, but the problem is that the second floor has to wait for the first floor to finish before they can start expanding. This problem has occurred because the design in the first place did not allow for individual

Elemental: *It is not that a poor family has no income; they do not have a regular income, rendering the mortgage impossible no matter how low the interest.*

growth of the building. Studying the case of social housing in Masese showed that the original houses had no provisions for extension when the number of family members increased. People added rooms to their houses in an haphazard way.²⁹ Considering these problems, we propose to introduce incremental housing, and state that half a good house is not equal to one small house, as shown in the illustrations.³⁰ Incremental housing means to allow and design for self construction and give households the opportunity to improve and extend their house based on income and affordability. Figure 25 shows what needs to be done to reach quality social housing³¹ (low rise density - without overcrowding and with possibility to grow)

With leaving space for incremental housing, you will allow people to find their own solutions to their challenges. Instead of giving them a finished house you give them a responsibility to create their own home. ...*(People) will invent ways of working as they go, not always safely and not always fairly, but tailor-made to needs, income and even sometimes aspirations.*³²

29 Based on interview and Observations in Masese
30 Aravena & Lacobeli, 2012, pp. 16-17
31 Aravena & Lacobeli, 2012, p. 20
32 Hamdi, 2010, p.144

For incremental housing in Kawama we focus on the following

- Housing typologies that leave half of the house for the members to complete themselves. When the first phase of the construction is finished, the empty space that is left, is designed in a way that is intuitive, easy and cheap to transform into a complete house.
- The first phase should contain the most difficult part of the house. This means that professionals should supervise the construction of bathrooms and kitchen in this phase.³³
- One of the challenges with incremental housing is the uncertain quality of the self constructed part of the building. One way to prevent this, is to define the initial structure of the extension to be framed and controlled.

33 Aravena & Lacobeli, 2012, p. 496

When designing specific areas in the construction to increment, this can be easy, cheap and safe. At the same time the design allows for different choices of materials, colors and texture.³⁴

-The members need sufficient place to develop communitarian association beyond the nuclear family. The households should be organized in more defined clusters than the existing site plan. This allows for a hierarchy of public space.³⁵

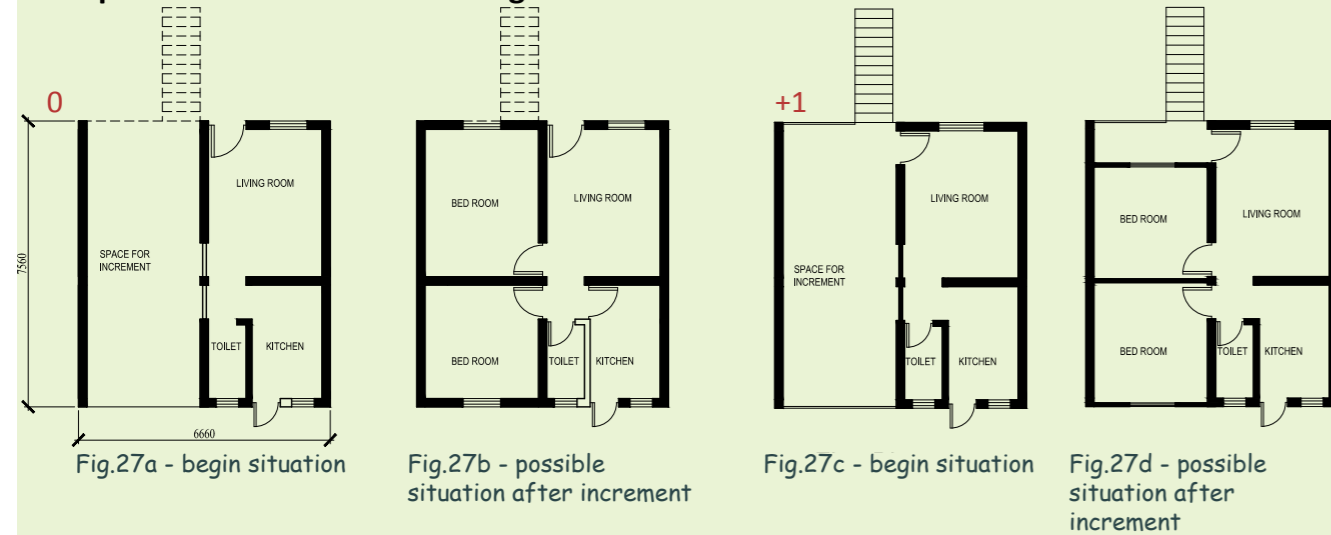
-The units should be restricted to two floorsmaximum. Use of load bearing walls instead of a framed structure are sufficient and cheaper. Internal walls can be made lighter.³⁶

34 Aravena & Lacobeli, 2012, pp. 70-71,103-104
35 Aravena & Lacobeli, 2012, p. 107
36 UN-HABITAT 2009

Fig.26 - The 6 unit building is not designed for increment



Proposal for incremental housing in Kawama



As shown in figures 27 & 28, we propose that kitchen, bathroom and a living room are implemented in the first phase of the construction. The space for increment can be extended into additional bedrooms in the second phase. By using the loadbearing structures from the first phase, this can be easy and cheap. The structure exist of two units on top of each other. The units can both extend horizontally but independent of each other, as the slabs are constructed in the first phase. The staircases, entering from outside the structure, will save space and give people more freedom to design the extension.

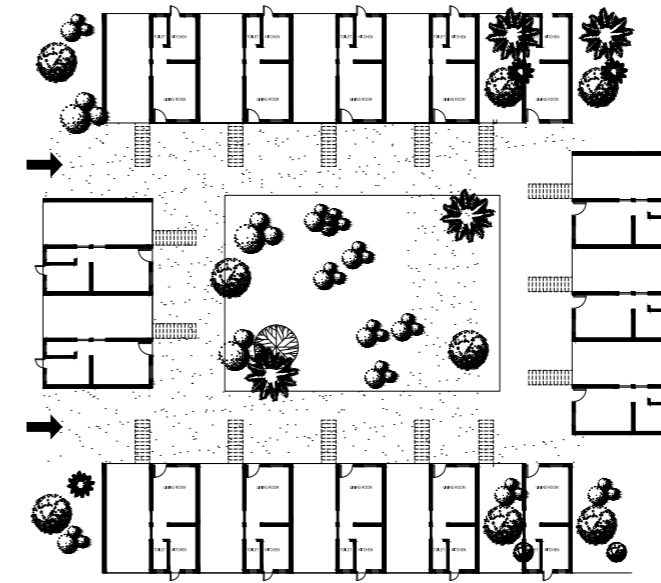
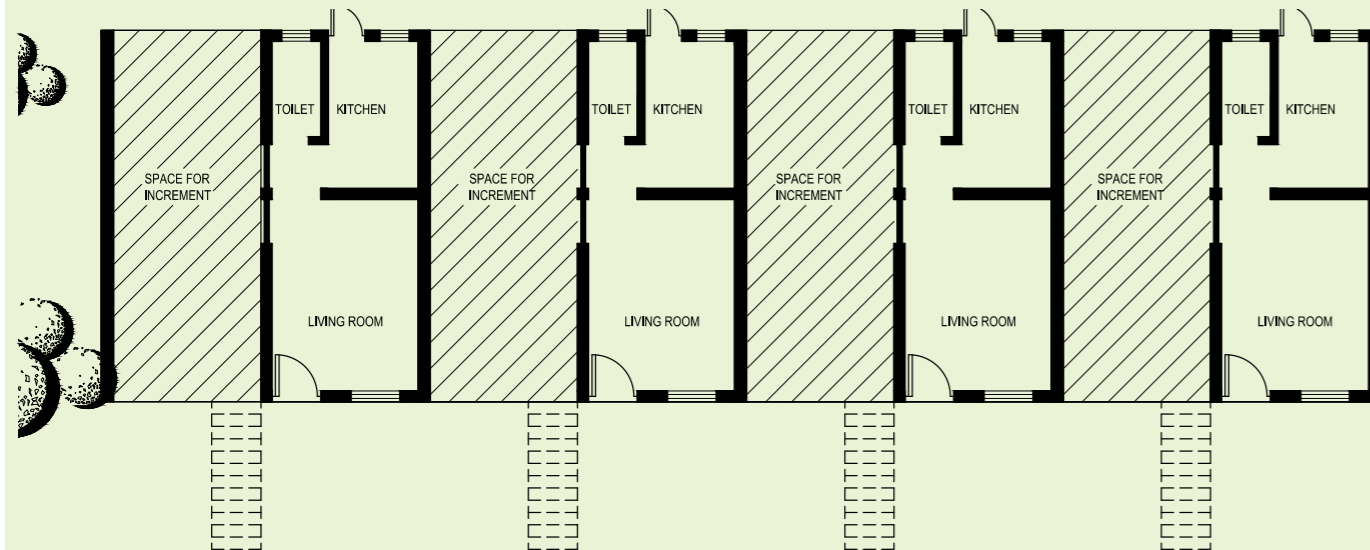


Fig.29 - Cluster of houses in proposed incremental housing

Fig.30 - Sketch showing possible incremented parts of the houses in the future



Fig.31 - Sketch showing cluster around common courtyard with possible increments



Fig.32 - Squatted house in Jinja



Fig.33- Abandoned house in Jinja



Fig.34 - Hotel Rippon
Picture by Marcin Sliwa

7. Alternative options on housing

According to Jinja's Municipality Structure Plan 2009-2014, 80% of its population lives in poverty. As the housing deficit for low incomes in Jinja is high, other options to face this challenge should be examined. this chapter proposes some alternative wayS of thinking to face the issue of housing for less economically stable households.

Use of existing buildings

Jinja's rich Indian past left the municipality with an extensive Indian architectural heritage in the form of large estates. After the expulsion of the Asians in 1972, many of those manors, often with high architectural detailing, were left by their residents. When the expulsion was brought to an end by Yoweri Museveni, just a small portion of Indians came back and a slightly larger amount reclaimed their properties.³⁷ Currently around 1 000 of these properties in Jinja Municipality remain unclaimed and are under hold of DAPCB.³⁸ Most of these estates, some squatted, suffer from the lack of maintenance, leaving only a memory of fading glory.

While the need for affordable, qualitative housing is pressing, those estates remain unused in this matter, although they are in favourable locations and enjoy access to existing infrastructure. The adaptive reuse of those buildings could deliver mixed-tenure affordable (rental) housing for both low and middle incomes.³⁹ The mixed tenure would make it attractive for private investors, while still meeting the housing need for the most vulnerable group. Furthermore the renewal would trigger for further regeneration of the surrounding estates and the urban development of the town. Additionally, the large plots could provide for livelihood opportunities, in the form of shops or workshops.

To make this regeneration process succesful, a study on the potential of the specific buildings should be conducted, as some of the buildings might not be suitable for residential use. Furthermore the management of the project is crucial for succes. This

³⁷ Swamy, 2007

³⁸ JMC Structure Plan 2009-2019, 2009

³⁹ As done in Johannesburg, South Africa by the Johannesburg Housing Company which housed almost 3 000 families in 24 abandoned buildings since 1995. Johannesburg Housing Company

requires the establishment of a public housing agency.

Densification

The low rise developments around the periphery of Jinja is threatening the use of agricultural land for housing developments. It is also increasing the cost of infrastructure provisions. These housing developments are increasing the travel distance to the town center and travel costs for the residents.

Density is no doubt one of the key factors that determines the cost of a housing development. High density housing development is necessary for efficient and sustainable use of expensive land. High density also helps to reduce the cost of a housing unit considerably by lowering the cost of installation of services and infrastructure. Densification does not necessarily mean accommodating everyone in high rise. Different forms and variety of high density should be worked out so that there are choices for people of all income groups in the city. *Residential density is far from being exclusively synonymous for tower housing! While ensuring an appropriate level of density, combinations of row houses, duplex and triplex can help create sustainable living environments, pleasant and diverse*⁴⁰

High Rise buildings

Multi story construction is often an obvious choice to achieve high density, though it isn't always the best option. It can be a good solution where land is scarce and expensive. Apart from the need of technical specialization and high cost, it does not properly cater to the need of provision of incremental housing, which is often a main feature of low cost housing. People living in high rise cannot add rooms when their families grow. They are not connected to streets hence have less employment opportunities. The community

⁴⁰ Beyond negative perceptions, density: efficient and pleasant

feeling is often absent due to a lack of public spaces for social interactions. Furthermore the operational and maintenance costs are high and the public spaces in these building are often overlooked. Another important aspect of a house is that every house owner wants to express his individuality, which is often not possible in high rise building.

High rise is not the only way to achieve high density. In Kawama, as the site is already located outside the city center and the land was supplied by JMC, choosing high-rise high density may not be the best option as it will only increase costs. Considering the social background and the financial constraints, low rise high density developments would be a better choice. It not only brings the cost of the units down but the concept of incremental housing can also be properly implemented.

Location

For low income earners the cost of the house itself is not the only important factor, location is equally important. Better located land is more expensive and for low income earners this makes housing a challenge. Displacing them to municipality's outskirts to compensate the cost of land is not a good solution, as this increases cost on the long run. Displacing those communities to the outskirts should be counteracted by allowing people to build incrementally.

Elemental: *The detached house typology may be acceptable for middle and upper class families who can compensate for the distance with speed (with cars and toll ways). Yet for poor families, this only means displacement from opportunities.*



Better connections to jobs and centers help increase livelihoods. By focusing on density and incremental housing, the settlements can be located closer to the city center.



Fig.35 - A groupmember explains the proposed changes to the leaders of Kawama

8. Conclusion & Way Forward

Kawama literally means a plant that grows by itself. The Housing scheme was named after it, hoping that it will grow and expand on its own. However, the reality is different and what was supposed to be a model project in Jinja is now stuck due to conflicts between Community, ACTogether and Federation. We had the chance to be involved in the real project and understand on the ground issues of a housing for low income earners. We tried to hear different perspectives from different actors and analyze them.

A project meant for providing shelter to so many people should not remain idle for too long. We felt that JMC should take a leading role in this project. In a project of such significance, all oral agreements should have been well documented. The way the project was managed, the role of ACTogether is questionable. Some questions are bound to arise- Why did the Federation and ACTogether start the construction when the Savings Group did not even have the legal ownership of land? Why is there no written agreement between the owners and federation/ACTogether? On what basis are they going to pay back their loan? These lapses in project management are raising the questions of accountability.

The way forward is to make an agreement on the number of beneficiaries, to sort out the land issues, identify the

role of each stakeholder and make all the transactions in the project transparent. The stakeholders have now realized their mistakes and they had a meeting initiated by the town clerk to resolve the issues. As students, we could only “hope” that things will be sorted out. We took our chances to propose changes for betterment. We presented our proposals to the community leaders regarding the changes that can make the existing structures better. They appreciated it and may implement it after consultation with the community.

Reflection

We encountered some difficulties while working in the field, which sometimes created a problem in carrying out our research the way we expected it to go about. Firstly, it was difficult when we did not have a Ugandan in our group and we didn’t know the local language. Consequently we always used a mediator/translator who was usually a community leader or an official which created a barrier between us and the community members. We felt that the people we interviewed did not give us critical information due to the leaders’ presence. Though it was later compensated by having the field supervisor, Peter Kasaija with us, as he was able to communicate better with the locals and make them understand our perspective in a better way.

We were greeted in different ways by different people. Female group members were sometimes not taken seriously by men on field and were hence given less importance while giving out information. This could be because of prevalent gender bias in the country in general. On the other hand, women were more open while talking to the female group members in particular. There were instances when they felt more free to talk about their situation. There have also be incidents where the Asian members were greeted not so warmly by the officials as the Europeans. Such behaviour is understandable as the general relations between

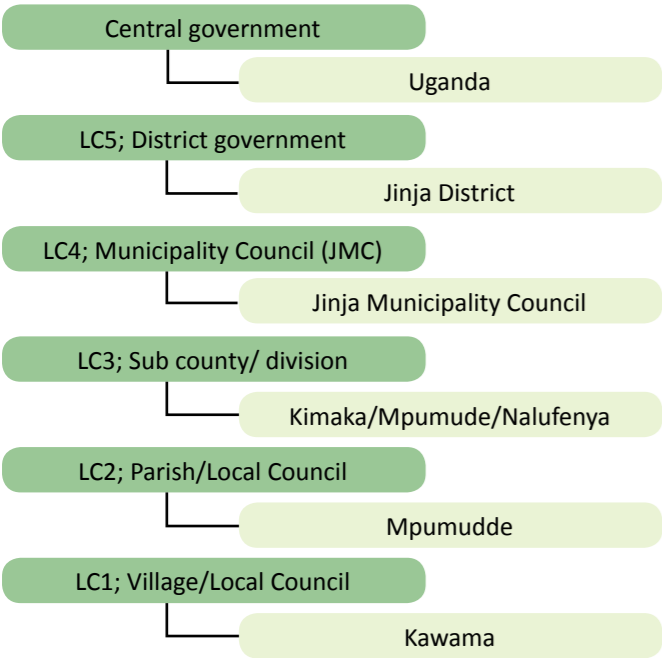
Ugandan and Indian community have not been very good owing to historical reasons.

Sometimes, specially in the beginning, we were carried away by the officials perspectives, because we were more in contact with them than the community members. It took us some time to realise that there was more than one aspect to the stories. This could have had another reason, when we started we were not sure about our objectives and hence got easily carried away with whatever information was provided to us. It was after we developed the framework for affordable housing that we realised what needs to be done and how to go about it. We still feel that there have been many contradictions in the views of all the stakeholders but we somehow interpreted things on the basis of information provided to us.

People in different projects had different kinds of expectations from us. Though our way of working has primarily been research based, communities had high expectations from us. For example people in DANIDA were expecting we could provide them with a market for their bead making and construction skills. As opposed to this, people in Kawama had a more basic expectation of helping the project move forward somehow. From the above it is clear that at least the people know what they want. JMC should acknowledge this fact and provide for flexible plans and designs which allows for people’s requirements and choices to build or live.

Last but not the least, there has been difficulty in getting help from JMC too often because the officials had been busy all the time. Though we really appreciated the way they responded to our work during the presentation in Municipality Chambers at the end of the fieldwork. It gave us a ray of hope that our work might be implemented for the good of the low income communities in Jinja.

Appendix 1: Different levels of goverment



Appendix 2: Laws, policies and standards that effected and effect housing for low income households in Uganda

1964: Town and Country Planning Act (physical planning mainly carried out by the central government through the Town and Country Planning Board while plan implementation was exclusively for local governments.)

1964: Public Health Act (Building standards on health issues like drainage and sanitation)

1975: Land Reform Law

1978: Housing Policy (never implemented)

1986: Draft National Human Settlement Policy

[1993: Decentralisation]

1993: National Shelter strategy

1995: Constitution of the Republic of Uganda (fundamental legal basis of land management and land issues)

1998: Land Act (specifies the modes of ownership, lists the different legally recognized ownership types and specifies the control of land use)

2002: National Planning Authority Act

2008: National Slum upgrading Strategy and Action Plan

2010: Physical Planning Act (provides for the composition, functions and procedure of the physcial planning organs & for the implementation & application through physical development plans) (Town and Country Planning Board got replaced by the National Physical Planning Board)

2011: National Physical Planning Standards and guidelines

2005: DRAFT: National Housing Policy

DRAFT: National Urban Policy Development

SANITATION

JINJA, UGANDA



BACKGROUND

GLOBAL AND NATIONAL SANITATION

Sanitation is a universal problem in the developing South and an essential, fundamental challenge for development. According to the United Nations 2.5 billion people around the world lack access to basic safe sanitation, putting them at risk for waterborne diseases (UN). According to 2012 statistics, approximately 1.5 million people die per year from diseases caused by poor sanitation practices (UN). Basic sanitation is arguably a basic human right and necessity for basic human dignity.

In 2006, only 38 percent of the African population had access to safe, improved sanitation facilities. The remaining use “unsafe” methods including open pit latrines, bucket toilets, open defecation and flying toilets (WHO and UNICEF, 2008). Only 48 percent of Uganda’s population has access to safe, improved sanitation and 18 million people have no access to sanitation services (Water.org, 2013). And many of those with “access” suffer from over-stressed and poorly maintained facilities. It is estimated that Uganda loses 389 billion shillings annually from poor sanitation (Coombes et al., 2012).

The challenge of sanitation is especially dire in light of Uganda’s annual population growth of 3.3 percent (PRB, 2011). Climate change adds an environmental challenge with expected overall reduction in rainfall, but increase in occurrence of droughts and floods (Timbiti, 2013). This both reduces water supply and increases risk of contamination and disease.

DEMAND VS. SUPPLY SIDE SANITATION

The conventional perspective on human urine and feces is that it is useless waste that is dangerous and should be removed from the source. And the conventional solution across the developed and developing world is a centralized supply driven piping network supplied by

waterborne toilets. Centralized systems are challenging, especially in informal settlements, use large amounts of energy and infrastructure, suffer from high leakage and risk of contamination and require technical expertise and oversight (UNESCAP). Waterborne sewerage require a large amount of water and energy to transport a small amount of feces (White). Maintaining a centralized piping network is difficult, time-consuming and expensive. Costs are often transferred to the consumer, burdening the urban poor. Many supply-side systems provide only limited services and fail to respond to needs and demands on the ground (Kar and Chambers, 2008, UNESCAP and Eales et al., 2013).

Centralized systems can be supplemented with small and medium scale demand driven projects to fill in service gaps with cost-effective complements (Eales et al., 2013 and Murray and Ray, 2010). Safe management of human waste close to the source reduces risks and costs and redefines waste as a resource. Decentralized or clustered systems are more flexible to increasing demand with urban and service expansion (White). This means communities can be more involved, creating livelihoods and strengthening a collaborative relationship between the community and government (Pervaiz et al., 2008).

Murray and Ray (2010) argue that unless “back-end” demand is created for products of sanitation (compost, treated wastewater, alternative fuel, etc.), it is difficult to sustain the operation and maintenance of decentralized sanitation projects. Achieving this involves incorporating a new group of stakeholders in the design process and creating incentives. Back-end users in create economic motivation for communities to use new sanitation facilities (Murray and Ray, 2010).

