

Building just responses to flooding

Centre for Community Initiatives (CCI) in the context of Dar es Salaam

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Table of contents

Acknowledgements	1
List of figures and tables.....	3
Acronyms	4
Abstract	5
1. Introduction.....	6
2. Framework.....	9
2.1. Strategic Action Planning Framework	9
2.2. Socio-Environmental Justice	9
2.3. Disaster Risk Reduction and Climate Change Adaptation	10
2.4. Methodology.....	10
3. Reframed diagnosis.....	11
3.1. Hazard and causes.....	11
3.2. Vulnerabilities and impacts.....	12
3.3. Actors and capacities	15
3.4. Flooding as a multidimensional risk.....	19
4. Strategy Development	20
4.1. Cross-cutting Finance.....	21
4.2. Cross-cutting Information	21
4.3. Strategy 1 – Infrastructure Network.....	23
4.4. Strategy 2 – Environmental management	25
4.5. Strategy 3 – Land & Resettlement.....	27
5. Conclusion.....	30
6. Bibliography.....	31
7. Annexes.....	36
Annex 1 - Fieldtrip Timetable.....	36
Annex 2 - Main Insights from Interviews and Conferences	38
Annex 3 - Walkthroughs	47
Annex 4 - Key Actors Map.....	50
Annex 5 - Resource Assessment of Key Actors	51
Annex 6 - Government structure	52
Annex 7 - Policy Map.....	53
Annex 8 - Timeline for proposed strategies.....	54

Annex 9 - Indicators.....	55
Annex 10 - Precedent Setting and Proposed Work Agenda.....	57
Annex 11 - Ecosystem Services Framework.....	60
Annex 12 – Insights for Land and Resettlement Strategy	61

List of figures and tables

Figure 1 - Flood prone areas and unplanned settlements in Dar es Salaam.....	6
Figure 2 - Settlements visited	7
Figure 3 - Strategic Action Planning	9
Figure 4 - Types of flooding affecting Dar es Salaam.....	11
Figure 5 - Natural and human causes - Riverbank erosion and poor drainage systems	12
Figure 6 - Social and physical vulnerabilities in Dar es Salaam	14
Figure 7 - Current strategies to address flooding risks in Dar es Salaam.....	17
Figure 8 - Current strategies to address flooding risks in Dar es Salaam.....	18
Figure 9 - Proposed strategies	20
Figure 10 - Proposed actor diagram in cross-cutting information	22
Figure 11 – Phases of indicator development	55
Figure 12 - Showing the discussion of human causes of increased flooding in Sunna	61
Figure 13 - 60-mt buffer zone as explained by Kinondoni Municipality official	61

Acronyms

BORDA - Bremen Overseas Research and Development Association
BRT - Bus Rapid Transit
CBO - Community Based Organisation
CCA - Climate Change Adaptation
CCI - Centre for Community Initiatives
CDKN - Climate and Development Knowledge Network
CLUVA - Climate Change and Urban Vulnerability in Africa
DAWASA - Dar es Salaam Water and Sewerage Authority
DDR - Disaster Risk Reduction
DEWATS - Decentralised Wastewater Treatment Systems
DMDP - Dar es Salaam Metropolitan Development Programme
DPU - Development Planning Unit
DRH - Dar Ramani Huria
DTMC - Disaster Management Training Centre
ESF - Ecosystem Services Framework
IHSS - Institute of Human Settlement Studies
KICAMP - Kinondoni Integrated Coastal Area Management Programme
KSA – Kombo Sanitation Association
MLHHS – Ministry of Land, Housing and Human Settlements
MRFN - Msimbazi River Federation Network
NAPA - National Adaptation Programme of Action
NEMC - National Environmental Management Council
NGO - Non-Governmental Organisation
SAP - Strategic Action Planning
SEJ - Social Environmental Justice
SSS - Simplified Sewerage System
STDN - Social Tenure Domain Model
TAFSUS - Tanzania Financial Services for Underserved Settlements
TUPF - Tanzanian Urban Poor Federation
UCL - University College London
WB - World Bank

Abstract

The overarching objective of this report is to present citywide approaches to increase socio-environmental justice (SEJ) in Dar es Salaam through the use of people-centred collaborative planning. Drawing from a wide range of academic planning literature concerning participatory planning processes, socio-environmental justice and disaster risk reduction (DDR) and climate change adaptation (CCA) theories, we firstly introduce a conceptual framework to structure our diagnosis of the flooding challenge in Dar es Salaam. Subsequently, we present the complex and multidimensional nature of flooding in the city using information gathered with communities and private and public-sector officials during our field trip in May 2017. We propose three key strategies aimed at the Centre of Community Initiatives (CCI), a Tanzanian non-governmental organisation, and its partners, as pathways towards expanding the room for manoeuvre for community-led approaches to flooding through infrastructure, environmental management and land and resettlement initiatives.

Key words: flooding, collaborative planning, socio-environmental justice, disaster risk reduction, climate change adaptation

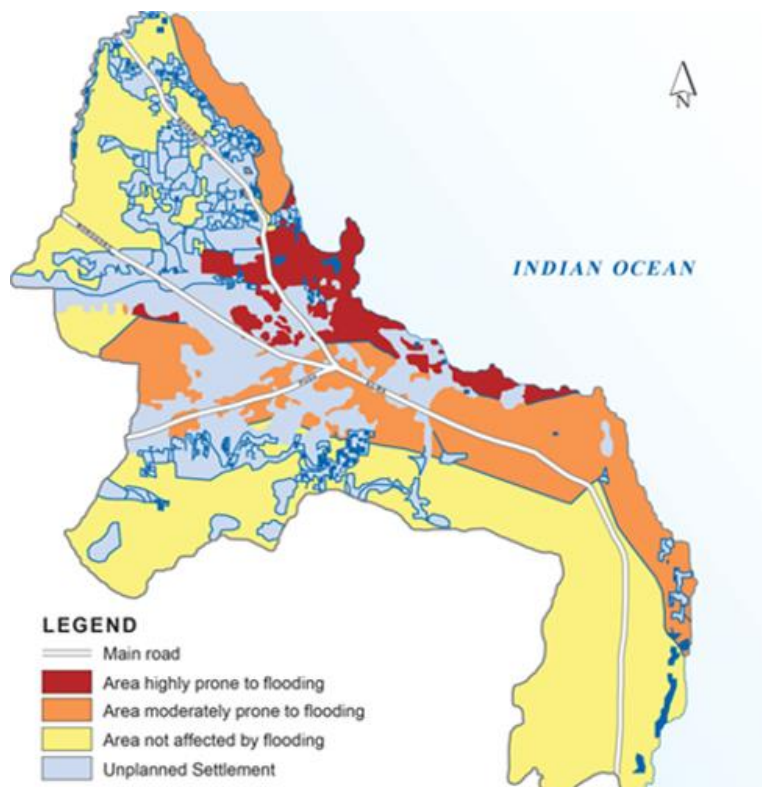
1. Introduction

Flooding has been the most frequently occurring natural disaster globally over the last two decades (Jha, et al., 2012). It has become a particularly serious development challenge in urban settlements where its impacts are multiplying through the effects of climate change and additional factors of demographic growth and rapid urbanisation (ibid). These issues are especially challenging in the context of sub-Saharan Africa where cities often face underlying problems like high poverty levels, governance issues, weak institutional frameworks and a lack of technical and financial resources (UNISDR, 2012).

As a large city which borders the Indian Ocean and surrounds a number of major rivers and tributaries, Dar es Salaam on the eastern coast of Tanzania faces many of these flooding-related challenges. The city, which is an important economic centre in the region, predominantly experiences a mixture of coastal, pluvial, fluvial and flash flooding events that vary greatly in magnitude and impact and affect its diverse people in varied ways. With over 70% of Dar es Salaam's five million inhabitants living in unplanned settlements, many of which are within flood-prone areas (see Figure 1), the policies and projects implemented by the Tanzanian government thus far have failed to reach the scale required to improve conditions for the majority of these people (World Bank, 2012). In some cases, government programmes have even led to forced evictions and demolitions due to a failure to recognise the rights of people living on hazardous land, particularly the rights of tenants, leaving some informal residents in worse conditions (DPU, 2016).