PROBLEM STATEMENT

An enumeration report conducted by ACTogether in Jinja's poor settlements found limited access to water and sanitation. The report concludes that only 18 percent of low income earners have access to a toilet close to their home. While some have shared pit latrines, many use open defecation, hand-dug holes or flying toilets (ACTogether A, 2012).

TSUPU (the Transforming the Settlements of the Urban Poor) is a programme initiated by the Ugandan government and its international partners that aims to promote sustainable urbanization by empowering local governments, increasing community participation and developing a national urban policy. It focuses on secondary cities, including Jinja, and is organized in several funding phases that allocate money to community initiated projects (Keene-Mugerwa, 2011).

In Jinja, TSUPU funding is currently in the second phase where about 13 projects have been prioritized. Funding originates from the World Bank and passes through the national ministries of Finance and Urban Development to the Jinja Municipality. The Jinja Municipal Development Forum then reviews and prioritizes proposals written by community savings groups. Secured, public land ownership is considered a requirement for prioritized projects (Umar, 2013).

Four of the prioritized projects are sanitation units in: Walukuba West Market, Walukuba East Market, Kimaka Market and the city centre. A sanitation unit in Loco Housing Estate was originally prioritized but later removed because of unclear land ownership.

OBJECTIVES

We are a group of three Masters students, two architects and one engineer, working with ACTogether and NSDFU on sanitation in Jinja. We were given a number of assignments from ACTogether that we have revised based on our observations and interactions with Federation members in Jinja to the following objectives:

- critically analyze existing sanitation practices and policies in Jinja settlements
- critically analyze constructed toilet units in Jinja
- develop criteria through which to evaluate success of sanitation projects
- propose urban and policy-level modifications to sanitation in Jinja
- propose and compare options for alternative toilet technologies appropriate for the TSUPU sites
- propose management and business plans appropriate for the TSUPU sites

This report is formulated for ACTogether, NSDFU, Jinja Municipality and community leaders interested in initiating sanitation projects. The report is supplemented by a toolkit of sanitation unit options created in collaboration with a student group working in Kampala, a comprehensive cost analysis and detailed design options for the sites in Jinja. Designs and costs were presented to the Municipality, NSDFU members and the TSUPU Engineer before we left Uganda.

In this report there is a critical analysis and outsiders' reflection on sanitation in Jinja. We present our subjective thoughts and suggestions for alternative ways forward, but by no means present a single final solution. It is our hope that the reflections and ideas included here can motivate and inspire changes to the ongoing process of development in Jinja that can be carried forward by the appropriate stakeholders.



METHODOLOGY

We have begun our process by understanding and analysing the existing sanitation situation in Jinja, based on visits to existing sanitation units and meetings with relevant stakeholders in the community and JMC. We have visited three existing sanitation projects constructed by the NSDFU: Rubaga, Masese and Ripon. Additional site visits were made to NGO projects in Loco Housing Estate (VIP) and Kisima Island (Ecosan toilet). Site visits were organized and led by NSDFU members and included discussions with toilet caretakers and savings' groups.

Analysis of these visits and meetings informed the creation of a list of criteria for the implementation of sanitation projects that all must be met for long-term success. These criteria drive the following site-specific design and maintenance recommendations included in the second half of the report. Design recommendations are also informed by questionnaires and discussions with residents or market vendors in: Loco Housing Estate, West Walukuba Market, East Walukuba Market and Kimaka Market. These gave us insight into the existing challenges, needs and wishes. Site visits and NWSC maps provide information on existing infrastructure for each site.

Case studies of existing projects are supported with a city-level analysis of the sanitation agenda and process, based on literature research and meetings with municipal officials. Analysis is paired with city-level recommendations for supplementing the existing centralized system with decentralized and clustered waste collection and treatments.



EXISTING PROJECTS

RUBAGA MARKET

Rubaga is a residential market in Jinja with over 1500 people. The original toilet was not functional and poorly maintained. With a loan from SDI, NSDFU built a new public toilet on the same site.

The new toilet was designed and built with community contracting, supervised by an engineer from ACTogether Uganda. The two-story design incorporated waterborne toilets connected to a septic tank, showers and water vending with an upstairs community hall. A new method of precast ceiling panels was successfully implemented to reduce project costs. The construction cost of 47 million shillings was one million less than expected.

Community contracting and the community hall created a strong sense of shared ownership and pride. Toilet maintenance is conducted by a salaried caretaker and overseen by NSDFU. Users pay per visit or buy a monthly user card. However, toilet use and profits are less than expected, significantly lengthening the expected 8-year payback period and incurring higher loan fees. The incorporation of other functions has significantly contributed to profitability: 36 percent of average monthly profits come from selling water and seven percent from the community hall (NSDFU B, 2013).

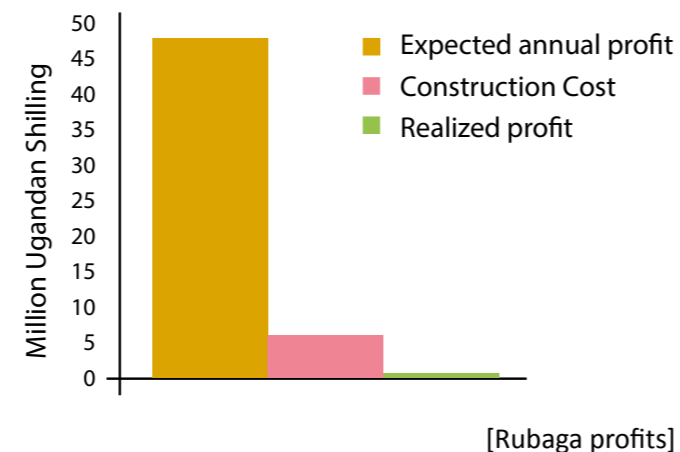
A survey conducted to understand the low usage found that cultural issues and use of incomplete building in the area as free “toilets” discourage people from paying for the sanitation unit (ACTogether B, 2012). Plans to officially close down the previous, run-down toilets and to make use of incomplete buildings illegal is expected to help (ACTogether B, 2012). Sensitization is also critically needed (ACTogether B, 2012).

MASESE LANDING SITE

Masese is one of Jinja’s largest settlements with more than 5000 inhabitants. A toilet project was initiated because of poor existing sanitation and risk of eviction: 80 percent of residents have no access to water and 75 percent no access to toilets (ACTogether A, 2012).

The resulting sanitation unit was constructed with municipal contracting for 50 million shillings on publically owned land across the street from the settlement (Umar, 2013). It was intended to serve both residents and fisherman coming to the lower landing site who previously practiced open defecation in Lake Victoria. The unit consists of waterborne toilets and showers with a septic tank.

As with Rubaga, toilet maintenance is managed by a caretaker and overseen by NSDFU, with users paying a small fee per use. However, use is low, largely because of poor location across a major road. There was also ineffective sensitization to address the health risks of flying toilets and pit latrines commonly used in Masese and open defecation practiced by fishermen. NSDFU hopes that continued sensitization will increase users (Umar, 2013).



RIPON

In Ripon, the original dysfunctional toilet was replaced with a new waterborne toilet after the savings’ group appealed to the MDF. The new toilet has six toilet stances, one handicapped toilet and two showers.

The design is similar to Masese, but cost an additional 5 million shillings due to unforeseen problems with the water table (Umar, 2013). The extra costs and a discrepancy of 17 million UGS between the community (28 million UGS) and municipal bid (45 million UGS) created mistrust and resentment. And still the community suffers from poor septic tank functionality. There is a caretaker, but no system of record keeping.

Repetition from Masese shows little consideration for the site-specific context in Ripon and a lack of pre-construction surveying shows lack of responsibility. This also highlights the need for an external consultant or advisor to support the PMC, who was unable to have their concerns validated.

There are additional common faults between the three projects. In all, unit costs vary significantly from the community proposals to the municipal bills of quantities, but also between the final bills of quantities for Rubaga and Masese (NSDFU A, 2013 and Jinja Municipality, 2012). Many materials chosen by the municipal engineer in these three projects are expensive and imported and not realistic for poor settlements. This requires expensive security gates to prevent residents from stealing costly items inside. And although handicapped toilets are included in response to demands from the disabled lobby, in all cases they are only used as storage space. And the little, if any, evaluation of the Rubaga or Masese toilets was not used in the designing of the later constructed Ripon.



[Rubaga sanitation]



[Masese sanitation]



[Ripon sanitation]

NGO PROJECTS

VIP IN LOCO

The Loco housing estate was originally constructed by the Ugandan Railroad Corporation in the 1950s. Over the years a mix of residents have moved in and found work in the neighbouring tanning factory, small-scale vending and fishing. The estate consists of ten residential blocks and houses over 1,000 residents. The residents are organized with a local savings group, block leaders and chairman.

The original estate had waterborne toilets connected to the municipal sewer line. However, influx of residents and deterioration of old toilets has created a shortage of facilities. In response, an NGO has built a VIP with five stances near the Chairman's block. Each block is assigned one locked toilet and residents have established a shared system for cleaning and maintenance that has been sustained since project construction about one year ago. The pit fills in about a year and the community has successfully managed to collect the 800,000 shillings required to pay an external company to empty the pit (Loco Chairman, 2013).

The success of this project is rooted in the appropriate location, scale and technology for the physical and social context. It represents a modest improvement in facilities that matches the living standards of residents, while still ensuring environmental and ecosystem safety. Because the design was conservative it was easily subsidized and minimal running costs can be sustained by occupants through a system of gradual and collective savings. Supervision by block leaders and communal sense of ownership ensures sustained cleanliness. This project shows a successful collaboration between an NGO and community.

ECOSAN TOILET ON KISEMA ISLAND

Kisema is one of three Jinja islands in Lake Victoria and home to about 1600 inhabitants. Six years ago, two NGOs collaborated on a sanitation project that included an ecosan toilet, a comprehensive sensitization and training programme and purchased agricultural land on which to reuse toilet waste as compost. The project is still functional today and has successfully bridged the cultural challenges to waste separation and reuse. There is a strong sense of shared ownership and the community contributes monthly to the toilet upkeep (Kisima caretaker, 2013).

However, despite willingness and desire to use the toilet, use has fallen in recent years because of a lack of funds for basic building repairs. The building is currently suffering from a broken door and roof and corroded pit covers. Also, despite interest in reusing the waste, the community is currently only dumping the waste uphill from the Lake, because of improper training in how to reuse waste for agriculture. Furthermore, a lack of evaluation from the implementing agencies prevents response to these problems. These problems have also created a misinformed stereotype of ecosan toilets across Jinja. Ironically, this has prevented the scaling of a successful technology in contrast to the NSDFU toilet in Masese that has been replicated in Ripon despite fundamental faults in Masese. Overall, the Kisima project speaks to the need for approaching sanitation projects holistically and addressing the entire life-cycle of sanitation in addition to the need for basic long-term financial planning. The need for agricultural waste reuse training also suggests that an expert consultant could be helpful during the running phase to fill in gaps missed during implementation.



[each stance is allocated to a housing unit]



[LOCO sanitation]



[drainage]



[water harvesting]



[ecosan Kisima]

CRITERIA

INTRODUCTION

The following criteria are essential components of a sanitation project that must all be considered for sustained, long-term success. The failures of the case study projects can all be attributed to a failure to consider one or more of the following criteria.

LOCATION AND SCALE

Sanitation units should be scaled and located to encourage ownership and use. It is necessary to find a balance between large, centralized units and accessible smaller units (Eales et al., 2013). The community should be included in these decisions through participatory design methods. Günther et al. (2012) concluded from a study in Kampala that no more than four families should share residential toilets to ensure cleanliness. This supports requests from Loco residents in Jinja.

Location should be chosen for proximity, safety and security especially at night and in poor weather, handicapped accessibility and truck access to empty the pit or tank. To prevent smell, toilets should be separate and downwind from residences. Land ownership, soil conditions, water table, and water and sewerage lines should all be considered.

APPROPRIATE TECHNOLOGY

Cultural challenges to technology must be acknowledged and handled (Eales et al., 2013). While bridging culture is very possible, appropriate training and sensitization are essential. Technology should also be chosen for the environmental conditions (eg. high water table) and space limitations of the site. Long-term costs and potential profits should be seriously considered when choosing technology.

ECONOMY

Because of limited funding and loan fees, initial construction and long-term maintenance costs must be minimized (Günther et al., 2012). A management committee and plan should be established to determine how long-term costs are managed, who is responsible for which cost and how profits are divided. Running costs should be covered by toilet profits or community savings and external funds used only to subsidize construction and implementation (UNESCAP, 2005). Long-term financial planning should be regularly evaluated and modified to sustain profitability. Toilet profits can be expanded by increasing the functionality of the sanitation unit (UNESCAP).

Initial design and choice of technology should consider running costs and construction costs may be valid if they reduce running costs. Community contracting, done correctly, is also a useful way of reducing costs. The initial design should be developed creatively with an efficient floor plan to reduce materials, placement of the septic tank or pit under the superstructure to co-function as a foundation, etc. Materials should be chosen based on long-term durability, function and cost and alternative materials such as interlocking brick explored.

OWNERSHIP

Creating and maintaining a sense of local ownership encourages proper and continued maintenance (Pervaiz et al., 2013). We have observed that communities involved in planning, financing, implementation and maintenance tend to take better care of toilets compared to toilets financed and planned by external parties. Where there is a strong social structure and available supervision, community contracting is a way to build a sense of ownership (Günther et al., 2012).

SECURITY

Protection from vandalism and stealing is a risk, especially with high-cost technology and materials. This is solved by security gates or padlocks on small-scale latrines, increasing costs. Creative floor layout can reduce the number of gates needed, but a more holistic solution replaces expensive materials with practical cost-effective alternatives.

HEALTH AND AWARENESS

Improper use of sanitation facilities risks further endangering public health. It is essential that the community and caretaker are properly trained to use the toilet and that an expert is available for consultation if needed during the maintenance phase of the project. Basic sanitation and hygiene sensitization should be incorporated with all toilet projects to improve general practices and encourage residents to use and pay for safe toilets.

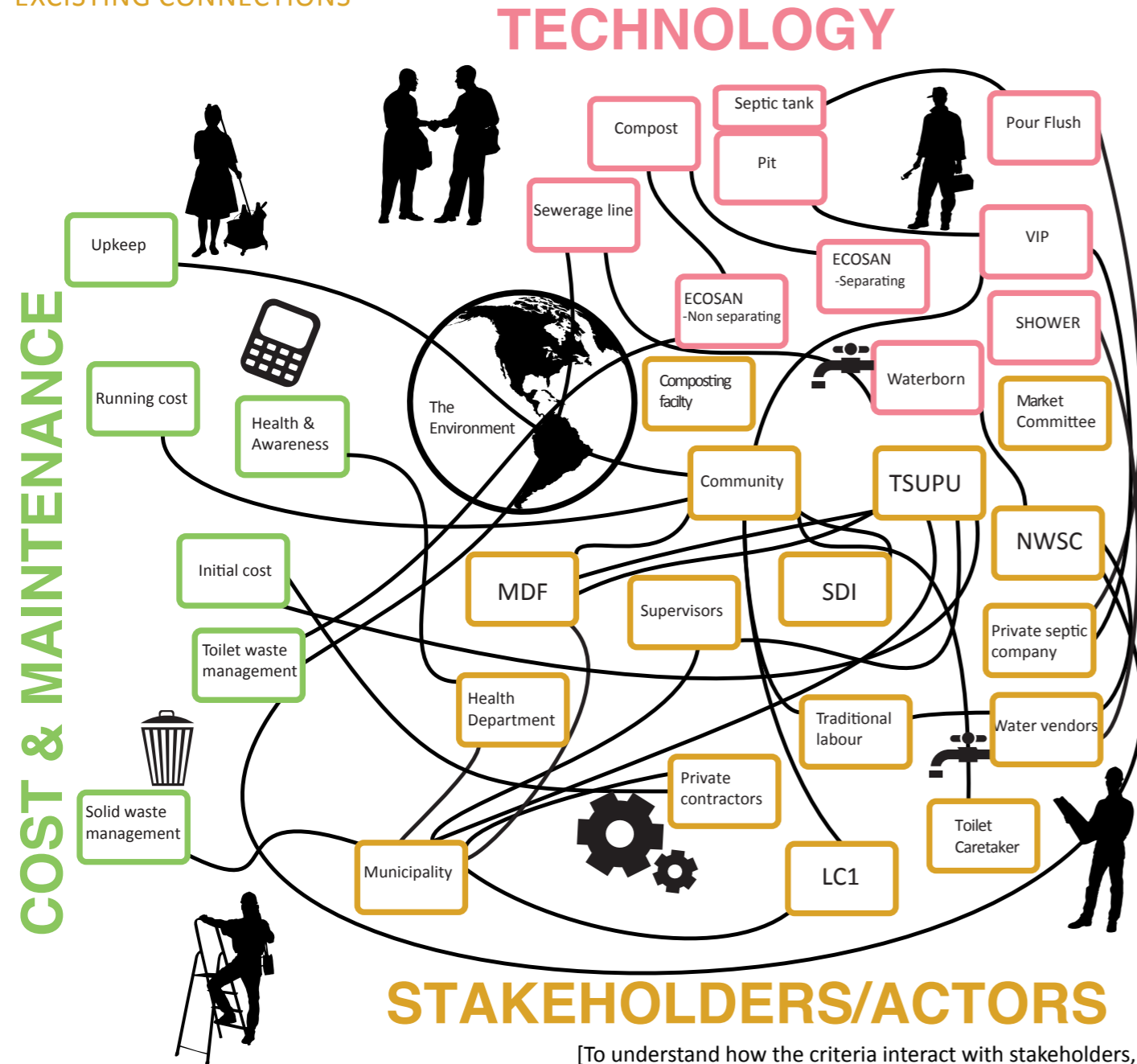
STAKEHOLDERS & PARTNERSHIPS

Implementation needs a network of partnerships and relevant stakeholders to initiate projects and provide support for technical design and construction, problem consulting, training and sensitization and financial support for loans and business models (Andrews, 2013). Multi-agent partnerships should be made between the government, public and private organizations and the community to share responsibility where local governments have limited financial and management capacities (UNESCAP, 2005). Community participation is essential for sustainability (UNESCAP, 2005). Communication and collaboration between stakeholders, especially between the community and the municipality prevents mistrust and confusion (Pervaiz et al., 2008).

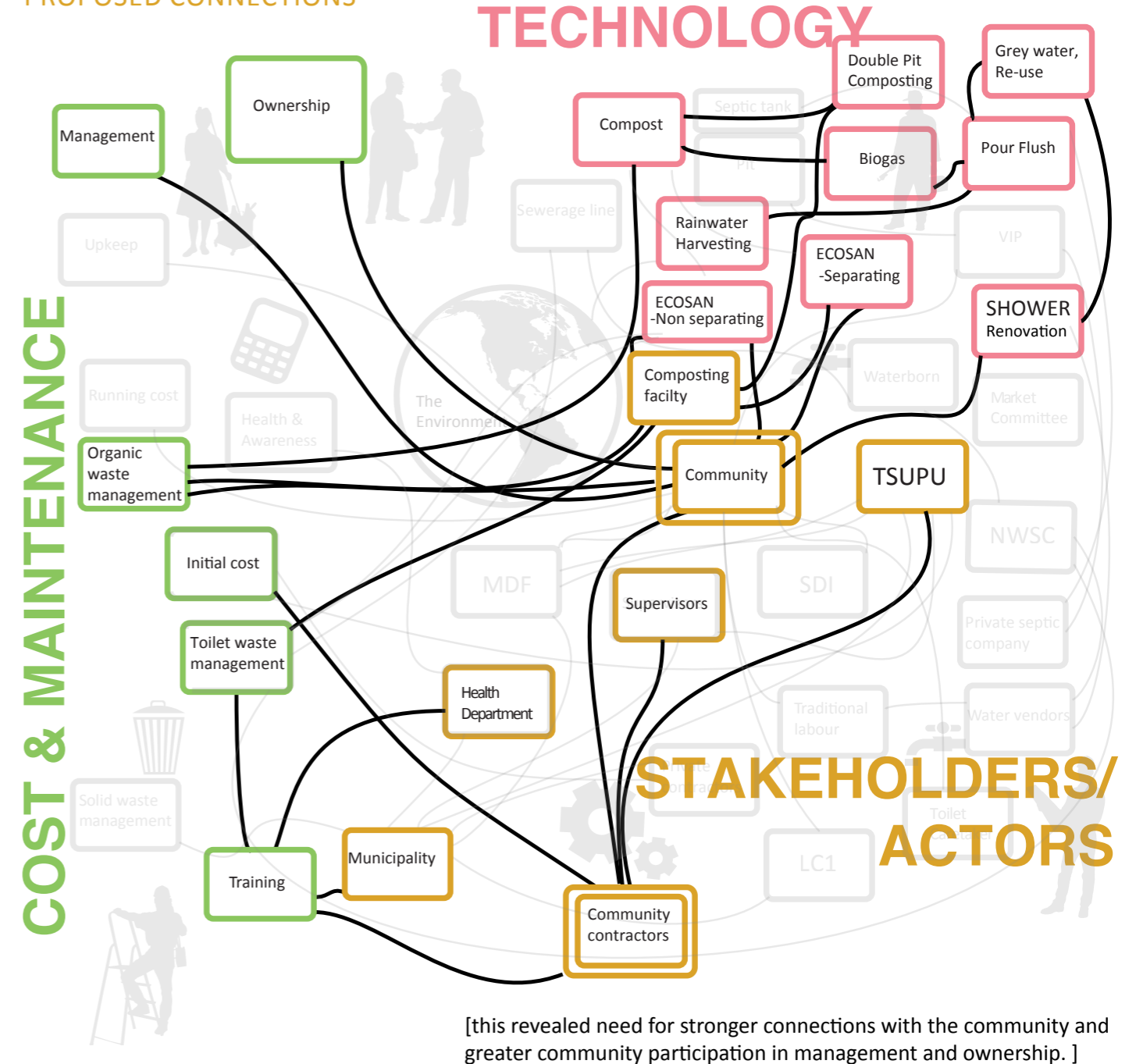


[Community meeting]

EXISTING CONNECTIONS



PROPOSED CONNECTIONS



TIMELINE OF PROJECT PROCESS

We have evaluated how development projects are implemented in Jinja and explored ways to revise the process to better address needs and prevent the failures observed in existing projects. This section reviews the existing process and identifies possibilities for improvement and key stakeholders that can facilitate these improvements (identified with stars in the diagram to the right).