Figure 1 - Flood prone areas and unplanned settlements in Dar es Salaam

Source: Ardhi University, 2011



Against this backdrop of marginalisation of Dar es Salaam's urban poor, the Centre for Community Initiatives (CCI), a national non-governmental organisation (NGO), was set up in 2004 to improve their access to land tenure security, adequate shelter and basic services by working in partnership with them. Through this, CCI also works with the Tanzanian Urban Poor Federation (TUPF), a network of small savings and loans groups living in informal settlements (CCI, 2017). Together, the organisations have worked in several settlements affected by flooding, most notably Sunna in Magomeni ward, Kinondoni Municipality. For some years, students at the Development Planning Unit (DPU) of University College London (UCL) have worked with CCI to develop people-centred collaborative planning responses to flooding issues. In this report, we build on this research to propose progressive city-wide strategies influenced by a socio-environmental justice outlook that CCI can utilise to defend the rights of people living on flood-prone land and improve their environment.

To achieve this, we conducted comprehensive desk-based research surrounding the socio-economic, institutional and climatic context of Dar es Salaam and further academic urban planning literature. We also undertook primary research during our field trip to Dar es Salaam in May 2017, which included interviews, focus groups and transect walks with communities in Sunna, Bonde La Mpunga, Vingunguti and Mabwepande settlements (Figure 2), as well as meetings with various private and public-sector officials (see Annex 1 for further detail). After introducing our theoretical framework in the second section, we draw from this research to thirdly present our diagnosis of the current flooding challenge in the city, namely the lack of acknowledgment of people's different vulnerabilities, perceptions of risk and coping capacities, alongside the lack of recognition of the rights of people living on flood-prone land. Fourthly, we present our strategies for CCI to improve socio-environmental justice for people affected by flooding. These include cross-cutting suggestions regarding finance and information-gathering in addition to three core strategies regarding infrastructure, environmental management and land and resettlement.

Figure 2 - Settlements visited
Source: Flooding group, 2017



Overall, our strategies aim to provide CCI with steps which they can practically implement by building on the widespread experience they have collaborating with communities in Dar es Salaam. The strategies each aim to involve local people from the earliest stages to empower them and enhance their capabilities. We recognise the important role the government needs to play to improve the rights and living conditions of people living on flood-prone land in the long-term. In this vein, each of our strategies provide recommendations on how different levels of government can be involved, utilising the connections which were made during the field trip with state agencies such as the Ministry of Land, Housing and Human Settlements (MLHHS) and the National Environmental Management Committee (NEMC). Ultimately, the strategies act as pathways that can lead to improving socio-environmental justice in Dar es Salaam.

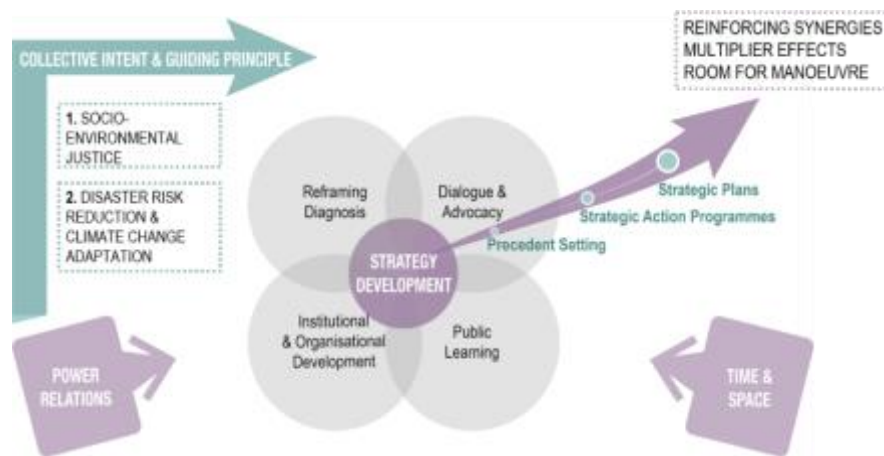
2. Framework

2.1. Strategic Action Planning Framework

We framed our approach to the flooding challenges in Dar es Salaam using the strategic action planning (SAP) framework (Healey, 1997) (Levy, 2007). Within this framework we first identified the 'collective intent' using socio-environmental justice as our main guiding principle. This informed our understanding of Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA), which led us to the awareness of flooding as a multidimensional risk. Next, we analysed the exposures and impacts of flooding on vulnerable communities. Building on CCI's existing work and capacities, we designed three strategies that could reinforce synergies, generate a cumulative multiplier effect and expand the room for manoeuvre.

Figure 3 - Strategic Action Planning

Source: Flooding group, 2017



2.2. Socio-Environmental Justice

To start, we defined socio-environmental justice, which served as our main guiding principle. Informed by Young (1990), Fraser (2000) and Schlosberg (2004, 2013), our definition seeks to address the evolving relationship between environment and nature which creates conditions for social justice. Therefore, we have identified three key principles that are essential to analyse the wide spectrum of flooding challenges in Dar es Salaam - recognition, redistribution and participation.

In the first aspect of justice, recognition, we highlight scholarly debates which emphasizes how flooding focuses on multiple vulnerabilities, and seek to understand its exposure and impacts towards marginalised communities (Pelling & Wisner B. , 2009). Within these debates, we have defined recognition in this context as the unequal vulnerabilities and exposure towards flooding hazard, and its impacts, experienced by different livelihoods and assets before, during and after a disaster risk. Within the dimensions of inequalities affecting livelihoods and properties, we correlate how women and youth groups are more severely affected than men by floods. Recognition of this involves inclusive access towards specific disaster responses within political, geographical and social context, at variant timeframes.

Secondly, in regards to redistribution, we incorporate principles from social, environmental and ecological movements in the redistributive notion that the word “justice” represents (Fraser, 2000) (Schlosberg, 2004). In this sense, we are referring to the redistribution of resources, responsibilities and benefits through mitigative, coping and adaptive strategies that empower the capabilities and wellbeing of the most vulnerable first. Distributive justice evaluates the material and social patterns which exacerbates production and process of inequalities in society. Institutional justice defines responsible parties to make relevant decisions, capacities individuals and organisations bring to influence them, and how these outcomes affect the wellbeing of beneficiaries within and beyond the system.

And finally, for participation, we draw upon how existing capacities highlight empowering mechanisms where vulnerable communities can engage in structural and systematic processes (Schlosberg, 2004), from the preliminary stages through negotiation of power relations, multiple scales in time and spaces for the development of inclusive strategic actions (Walker, G. & Burningham, K, 2011). Therefore, participation is the involvement of all actors in decision-making processes from the earliest stages, including the formulation and implementation of flood risk reduction and climate change adaptation strategies in both local and city-wide agendas

2.3. Disaster Risk Reduction and Climate Change Adaptation

Applying the socio-environmental justice principle within the context of flooding challenges in Dar es Salaam, we have understood flooding as a multidimensional risk as adopted under the World Bank (WB) (2012) and Sendai Framework (2015). In order to fully utilise these terms, we have defined them here. DRR is the ability to make livelihoods more resilient through reduced risk factors to flooding hazard, such as improved preparedness from impacts of flood, reduced vulnerabilities of people and assets and a just management of land and environment. On the other hand, CCA is the ability to respond and adjust to actual or potential impacts of climate conditions in a just manner that moderates or transforms positive opportunities that affords the environment (World Bank, 2012). DRR and CCA correlate the complex relations between society, environment and institutions. These include strength, attributes and resources made available to institutions to play effective roles in facilitating adjustments and account for the incremental and gradual changes in climate conditions within local and city-wide level. DRR and CCA feeds into three levels of capacities - mitigation, adaptation and coping capacities - which will be discussed in Section 3.3.

2.4. Methodology

We divided our research methodology into three phases. First, we undertook a three-month desk-based research. We defined the main gaps and opportunities, formulated entry points to develop potential strategies using the web of institutionalisation (Levy, 1996) and strategic action planning framework (Levy, 2007). In our field trip, we collected primary data by participating in site visits to four communities: Mabwepande, Bonde La Mpunga, Magomeni Sunna and Vingunguti. We conducted transect walks, focus group discussions and individual interviews with key stakeholders (women, men and youths) and government agencies like NEMC and local government officials. Representatives from CCI assisted as facilitators and interpreters. Here, we pioneered the use of drones for aerial photography and video filming, including youth in the process. Finally, feedback from both Ardhi University and CCI refined our diagnosis and defined entry points in our strategy development.