INITIATION FROM COMMUNITY NEED

Today, projects are initiated only when there is external funding. We think that the process should be initiated when there is a need. The Community Development Officer (Municipality) or an NGO should assist in securing external fund, government funds or community's savings for a low-budget project.

Secured public land ownership is required today for project proposals. While secure land titles ensure project longevity, when most land ownership in settlements is unclear, many communities are unable to fulfil this requirement. It is imperative that an alternative, flexible and temporary solution be developed for communities at risk for eviction.

FUNDER DECIDES

The funding agency has the authority to decide how much, when and in what manner funds are used. International funding is channelled through national ministries and the Jinja Municipality before reaching the community, raising the risk of losing money to bureaucratic processes (Umar, 2013).

MONITORING AND EVALUATION

It is essential that projects are monitored during the design and construction phases and decisions are transparent. This could be facilitated through an active PMC initiated early in the process and facilitated by an

external mediator. Projects should also be evaluated by a committee of independent stakeholders after construction. The results should be used to make changes in management and inform new projects (UNESCAP, 2005).

COMMUNITY INVOLVEMENT

There is need for improved communication with, and involvement of, the community in the design, construction and maintenance phases. In municipally contracted projects, the engineer and contractor should explain cost and design changes to the PMC. Any discrepancies and design changes should be accepted by the PMC before the process continues. A mediator could be useful to negotiate between the PMC and municipality. Community contracting should be used where possible, but needs expert supervision and training.

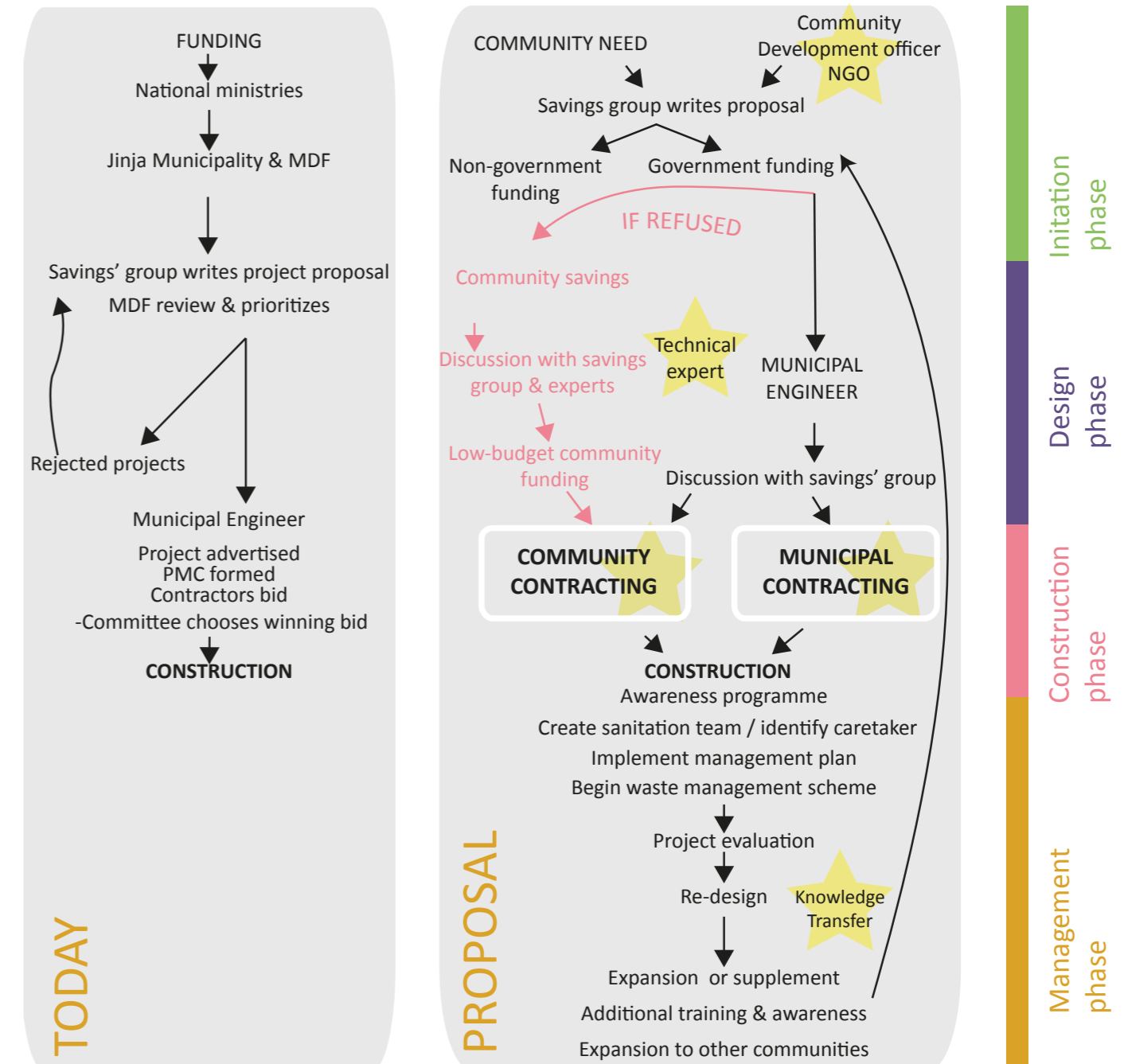
MANAGEMENT

Today the timeline ends at the construction with little effort on sensitization and management. This is critical to disseminate the benefits of using (and paying) for safe sanitation facilities. Training for caretakers, PMCs and community builders is necessary for oversight and project success during construction and maintenance. Sensitization can be conducted by the Municipal Health Department or an NGO and solutions to maintenance problems recommended by a consultant.

KNOWLEDGE TRANSFER AND SCALING UP

Successful projects can be scaled by transferring knowledge to other communities through workshops, media and publications, direct communication, etc. (UNESCAP, 2005). Knowledge transfer can occur in three phases: general awareness to encourage new projects, detailed information and site-specific consulting (UNESCAP, 2005).

EXISTING PROCESS & PROPOSED PROCESS



SANITATION INFRASTRUCTURE

NATIONAL WATER AND SEWERAGE CORPORATION

The National Water and Sewerage Corporation of Uganda (NWSC) is a government owned company started in 1972 with the mandate of providing water and sewerage services to urban areas in Uganda. In Jinja, NWSC operates 432 km of water pipes and 67 km of sewerage pipes for almost 14,000 water (22 percent of the population) and 3,000 sewerage customers (DWD, 2010).

The NWSC has the goal of becoming a leading water utility in the world (NWSC, 2008). However, despite successful internal restructuring and performance improvements in recent years, operation and expansion costs are too high for NWSC to recover with customer payments alone (Mugisha and Berg, 2006). It is therefore necessary to rely on donor support to finance large capital projects such as infrastructure expansion (Mugisha and Berg, 2006).

JINJA MUNICIPALITY ON SANITATION

The Municipality's main sanitation goal is to expand waterborne sanitation through the NWSC networks, despite high initial and running costs associated with waterborne toilets (Health Inspector, 2013). The Municipality believes that it has the responsibility to provide sanitation, but because of limited financial resources is forced to wait for funds before expanding the centralized supply network or building public sanitation units. Little consideration is given for efficiently using available funds to maximize sanitation delivery in areas in need of safe sanitation today. Instead, the Municipality has adopted a slow plan for gradually and ad-hoc building arguably over-priced toilets for limited number of users. Little consideration is given for the long-term costs and financial capacity of JMC or communities to manage long-term costs.



[corn growth in old garbage]



[fertilizer last stage]

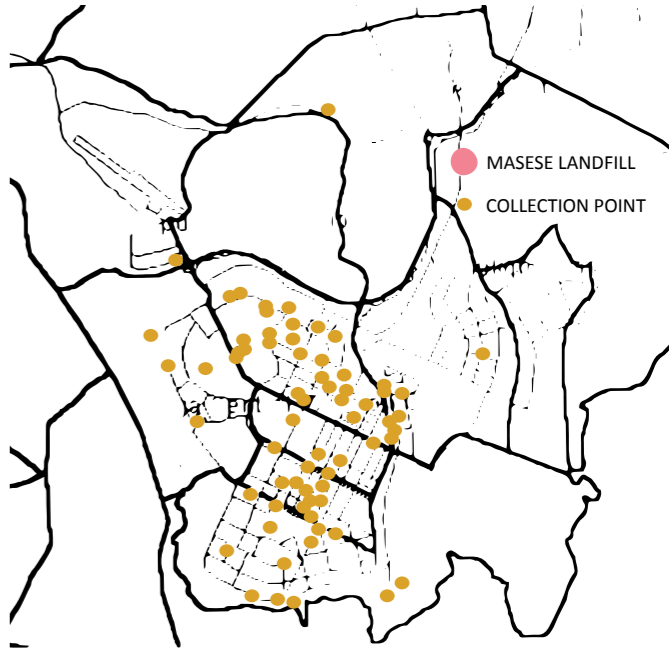


[fertilizer facility]

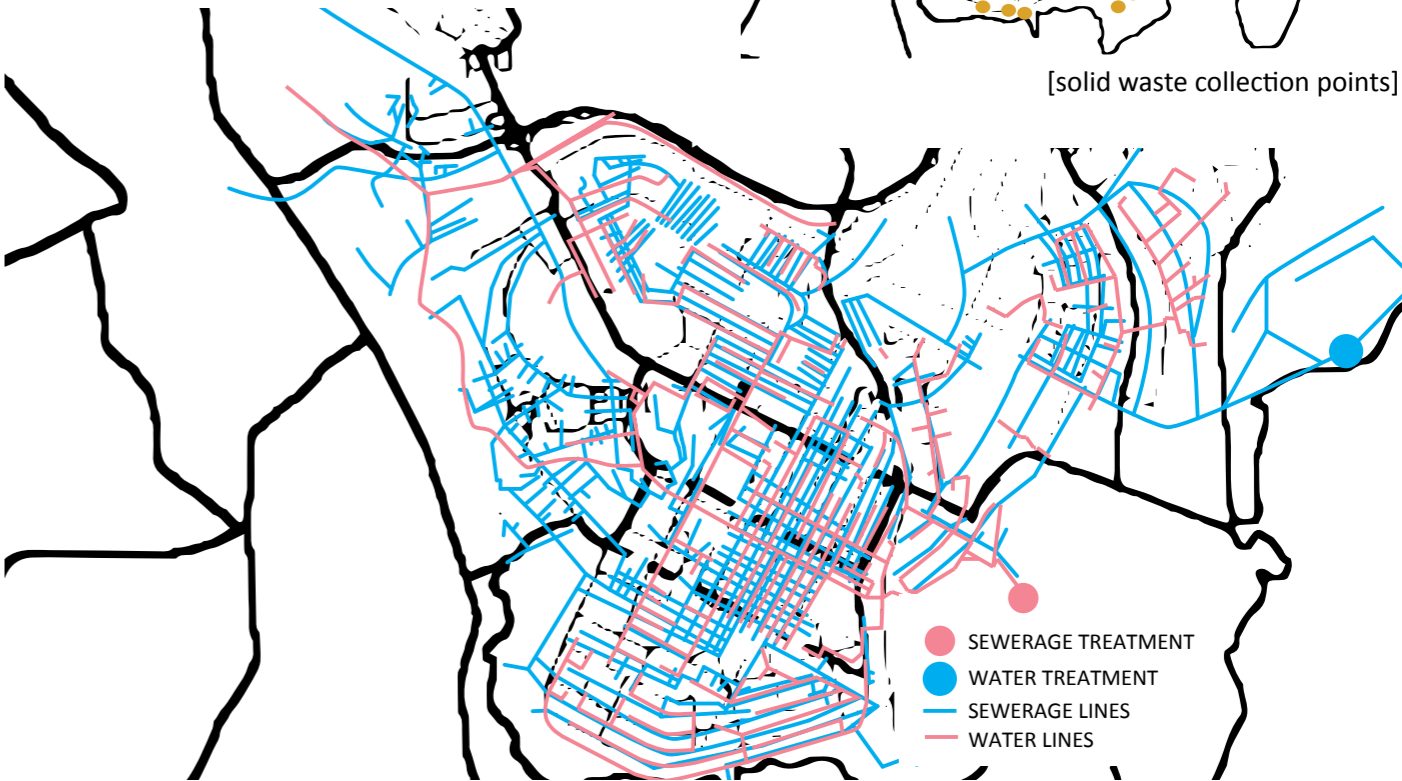
The Municipality used to own a fleet of trucks to empty private septic tanks, but they have since fallen out of repair. Private companies now provide this service, but there is only one company that operates out of Jinja.

MUNICIPAL SOLID WASTE COLLECTION

The Municipality recently started a centralized fertilizer facility that collects and separates solid waste, producing compost fertilizer that can be sold for profit to farmers (Fertilizer facility, 2013). Although only started, its initial success shows promising potential for clustered waste collection and centralized processing for waste reuse.



[solid waste collection points]



[sewerage, water lines and treatment plants, based on data from NWSC]

TSUPU FUNDING PROGRAMME

One of the main goals of the TSUPU Programme is to increase community involvement (Keene-Mugerwa, 2011). To encourage this and increase funding transparency, the World Bank (a TSUPU partner) has stressed the importance of community contracting (Joseph, 2013). However, the national Ugandan PDA laws prohibit the use of community contracting in projects costing over 500,000 shillings (TSUPU Engineer, 2013). Because of a failure to reach an agreement between these conflicting regulations and pressure from the World Bank to use TSUPU funding as soon as possible, the Jinja MDF will likely be forced to go ahead with municipal contracting (Joseph, 2013).

The World Bank actually promises more money to TSUPU projects that use funding quickly, regardless of the way in which the money is used (Joseph, 2013). There is no consideration for the extra time needed for community contracting or community decision making processes, despite programme goals of increasing community involvement. Project speed is prioritized over project quality. There needs to be a revision in the timeline of donor funding and a change in the evaluation of donor-funded projects to ensure that funds are used in the manner most effective on the ground and with flexibility to adjust to changing situations and slower, participatory processes. The structure and timeline of funding should be driven by demands on the ground, not the short-term demands of international donors who want fast results and superficial evaluations. Projects should not be seen as one-time donations, but as long-term investments and collaborations with local communities.



[Danida watertap TSUPU funded]

ENVIRONMENT

WATER SUPPLY

Uganda is already suffering from decreasing water levels in Lake Victoria, which disrupts NWSC inlet pipes and hydropower facilities, risking the population's water and energy supply and increasing service cuts (Lwasa). In response, NWSC has added expensive extensions to inlets (DWD, 2010).

WATER CONTAMINATION

Unsafe sanitation practices increase the risk of drinking water contamination and disease. When bucket, flying toilets and pit latrines are emptied into open drainage channels there is a high risk of contaminating surface and groundwater and providing breeding sites for disease-carrying insects (WHO, 2013). Dumping untreated waste into the environment also affects ecosystem health (WHO, 2013). The risk is particularly high in Jinja, where Lake Victoria is the primary water source for shoreline communities and the NWSC network (DWD, 2010).

CLIMATE CHANGE

Climate change exacerbates the environmental challenges of sustainable water and sanitation. Expected rise in weather variability is likely to increase the occurrence and severity of droughts and flooding (IPCC, 2013). In Uganda overall warming and decreased rainfall is expected, but with increased intensity and length of rainfall (Lwasa, 2010). Increased droughts endanger the long-term sustainability of water supply, increasing the importance of conserving existing ground and surface water sources. Increased flooding stresses stormwater infrastructure and wastewater treatment systems. In settlements, flooding spreads waste and raises risk of disease outbreaks.



[Flooding]

CITY-LEVEL RECOMMENDATIONS

It is essential that the JMC and NWSC acknowledge both their limited financial and management capacity and fundamental responsibility to provide basic services to all of Jinja, including informal settlements. The recent availability of donor money has let the government become reliant on donors to fund basic needs.

REDUCING DONOR DEPENDENCY

There needs to be a restructuring of JMC policies and financial planning to reduce dependency on donors and creatively focus existing resources on the basic needs of the entire population. This requires financial resourcefulness and accountability and establishing partnerships to share responsibility and skills. Available money should be used creatively to support the entire sanitation process and incentivize back-end users and decentralized on-site waste recovery.

JMC therefore has to rethink their existing policy of toilet provision and centralized waterborne sanitation. NWSC does not have the capital to expand its network

without external funds and JMC does not have the funds to subsidize NWSC fees for the poor. Because safe sanitation is an urgent and universal need, it is irresponsible to postpone infrastructure development for external funds and use existing funds inefficiently, as they have done in the case study projects.

FOCUSING NWSC NETWORK

The NWSC centralized network is arguably appropriate for the centre of Jinja where population is dense and wealthy. However, there are high energy, infrastructure and water costs associated with extending the network to outer lying areas such as Masese. NWSC should focus their limited resources on proper maintenance of the existing pipes, before expanding, if at all.

DECENTRALIZED SOLUTIONS

A functioning network can be supplemented with less expensive, ecological decentralized systems in outer lying areas and poor communities currently without safe sanitation. It is imperative that the JMC

support exploration into these alternative options and collaborate with research organizations, technical experts and NGOs who have experience in other sanitation systems.

CLUSTERED COLLECTION BY JMC

JMC can maintain an organizational role in managing the sub-components of a diversified sanitation programme without losing control. The success of the JMC's clustered collection of solid waste suggests capacity for a similar human waste system. Ecological toilet waste (composting, VIP, biogas, ecosan) not reused onsite could be collected at regional points around the city and regularly trucked to the fertilizer facility or wastewater lagoons to be combined with organic waste or sewerage sludge, respectively. The community would be responsible for transport from toilet to collection point and JMC from there to the centralized facility. Existing solid waste collection points could be inexpensively renovated to include toilet waste. A communal septic tank connected by pipe or municipal truck to NWSC lagoons is a less expensive, decentralized waterborne option.

INCENTIVES

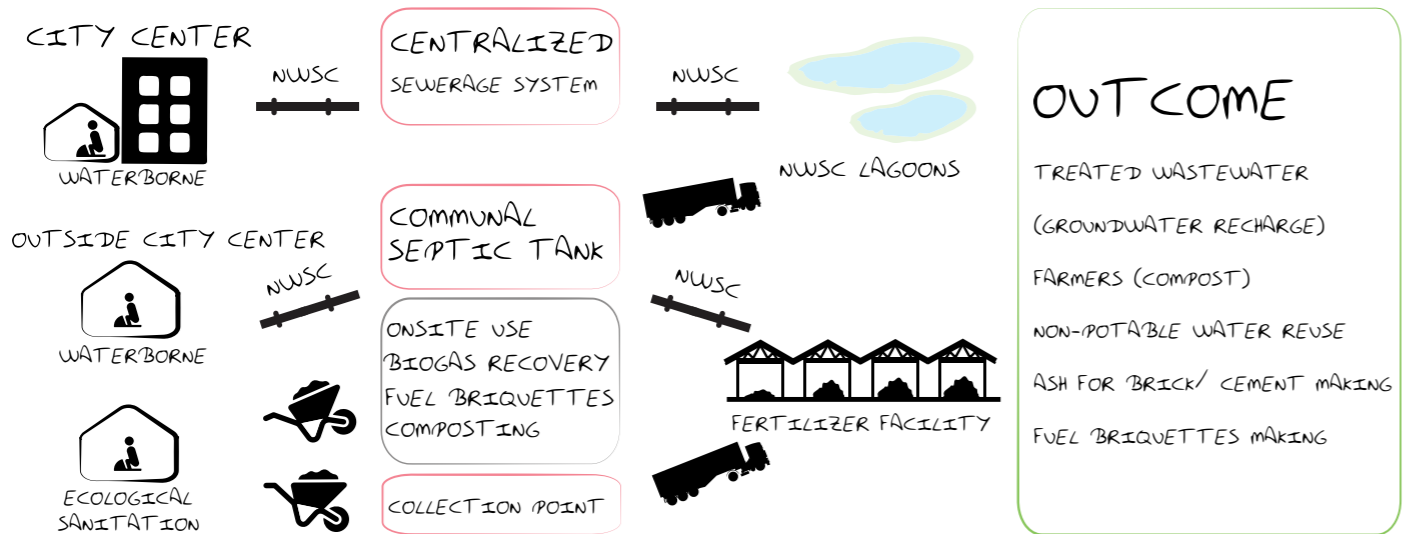
Facilitating on-site reuse with training and sensitization gives human waste a non-monetary worth that incentivizes ecological toilets. Initial subsidizing of fertilizer produced by the municipal fertilizer facility and NWSC sludge would create a back-end demand by farmers for waste as a resource that incentivizes proper management of the fertilizer facility and NWSC. It also raises NWSC profits, increasing their financial sustainability. Also, combining the reuse and transformation of waste with supplementary systems (solid waste, agriculture, energy production) promotes the creation of new livelihoods and community resilience.

SITE-SPECIFIC RECOMMENDATIONS

This section provides site-specific design options for four of the sites proposed for TSUPU projects: Loco, Walukuba East and West markets and Kimaka market. Options include both waterborne toilets connected to the NWSC network and decentralized ecological toilets that facilitate waste reuse on-site or safe clustered collection. These sanitation units would thus become pieces in a larger, multi-faceted Jinja-wide sanitation programme.

The range of options presented here is used for a comparative discussion of designs, benefits, initial costs and running costs. Designs are paired with implementation and management plans for residential and market scenarios. Design options enable community discussions on technology choice and unit design. Management plans lay the framework for the sustainable long-term use of units.

Design options are specific to the physical and social nature of each site. Note that these are not finalized designs, but offer preliminary options and cost estimates that can be used as a basis for discussion and detailed designs. And what is included in this report is a summary of more detailed design and costs developed and presented to JMC, NSDFU representatives and the Jinja TSUPU engineer. More detailed designs and explanation of cost estimates are included in the sanitation toolkit. Cost estimates include material costs based on bills of quantity for Rubaga and Masese and TSUPU community project proposals and approximate labour costs. See Appendix A for a more detailed explanation of costs.



[sewage treatment proposed process]

LOCO HOUSING ESTATE

The original waterborne toilets were connected to the NWSC sewerage line, but have since been clogged and fallen out of use. Today residents use one of three pit latrines, with about 120 people (1 block) sharing each stance. Most stances are locked and blocks have a shared cleaning scheme. The community collectively raises 800,000 UGS to empty their pit latrine (Loco Chairman, 2013).

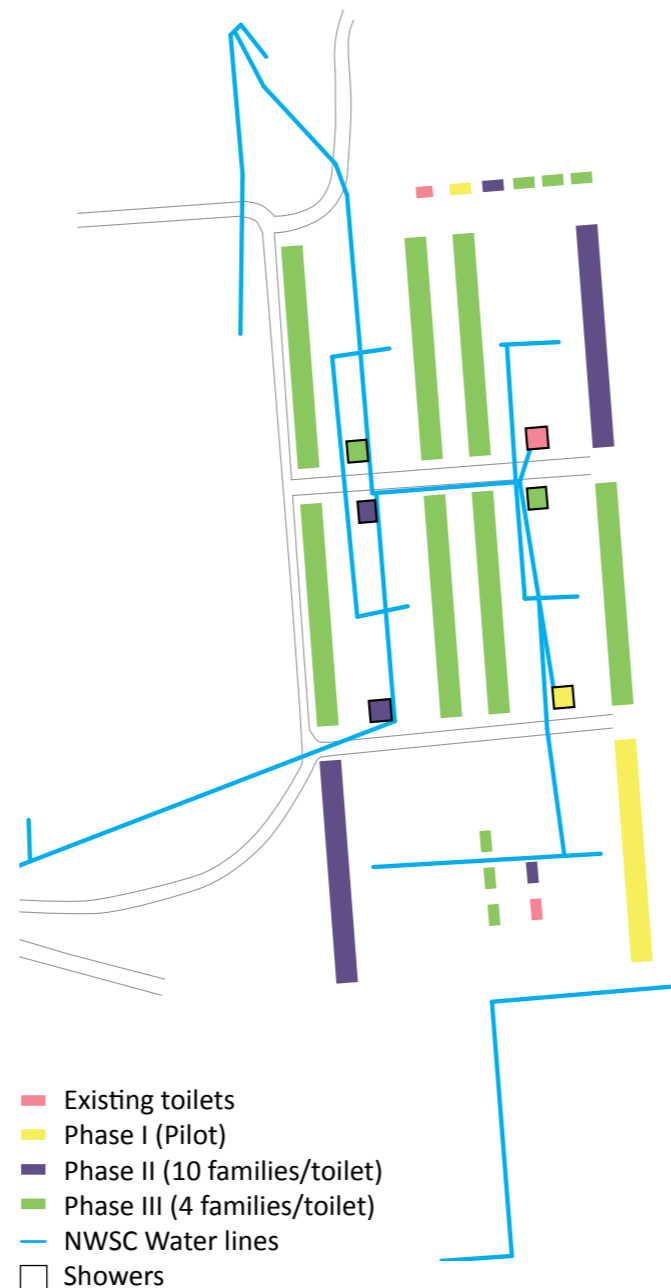
While there are private water vendors in Loco, taps sometimes run dry in the dry seasons, forcing residents to buy water from the tanning company. Loco was selected as a pilot village for solid waste management, with an external organization successfully implementing a system of separating inorganic and organic waste for composting and selling to a recycling company. Residents are currently using the original toilets as make-shift showers with two blocks sharing two showers. Because the original drainage system has been blocked, shower run-off collects in open pits of standing water.

According to discussions we had with Loco residents, the main complaint was not enough toilets and the high expense of pit emptying. Many also expressed willingness to contribute money or labour for the construction and maintenance of additional latrines.

LOCATION AND OWNERSHIP

The housing estate is currently owned by the Ugandan Railroad Corporation, but it is possible that the estate will be bought by the neighbouring tanning factory, resulting in the eviction of current estate residents. The only publicly owned land is to the southwest across the access road.

Residents are pleased with the existing location of pit latrines (see map to the right) and suggested that new



[Loco overview]

latrines be placed next to current ones. They wished for the latrines to be separate from the housing blocks and showers.

A sanitation unit in Loco was originally prioritized for TSUPU funding, but was removed because of unclear land ownership. Despite the risk of land ownership changes and eviction, we have proposed the construction of new toilets inside the housing estate next to existing latrines for accessibility and security. We have also included a temporary, lightweight superstructure option that is cost effective and could be moved in the case of eviction. We do not see the risk of eviction as a reason to ignore Loco, but rather as a motivation for a different kind of solution that is low-cost, temporary and transportable.

ADDITIONS

We have explored opportunities to add features to toilets in Loco to simultaneously reduce running costs and provide secondary benefits to the community. The additions supplement the existing water supply and solid waste separation systems and complement each other as depicted visually in the diagrams on the opposite page.

Rainwater harvesting can provide free, safe water for handwashing, toilet cleaning and showers. Basic renovations to the superstructure of original toilet buildings can convert them into functional showers. A simple garden with a soil filter can be attached to the showers to alleviate the poor existing drainage and connected health risks. Combined compost from composting toilets and organic waste from the solid waste separation scheme can be applied to the garden. Explanation of cost estimates is included in Appendix A.



[old sanitation unit]



[shower drainage]



[organic waste disposal Loco]

1. Rainwater catchment

Rainwater can be collected on the corrugated iron roofs of the housing blocks. A self-made system with a 10,000 litre plastic or concrete storage tank collecting rainwater from one side of a housing block in Loco can be constructed for 3.3 million shillings and have a payback period of 5 years. This system can generate an average of 16 bucket showers (30L) each day, saving an average 60,000 shillings each month.

Rainwater collection provides an additional source of water and alleviates the pressure on the groundwater aquifer facilitating groundwater recharge. Widespread rainwater collection can therefore reduce the risk of water cuts during the dry season.

2. Hand-washing station

A simple hand-washing station can be constructed out of a jerrycan, tap and stand connected to the side of the toilet superstructure. The presence of a handwashing station coupled with sensitization encourages basic hygiene practices, reducing the risk of disease spread.

3. Shower renovations

Renovating two units of the original estate toilets into showers with wall plaster and paint, new doors, latches and locks would cost about 500,000 shillings.

4. Greywater garden

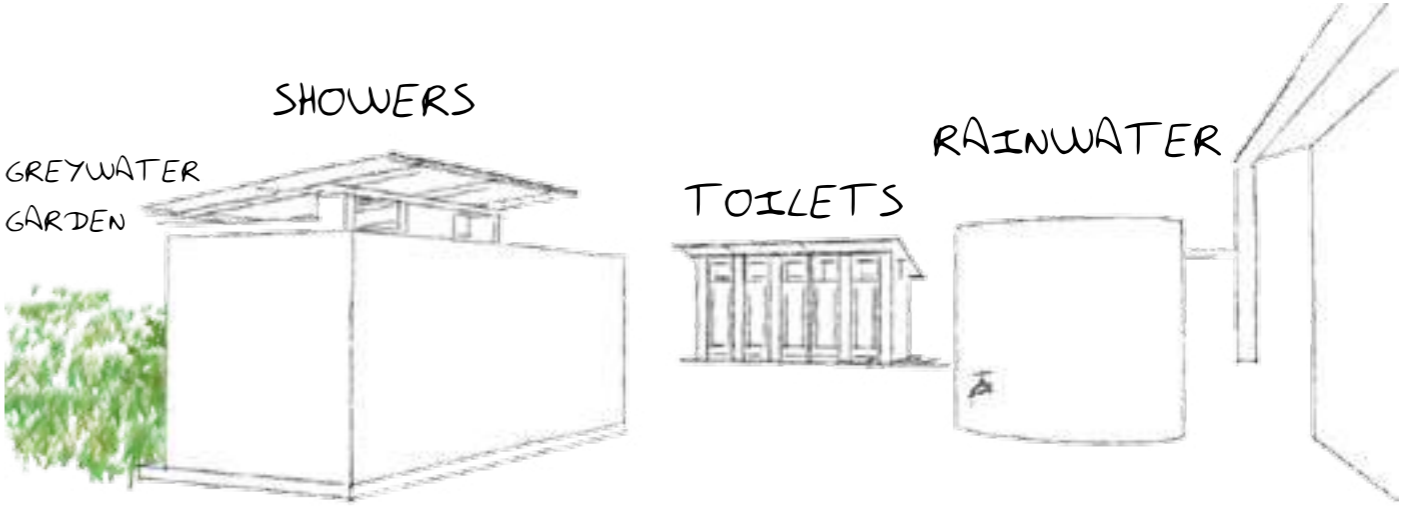
A simple garden with an underlying soil filter of gravel, sand and mulch layers can both alleviate the existing drainage problems and produce edible produce. Toilet and organic compost can be combined for use on the plants. A more temporary alternative is potted plants or “tower” gardens (see image to the right) constructed out of poles and plastic that are viable options when eviction is a risk.



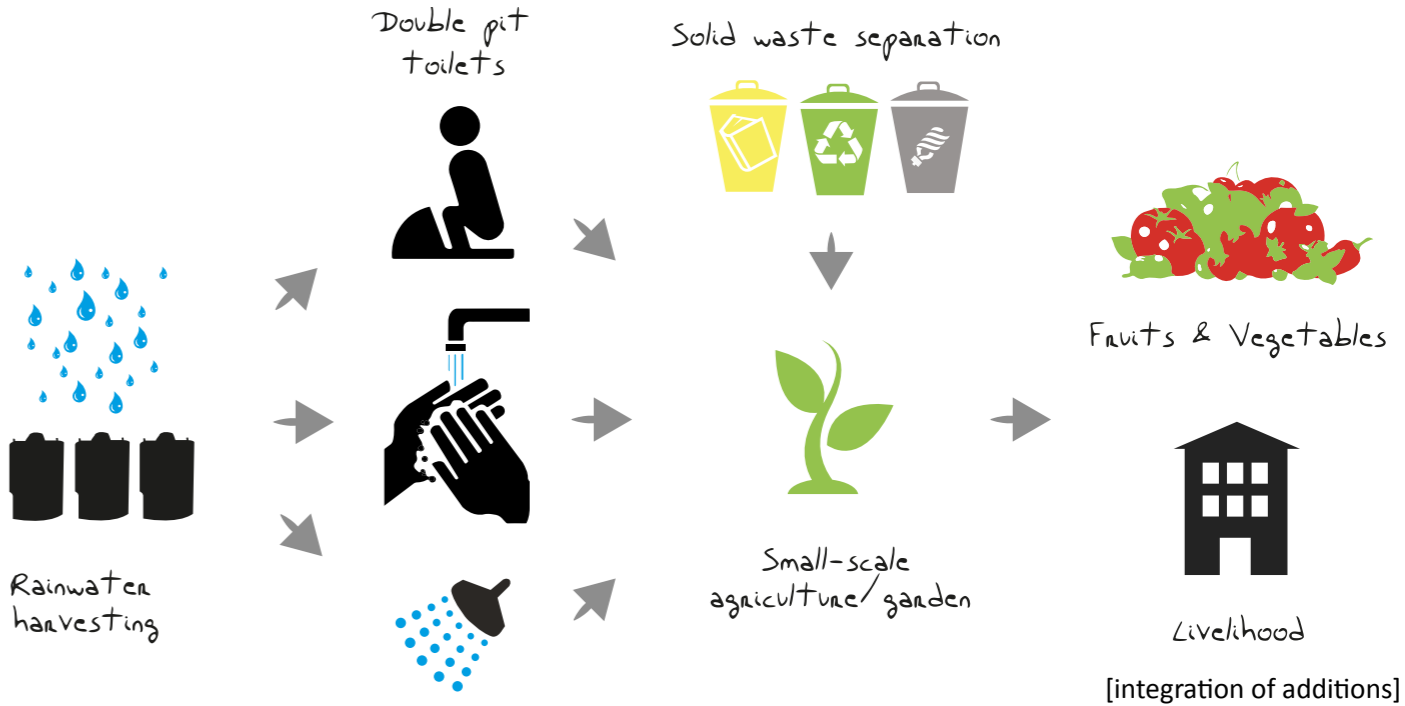
[hand wash]



[greywater tower, Sacher.N & Gensch]

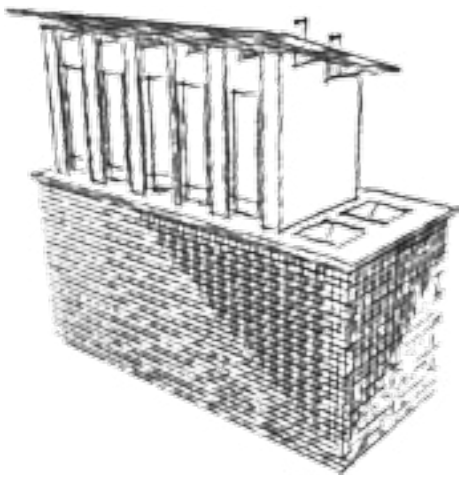


[rainwater harvesting with greywater garden]

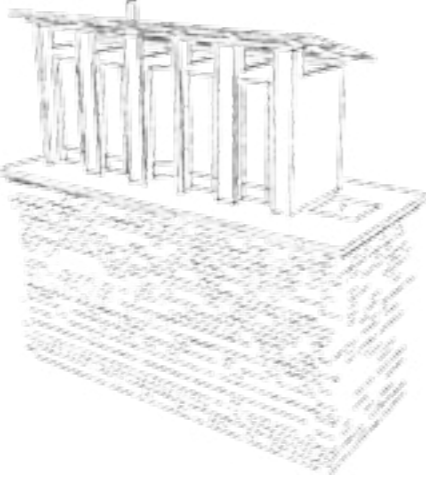


[integration of additions]

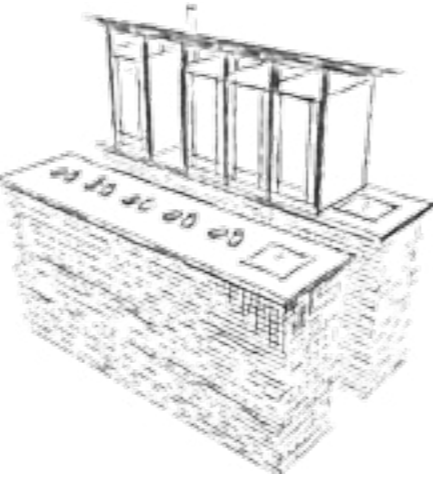
DOUBLE PIT PERMANENT



5 YEAR VIP



DOUBLE PIT MOVABLE



COST	2-PIT PERM	VIP	2-PIT TEMP
Intital-Comm. Contracting	4.5 to 5.5 mill	4.1 to 5.0 mill	3.8 to 4.9 mill
Intital-Municipal. Contracting	6 to 7.4 mill	5.5 to 6.6 mill	5.1 to 6.5 mill
10 year	10.9 to 11.7 mill	4.5 to 5.5 mill	3.8 to 4.9 mill

UNIT SIZE

1 STANCE / 4 FAMILIES
(1 UNIT OF 5 STANCES / BLOCK)

COST & DISCUSSIONS

The tables on this page summarize cost variations in the three options developed for Loco. All three are forms of pit latrines, because residents were satisfied and comfortable with latrine technology. Previously installed waterborne toilets were not functional and residents have neither the money nor wish for waterborne toilets.

UGS	Burnt	Inter-locking
Separated 2-pit	2.0 mill	1,3 mill
Connected 2-pit	1.8 mill	1,2 mill
Deep pit	1.6 mill	1,1 mill

[Pit costs- Burnt vs Interlocking]

Material	UGS
Plywood	1.7 mill
Papyrus	1.7 mill
Recycled jerrycan	1.8 mill
Ferrocement	1.7 mill

[material cost temp.superstructure]

CONTRACTING AND ANNUAL COSTS

Municipal contracting raises initial costs by about 33 percent. The VIP has higher 10-year costs, because of VIP emptying by an external company. Because the composting toilets store waste until it decomposes, it is safe to self-empty latrines free of charge. Composting latrines also provide the extra benefit of turning waste into a resource for agriculture or sale.

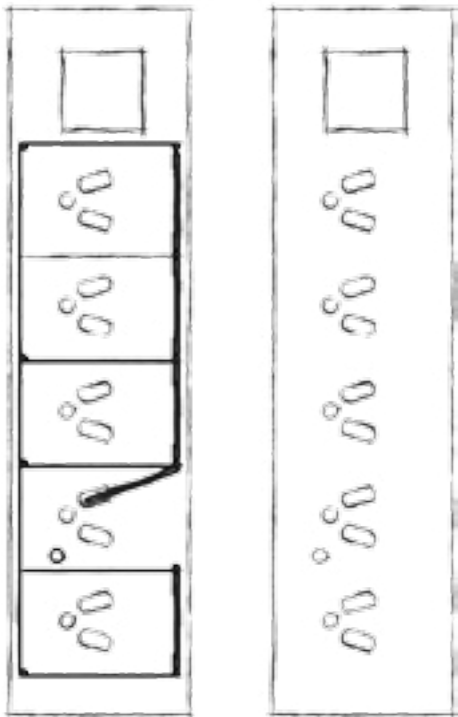
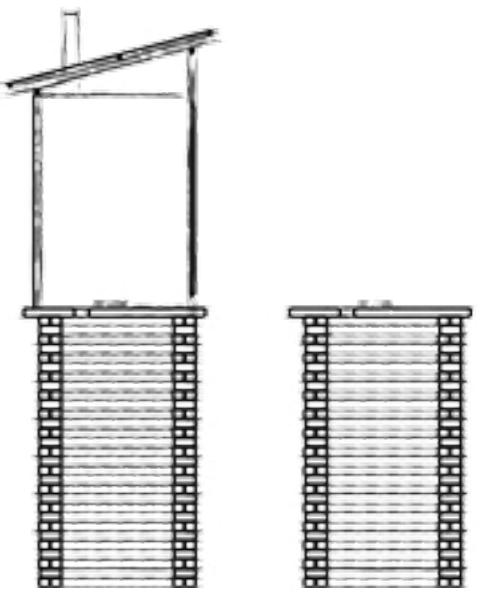
The higher initial cost of the VIP reflects the higher cost of the deep, five-year pit. However, the initial cost is offset by lower running costs compared to a smaller pit. Still, running costs are higher than the self-emptied composting latrines. The VIP is a viable option if the community decides it does not want to self-empty.

MATERIAL CHOICE

Interlocking bricks can significantly reduce costs and increase pit stability. But because interlocking bricks cost more per brick and production is limited, there is resistance to using these bricks. Successful sanitation projects with interlocking bricks could bolster the interlocking brick industry and encourage their expansion to other projects.

TEMPORARY SUPERSTRUCTURE

The material costs for temporary superstructures show the range of materials that can be used to stretch across a wooden or steel frame. Materials were chosen based on local availability, cost and weight. The temporary superstructure is a less expensive option that can be transported in the case of eviction. For a really inexpensive or temporary option, a simple unlined pit can be dug with the temporary superstructure. In this case only the top half meter of the pit would be lined with bricks (to prevent waste seepage into drainage water).



[doublepit temp.superstructure section+floor plan]

RESIDENTIAL MANAGEMENT-LOCO

STEP-BY-STEP IMPLEMENTATION

Due to limited financial resources and unconfirmed external funding, sanitation development in Loco could be initiated incrementally as funding is available or as the community collects sufficient funds. Initial units should be shared, so that all residents benefit from a gradual increase in access to safe sanitation. The initial phase should also be a pilot phase with lessons learned informing designs in the next phases.

For example, the initial phase could consist of one toilet unit, shower building renovation and rainwater harvesting system. The second phase could consist of two toilets, showers and rainwater harvesting systems and the third phase of the remaining blocks. The goal is for each block to have their own toilet unit and rainwater harvesting system and for all blocks to share the six renovated shower buildings with stances allocated to specific blocks. This fits the number of families per unit (four) requested during our discussions with residents and suggestions from literature (Günther et al., 2012). Half the toilet units would be located above the blocks and half in the open space between the two lower blocks (see map on page 38). The existing VIP in the lower section would remain, but the other two latrines would be replaced because they are not sufficient.

COMMUNITY CONTRACTING

In Loco where the community has a strong social structure and willingness to contribute time and labor to construction, community contracting is an opportunity to transfer knowledge and strengthen a sense of ownership. However, it is essential that expert oversight is provided both during the construction phase and afterwards as needed. Community contracting is especially important because of the risk of eviction:

sanitation construction and management knowledge can be easily transported and used to construct and maintain new toilets in the new location.

SENSITIZATION & TRAINING

Sensitization and training should be conducted before implementation, when the toilets are first emptied, and throughout the project lifespan as necessary. It could be conducted by the Jinja's Municipal Health Department or a local NGO and should include:

- Handwashing and hygiene
- Composting toilets – how to use, how to empty, how to remove and reuse waste safely
- Rainwater harvesting – how to build system, clean

and repair, safely use water

- Danger of open defecation and flying toilets
- Construction building training and building repair maintenance
- Management of waste for children, elderly or sick who are unable to use the latrines and how to modify latrines for handicapped accessibility if necessary

REGULAR CLEANING

Toilet cleaning should be shared among the users through a plan organized and regulated by the block leaders. A small monthly fee should be collected by the chairman or the block leader that can be used to buy cleaning supplies and water for toilet cleaning.

OWNERSHIP & SECURITY

Families should be assigned one toilet stance to use and toilets should be locked. One family or the block leader should keep the key. This promotes both a sense of shared ownership to a particular toilet and reduces the risk of vandalism.