3. Reframed diagnosis

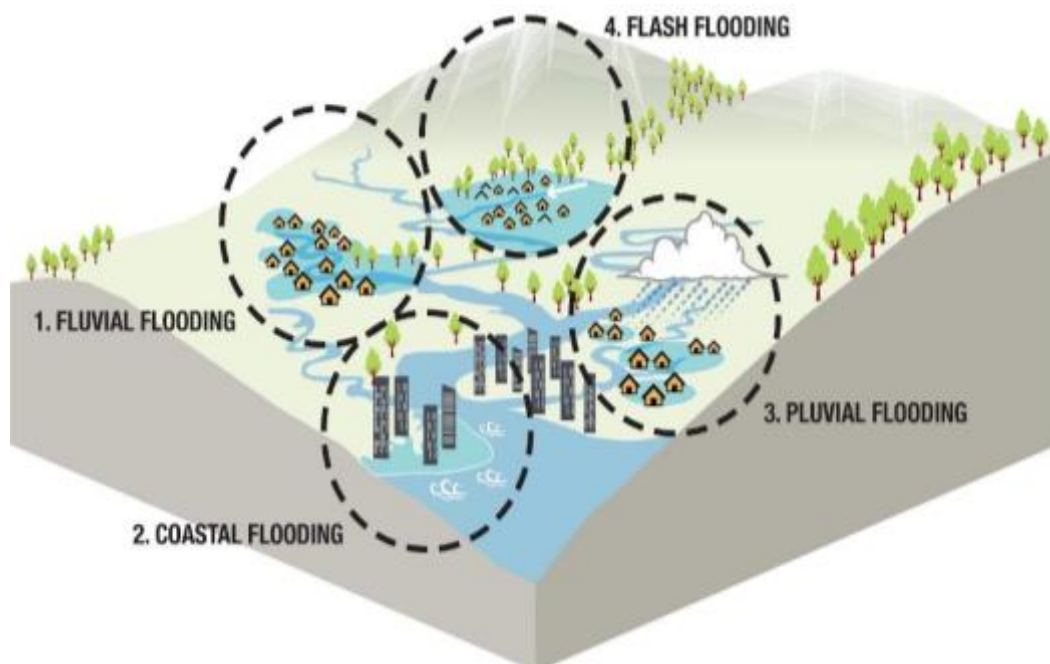
3.1. Hazard and causes

According to the UN, a hazard corresponds to a “potentially damaging physical events, phenomena or human activities that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation” (UNISDR, 2004, p. 16). Floods are a form of natural hazard; the most frequently occurring destructive natural events, affecting both rural and urban settlements (Jha, et al., 2012). Although flooding impacts are felt across cities, the most affected are vulnerable communities, especially poor households, living in informal settlements in hazardous areas (Sakijege, T., et al., 2014).

In Dar es Salaam, 1.2 million people are affected by floods (World Bank, 2012). Due to its location and water ecosystems, the city faces multiple types of flooding. Fluvial flooding occurs after continuous rainfall which dangerously increases the water level in rivers. This rise provokes disasters and damages at a human scale. This type of flooding can be seen in Dar es Salaam in Magomeni Sunna, which is located on the river bank of the Msimbazi. Flash flooding is caused by a high-speed course of water in an existing river channel. These floods are very dangerous and difficult to prevent, and they occur in many areas of Dar es Salaam. Coastal flooding happens in the city due to its proximity to the Indian Ocean in addition to extreme weather conditions. Finally, pluvial flooding occurs due to poor drainage systems which are unable to handle the increased amount of water caused by heavy rainfalls. This was the most common type of flooding we witnessed across the field sites we visited (Sunna, Vingunguti and Bonde la Mpunga).

Figure 4 - Types of flooding affecting Dar es Salaam

Source: Flooding group, 2017



Flooding in Dar es Salaam is the result of natural and human causes. From March to May, the city faces strong continuous rainfalls, which is followed by 'short rains' from November to January. The seasonal effect of 'El Niño' is reflected in the sea level rise and changing tides which provoke coastal erosion and destruction of water pathways (e.g. N'gombe River). Additionally, the topography of the city worsens the situation as water concentrates in lowlands and coastal zones. The hazard is aggravated further by the unpredictable nature of flooding events which makes them difficult to predict, alongside the effects of climate change. Indeed, the frequency and intensity of extreme rainfall events is expected to increase, posing more risks to the city (Osuteye, 2017) (CLUVA, 2013).

Figure 5 - Natural and human causes - Riverbank erosion and poor drainage systems

Source: Flooding group, 2017



Likewise, human-induced causes exacerbate these environmental challenges through, for example, the transformation and degradation of water ecosystems, poor solid waste management, deforestation, salinification and riverbank erosion; deficient and lack of drainage systems; the absence of integrated land-use and disaster risk reduction planning, and; rapid and uncontrolled urbanisation in areas prone to flooding.

3.2. Vulnerabilities and impacts

In order to fully understand the impacts of flooding, it is vital to acknowledge the different vulnerabilities that low-income communities and local authorities in Dar es Salaam encounter. Here we distinguish among three types of vulnerabilities: social, physical and institutional.

Based on our research, we recognise social vulnerabilities relating to age, gender and economic dependence. Children and the elderly are more vulnerable to the impacts of flooding, as they are more prone to diseases and vulnerable to physical impacts. Women are also vulnerable because of their economic dependence, their social situation, their role in the family, household activities and therefore limited social mobility. Finally, renters represent an important part of the population located in flood prone areas, presenting severe vulnerabilities due to the common social detachment with local communities and the insecurity of tenure (CCI & TUFPP, 2016) (John, 2011) (Annex 2).

Physical vulnerability in low-income settlements in Dar es Salaam, such as in Vingunguti, Sunna and Bonde la Mpunga is fundamentally caused by the location of unplanned settlements, namely in lowland areas near the coast or alongside river valleys. These are mostly characterised by insufficient infrastructure, such as water and sanitation, roads and drainage systems. Aggravating factors are the lack of maintenance to existing infrastructure, to drainage systems in particular (CCI & TUFU, 2016) (Kiunsi, 2013). In addition, city dwellers heart attacks or electrocution (John, 2011) (Jonkman, S.N. & Kelman, I., 2005). The health implications of daily flooding events encompass mostly an increase in the transmission of waterborne diseases such as malaria, cholera and urinary tract infections, alongside mental health issues, such as anxiety and physical trauma (CCI & TUFU, 2016) (Ahern, M. & Kovats, S., 2006) (World Health Organization, 2002) (Annex 2). Furthermore, the improper disposal of solid waste creates a health threat through flooding (Jha, et al., 2012).

Apart from the health impacts, it is also crucial to take into account the social impacts of flooding. Based on CCI's vulnerability assessment and our engagement activities in Sunna and Vingunguti, we learnt that flooding disrupts social networks and community structures, leading to the disenfranchisement of communities, like the TUPF and their savings groups. Not only have social networks been affected, but families have also been separated, with some parts of the family staying in Sunna and others being resettled to Mabwepande (CCI & TUFU, 2016) (John, 2011) (Annex 2).

The built environment and utility facilities are indirectly and directly affected by flooding. Poor infrastructure, predominating in low-income communities, aggravates the effects on houses, roads, drainage systems, and pit latrines, which we observed in Vingunguti and Sunna (Jha, et al., 2012) (Du, W, et al., 2010) (John, 2011) (Annex 2). The extent of the flooding, depending on the flooding type, ranges from small disasters to disasters that wash away entire houses, like in Sunna in 2011 (Allan, S. et al., 2016).

Moreover, the threats of flooding to communities also involve economic and financial impacts. The loss of important possessions such as clothes and furniture or the interruption of economic activities and livelihoods (for street vendors who work in the settlements or in neighbouring areas like Kariakoo market for instance) represent a consequence of various types of flooding events, also recognised in CCI's community engagements regarding the impacts of flooding (CCI & TUFU, 2016) (ActionAid, 2006) (John, 2011) (Annex 2).