LONG-TERM MAINTENANCE

- Emptying
- Waste reuse
- Building maintenance

Long-term maintenance should be coordinated by the Loco chairman and funded by a monthly maintenance fee collected by the chairman or building leader. A consultant within the municipality or local organization should be available to assist the community in building maintenance or modifications.



[Task management]



[Implementation plan]

KIMAKA

INTRODUCTION

Kimaka market is a large agricultural and vending market, divided into a lower agricultural market and an upper vending kiosk market. There are private water vendors and solid waste collection, but vendors complained of no shaded meeting place or storage.

EXISTING SANITATION

There are two existing toilets in the market, but the pit latrine in the lower level has limited capacity and the septic tank toilet in the upper level is too small. They are both in limited operation today, but vendors want more functional, waterborne toilets and showers.

LOCATION AND OWNERSHIP

Despite initial disagreement with the army, public land ownership has been secured in the location of the existing toilets. Vendors are satisfied with the location of the lower level toilet, but uneasy that the upper toilet is so close to the kiosks. We suggest that the lower toilets are expanded and the upper toilets converted into showers.

UNIT SIZE

300 people (toilets) and 30 people (showers)
6 stances: 3 ladies (one handicapped), 2 gents, 1 urinal

Cost (UGS)	Initial	10-year
2-pit	7.9 to 9.5 mill	7.9 to 9.5 mill
PF sewerage	8.4 to 9.5 mill	46 to 47.4 mill
PF septic	9.6 to 10.6 mill	31 to 32 mill
WB sewage	10 to 11 mill	105 to 106 mil
WB septic	11 to 13 mill	62 to 62.9 mill
PF biogas	13 to 14 mill	32 to 33 mill

DISCUSSIONS

The initial costs are for toilet units without showers. Showers add between 1 and 2.2 million UGS.

ADDITIONS

1 Greywater re-use

If showers are connected in the same unit, greywater reuse of shower water in the toilets can reduce running costs by 25 to 40 percent.

2 Storage & community space

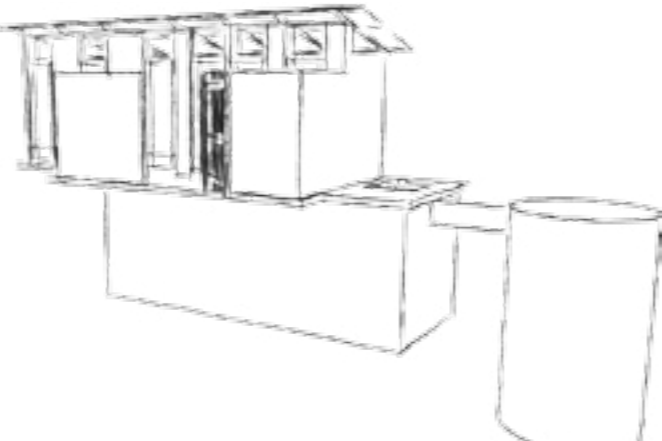
A simple metal roof extension off the side of the building enclosed by a folding fence could co-function as a meeting space in day and storage space at night and increase rainwater collection potential. Storage roof costs about 1.5 million UGS.

3 Rainwater harvesting

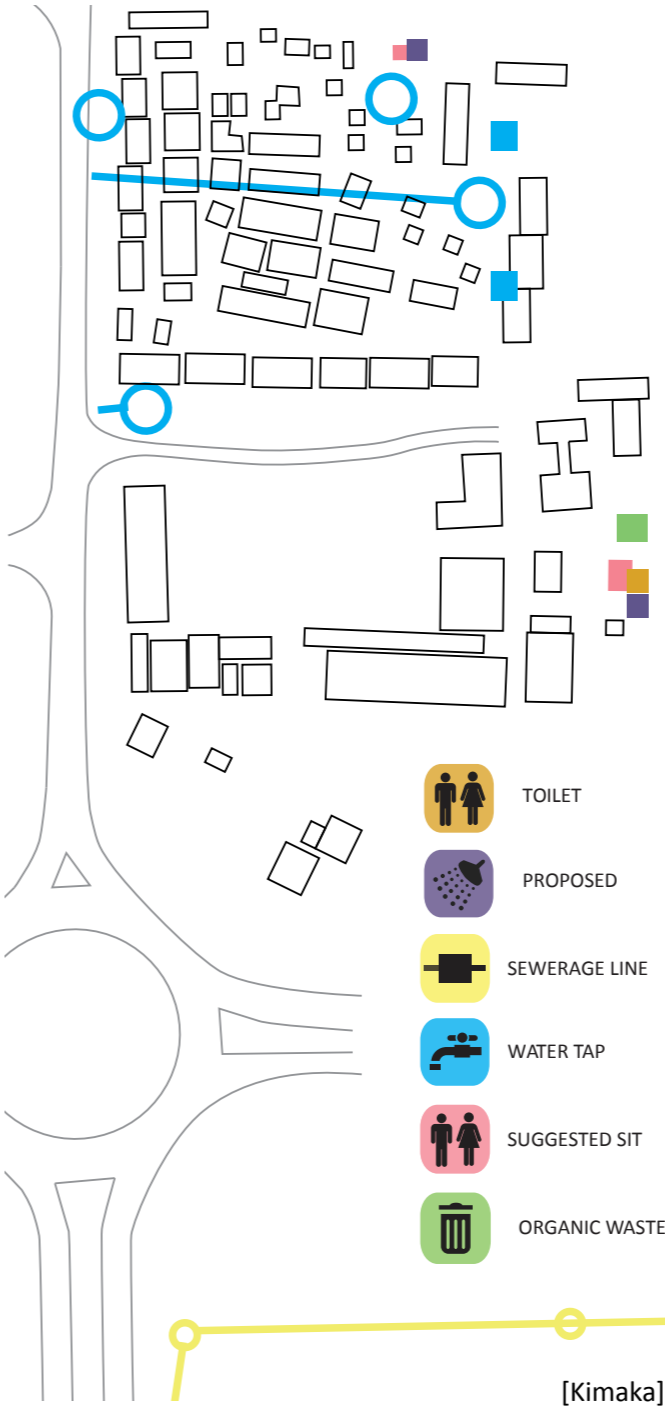
A rainwater harvesting system can collect between 2500 and 8000 L of water a month, saving 150,000 UGS per year (2 to 6 percent reduction in running costs). This water can be used for free handwashing or toilets.

4 Shower renovations

The upper toilets can be renovated into showers for about 660,000 UGS per two units (new doors, latches, locks, paint, cement).



[Sanitation with Septic Tank]



[Kimaka]



[existing toilet]



[organic waste]



[Kimaka market]

MARKET MANAGEMENT

IMPLEMENTATION & CONTRACTING

In a market setting, municipal contracting is most appropriate, unless there is a strong surrounding community willing to contribute construction labour.

SENSITIZATION AND TRAINING

As with residential areas, sensitization is essential in market sanitation units to introduce new technology, emphasise the importance of basic hygiene and using safe sanitation and teach construction and maintenance practices. Both vendors and the surrounding communities should partake in the sensitization. The toilet caretaker should have a more thorough training. Sensitization can be conducted by the Municipal Health Department or an external NGO.

OWNERSHIP

While a market sanitation unit is likely owned by the municipality, the market community should feel a shared sense of ownership to encourage use and maintenance. This can be facilitated by incorporating the community in the design process, community contracting if the surrounding community is involved, employing a reliable caretaker from within the community and providing secondary functions of benefit to the community. Possible secondary functions include free handwashing, meeting space, storage space, etc.

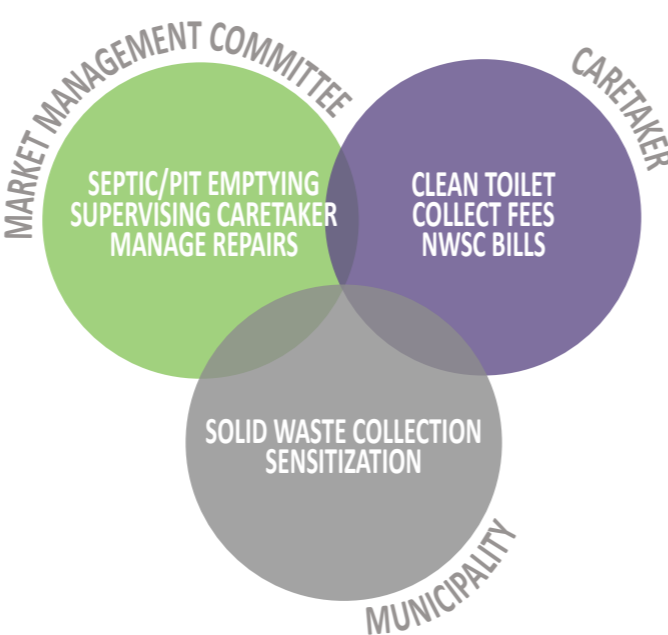
BUSINESS PLAN

In the market setting, a business model with a caretaker and user payment is appropriate for maintenance. Vendors in the markets are able and willing to pay a small fee for toilet use. Still, fees should be minimized to encourage use within the means of the community. Alternative payment methods can be experimented including monthly membership or adding toilet fees to

monthly fees vendors pay to the market. The exact fee should be collectively decided by the market community before opening the toilets. Sensitization is also critical to ensure that people understand that paying toilet fees are worth the public health benefits.

CARETAKER

The caretaker should collect and record toilet usage and transfer the money to the market committee. The committee in turn should be responsible for using the profits to pay NWSC bills (waterborne toilets), municipal taxes and fees and the caretaker’s salary. The caretaker’s salary should be a percentage of the profits to encourage the caretaker to maintain the toilets throughout the day. A percentage of the profits should also be saved for



[responsibilities]

long-term building maintenance and pit or septic tank de-sludging.

Toilet fees can be reduced by the design additions discussed earlier in this section. Toilet profits can be increased by adding secondary functions to the toilet unit including: showers, water vending, attached kiosk, selling airtime, advertising on the toilet wall, selling compost back to farmers, rented storage or community space, etc.

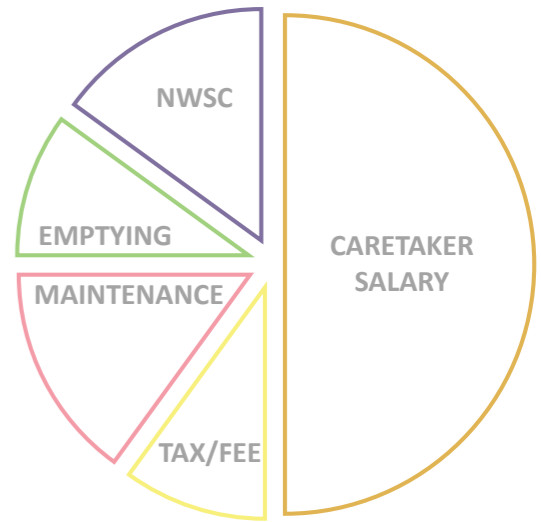
The caretaker should be chosen carefully. An ideal caretaker would come from the market and be a reliable, well known member of the community. The community and market committee should nominate someone for the role. If desired the existing water vendor or other vendor could combine their regular tasks with the toilets for extra earnings.

MAINTENANCE PLAN – STAKEHOLDERS’ RESPONSIBILITIES

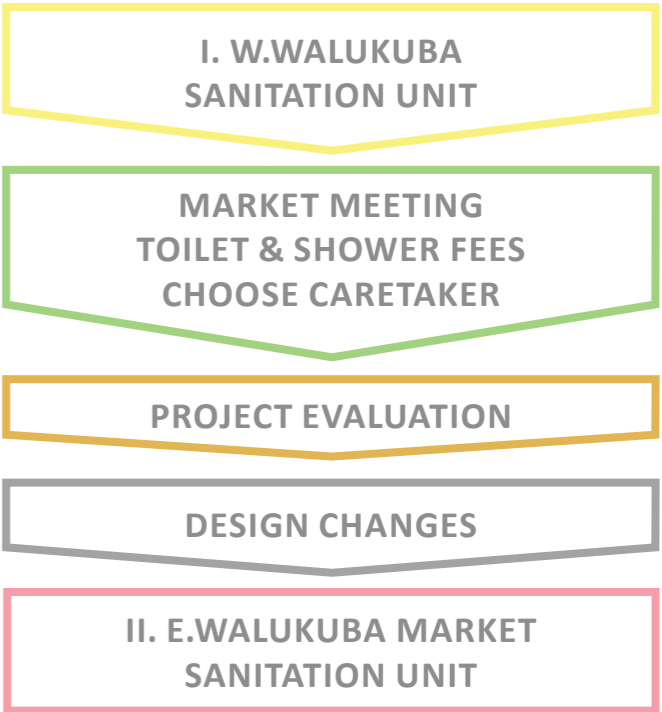
Maintenance of the toilets should be shared between the caretaker for daily maintenance and the market committee for long-term maintenance. The market committee should supervise the activities of the caretaker and act as a liaison between the community and JMC.

EVALUATION

It is essential that an evaluation be conducted during the maintenance phase by an external, independent committee to evaluate the success of the project based on the criteria outlined previously in this report. All relevant stakeholders should be represented in this committee. Conclusions from the evaluation should inform future projects.



[economic management]



[evaluation process]

RECOMMENDATIONS & CONCLUSION

From our case studies and interactions on the ground with authorities and communities in Jinja, we have observed that the existing sanitation policies and projects are failing to meet the basic needs of Jinja's poorest residents. It is unlikely that continuing on the same path, especially in light of future population growth and climate change, will ever be able to fully address the basic sanitation demands of all of Jinja. JMC and NWSC do not have the financial or managerial capacity to expand a centralized waterborne sanitation system and many residents do not have the financial capacity to pay monthly water bills. Even if JMC were to somehow raise enough money to fund expansions and subsidize fees, a centralized system uses high amounts of water and energy, endangering the already declining groundwater aquifer and the town's source of drinking water.

It is essential that JMC critically evaluate their existing stance on sanitation, acknowledge their responsibility to ensure basic needs for all of Jinja and honestly assess their financial and managerial capacity to fulfil this responsibility. Doing so demands the development of a creative, comprehensive and multi-faceted sanitation program that shares responsibility between a variety of stakeholders and experts.

REDEFINING HUMAN "WASTE"

We have to replace the negative taboo of human waste and the change the conception from waste to a resource that can build self-sustainability, resilience and livelihoods. This requires changing from linear waste removal to a life-cycle resource management. Toilets become sanitation units that can act as development catalysts, linking to existing processes of solid waste management and small-scale agriculture and initiating new livelihoods and self-sustainability.

RETHINKING SANITATION

It is imperative to rethink the convention of supply-driven centralized waterborne systems. Arguably these systems are neither appropriate nor sustainable for the developed world, let alone the developing world. Instead of replicating the mistakes of the developed world, it is essential to find a holistic solution that is adapted to the Jinja context and integrated into the complex socioeconomic, political and environmental systems in Jinja.

RE-ENGINEERING "WASTE" MANAGEMENT

It is important to acknowledge that different communities in Jinja have different needs and priorities and that a single sanitation solution is not applicable in all neighbourhoods. A flexible, multi-faceted sanitation programme can connect different site and community-specific solutions. This means combining the existing centralized waterborne sewerage system with decentralized and clustered collection systems; collaborating with experts and research organizations with knowledge on alternative sanitation system; incentivizing and supporting new industries that reuse waste as a resource; and incorporating communities more closely in the decision-making, design and maintenance processes.



[biogas plant Mukono: appropriate technology centre]



[Ripond savings group]

REFLECTIONS

Over the course of our two months in Uganda, our experiences and interactions challenged many of our preconceived notions and allowed us to critically reflect on both the situation in Uganda and our personal roles as designers in the developing world.

CULTURE

While we understood that sensitivity towards culture and traditions is important, especially in a culture that is not our own, we also realized that culture should not be seen as a barrier. Culture is a dynamic phenomenon that is constantly evolving and changing. While the backbone of a culture creates a collective sense of community, it arguably should be critically analyzed and challenged when it prevents development.

Relationship between JMC and communities

We observed tension between JMC and the community. JMC was skeptical about community capacity to understand technical design and communities mistrusted the priorities and technical capacity of JMC. From our perspective, mistrust on both sides is valid. Untrained community members lack the technical knowledge of conventionally trained experts. And the municipal contractors did show lack of professional ability in Ripon, for example, when they did not survey the site as requested by the PMC and consequently had problems with the septic tank. Despite its validity, the presence of tension between residents and their government prevents collaboration, stagnating holistic urban growth.

INTERNATIONAL ORGANIZATIONS

Our experiences with TSUPU projects funded by the World Bank challenged the Western perception of large international organizations as effective leading experts in international development. We observed first-hand that the rigid regulations and fast timeline demands of

World Bank funding destroys its potential to make lasting change on the ground. Despite a central TSUPU goal of increasing transparency and community involvement, there is little flexibility in the funding structure for time intensive community decision-making and participatory processes. The organization seemed to prioritize high overturn of money and superficial success over long-term sustainability. Priority was placed almost entirely on provision, with limited efforts to empower the community to continue after donors leave. Improper monitoring and evaluation enable inaccurate claims of success and the continuation of ineffective development practices.

OUR ROLE

We thought critically about our role and right to participate in the development process of a community that we entered as foreigners for only two months. While our roles as foreigners gave us a detached perspective and flexibility to be critical and analyze the larger picture, we have to acknowledge our limited capacity to fully understand the situation. We have to acknowledge that we entered the local setting with our preconceived notions and ideas informed by our cultures and experiences. Our role was further complicated when we were introduced to communities as evidence of progress or when communities misinterpreted our visits as promises of future changes. It is therefore critically important to emphasize that we are students presenting our subjective opinions and ideas. We are by no means offering one solution or the solution. Instead, we hope that our work can provoke critical self-reflections by JMC and other stakeholders in Jinja. We hope that our ideas can inspire continued exploration and innovation towards a development path that is defined by and for the entire community of Jinja.

APPENDIX-A

Cost approximations were developed to provide a comparative base on which to discuss design and technology options for sanitation units. The costs estimates are not final bills of quantities and would need to be developed for site-specific designs and updated unit costs. However, they are used here to give a rough idea of initial cost that can be used for comparison. See the Sanitation Toolkit for detailed cost estimates, systems sizing and designs.

CONSTRUCTION COSTS

Extra plumbing, substructure bracing in weak soil and superstructure foundations needed when the substructure can not co-function as the superstructure foundation are not included. An extra 10 percent is added to the final material costs to reflect the likely additional fees incurred and create a conservative estimate of costs.

Costs are approximate and based on both the bills of quantities developed by community savings' groups for TSUPU proposals and the Municipality's bill of quantity for the Masese toilet (NSDFU A, 2013 and JMC, 2012). Where material costs were included in both bills of quantities, the community's quote was used.

MATERIALS

The range in initial costs in this report reflects a comparison of different material options for substructures and superstructures between burnt and interlocking bricks. Bricks are prioritized over concrete because they are available and produced locally and several of the savings' groups expressed a desire to use materials produced within the community.

Brick unit costs are taken from community proposals (NSDFU A, 2013) and HYT (2012). Number of bricks needed per square meter is based on UNHABITAT (2009) and HYT (2012). Cost estimates for materials used in temporary superstructures are based on costs from projects constructed at the Appropriate Technology Center in Mukono outside Kampala (Bamutaze, 2013).

SIZING AND DESIGNS

Sizing of the various types of pits, septic tanks and biogas digester are based on the assumed number of visitors for the different sites. Slab designs are based on Farmer (2002), septic tank design on Harvey (2007), pit latrines on Sandec (2008) and Hesperian Health Guides (2013), rainwater harvesting on WaterAid (2013) and biogas on Jha, Dahunsi and Oranusi (2013) and ESF (2007). Biogas cost estimates are based on Oewieja (2010).

LABOUR COSTS

For community contracting, labour is assumed to be 15 percent of the materials cost as it was in the Rubaga market project (NSDFU, 2012). Labour for municipal contracting is assumed to be 35 percent (A4architect, 2013) and VAT 18 percent.

RUNNING COSTS

Calculated running costs include the cost of pit emptying and septic tank or biogas desludging by an outside company based on quotes given to us in an interview with a private septic tank company (Septic Representative, 2013). NSWV fees for water and sewerage are included for pour flush and waterborne toilets. Water savings from greywater reuse and rainwater for latrines assumes that water is purchased from a private water vendor at 100 shillings per jerrycan. Fees for cleaning supplies and toilet paper, etc. are excluded, as they are assumed to be the same across all options.

APPENDIX-B

COST WALUKUBA

Options Comm. Contracting	Initial	10-year cost
Double pit	6.3 to 7.5 mill	6.4 to 7.5 mill
PF sewerage	5.5 to 7.1 mill	31 to 32 mill
PF septic	7.0 to 9.8 mill	22 to 25 mill
WB sewage	7.3 to 8.8 mill	71 to 72 mill
WB septic	8.8 to 11.6 mill	43 to 46 mill
PF biogas	10 to 11.6 mill	23 to 24 mill

ASSUMPTIONS FOR BIOGAS DESIGN

- 2 liters of biomass is fed to the biogas digester
- 40 liter of biogas is produced per user per day
- 5 biogas lamps are going to be supplied by the plant
- 120 l of biogas is consumed per lamp per hour
- The hydraulic Retention time is 30 days
- 1 kg of organic waste produces 200 l of biogas
- The biogas production is evenly distributed throughout the day.



BUILDING MATERIALS TRAINING CENTER

JINJA, UGANDA

FIONA NSHEMERIRWE TRYAMBAKESH SHUKLA SIGNE LOUISE ANDERSEN

INTRODUCTION

Rapid Urbanization, inefficient land administration and inadequate capability to cope with the housing needs of people in urban areas have contributed to the development of the informal settlements [UNECE, 2009], which is a common phenomenon in all developing countries [Abrams, 1964]. On the surface, all we see is the physical appearance of the shacks for housing and an informal environment for a life. Yet the challenge is far beyond what meets the eye, it is the high unemployment levels, inadequate service delivery, poor sanitation, lack of access to basic services, insecure tenure and a myriad of other issues that come along. With over a billion of the world's population living in slums, the solutions to these challenges cannot be a single intervention but in a meld of interventions that not only solve the problems but provide a platform to sustain the found solutions. Uganda has a population base of 34 million and a high population growth rate of 3.2% making it one of the fastest growing populations in Africa. This exerts pressure on demand for land, housing, water, health, education, jobs and municipal services as well as expected impacts on the environment [MLHUD, 2011].

Regularization programmes are increasingly being used by national and local governments to improve tenure security in urban informal settlements. These regularization programmes are not only concerned with juridical (or legal) regularization but physical (or material) regularization also. Physical regularization is concerned with the material creation or improvement of physical infrastructure including shelter, social amenities and basic urban services such as education, water and sanitation facilities, and sewage and drainage systems. Such material upgradation increases the defacto tenure security in the informal settlements. Studies show, tenure security has a positive relationship with economic status and level of poverty.

For 10 years the National Slum Dwellers Federation of Uganda (NSDFU), a member of Shack/Slum Dwellers International (SDI) has attempted to find solutions that seek to address the challenges faced among the urban poor in Uganda. The apparent need for better housing, basic needs like sanitation facilities, water facilities and skills for employment opportunities resulted in solutions such as the use of low cost building materials in construction of housing and sanitation facilities. The Federation in Uganda has been previously engaged in construction of sanitation units and houses, using Interlocking stabilized soil blocks and prefabricated materials known as T-beams and Laddys; making housing more affordable for low income groups. So, the SDI and the Federation came up with an idea of establishing a Building Materials Training Center (BMTC) for providing training of fabrication of low cost building materials.

OUR ROLE IN THE PROJECT

The Project was assigned to us as part of our academic program (MSc. Urban Ecological Planning) at NTNU, by NSDFU and ACTogether Uganda. We spent two months in Jinja and Kampala where we endeavored to understand the context we were in and current status of urbanization in Uganda and challenges that come with it.

Our intervention was structured in making an in-depth study of low cost building materials, low cost housing projects, and community organizations in projects similar or related to low cost building materials. We engaged stakeholders in the project to understand what their roles are. At the end of the field work, the findings of our work would then culminate in informed recommendations on the best approach for the BMTC to function well.

OBJECTIVES OF THE STUDY

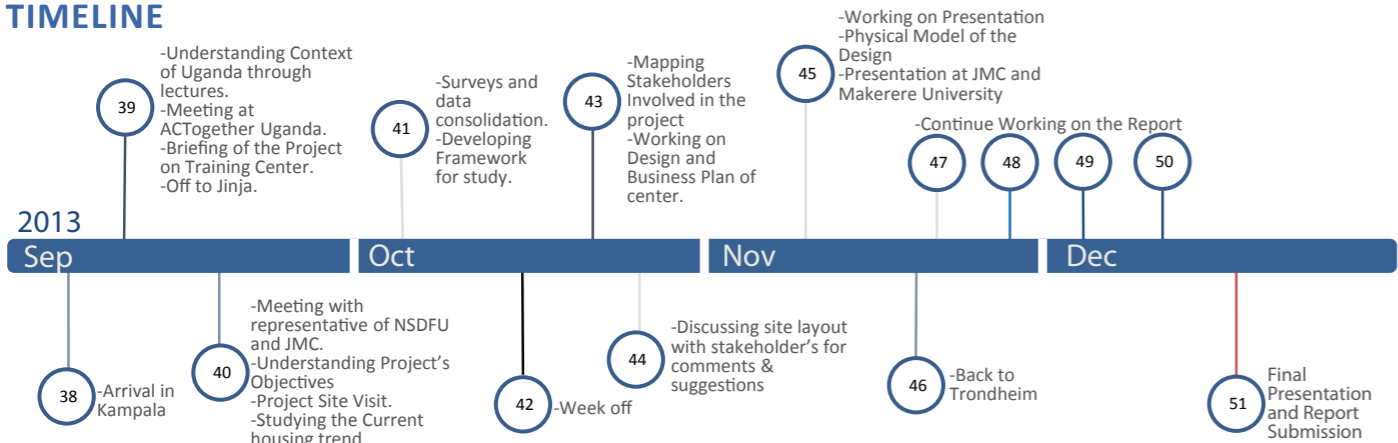
The overall objective of the study was to make meaningful interventions, mindful of the contextual dynamics, embedded in the tasks at hand. It was also about gaining an understanding of how the different aspects of planning and architecture together come to life in the ‘real world’.

SPECIFIC OBJECTIVES

- To study existing low cost building materials and techniques involved in fabrication and construction using these materials.
- To study the financial feasibility of the project by analyzing and studying the attributes eventually contributing towards profit generation.
- To design a functional site layout of the center.
- To analyze the project as a whole and give recommendations for future implementation of the project.

The specific objectives were developed after a deeper understanding of the housing needs among the low income earners in Uganda and based on case studies in Jinja.

TIMELINE



METHODOLOGY

BACKGROUND STUDY

- Lectures and Literature study
- Objectives of the project

FIELD WORK

- Site Visit (observations)
- Market Assessment of Low Cost Materials
- FGD with Savings Group
- Mapping Stakeholder's Participation

DEVELOP PROPOSALS

- Preparation of Business Plan
- Financial Feasibility of the Project
- Proposals for Training Programme
- Layout Design of the site
- Costing and Phasing of the Design

CONCLUSIONS AND RECOMMENDATIONS

BACKGROUND

Jinja has a total of approximately 9 informal settlements in the periphery of the city center. According to the 2010 Jinja slum profile report by the National Slum Dwellers Federation of Uganda (NSDFU), the settlements are home to over 20,000 people. The need for decent housing and skills for employment is apparent in the population that inhabits Jinja's informal settlements. As we later come to learn, this situation is not unique to Jinja. According to the National Housing Indicators 2012-2022, Uganda had a total of 710,000 housing backlog (Difference between the housing need and existing housing stock) in 2012 [MLHUD, 2011]. A situation attributed to, among others, the inadequate supply of cheap building materials on the market which has enhanced competition for the few available building materials and thus high costs of construction.

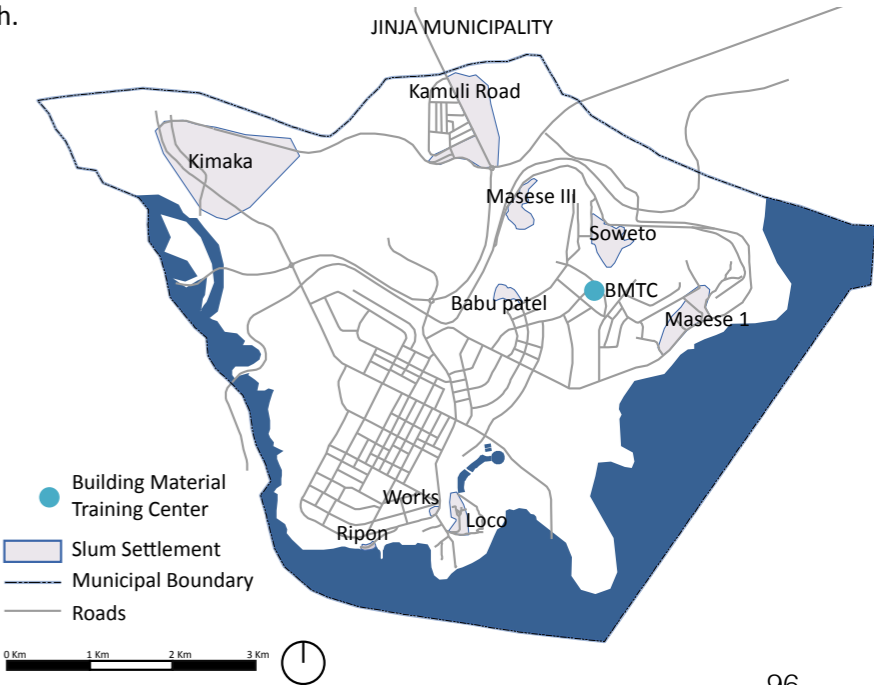
In May 2012, the NSDFU was granted permission to establish a skills development center cum community center at the reserved site in walukuba East Parish.

According to Ms. Tabitha the physical planner in Jinja Municipal Council, it is the municipality's mandate to; Draw Plans for Land and its use, Reserve public land, and Mobilize resources for development for public benefit.

"This is why the slum dwellers were given this opportunity to utilize the space for the community center to set up both a community center and a Low cost building materials training center that would benefit the community"

- **Ms. Tabitha, Planner Jinja Municipality**

The Map below shows the Slums mapped out by NSDFU in 2011 as part of a government program "Transforming Settlements of the Urban Poor in Uganda" (TSUPU). The map also shows the location of the Building materials training center in Walukuba Division.



HOUSING TRENDS

Housing in Uganda especially in urban areas is characterized by mainly 3 types of housing; permanent, semi-permanent and temporary housing. These types of housing are defined by the kind of building materials used in construction of the housing and the number of years the structure can stand. Roofing tiles are used on permanent structures while Corrugated Iron sheets may be used on both permanent and temporary structures. For walling; Burnt bricks, are used on permanent and semi-permanent structures while wood, Adobe, mud and wattle and iron sheets are used on temporary structures. For flooring, permanent structures may use ceramic tiles, while semi-permanent structures use cement screed and the temporary structures have earth floors and plastic sheets.

NATIONAL HOUSING POLICY FOR UGANDA- APRIL 2013

The current Urbanization rate in Uganda stands at 5.2% per annum. This has created a huge housing need which has led to the development of slums and informal settlements estimated at over 60% of all urban settlements. In the 1960s, the Government of Uganda attempted to draft a housing policy that would provide housing for low income earners and also regulate the type of housing to meet the needs of the people. However due to limited resources and political, social and economic challenges, the objectives highlighted in the policy were not met. Subsequent governments in the 1970s continued to pursue policy interventions aimed at;

1. Improving access to infrastructure and services at affordable standards, such as sites and services (1970's)

2. Upgrading schemes for spontaneous settlements. This resulted in the implementation of Namuwongo Upgrading and Low Cost Housing Pilot Project (1987)
3. Reviving of the housing industry by rehabilitating building materials industries, restarting mortgage schemes, retooling and human resources development; and
4. Reconstruction and redevelopment of the war ravaged areas of Mbarara, Masaka and Arua.

From the period of the previous housing policy to today, there has been introduction of new types of building materials both local and foreign such as soil stabilized blocks, interlocking blocks, floor and roofing tiles, synthetic shutters etc. As a result standardization has created challenges, poor usage of these materials has resulted, adulteration of building materials have occurred resulting in several collapsing buildings. Low levels of household incomes estimated at USD 150 per month by the Uganda National Household survey and the inadequate supply of cheap building materials on the market has made access to decent housing an elusive dream to the majority of population.

Uganda has an urban population of over 5 million people according to the 2011 Uganda Statistical abstract report. The policy recognizes the need for better building materials that respond to the housing needs and are at the same time affordable to the low income earners.

[MLHUD, 2013]



THE NEED FOR A BUILDING MATERIALS TRAINING CENTER



LOW COST HOUSING

The use of durable yet affordable raw materials in construction as a solution to the high cost for decent housing.



CONSTRUCTION TECHNIQUES

Introduction of new techniques of production and construction in the current market.



SOCIAL SPACE

The need for social infrastructure such as a community center and community gardens as a catalyst to building community.



EMPLOYMENT GENERATION SKILLS

Through construction skills in low cost housing, the ordinary person has a chance to gain employment in a field highly monopolized, and get the skills to construct own housing incrementally.



OPTIMAL USE OF LAND

The need to have a livelihood on land that is incredibly scarce in urban areas.



PHYSICAL INFRASTRUCTURE

The need for physical infrastructure such water, toilets, remains top of the needs list in slums. New low cost techniques in sanitation and water.

BUILDING MATERIALS

To gain an understanding of local building materials and construction techniques we studied the existing materials and how they are used in housing. We also studied the advantages and needs of construction using low cost materials over traditional building materials, and how the materials can be fabricated locally.

We observed different housing typologies and different construction materials and methods. There is a great difference between the settlements in material use.

WALLS

Stones, cement, sand, adobe bricks, burnt bricks, mud blocks, Iron sheets, mud and wattle and timber are materials commonly used for the construction of walls in Uganda. Alternative materials such as mass concrete walls which were used in the early 90s in the Walukuba- Masese housing project are no longer being used in the present day due to the high cost of cement. Cement blocks are rarely used except in high end commercial buildings and for fencing walls. They are, however, not widely accepted by individual developers because the technology is not yet embraced.

MATERIALS USED FOR ROOFING

Corrugated Iron sheets are considered the most widely used type of building material for roofing in Uganda, Iron sheets can be seen on both low income and high income housing. This is because they vary in quality making them affordable for all income groups.

Clay tiles on the other hand are considered to be roofing materials for the wealthy who can afford them. The scarcity of clay and the fact that they are manufactured by a few industries has made their costs not affordable to low and medium income earners.



Larger concrete blocks used for wall construction



Metal sheets for walls and roofing



Tiles for roofing

ADOBE BRICKS

These are locally known as sun-dried bricks in Uganda. They are highly unstandardized and are commonly used for construction of low income housing. They are not accepted as materials suitable in the urban setup, although they are informally still produced in urban areas. If properly produced and improved by stabilization, compression and standardization, they are ideal for construction because they are cheap, environmentally friendly and can be easily produced.

BURNT BRICKS

These are the most commonly used materials for construction of housing walls in Uganda. They can be made using clay, or non-organic soil however due to the scarcity of clay, soil is commonly used. The bricks can be used to construct single or multi-story houses.

TIMBER

There are a variety of timber species in Uganda. These include Mahogany, Mvule, Pine, Elgon, Olive, Nkoba, Eucalyptus to mention a few. In construction, timber is one of the most essential materials needed for roofing, making doors, windows, tools, walls and furniture. In slums, timber is used to construct a house as either a dwelling unit or a business unit.

CEMENT AND LIME

Cement is used in making concrete and mortar mixtures. It is also used for making floor screed. Lime may be used as an alternative to cement in similar functions.



STONES

Stones are commonly used in two ways; they may be used as external finishing on a built structure or in crushed form in construction of drainage channels, foundations, concrete floor mixtures among others. The cost of stones depends on whether they are crushed by machine or by hand. Machine crushed stones are high quality and thus are more expensive.

SAND

Sand is essential in construction in Uganda. Regardless of whether the structure is permanent or semi-permanent, different sand mixtures may be required. There are various categories of sand to serve different purposes such as; beach sand, fine sand, utility sand, fill sand, mason sand, concrete sand and many others.

IMPORTED MATERIALS

There is a heavy reliance on imported materials such as steel products, roofing materials, furniture and fittings in Uganda. A tendency that is partly responsible for the high costs of housing in the country. This is attributed to the quality of materials produced by the local steel and furniture industries that do not meet the required standards.



LOW COST BUILDING MATERIALS

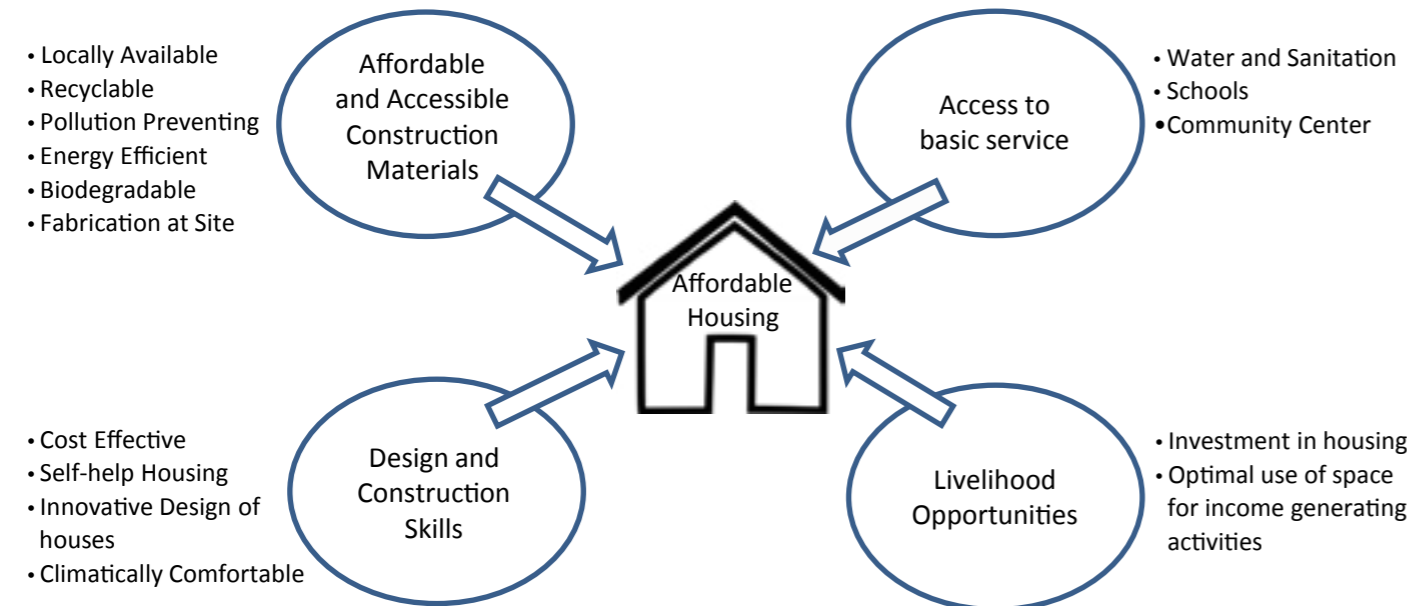
Low cost building materials make the construction of a building more affordable compared to traditional materials. To build a low cost building you have to consider a series of cost saving-measures, not only the cost of one brick in the wall. The materials in themselves may not be cheaper than traditional materials, but costs are cut in these ways;

1. Low cost materials are often produced locally on site; this reduces transportation cost both for raw materials and ready-made products.
2. The materials are often bigger than traditional materials, for example the Compressed Stabilized Earth Blocks (CSEB). The CSEB is designed to make the construction easier, and therefore reduces the building time and labor costs. In addition, people can produce their own materials and build their own house, incurring no costs on labor.

3. The design has to have simple shapes and efficient use of space. Vertical structures increase circulation space on the ground and allows for more uses.
4. The materials are of good quality to minimize costs in the future for maintenance.
5. Waste materials such as broken blocks should be recycled or reused.
6. Only materials needed should be produced. Over production leads to waste.

"Products to be produced at the center should be of good quality, durable, aesthetically appealing and above all affordable for the poor."

- Ms. Tabitha, Planner Jinja Municipality



MATERIALS PRODUCED AT THE BMTC

The following materials are considered made at the Building Materials Training Center; T-beams and laddys, Fiber-Reinforced Cement tiles for roofing, and Compressed Stabilized Earth Blocks.

T-BEAMS AND LADDYS

A low cost alternative to concrete slabs in construction of storey buildings is to make prefabricated concrete T-beams and laddys. The T-beams can be scaled down (3,5 m) so that humans can lift them without help from machines. To make a slab for a floor you make a grid with the T-beams, and between them you put the laddys.

To make the T-beams and laddys you need moulds, these are generally made from wood. For the laddys they use wood and a plastic bag to make the concave shape of the laddys. The moulds can be prefabricated and they can be reused 3 – 4 times.

FIBRE-REINFORCED CEMENT (FRC) TILES FOR ROOFING

Roof tiles are rarely used in Jinja due to their high prices. In addition to being expensive, they currently have to be imported from Mbale or Kajjansi. Instead of roofing tiles, contractors mostly use metal sheets, which incur significant transport costs too, since they are not produced in Jinja.

To make the roofing tiles low cost, they must be produced locally, thus cutting out transport costs, and at a price that can compete with iron sheets. Use of tiles can give a better indoor climate compared to iron sheets, and they are more aesthetically appealing. But like the iron sheets, they have to be replaced after some years if they are not maintained.



T-beams

Laddys

FRC Tiles



Tanzanian hydraform interlocking block
Photo by: Alibaba.com



ISSB top, projecting

ISSB bottom, depression



Interlocking Stabilized Soil Blocks

COMPRESSED STABILIZED EARTH BLOCKS (CSEB)

The CSEBs are made using ordinary non-organic soil (murrum), sand, a small amount of cement and little water. This mixture is put into a special press (Interlocking stabilized soil block machine) that compresses the mixture into a block. The blocks must then be cured by drying the blocks in a shed for 7 – 14 days, depending on the mixture, and then it can be used for building.

The CSEBs in the market are of many types, and these depend on the press that has been used to mould the blocks. The most common shape is the Interlocking Stabilized Soil Block (ISSB), but standard soil block, channel blocks and hollow blocks can also be made.

The interlocking blocks are shaped with projecting parts, which fit exactly into depressions in the block placed above. In this way the blocks are automatically aligned horizontally and vertically.

In the hollow blocks, known as tanzanian hydraform interlocking block, each block has two vertical cylindrical holes, which reduces the weight of the block. Steel rods can be inserted for reinforcement of the building. Grout can be poured into the holes, which runs through the full height of the wall thus increasing its stability.

In the channel blocks there is a channel along the long axis, into which reinforcing steel and concrete can be placed to form a ring beam to stabilize the building.

ADVANTAGES OF CSEB

CSEBs are up to 80% stronger than fired bricks. They are uniform in size and shape with defined edges which makes construction easier and saves construction time. The amount of mortar used between the blocks is minimal as the blocks can be interlocking. They produce less waste as if the quality of the brick is bad after it's been compressed, its put back into mixture and reused in the production. Unlike other traditional bricks CSEBs are cured on site and not fired using firewood. This reduces the environmental damage in CO²-emissions and preserves forest. Production on site also reduces transportation cost, both for raw materials and produced blocks. Additional costs are saved by building loadbearing walls, instead of infill walls between a structural frame work.

The hollow blocks also have beneficial climatic impact due to its high thermal capacity, low thermal conductivity which can moderate extreme outdoor temperatures and maintain a satisfactory internal temperature balance in comparison to concreted blocks.

The block press is easy to operate and two persons are required in the production of the blocks. The block press comes in single or double interlocking models.