Building on our field work, we understand that the loss of agricultural land and crops, polluted water and vegetation, landslides and erosion can be considered as repercussions of flooding. Therefore, the environmental impacts of flooding, ranging from disasters to daily events may result in food insecurity and serious threat of shelter and housing (Jha, et al., 2012) (Annex 2).

Figure 6 - Social and physical vulnerabilities in Dar es Salaam

Source: Flooding group



3.3. Actors and capacities

Multiple initiatives are carried out in Dar es Salaam to reduce flooding risks. These initiatives take place at different levels (city-wide, community and household) and by different actors (public, private, civil society and communities) who present varying capacities and resources (Annex 4). By capacity we refer to “the positive features of people’s characteristics that may reduce the risk posed by a certain hazard. Improving capacity is often identified as the target of policies and projects, based on the notion that strengthening capacity will eventually lead to reduced risk” (Field, 2012, p. 72). Building on this, we carried out an analysis of key actors by assessing the capacities that each of them has in light of the initiatives they deploy and the resources available. The elements that were analysed are in line with our framework and guiding principles, and correspond to different capacity needs: i) to prevent; ii) to cope and respond and; iii) to adapt to risks. These capacities require different resources (technical, financial and communicational), networks, partnerships and actors to scale-up and out. A summary of this assessment is presented below and in Annex 5.

Households and communities

Households and communities have developed limited capacities to prevent, cope and adapt to flooding risks by mobilizing financial resources via savings groups, developing technical skills for simple construction work and exchanging knowledge among each other to replicate and expand. Household-scale initiatives include low-built walls, barriers and barricades using tyres, simple rain harvesting systems to reduce water runoff and moving furniture to high shelves, roofs or improvised second floors (see Figure 7). Communities like the TUPF recently created the Msimbazi River Federation Network (MRFN), a network of 18 communities that provides technical, financial and communication resources to multiple households in order to strengthen and increase their capacities. Due to lack of place attachment and insecurity of tenure renters face particular difficulties to engage and deploy capacities to cope with flooding henceforth increasing their exposure to risk. This situation constitutes a threat and barrier to any activity or programme developed by and for local communities, however the recognition of renters’ rights, duties and hidden capacities as a starting point offers an opportunity to explore other types of engagement and participation with the MRFN (See Strategy Development section).

Local non-governmental organisations

CCI support communities like the TUPF, providing technical and financial resources to design and implement community-driven solutions to flooding risks. CCI has solid technical and communicational resources that allow them to work hand in hand with communities, co-producing solutions and leveraging resources from international and local institutions, increasing their capacity to develop strategies and set precedents. Their main activities include: i) enumeration and mapping activities to build vulnerability and risks assessment of unplanned settlements (see Figure 8); ii) small-scale water and sanitation projects to reduce development deficits and; iii) environmental management activities to clean up the Msimbazi river and clogged storm water drainages. Although these activities are important precedents, further capacities, partnerships and resources are needed to develop more integrated and comprehensive solutions.

Research institutions

Ardhi University has a long tradition of assessing risk, hazard and vulnerability via the Disaster Management Training Centre (DMTC) and the Institute of Human Settlement Studies (IHSS). One of their most important and recent endeavours is the Climate Change and Urban Vulnerability in Africa (CLUVA) project, a joint research with the European Union that provided risk, vulnerability and hazard assessments across multiple communities in Dar es Salaam (see Figure 8). Although Ardhi has solid technical and financial resources, their capacity to provide greater influence in policy making and work hand in hand with local organisations like CCI, depends in their communicational resources and their willingness to mainstream the outcomes of their research.

Local and National Government

The local government of Dar es Salaam (Annex 6) and the National Government of Tanzania, have developed environmental management, climate change, land and urban development policies and projects (Annex 7) that only indirectly and superficially address flooding issues. Moreover, the city lacks a comprehensive policy that explicitly deals with CCA and DRR, and a city-wide plan that integrates these with wider land-use, urban development and environmental management strategies. Although the recently enacted Disaster Risk Management Act sets up an institutional framework at the national and local level for DRR, technical and financial allocation of resources is limited. In general, the policies and projects carried out by the government face shortcomings in terms of implementation, participation of communities, resource allocation and coherence.

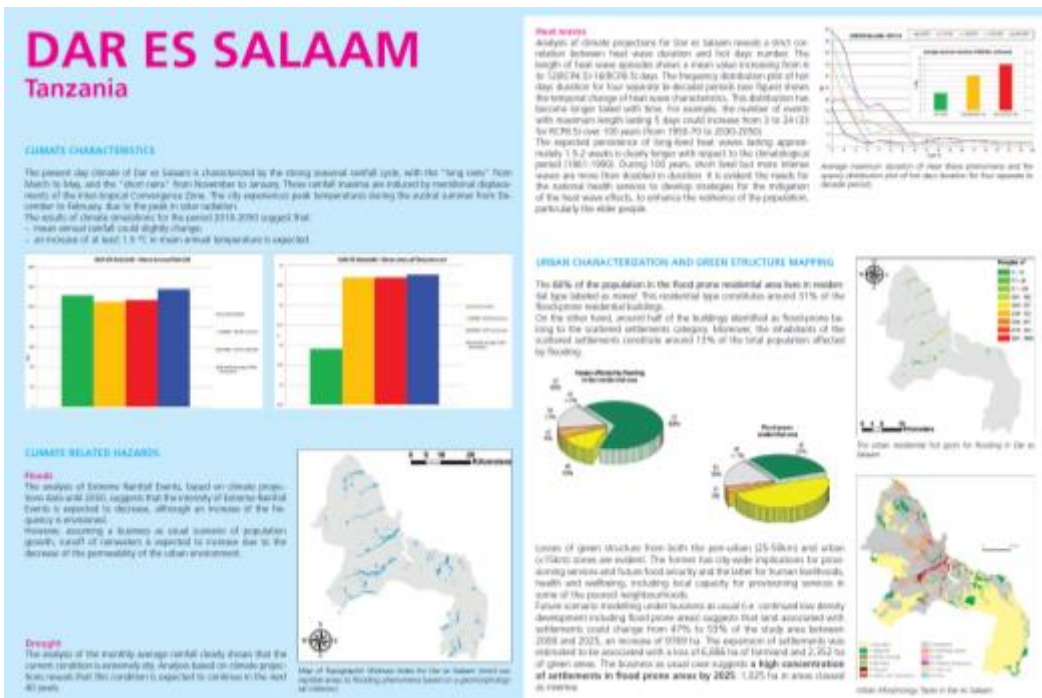
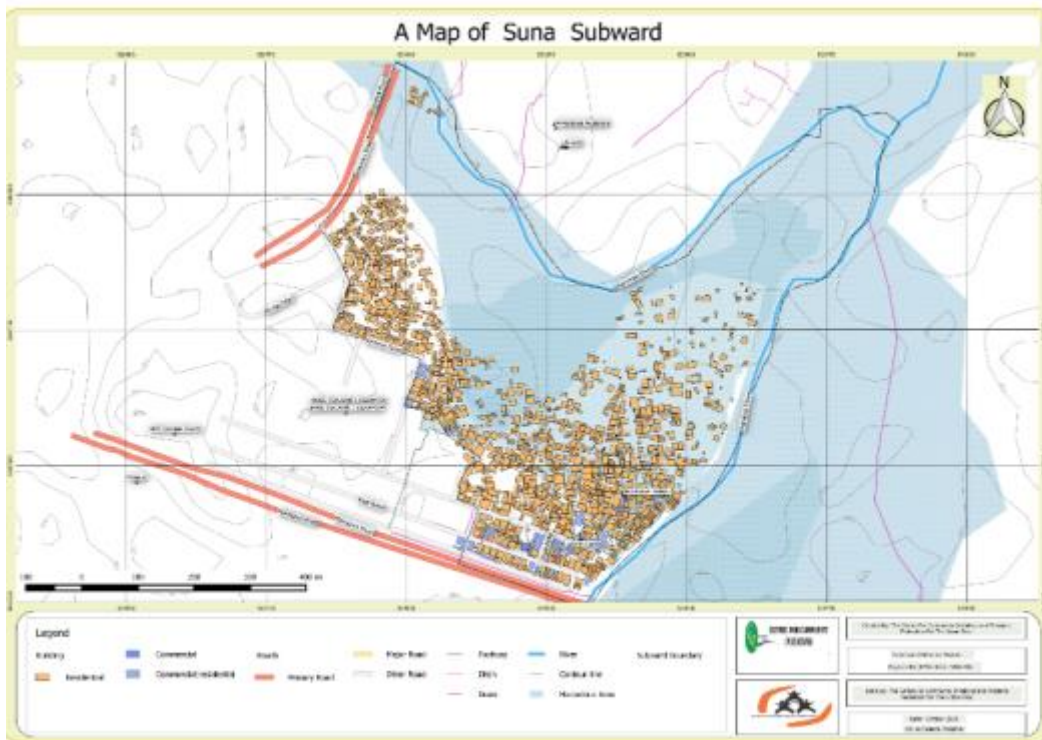
International institutions

The WB provides technical and financial resources to the government of Tanzania and Dar es Salaam to address development deficits and flooding risks. Most recently both have agreed on a US\$ 300 million development programme that includes the deployment of roads and primary level drainage infrastructure to reduce water runoff and community upgrading projects to reduce physical and social vulnerabilities in unplanned settlements, projects that contemplate the relocation and resettlement of multiple households. The programme offers opportunities for the city and multiple actors, like CCI, to strengthen capacities in order to address flooding and development challenges and has specially improved information about flood prone areas via the Dar Ramani Huria (DR) project.

Figure 7 - Current strategies to address flooding risks in Dar es Salaam
Source: Flooding group



Figure 8 - Current strategies to address flooding risks in Dar es Salaam
 Source: CCI and Ardhi University



3.4. Flooding as a multidimensional risk

We have considered flooding as a multidimensional risk, where its main components - hazard, vulnerabilities and capacities - have multiple layers and complexities that need to be considered. The equation of risk shows that risk cannot be differentiated from the vulnerability, hazard and capacities as they are all interlinked.

$$Risk = \frac{Hazard \times Vulnerability}{Capacity}$$

As the hazard and vulnerability increases, the risk increases, conversely, when coping capacities increases the risk will decrease. Our aim is to develop these capacities to reduce the flooding risk in the city of Dar es Salaam. With this multidimensional understanding of risk, different perceptions of flooding within institutions, organisations and communities can also be acknowledged.

With this multidimensional understanding of risk, different perceptions of flooding within institutions, organisations and communities can also be acknowledged. Risk is defined as the combination of the probability that an event can occur and its damaging consequences (CIIFEN, 2017). It has many interpretations, depending on the different actors involved. Acknowledging the social perception of risk, helps to formulate efficient mitigation strategies. For example, in Dar es Salaam, the inhabitants of Sunna and Bonde La Mpunga are affected by various types of flooding as previously mentioned, and their experiences and perceptions could help in influencing policy-making to tackle the flooding issue. The perception of risk involves the behaviour, emotions and position to cope with the hazard (Cid-Ortiz, G, et al., 2012). It is influenced and shaped by the following intersecting issues: age, gender, disability, MRFN economic level and class. (ibid.).

After conducting three focus groups in Sunna, we came to the conclusion that within the most vulnerable groups the perception of risk changes. Not only gender, age, etc. have an impact on the perception of risk, but also level of knowledge and people's education, which increases the awareness and capacity to understand the hazard itself. People consciously place themselves at risk of natural hazards, due to its unpredictable nature, lack of options and resources. Moreover, benefits of hazardous locations may well outweigh the risks involved in staying in the area. These can be linked to jobs, (street and food vendors at Kariokoo market), lack of knowledge and cultural tradition, acceptance and imposition of risk. In Sunna, some residents were willing to accept the consequences of flooding in order to avoid losing their jobs (Annex 2). In some cases, people accept the risk voluntarily, and seem more willing to accept risks that are highly beneficial, conversely, others are imposed to cope with the risks without any alternative (Fintling, 2006).

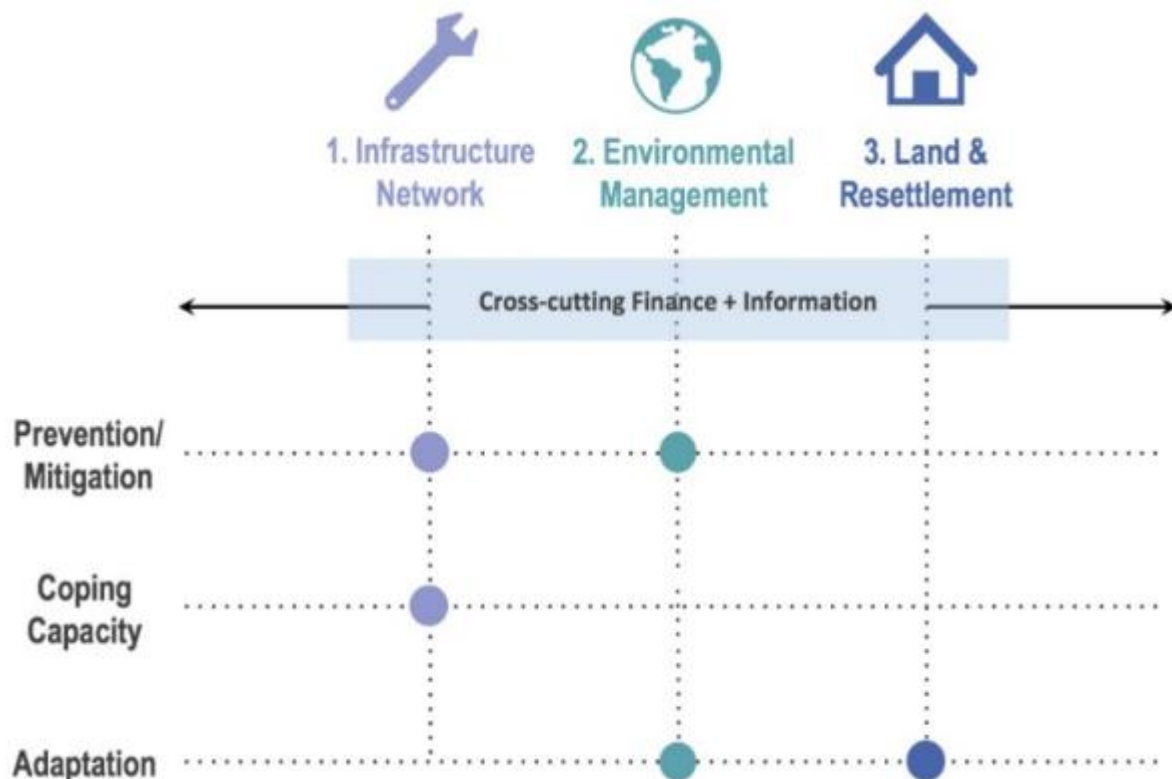
4. Strategy Development

Based on the information gathered during our desk-based research and our work with stakeholders in the field, we are proposing three strategies that CCI could implement in response to the everyday impacts of flooding that are experienced by vulnerable communities and the natural environment in Dar es Salaam. Applying our definition of socio-environmental justice, these strategies are intended to address issues that are currently not being recognised and to include actors from multiple levels while emphasising the role of community members. We developed these strategies in order to utilise and strengthen the relationship that CCI has with vulnerable communities in the city while also maximising the available entry points to expand the room for manoeuvre and contribute to transformation at the city-wide scale in short- medium and long-term objectives (See Annex 8).

Our strategies focus on three specific areas that are responses to the particular vulnerabilities experienced by flood-prone communities in Dar es Salaam - Infrastructure, Environmental Management, and Land and Resettlement. Within our framework of disaster risk reduction, these strategies sit within the different types of capacities – Mitigation, Coping Capacity, and Adaptation. As seen in Figure 8 below, the three strategies do not fit into only one type of capacity. We have defined flooding as a multidimensional risk and therefore our strategies are meant to address this challenge from a multi-faceted perspective.

Figure 9 - Proposed strategies

Source: Flooding group, 2017



Furthermore, in the development of these strategies, we recognized two cross-cutting elements – Finance and Information. Both of these elements are essential to strengthening our strategies and to global approaches to sustainable mitigation and adaptation. CCI has experience working within these elements so our recommendations are intended to build upon the work that CCI already does. Problems with finance and information often hinder the implementation of sustainable strategies which is why we are addressing these elements first. While these elements have specific criteria within each strategy, they also have overarching characteristics relating to the overall approach that we are recommending. We will first discuss these two cross-cutting elements and then present our three strategies.