DISADVANTAGES OF CSEBs

Bad quality or inappropriate equipment in the production of blocks can lead to a poor quality block. The raw materials for the CSEB need to be carefully chosen and mixed. Over-stabilization arises due to fear or ignorance resulting in high costs, and under-stabilization resulting in very low quality products. Many builders are also not aware of that the CSEB need to be protected from rain by providing a good over-hang of minimum 600mm.

WHY INTERLOCKING STABILIZED SOIL BLOCKS (ISSB) FOR WALLS?

To compare the ISSB with traditionally burnt bricks you have to consider the overall costs. One ISSB is more expensive than one burnt brick, but because of the size of the ISSB you'll need more burnt bricks pr. ISSB. There is also need for more mortar if you build with burnt bricks compared to the ISSB. Wood that is used to make the burnt bricks is expensive, and the burning causes a lot of CO² emissions.

The fact that the ISSB can be produced on site also reduces the transportation costs and CO² emissions from the transportation. Construction with ISSB can be done faster than with burnt bricks, and people can be trained in production and construction and be able to build their houses themselves.

Simple calculation shows us that use of burnt bricks increases the total construction cost by 40% compared with ISSB.

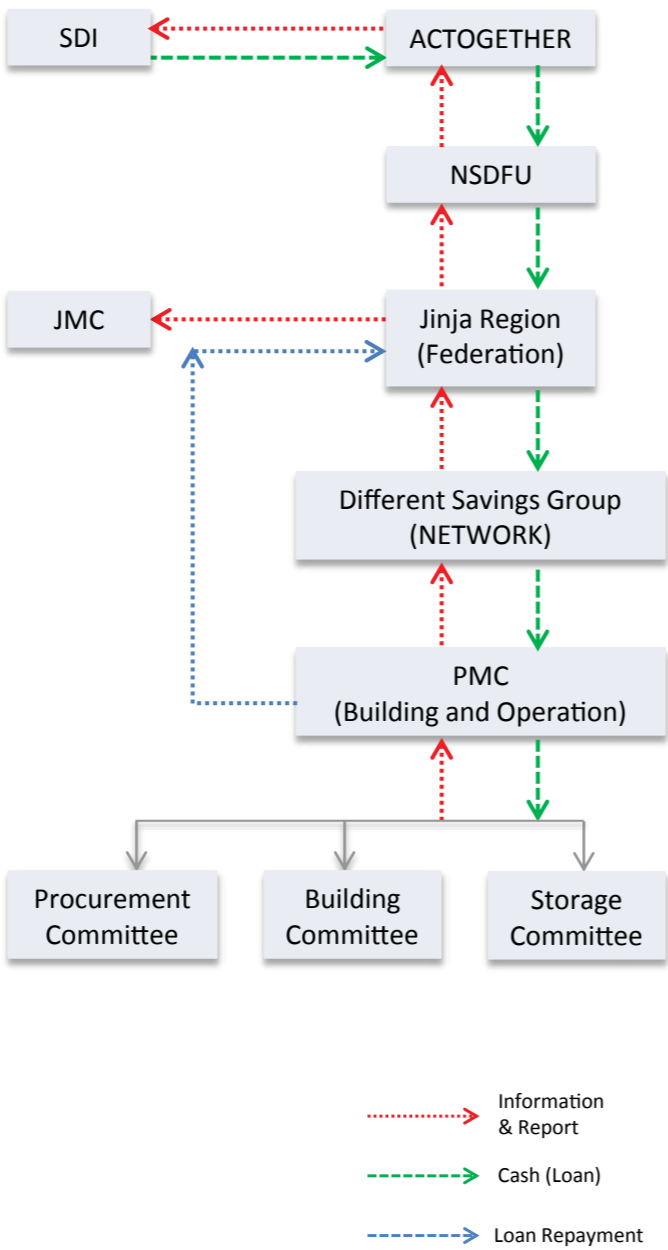
[Eng. Dr. Moses Kizza Musaazi]

STAKEHOLDERS

There are different stakeholders’ with various interests in the BMTC. The roles of each stakeholder’s in this project are as follows:

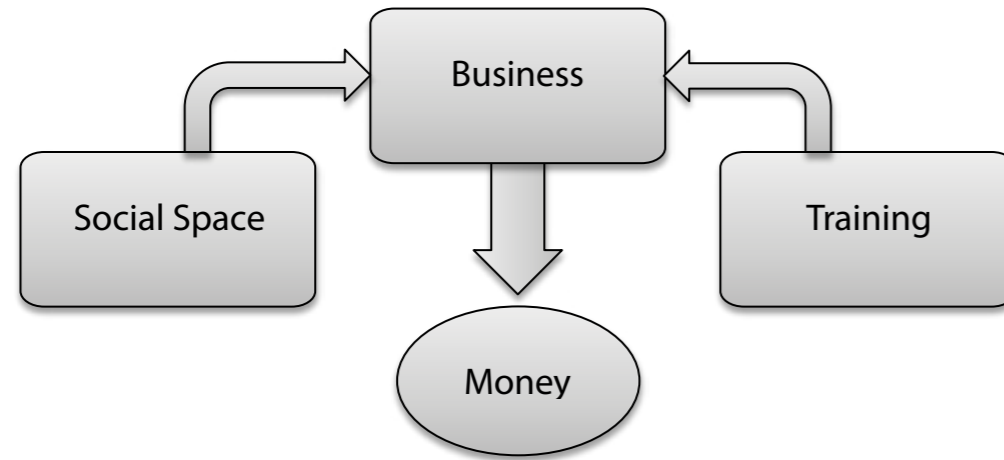
- 1. **Shack/Slum Dwellers International (SDI):** SDI is the funding agency in this project. The SDI is providing a loan of UGX 67 million (27000 USD) to kick start the project.
- 2. **ACTogether Uganda:** It will be responsible for developing the organizational capacity of the training center by providing them with technical support, and in the operations and management of the center as a whole.
- 3. **National Slum Dweller Federation of Uganda (NSDFU):** NSDFU is responsible for the coordination between the savings group and ACTogether. The federation is also responsible for mobilizing the savings group for making different groups who will have different tasks in the construction and management of the BMTC.
- 4. **Jinja Municipal Council (JMC):** The BMTC is located in the vicinity of the Jinja Municipal Council and has provided the land allocated for the community center and construction of the BMTC.
- 5. **Savings Group:** People from different communities form savings group which come together and form a network. These savings group will constitute the Project Management Committee (PMC), responsible for executing the tasks to be carried out for construction of the BMTC.

The following diagram gives a schematic representation of various stakeholders’ participation in the BMTC. The diagram represents what will be the communication process among the stakeholders and how information and cash will flow at different levels.



Project Management Committee

BUSINESS MODEL



The first major objective of the BMTC is to generate revenue from selling products in the market and by providing training to people for construction of low cost materials. The center will generate some income by renting out the community center in its periphery for organizing social events.

The following attributes were taken into consideration to assess if the project is feasible or not in terms of profit that will be generated:

1. Startup Capital
2. Market and Customer Analysis
3. Sales Analysis
4. Income in form of Training Fees
5. Income from renting out Community Center

STARTUP CAPITAL

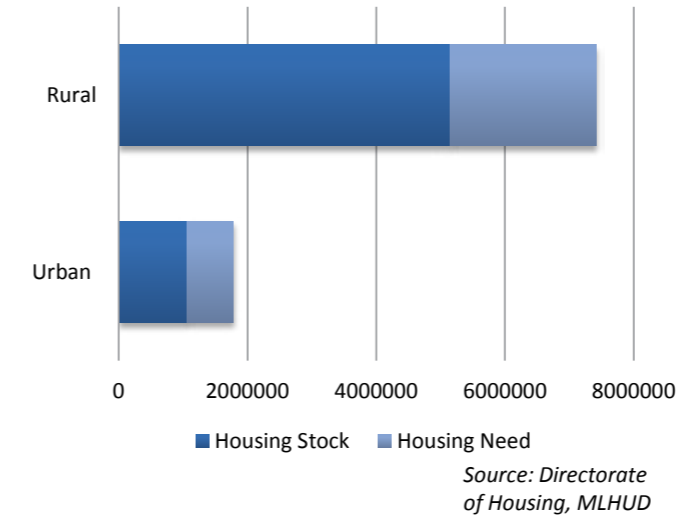
Shack/Slum Dwellers International has provided a loan amount of UGX 67 Million (27000 USD) to kick start the project. Additional UGX 2.4 Million is being contributed by the community from the savings fund as a startup capital. This money will be used for construction of sheds and curing ponds in the initial phase of the project, and for purchasing materials for fabrication of low cost building materials.

The money has been provided in a form of loan which has to be repaid in 5 years at an interest rate of 12% per annum. The loan will only be provided for the project if the community comes up with some basic infrastructure for the project in its initial phase.

The loan will be repaid to the NSDFU and recovered funds will be used as an investment execution of some other projects.

MARKET AND CUSTOMER ANALYSIS

The population of Uganda in the year 2010 was about 34 million and its growing with an annual growth rate of 3.4%. The following graph shows the current housing stock and additional housing need to provide shelter to the people.



There is an additional housing need of 3 million houses in the urban and rural areas of Uganda and since, there is high cost of Land and Housing delivery in Uganda, alternative building materials can support the housing demand by providing low cost and effective building materials in the market. Though, talking with various groups of people (students at Makerere University and Stakeholder's in the project), we understood why there is no potential market for the low cost housing in Uganda.

The following are the reasons for low cost materials market to be underdeveloped in Uganda:

- Generally people are not aware of alternate building materials and one who knows about them does not have trust in the structural stability of the house.
- People usually prefer burnt bricks as the unit cost of burnt bricks is lesser than the unit cost of ISSB, but they overlook the overall cost of the structure.
- People are influenced by the western style of construction using concrete and steel.

This wrong or false opinion about low cost materials should be corrected and people should be encouraged towards use of low cost materials. This is only possible when housing projects can be done using these materials, in order for people to develop interest in such projects.



SALES ANALYSIS

We did some research on current price of low cost building materials in Uganda. We calculated the production cost involved in fabrication and the selling price of the products in the market. We assumed a scenario and tried to estimate the profit that can be generated by the BMTC from selling the products in the market.

Materials	Cost/ Production UGX	Production /day /person	Production Cost/day UGX	Selling Price UGX	Total Selling/day UGX
Interlocking Bricks	439	100	43900	500	50000
T-beams	64380	5	321900	75000	375000
Laddys	17128	5	85640	20000	100000
Tiles	477	50	23850	550	27500

If 100 interlocking bricks, 5 T-beams, 5 laddys and 50 Roofing Tiles can be fabricated in a day, the total production cost involved in the fabrication equals to UGX 0.4 Million and if all the materials that is being produced is sold in the market at the market price, the income made from selling the products is UGX 0.5 Million.

When we extrapolate the above scenario, the following result is obtained.

-Total Production Cost/Year: UGX 171 Million.

-Selling Cost/Year: UGX 200 Million.

-Total Income from Selling Products/year: UGX 29 Million.

INCOME IN FORM OF TRAINING FEES

The training will be provided to the beneficiaries at the certain training fees. The training fee is charged so that the center can generate income. The profit can be used in operation and management of the BMTC. When fees are charged people will value the essence of training.

We calculated the income that can be generated in the form of training fees by estimating the number of trainees that will be hired and the fees charged for the total training period. The following table shows income that can be generated in terms of training fees. The center will take 18 trainees for a period of 3 months. These will provide training on low cost building materials.

Training	No. of Persons	Training Fees (for 3 months) UGX	Total Amount, (in 3 months) UGX
Interlocking Bricks	3	120,000	360,000
T-beams	6	120,000	720,000
Laddys	5	120,000	600,000
Tiles	4	120,000	480,000

The total income that can be generated in form of training fees is UGX 8.6 Million per annum. But there is an expenditure that will be incurred on providing training to the beneficiaries. We calculated how much will be expenditure that will be involved in providing to the above trainees during the training period.

Materials/ Person	No. of Person	Amount Spend/ Person	Total Amount UGX
5 Bricks/Person	3	2193	6578
3 T-beams/Person	6	194,490	1,266,940
5 Laddys/person	5	85,640	428,200
50 Tiles/Person	4	23,820	99,280

The total amount that will be spent on training people amounts to be around UGX 7.2 Million per annum. So if we see the amount that is made by the center in terms of training fees over the amount that is spent of training, it's really nominal.

INCOME FROM RENTING OUT COMMUNITY CENTER
The training center will have a social space in form of a community center in its vicinity which will be rented out for organizing community meetings and functions at certain rental charge. We made some assumptions of rentals from our research and calculated amount that can be generated by renting out the community center. The annual income that can be generated by renting out the training center annually amounts to be UGX 360,000 (@UGX 30,000/Month).

FINANCIAL FEASIBILITY OF THE PROJECT

The project will only be feasible if the BMTC is able to:

- 1. Generate enough profit to repay the loan in given time period (i.e. 5 years).
- 2. Generate enough Income to bear the overhead charges and to manage the fixed costs involved in the project.
- 3. Generate enough Income to build the entire necessary infrastructure as proposed in the design in the given time frame.

We looked at the above given attributes that were taken for assessing the feasibility of the BMTC in terms of profit that will be generated. The attributes taken for the study are not conclusive but give a scenario of profit that can be generated by the BMTC under the assumptions made. The following table shows the total income that can be generated from selling products, in terms of training fees and from renting out the community center.

Income from Sales	29 M UGX/Year
Income in form of Training Fees	1.4 M UGX/Year
Income from renting out Community Center	0.3 M UGX/Year
Total	30.7 M UGX/Year

The total income generated by the BMTC under the assumptions made above amounts to be UGX 38 Million per annum. The following table illustrates the profit that can be generated after repayment of loan amount and after bearing the expenditure on training.

Total Production Cost	171 M UGX/Year
Expenditure on Training People	7.2 M UGX/Year
Total Income	30.7 M UGX/Year
Loan Repayment (@12% interest rate)	18 M UGX/Year
Profit (after repayment of loan)	12.7 M UGX/Year
Profit %	7%

The profit made by the BMTC inclusive of sales, training fees and income generated from rental of the community center is 7% per annum. This profit does not include the overhead charges and fixed cost that will be incurred in day to day running of the BMTC and for paying wages and salaries.

According to the above analysis, this project will not be financially feasible as it is not able to generate enough profit to run the daily operations and management of the center.

RECOMMENDATIONS FOR MAKING THE PROJECT FINANCIALLY FEASIBLE

It’s essential for the BMTC to generate enough profit to make the center self-sustaining. In order to do so, we have provided the following recommendations that can help in achieving maximum profit by the BMTC in the long run.

The BMTC should produce materials as per market demand and there should be a separate manpower for production and a separate manpower for providing training to the people. Although it will take time for the center to establish a proper market for the low cost materials, in the long term there is a possibility of generating profit. Looking at the assumptions made for sales analysis, the BMTC is generating UGX 29 Million (14% profit) from sales. But, the center should increase their sales to at least to 40-45% profit so that the fixed cost of the BMTC can be managed.

The training fees being levied by the BMTC are less than the expenditure that is being incurred on providing training. Therefore, it should reduce the cost of providing training and increase training fees amount in order to generate maximum profit.

Materials	No. of Persons	Training Fees (3 months) UGX	Amount Spend on Training/person UGX	Total Amount Spend on Training UGX
Interlocking Bricks	2	300000	2193	4386
T-Beams	3	450000	194.490	583470
Laddys	3	450000	85.640	256920
Tiles	2	300000	23.820	47640
Total	10	1500000		892416

If training fees were increased by UGX 30,000 for a 3 months training period and the number of trainees to be enrolled for the training period was 10. At this rate, the total income that can be generated from training fees is UGX 6 Million per annum whereas the amount spent on training is only UGX 3.5 Million per annum and this results in annual profit of 42% from training.

The BMTC should try to find ways to generate more profit from the use of the community center. The community center should be rented out for organizing events and other social functions.

TRAINING MODEL OF THE BMTC

The second major objective of the BMTC is to provide training to people in two major fields:

- i. Fabrication of Low Cost Building Materials
- ii. Entrepreneurship Training

We formulated the training cycle as shown in the figure to depict the training model of the center.

TRAINING OBJECTIVES

The specific objectives of the training are:

1. Producing the required manpower to create a competitive force in the construction market.
2. Addressing the training needs of the industry.
3. Generating revenue to support other activities in the center.

TRAINING PROGRAMMES

The training programmes of the BMTC will basically focus on two aspects:

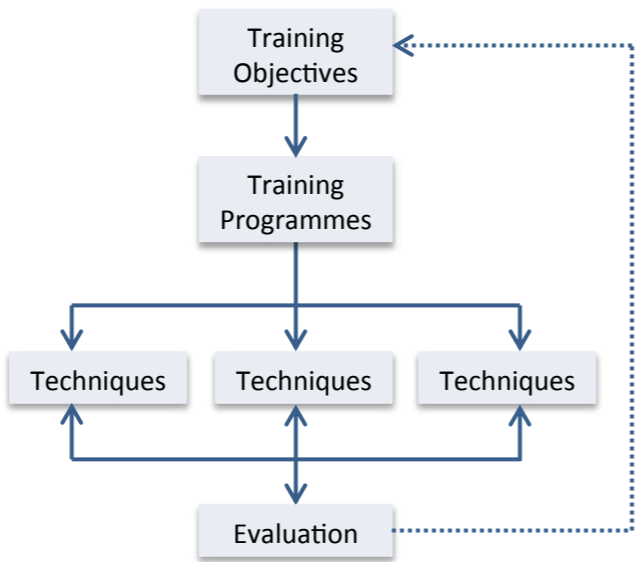
1. Fabrication of T-Beams, laddys, ISSBs and FRC roofing tiles.
2. Basic training on managing a small scale industry and self-employment generation.

TECHNIQUES

The trainers will be provided with techniques of construction using the low cost materials, how to use the machinery for making ISSBs and making moulds for fabricating T-beams, laddys and FRC tiles.

FACILITIES

The trainees will be provided with all adequate facilities which will help them in enhancing their knowledge. The BMTC will be equipped with all the necessary machinery and moulds required for fabrication and



other than that the entire necessary infrastructure like sheds, hostels, classrooms, demonstration house and curing ponds.

TRAINERS

The BMTC will hire professional trainers to provide training on fabrication of ISSBs, T-beams, Laddys and FRC tiles.

The BMTC can partner with organizations like Makerere University, HYT Uganda, Good Earth Trust, Shelter and Settlement Alternative among others, for exchange of knowledge and human resources.

All these aspects of the training cycle will be continuously evaluated through a feedback mechanism and recommendation will be taken into consideration for gradual improvement of the BMTC.

COMMUNITY CENTER

COMMUNITY CENTER AS A SOCIAL ASPECT OF THE BMTC

The land acquired for construction of the BMTC was basically a land allocated by Jinja Municipality for construction of a Community Center for Walukuba East Parish. While conducting interviews with people in the community and understanding the needs of the community, they strongly emphasized the need of a community center in the area.

The community center will not only act as a public space but also revenue generating source for the BMTC.

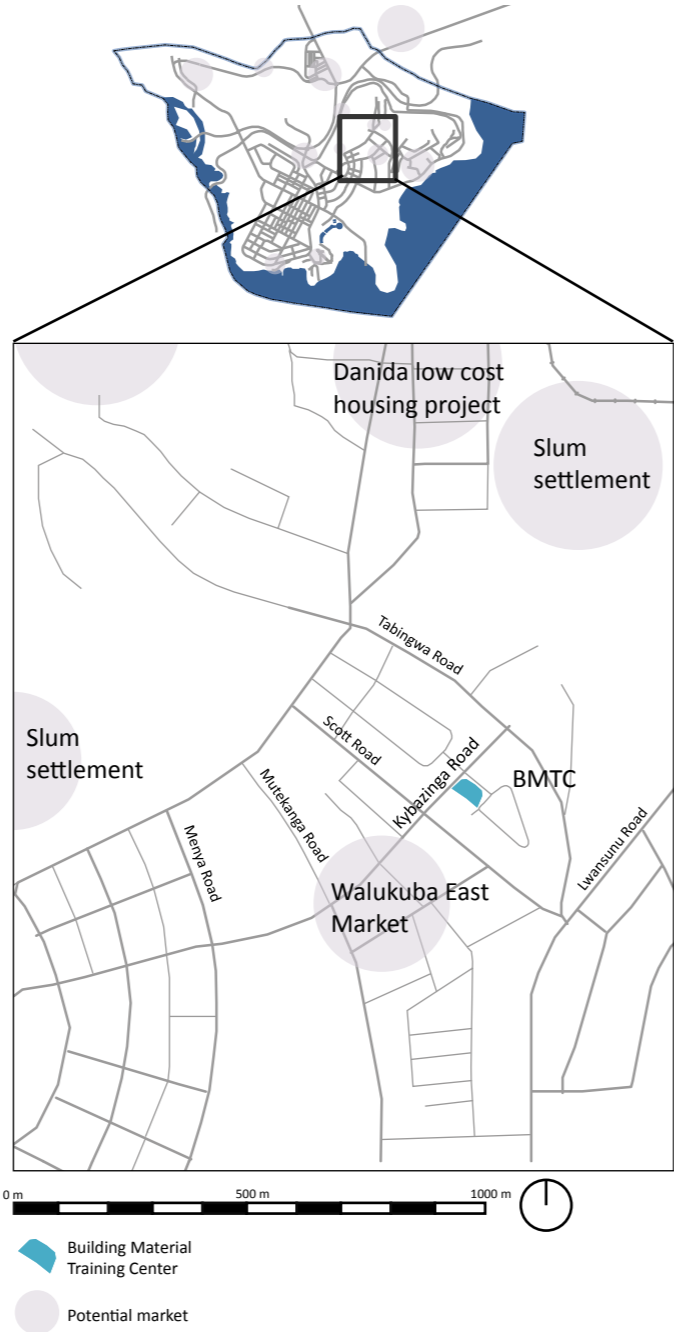


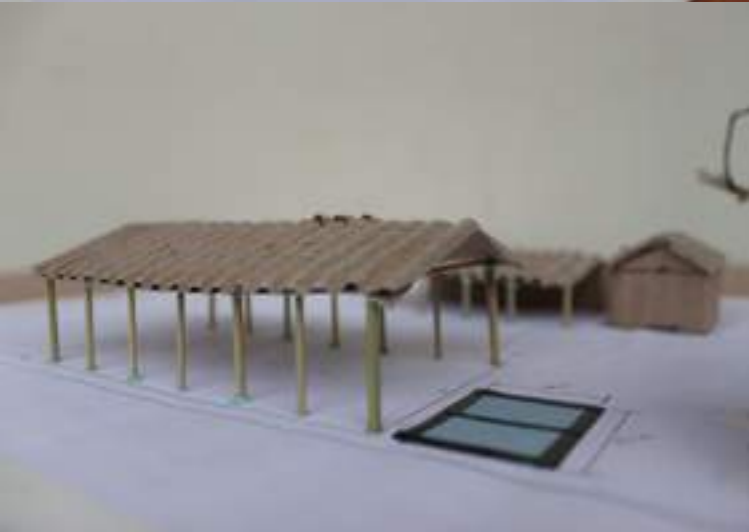
THE SITE

The site of the BMTC is located in Ntege village, Walukuba East Parish Walukuba division, Jinja municipality. The land covers 4 plots of land approximately 1400m². It is bordered by Kybazinga road by the entrance and Kafuko road at the back. The site is currently fenced, a storage container is placed on site and the PMC is working on getting a water connection.