4.1. Cross-cutting Finance

Starting with the cross-cutting element of finance, we focus on CCI's work with the TUPF and the Jenga Fund. The TUPF created the Jenga Fund as a revolving fund that aims to help “communities to improve their quality of life by providing micro loans” (Ntanga, n.d., p. 8). During the field trip, we had the opportunity to interview Jenga Fund loan recipients from various projects, such as those who were resettled in Mabwepande who are using loans to build their houses and those in Vingunguti who used loans to build household toilets connected to the city's main plumbing system. In these discussions, we noted some shortcomings with the Jenga Fund, such as lack of repayment and lack of financial management. Despite these issues, the Jenga Fund is one of the most accessible means of funding for the urban poor in Dar es Salaam and we acknowledge its potential to finance our proposed strategies. For these reasons, we recommend the following actions for CCI to strengthen and improve the Jenga Fund:

- CCI with the TUPF could develop relationships with other financial institutions in order to strategically place themselves into avenues where external funding can become available, like in the Community-Led Infrastructure Facility program in India (Levy, 2007).
- TUPF can emphasize more financial management training, especially with those who are seeking financing, but also for those who serve on the TUPF committees at regional and national levels.
- Similar to the Baan Mankong program in Thailand, CCI could establish a joint-committee to oversee implementation of projects that are funded by the Jenga Fund. This committee would include community members, NGOs, academic institutions, professionals and government officials (Boonyabanha, 2009).

Our recommendations are based on best practices developed by other community-led programs which CCI could utilize to enhance the TUPF and Jenga Fund. Although the fund is one of the best mechanisms for the urban poor to access funding to kick-start pilot projects, we also suggest other means of funding in order to diversify CCI's finance portfolio. The funding options will be explained in each of the strategies.

4.2. Cross-cutting Information

Equally important to our strategies is the cross-cutting Information element. This element is the foundation for the development of our short-term objectives for each strategy. Using information gathered from interviews and focus groups with community members, and in discussions with CCI staff, this element was established to utilize and potentially strengthen CCI's relationship with vulnerable communities.

Within this element, CCI would transfer some of their responsibilities to the community in order to not only collect and consolidate data on flooding, but also empower community members to take ownership of this

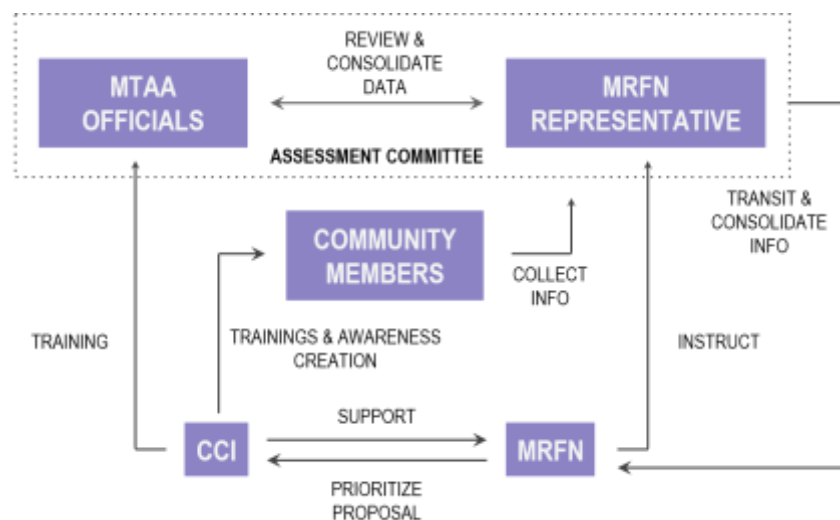
task. Furthermore, this element can potentially better reflect the everyday impacts of flooding that are not currently being acknowledged. Therefore, we are recommending the following actions:

- CCI would assign one federation member in two chosen pilot communities. This voluntary member would be trained on how to consolidate and interpret flooding data by CCI.
- CCI would also recommend a government official from the local Mtaa office in each of the pilot communities to work closely with each federation member to review and consolidate data.
- CCI would then train communities members in the pilot communities on how to daily log flooding events. Ideally this task would only take a few minutes a day and would be based on responses to pre-determined questions that CCI and the community have agreed upon.
- The daily log could take the form of a logbook or be recorded on cell phones, but ultimately this aspect is being left to the discretion of CCI as to the best method to collect data.
- The assigned federation member would collect and review the data with CCI on a monthly basis.
- The data would vary based on each of the focus areas of each strategy, i.e. infrastructure, environmental management, and land and resettlement. If CCI were to pilot this data collection for each of the three strategies, the implementation should be spread out amongst different communities so as not to over load the same communities.

The proposed activities carried by each actor can be visualised in the next diagram:

Figure 10 - Proposed actor diagram in cross-cutting information

Source: Flooding group, 2017



Through these actions, the community can not only synthesize flooding data, but collect the data themselves based on criteria that they, along with CCI, have established. On a monthly basis, the community can review and evaluate the findings, have concrete data to share with external stakeholders, and produce more detailed assessments on how flooding impacts their lives not only during a large-scale disaster, but on a daily, weekly, and monthly basis (See Annex 9 for examples of indicators). By including these cross-cutting elements, CCI can take a unified approach to building the capacities of flood-prone communities. The cross-cutting elements enable the strategies to work together to achieve change while also allowing for flexibility within each strategy. Finance and Information are essential aspects to the following strategies which we will now describe.

4.3. Strategy 1 – Infrastructure Network

Infrastructure building could be regarded as the most basic coping approach for people to protect themselves from natural hazards like flooding. Advanced flooding defence infrastructure like sustainable drainage systems in flood prone areas can effectively reduce physical vulnerabilities and its impact on people. However, in the context of Dar es Salaam, the lack of basic infrastructure and poor maintenance of the existing ones at community and city levels exposes people, especially the poor, to the threat of flooding without sufficient protection and warning. Thus, our first strategy involves the creation and implementation of a framework to develop a community-based infrastructure system where communities are able to participate in the design and implementation and collaborate in the future maintenance:

Objective 1.1: Maintain existing flood-related infrastructure to ensure that it works functionally and effectively

Although there is basic infrastructure in the communities explored in our fieldtrip, such as small-scale drainage and sewage systems (Uithol, P., et al., 2016), they are often inoperable due to blockages or lack of proper maintenance. Based on the limited resources and capacities of the local government, it is important for communities to protect and maintain existing local infrastructure through mobilising communities to monitor and to contribute to basic maintenance work in order to better prepare to the impacts of flooding.

The first action is for CCI to work with the cross-cutting element of information and the vulnerability assessment of 2016 to compile a database with the support of community leaders and Mtaa officials which lists and maps the state of existing community infrastructure. Following this, CCI could raise awareness of the importance of basic maintenance work among the community, whilst emphasising the skills and capacities that residents already have in this regards for example, promote small households to regularly collect waste from their own drainage system utilising their current capacities and technologies (See Annex 10 for more information about household management).

In terms of public areas or maintenance work which requires more knowledge or collective cooperation, CCI could bring together a pilot part-time infrastructure maintenance team consisting of active federation members and community volunteers who could share their skills and capacities. The maintenance team could also play a more constructive role in terms of raising preparedness to flooding within the community. For instance, the Kombo Sanitation Association (KSA) in Vingunguti oversees the maintenance of a newly constructed sewerage system (Cambridge Development Initiative, 2014). The team also clean and dredge bigger public drains, connect separated drainage systems between households to systematise them, and use simple sandbags and other anti-flooding materials to repair and fill temporary leaks along the river bank.

The above participatory process could benefit individuals and communities through skills enhancement, knowledge sharing, social network creation, and awareness creation. Meanwhile, since basic maintenance work such as cleaning does not require a large budget or knowledge, households can utilise basic equipment such as shovels and bags. As a self-organised service provider, the team could get financial support from community funding sources such as the JENGA fund. In addition, as infrastructure maintenance and related construction experience is gained, CCI can also look for support through potential

partnerships with external private or public-sector organisations such as Dar es Salaam Water and Sewerage Authority (DAWASA) or NEMC.

Objective 1.2: Develop a fully participatory infrastructure framework for future construction and upgrading

Following the awareness-building element, the second objective proposes the development of a participatory mechanism for future community infrastructure projects: from planning and design; to implementation; and later assessment and maintenance.

For the first task, CCI could support the active members of the infrastructure maintenance team to lead in an innovative approach in the use of labour-based community contracting and management, involving community members in the planning of small-scale infrastructure projects. Adaptive technologies such as rainwater harvesting or sustainable urban drainage to reduce surface water run-offs can be piloted in small numbers. The effective monitoring of these pilots is important to evaluate their responses capacities and the perception of communities towards them. Participatory and innovative solutions have an opportunity to be financed by climate funds such as Climate and Development Knowledge Network (CDKN) pilot programs.

CCI could then take the role of building a framework for these collaborations and innovative practices to be implemented further by channelling advice from good precedent for co-production of projects. The Participatory Community Infrastructure Upgrading in Hanna Nassif (Nnkya, 2005) and the Decentralised Wastewater Treatment Systems (DEWATS) pilot project of simplified sewerage system in Vingunguti are existing precedent of co-production among NGOs, Community-Based Organisation (CBO), communities and government (DPU, 2016) that CCI can help involve as assistants and evaluators.

In a longer term, community participation should be embedded not only in the construction process, but also within the decision-making processes of larger infrastructure developments. CCI would support the MRFN as a platform to negotiate with different communities and local levels of government to advocate for integrating community projects to main drainage system or cross-regional riverbank protection projects such as the Dar es Salaam Metropolitan Development Project (DMDP) currently being implemented.

Based on our fieldtrip research, the construction of these city-wide projects, have increase the exposure to the impacts of extensive and intensive events of flooding (See Annex 2). Collaboration with local communities and research institutions like Ardhi University and UCL can reinforce the communication with NEMC as a path to increase its capacity to undertake more comprehensive preliminary impact assessments to ensure large-scale infrastructure projects are designed and built in a just responsive way. CCI can therefore advocate to introduce the guidelines for community-based infrastructure, evaluation and management as a tool to assess flood risk management at a regional and national levels.

4.4. Strategy 2 – Environmental management

The second strategy utilises the entry point that was opened during our field trip when CCI, members of our group and Carlos Mbuta, Principal Environmental Management Officer of NEMC were able to meet and discuss collaborative actions of monitoring and environmental assessment by CCI and the communities (See Annex 2). Primarily, building on this entry point is a crucial step in reconciling with NEMC after the 2015 evictions in the Msimbazi river valley (CCI & TUFPP, 2016) (CCI, 2016). Thus, CCI has the potential to bridge environmental management at community level with city or regional wide management where government institutions have had limited or non-existent reach.

Environmental management has an integral position in accomplishing progress in disaster risk reduction by reducing the exposure to human-caused hazards such as environmental degradation (UNEP, 2010). Moreover, the effective management of environment resources such as river-basins to decrease physical and social vulnerabilities requires new monitoring and evaluation arrangements, from local communities to global efforts (Reid, W. V., et al., 2005). Furthermore, communities play an important part in addressing localised environmental issues, not only by having an active role in monitoring, but also by stimulating better responsive strategies through partnerships with other communities, government institutions (Storey, 2012) and academy through the form of 'citizen science' projects (see UCL based ExCiteS department). The actions that CCI can take to enhance these mitigation and adaptive capacities through environmental management from community level can be framed in the following three objectives:

Objective 2.1: Reinforce MRFN by empowering communities

Building on the work of the cross-cutting element of information consolidation, this objective aims to strengthen the MRFN to systemically monitor and evaluate the environmental status of flood prone areas at river wide scale.

The first action is to use this information to strengthen CCI's vulnerability assessment of the Msimbazi river communities of 2016 to include everyday impacts of flooding beyond the scope of waste management and water services (CCI & TUFPP, 2016). Clear definitions of these impacts, specifying location and the economic impacts on households, may provide a more complete assessment on the existing assets and capacities of MRFN communities (See Annex 9).

CCI would lead and facilitate the platform where meetings can be arranged and the consolidated information can be shared and discussed among community members and groups such as youth associations, women's groups, religious groups and schools. These meetings would provide the basis for discussing an initial prioritisation of proposals and actions to promote environmental management within these groups. By encouraging the participation of MRFN representatives and the environmental committee from each Mtaa, the existing responsibility of data consolidation, taken by one CCI member such as Meki Mkanga, can be transferred to the local community level. Analysing this information with other communities, especially if they compare upstream-downstream locations, is key to building responsive proposals to mitigate flood impacts in a coordinated manner.

Objective 2.2: Develop a framework for community-based environmental management programs

The second objective calls for the development of a methodology to incorporate the information described in Objective 2.1 into the co-production of a framework where further progress and implementation of projects can take place.

The existing collaboration of CCI with the expertise found in research entities are an important resource of knowledge and validation of information. This way action can be centred in the forming of a Msimbazi Environmental Committee with the support of the DTMC and IHSS departments of Ardhi University, the Climate Change and Urban Vulnerability in Africa (CLUVA) and with the assistance of the DPU. The role of this committee would be threefold:

- Organise a platform of meetings to assess and further prioritise community projects from the initial proposals along the Msimbazi River.
- Develop a methodology to develop these projects based on Ecosystem Services Framework (ESF) as a form of recognition of the links between the communities and their environment (See Annex 11 for ESF examples).
- Design and campaign for environmental awareness programs from the community livelihoods and local government institutions.

These initiatives would be communicated to NEMC through periodic meetings which are necessary to begin developing a foundation for further financing and implementation. As for funding, CCI may be able to access some of the many climate adaptation funds, like the CDKN support on innovative measures for climate adaptation (CDKN, 2017).

Objective 2.3: Implement and Integrate community-based environmental management

Actions would be focused on supporting the application of the framework developed in Objective 2.2 by initiating a project between communities. For example, an extensive Mangrove Management Project to clear or plant mangroves based on the environmental need indicated by communities. Furthermore, the Msimbazi Environmental Committee would oversee and evaluate the progress of the project before, during and after implementation.

It is important to acknowledge that the success of community-based management projects depends largely on the clear assignment of responsibilities and the support of agencies that can assist their implementation (Balint, P. J. & Mashinya, J, 2006). In the context of Tanzania, community-based forest protection management programs supported by the National Adaptation Programme of Action (NAPA) objectives are useful examples of project development. CCI could utilise the lessons learned from these programs such as the United Nations REDD Program (REDD+) in rural areas and the Kinondoni Integrated Coastal Area Management Programme (KICAMP) in coastal ecosystem management in the form of advisory agencies to support the sustainability of the programs.

Potential funding could be sourced directly from the relation with NEMC. The National Environmental Trust Fund, residing in the National Environmental Management Act 2004, that encourages community-based environmental management projects (article 214), has only limited application (National Assembly, 2004). However, building on projects like the DRH in Dar es Salaam can be an opening for CCI to strengthen

collaborations with international donors in order to advocate for accessing this fund in form of grants through the NEMC Environmental Research Program (NERP) (NEMC, 2007).

Based on the lessons learned from the implementation of the first of these projects and looking at integrating it to a city-wide scale with the support of NEMC, in the longer term, a manual could be produced for environmental management projects, similar to the US-EPA Community-based environmental Protection Manual (EPA, 2000). CCI can then coordinate and train other communities along the river so that eventually the MRFN incorporates all communities that are located in the river basin, thus enabling a river-wide range.

4.5. Strategy 3 – Land & Resettlement

The third strategy focuses on addressing the flooding challenge as an issue of land rights by: 1) confronting the process by which land is currently assessed as “hazardous”; 2) supporting the rights of people living on flood-prone land, particularly tenants, by making them more visible; 3) promoting just resettlement and compensation processes where land is collaboratively deemed to be uninhabitable.