The land had been reserved by the municipality as public land for the establishment of a community center to serve the community needs for a meeting point in Walukuba East. The only available community center close to this community is in Walukuba West and it is in poor state and no sanitary facilities available for the center.

Community centers serve an important role in the development of a “community” fabric that has each strand dependent on one another. Less than 200 meters from the site is the Walukuba East market, where majority of residents buy food and others earn a living. It is in this market, in the Local chairman’s office, that community meetings have been held on matters of health, politics and other development issues. The market is planned for upgrading. This is strategic for the Building Material Training Center because materials and labor to facilitate upgrading can be produced at the center.





DESIGN APPROACH

We designed the site layout for the BMTC focusing on four aspects; the functionality of the different activities of the center, circulation on site, orientation and optimal use of land. In the site layout we proposed an arrangement of production shed, Curing Ponds, Storage Shelter, Demonstration House, Training/Community Center and Community Garden. This is done based on feedback and cooperation with Mr. Waiswa (ACTogether) Mr. Kaliro (Architect) and the Project Management Committee (PMC).

Looking at previous designs for the site, we saw some areas that needed attention.

- No available space for loading and offloading of building materials.
- Lack of storage space for produced materials.
- Parking
- Design using low cost materials
- Placement of storage container (currently on site)

The layout responds to the needs of the functions of the BMTC and the center as a business. The bubble diagram shows the functions on the site and how they relate to each other.

Areas we present in the design are based on case studies from DANIDA and community centers else where. The proposed design is not definite, it can be changed to fit into the available budget. The design also leaves space for expansion.



DESIGN PHASING

PHASING

We are proposing to develop the site in 4 phases.

Project phasing		UGX	USD@2500
	Pre-phase	18,500,000	7,400
	Phase 1	10,498,430	4,199
	Phase 2	33,050,000	13,220
	Phase 3 & 4	76,000,000	30,400

PHASE 1

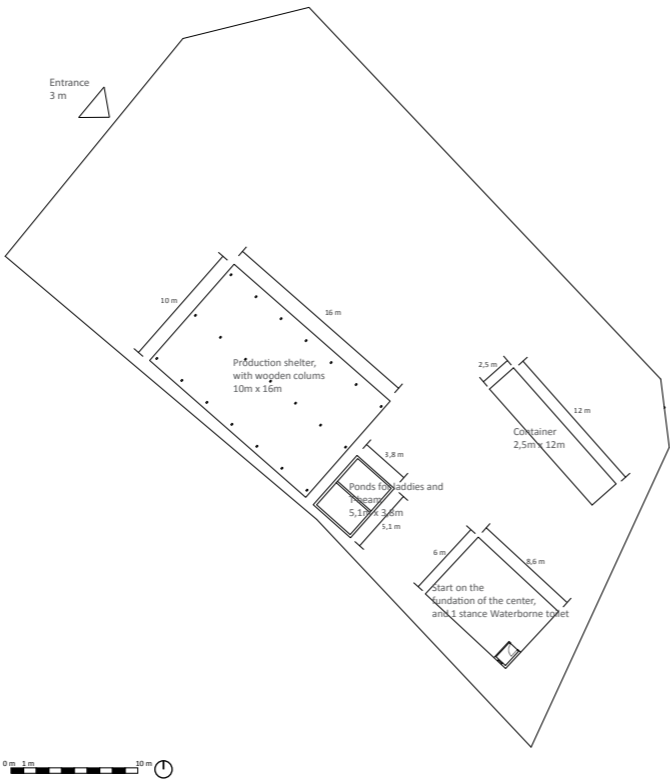
Construct a basic temporary structure in wood with iron sheets which gives shelter for training and production of Interlocking Stabilized Soil Blocks (ISSB), T-beams and laddys. This will be built in the middle of the site, to have close access to the storage container, and leave space for a possible extension of the shelter towards the entrance.

To start the production of T-beams and laddys, curing ponds are required. These are placed as an extension of the production shelter, put in open air so they can use rainwater to fill the ponds.

The foundation and ground floor of the center also needs to be started in this phase, since there is a high demand for a place where the community can gather.

A sewage line is located along Kafuko road; therefore a water borne toilet is constructed at the back of the site close to the sewer line. The toilet will later on be implemented in the center with sanitation facilities. We recommend temporary materials for the toilet in phase 1.

In the first phase they also have to purchase an ISSB machine and raw materials for production of T-beams, laddys and ISSBs.



PHASE 2

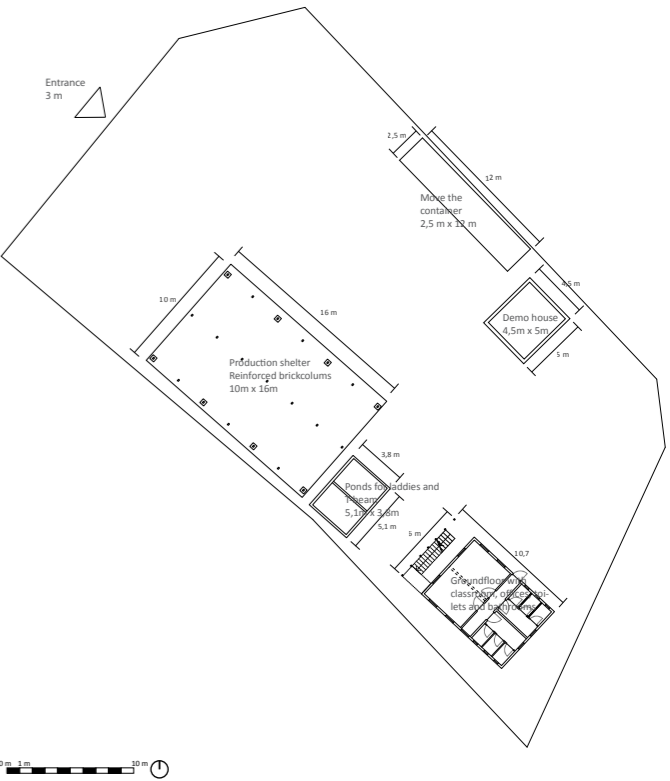
In phase 2 we suggest to move the storage container to give more space for gardens connected to the center, and space for a Demonstration house. Division of the site into a commercial side and a social side will also be more defined by moving the container.

The commercial side will have an open space for parking and on/off-loading connected to the storage. By organizing the site like this we can concentrate all circulation of heavy trucks, cars and materials near the entrance and the main road, and leave the back open for social space.

The damaged blocks from production, that might otherwise be considered waste, can be used to reinforce the wooden columns of the production shelter with brick columns. Blocks from the training can be used to start the construction of the demonstration house, and in this way also give training in construction.

Sanitation facilities (4 toilets and 2 bathrooms), office space and training room will be on the ground floor. The center has one main entrance to the sanitation facilities and the two rooms for office and training room. However by locking the access doors to the class room for training and office rooms, the sanitation facilities can still be used when the center is closed, and then generate income.

The staircase is constructed outside the center block to save costs of construction.

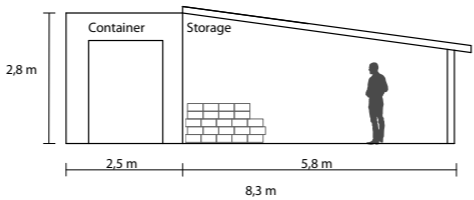
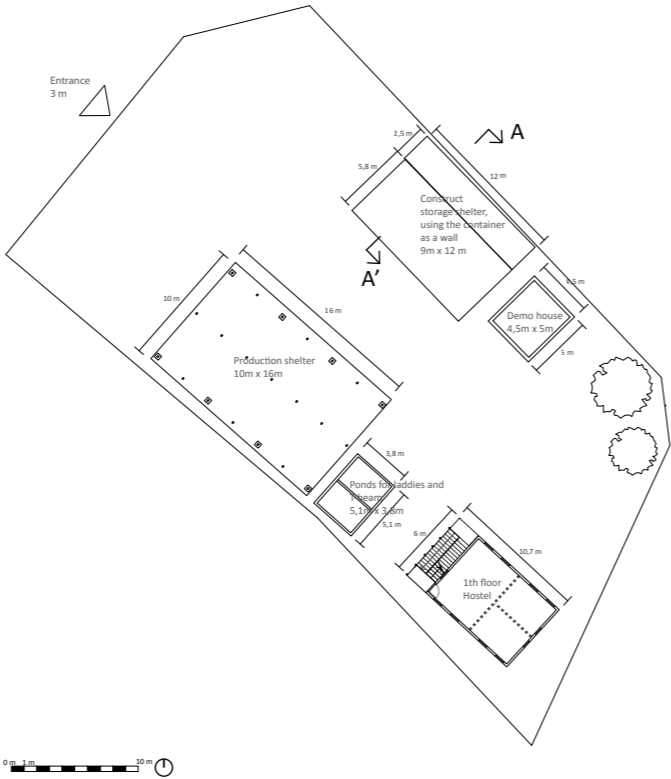


PHASE 3

In the third phase the demonstration house and the first floor of the center will be completed.

The intention for the center is to accommodate classrooms, offices, community center and a hostel for other training exchanges. To lower the costs we propose that that floors should have as few fixed walls as possible, so that the rooms can be multipurpose rooms.

If there is need for more storage space for produced materials, we suggest building a storage shelter attached to the container, using the container as a wall. See section.



Section A -A'

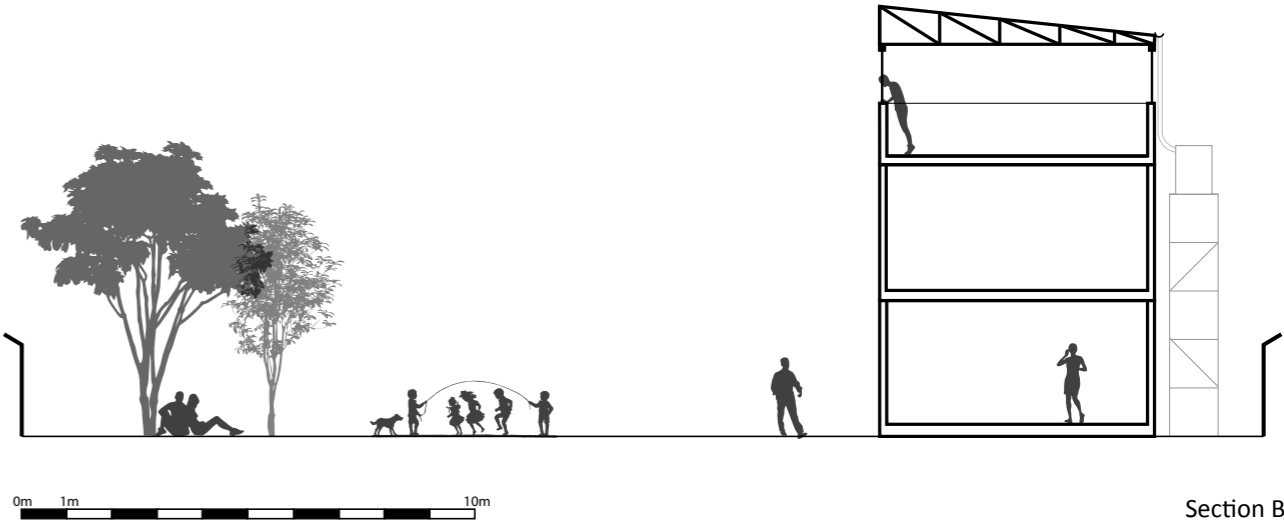
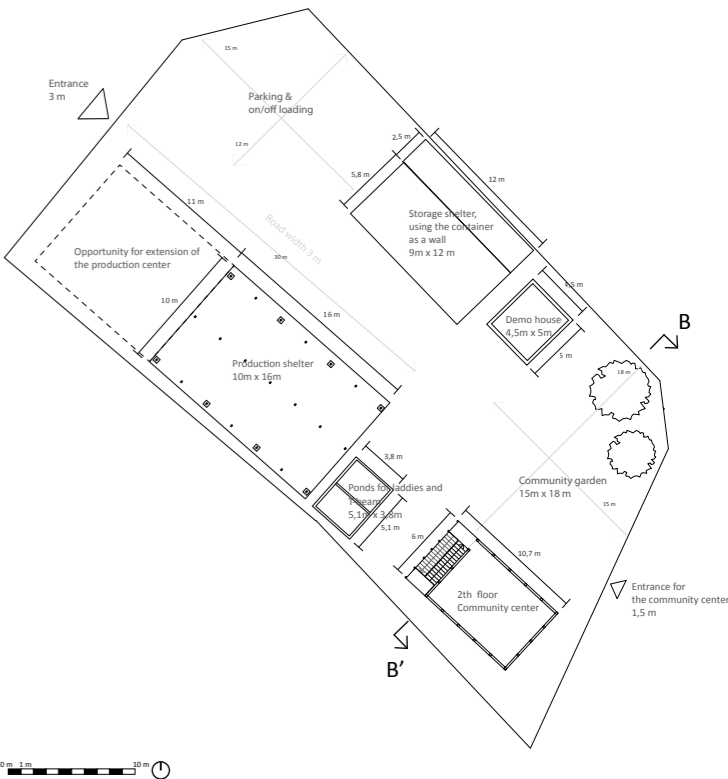
PHASE 4

In the final phase the center will be completed. We suggest that the second floor of the center is an open floor that can be used for a community center. In the future they can fill in the walls with windows and doors.

The roof will be tilted towards the back of the center to allow rainwater harvesting in a tank. This water can then be used for the bathrooms and flushing the toilets.

The garden can hold social functions and generate income from these. The garden together with the demonstration house will show how optimal use of land can be done.

Rebuilding the existing open-roofed structure can, in the future, be transformed to a functional building like a school, just by filling in the walls with blocks between the columns.



Section B-B'
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DESIGN COSTING

The entire project is estimated to cost approximately UGX 138 Million equivalent to USD 55,000. With a startup capital of UGX 67 Million, the project has to be phased and the business part must thrive to enable the completion of the project and the loan repayment.

	UGX	USD
Total cost of the project	137,048,430	54,819
LOAN from SDI	67,000,000	26,800
Funds already spent from ACTogether	18,500,000	7,400
Total amount needed to complete site development	51,548,430	20,619

To determine the feasibility of the project, rough estimates were made following estimates from two projects within ACTogether and the federation because of the similarities in implementation methods and costs. We chose to look at the Rubaga sanitation unit project and the Kawama low cost housing project.

The Rubaga sanitation unit block has a ground floor coverage of 57m², total 116m² and it cost UGX 47 Million equivalent to USD 20,000 about UGX 406,000/ m² (USD170/m²).

A general ‘rule of thumb’ cost on building like these are about UGX 550,000-600,000/m2. [Mr. Waiswa]

The principal reasons for this difference (UGX 550,000-UGX 600,000 compared to UGX 406,000/UGX 420,000) are linked to two issues:

- 1) A certain contribution in kind from members of the community (free labor).
- 2) Stringent and close supervision on the part of ACTogether.

The Kawama 6 unit housing structure was constructed using the Tanzanian Interlocking Stabilized Soil Blocks similar to those to be produce at the BMTC in Walukuba. A single unit at Kawama has a ground coverage of 40m² cost UGX 8 Million equivalent to USD 3200 about UGX 200,000/m² (USD79/m²).

To estimate the costs for the project we use UGX. 550,000/m² (USD218/m²) for the community and training center building, and UGX 200,000/m² (USD 79/m²) for the demonstration house. There might be significant differences in the estimated costs linked to fact that the buildings will be constructed using ISSBs and precast T-beams and laddys produced on site.

BUILDING MATERIALS PROJECT COSTING ESTIMATES (UGX)		USD@2500	PROJECT PHASING (UGX/USD)		
FENCING; using chain link and concrete columns	8,500,000	3,400	Pre-phase	18,500,000	7,400
STORAGE; Container 2.5m by 12m	10,000,000	4,000			
Production shelter	3,785,000	1,514	Phase 1	10,498,430	4,199
Water extension on site	300,000	120			
One stance water borne toilet+ Labor and Water tap	2,350,000	940			
Raw materials 1st products (Laddys, T-beams, blocks)	863,430	345			
ISSB Machine purchase	2,000,000	800			
Curing Ponds	1,200,000	480	Phase 2	33,050,000	13,220
Moving the container	50,000	20			
Ground floor Training center and sanitation facilities	33,000,000	13,200	Phase 3 & 4	76,000,000	30,400
Demonstration house 45m2 house (double storied)	9,000,000	3,600			
1st and 2nd floor; Hostels and community center+ Rain water Harvesting	67,000,000	26,800	Phase 3 & 4	76,000,000	30,400
TOTAL COST	138,048,430	54,819			



CONCLUSIONS

Conclusions are drawn from a critical perspective of the project resulting from interviews, observations and analysis of the current situation in Uganda.

There is a market risk for low cost building materials in Uganda attributed to a number of issues which include;

- The lack of sufficient information about low cost building materials and the advantages associated with using this type of materials.
- Architectural schools and building technical institutions have not made efforts in including low cost building materials in curricula.
- The lack of training in fabrication and use of low cost building materials has left room for mistrust for these materials among the public.
- The market is highly saturated by traditional building materials that are widely produced and are easily accessible compared to low cost building materials.
- Low cost building materials have a high cost for initial production but significantly reduce the costs of the building and the amount of maintenance costs.

The UGX67 million loan amount cannot cover the costs of construction and setup of the entire project. The best approach is to phase the implementation and completion of the project with a defined timeframe.

RECOMMENDATIONS

The center holds great potential of achieving its goals both as a business and as a social space. However, the recommendations given below hold a great impact on the ability of the center to function as desired.

The current unreliable market for low cost building materials remains the biggest threat to the project. The federation, ACTogether and JMC must invest in building a market through Projects, sensitization, by-laws.

According to the business feasibility study, for the BMTC to function as a viable business, it must only produce for the market demand. If the center is not able to sell products in the market it will only be able to pay back the loan, but it will not be able to cover running costs and expenses.

The timeline for the loan repayment should be increased to give enough time to establish the business and explore the market.

It is important to phase the project and not use the entire loan before a market assessment is done. Phasing the project protects the investment and allows monitoring and evaluation.

Stakeholders should be integrated into the project with specific roles that would bring the cost of the project lower. JMC, for example, as one of the stakeholders in the project is mandated to provide a community center for the people in Walukuba East. It can contribute not just land, but the costs for the establishment of a community center.

Makerere University through student internship programs can promote the BMTC and stimulate innovation in fabrication and construction techniques.

The roles of each stakeholder should be clear and agreeable to all the parties involved. This can be done through a Memorandum Of Understanding.

The production lines for business and training should be kept separate to have a system that allows optimum production to meet market demands and training that meets the objectives of the training center.

REFLECTIONS

IMPRESSIONS & EXPERIENCE FROM THE FIELD

What represents a city is a complex network of roads, buildings, markets, spatial forms and people who dwell in the city. Like any other city from a developing county, Kampala also faces high population growth and poverty which is perceived by looking at the chaos in the city. When we were walking through one of the settlement in Kampala, the kids were following us and people were strangely looking at us and monitoring our move. When people see strangers in their settlement, they get threatened and this is natural to happen in a settlement that is under eviction threat.

In Walukuba East, when we reached to our proposed site, our presence was announced on loud speakers installed in the small market communication center, as a way of creating awareness in the community about our agenda. This is a system that has been established in this community to create awareness, mobilize the community and avoid any misunderstandings that might arise as we later experienced in other settlements. During the field work, moving with a local leader or a community member from the federation is what enabled us to acquire information from the community without appearing as donors. It is very necessary to know someone in the community and build trust among the people as these communities are really vulnerable.

CONTEXTUAL CONSTRAINTS

Viewed as professionals, we were compelled to stretch beyond our capacity as students and develop methods that allowed us to obtain all the information needed in the study. The ideal approach was to give the community a chance to understand their stake in the project and appreciate the fact that the BMTC is as much their responsibility as it is ACTogether and Jinja Municipal council.

The question of affordability of the materials produced at the center was one of the fears expressed both in the community and among the Architect and Planning students at Makerere University. The BMTC is targeted to meet the needs of low income earners. But in reality they may not be able to afford the blocks or have the ability to produce them in the short term.

In spite of the size of the site being limited, the community still wanted a community garden to hold social functions. We discussed the design and tried to incorporate their comments and suggestions therein. In the end, we were able to satisfy the needs of the community and other stakeholders.

STRATEGIC VALUE

As Planners and Architects, it's necessary to understand the community and enable them participate in the planning process. The experience from the field work changed our perception and made us think critically over the issues before making decisions. At first, it appeared as a design task but after a deeper understanding of the priorities and needs of the community, it turned to be more than just the design. It was a response to the housing needs, sanitation needs and the need for a community space.



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