Flood-prone land is currently defined as “hazardous” if it lies within 60m of a river, expressed in the Environmental Management Act (United Republic of Tanzania, 2004). Furthermore, the National Land Policy of 1995 demands “compensation to any person whose right of occupancy, recognized long-standing occupation or customary use of land is revoked or otherwise interfered” (Tanzania, 2011). However, several unplanned settlements are located within this buffer zone due to the low cost of often centrally-located land and many people living here do not have proof of ownership or tenancy which makes it difficult to recognise their rights (Kironde, 2016). In several cases, such as Magomeni Sunna ward, we have found that these factors have been used as political means to justify forced evictions and demolitions in the absence of just land assessment, tenure systems, resettlement and compensation procedures like the Msimbazi valley evictions of December 2015 (CCI, 2016) (Annex 2). We therefore propose a framework for community-based projects to reassess flood-prone land and recognise multiple existing land tenure systems by developing an open land information database with local people. We also suggest steps towards developing just resettlement procedures through collaboration with WAT-Human Settlement Trust and Ardhi University and the creation of a working paper on fair resettlement guidelines.

Objective 3.1: Land Assessment and Data-Gathering

The first objective of this strategy aims to acknowledge community perspectives on risk in assessing “hazardous” land through community-led mapping of flood-prone areas and cross evaluations between CCI, federation members, community representatives and Mtaa officials.

Building on CCI’s existing community-based profiling and enumeration projects in 18 communities across Dar es Salaam (CCI & TUFP, 2016), we suggest that CCI continues these initiatives in collaboration with the MRFN and committees at Mtaa level in order to also begin community data-collection of flood-prone areas. On a weekly basis, flooding in the community should be recorded by measuring indicators such as the locations and severity of flooding, and any impacts on local infrastructure, tenure security and property loss value of those affected, varying levels and conditions of loss (Annex 9). Such a platform would be extremely valuable in allowing different individuals’ and communities’ vulnerabilities to be acknowledged

and recognized while enabling accessibility of information to support a negotiation platform with governments and organisations.

Subsequently, we recommend that CCI develops an open land tenure inventory in one or two pilot communities to ensure that vulnerable members of the community receive fair compensation and resettlement support where relocation must occur. Data such as different land tenure systems and estimates of land and property structure values should be recorded to provide room for negotiation where there are contradictory official land surveys. In the long term, this inventory could be used as an advocacy tool by CCI to encourage the government to recognize multiple land tenure systems in policy by making them publicly visible. Potential financial and technical supportive resources could initially be obtained by working in collaboration with Ardhi University (DTMC and IHSS departments) and DPU (UCL).

As many people living in informal settlements do not have verifiable proof of ownership or tenancy documents, CCI could collect other personal identifiers such as fingerprints following successful models such as UN Habitat's Social Tenure Domain Model (STDN) which has proved to be successful in poor urban settlements in countries like Kenya, Uganda and Ethiopia (Mundy, 2010). Alternatively, CCI could build upon the photographs taken of landowners and property owners in the enumeration done by the Municipalities following the 2015 flood crisis. This would also allow CCI to collect information about different individuals' vulnerabilities relating to characteristics such as gender or age for example.

In the long-term, CCI could use actors such as Bremen Overseas Research and Development Association (BORDA) and the World Bank's DRH project to scale-up the aforementioned actions across the city. BORDA have already initiated an online map of sanitation facilities across Dar es Salaam, while the DRH project involves community-led mapping of flooding incidents. Eventually, CCI could link up with these initiatives to develop a comprehensive information base which incorporates the multidimensional aspects of flooding risk including infrastructure and land. This could be a powerful force in influencing government policies on land and resettlement.

Objective 3.2: Developing Resettlement Strategies and Guidelines

This second objective focuses on the action that CCI can take to begin developing strategies for just resettlement through collaboration with WAT-HST and the Tanzania Financial Services for Underserved Settlements (TAFSUS) and how they can advocate that these guidelines are followed in government-led resettlement projects.

We firstly suggest that the Chamazi and Mabwepande projects are evaluated thus far, using the experiences of resettled people to identify areas of improvement, and successful actions to take forward. Subsequently, building on the suggested open land tenure inventory, a collaboration with WAT-HST and TAFSUS could allow CCI to identify sites across the city that could be used as temporary resettlement sites, or permanent brownfield or greenfield resettlement sites (See Annex 2). Possible opportunities could be sought such as land banks, which seek to reassess land and land use systems to benefit lower income earners. Diverse criteria to finding suitable areas such as spaces, use, ownership systems, location sizes could be discussed and analysed involving participation of all actors

In the medium to long term, CCI could collaborate with WAT-HST, TAFSUS and Ardhi University (IHSS) to develop a working manual on human-rights based approaches to resettlement as more knowledge and

experience is gained. This could act as an advocacy tool or guideline for just resettlement processes within the DMDP project and eventually, in government land and resettlement policies, for example informing the Mabwepande of the Chamazi cases on ideas of block titles or strata/communal titles, community land regularisation as was the case in Ubungo Darajani (Kessy, 2005) (Annex 2 and 12). Following a community-led pilot resettlement, monitoring and evaluation of the project's successes and failures could continue informing the initial manual to ensure guidelines remain relevant, objective and flexible. It is important for CCI to continue challenging the socio-economic inequalities that the urban poor face in acquiring and owning suitable land, and advocate for just recognition and redistribution of land and resources for the disadvantaged communities.

5. Conclusion

Dar es Salaam faces many challenges related to flooding and the most vulnerable communities are often the ones most severely impacted, not only during large scale disasters, but also on a daily basis. However, CCI can play a crucial role in developing more socio-environmentally just responses to flooding due to their relationship with these vulnerable communities. By focusing on the human-related causes of flooding – lack of infrastructure and waste management, environmental degradation, and unplanned urban development - and utilizing CCI's relationship with local communities, we developed three strategies that could not only build upon CCI's current work, but also expand the room for manoeuvre in regards to reducing the flooding risks for vulnerable communities.

Within the framework of strategic action planning, our strategies are built on the understanding that flooding is a multidimensional risk with varying impacts stemming from differing vulnerabilities which are linked to different capacities. The relationship between CCI and vulnerable communities is a key component in supporting these capacities. The objectives of each strategy aim at reinforcing synergies by building partnerships. These partnerships include actors from multiple levels and entail transferring skills from the institutional level to the community level. The implementation of the strategies are intended to have a cumulative multiplier effect based on community-led action that could be scaled up to address flooding on a citywide or regional level. This will expand the room for manoeuvre by enabling and empowering communities to design and participate in their own mitigation, adaptation and coping capacities while also enhancing the expertise and resources available in academia and government institutions.

As flooding becomes more frequent due to climate change and as Dar es Salaam continues to grow, the current flooding challenges will only be exacerbated. CCI has the opportunity to be a lead organisation in developing just responses to flooding. Our strategies are not solutions to all the challenges that Dar es Salaam faces, but they are three potential pathways that could lead to a more socio-environmentally just city.

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7. Annexes

Annex 1 - Fieldtrip Timetable

Date	Activities
Sunday, 30 th April, 2017	Arrival
Monday, 1 st May, 2017	City Tour Conference in Temeke Municipality Presentations by the mayor of the municipality about general information of the city CCI director Dr. Tim Ndezi Ruth McLeod about students' research work Street chairperson for Chamazi, Karakata and Sunna Brief introduction of translators, CCI staffs, Street chairperson for Chamazi, Karakata and Sunna
Tuesday, 2 nd May, 2017	First visit to Sunna: Meet our translators: Prudence and Edwin; and CCI staff: Meki MKanga Transect walk alongside Msimbazi River Meet with federation members Habiba, advisors to Community Development Office, Municipality Council Officers and other residents Introduce the drone to the residents
Wednesday, 3 rd May, 2017	Second visit to Sunna: Interviews with focus groups: women, men and the youth Use the drone to shoot views along Msimbazi River Presentation by the official from Public Affairs Dept. in Kinondoni Municipality
Thursday, 4 th May, 2017	The group was divided into 3 sub-groups to visit 3 communities. Mabwepande: Meet and discuss with Habiba, CCI representatives, Mabwepande federation members Split up into sub-groups to visit different households' homes Unstructured interviews with households and the federation members Vingunguti Ward (Msimbazi River): Unstructured interview with the Mtaa leader, Mr. Gasi Walking tour of the upstream of Msimbazi River and use the drone to overlook the site Visit the toilet project in Vingunguti done by CCI Walk around the community and visit the dumpsite Msasani Ward (Bonde la Mpunga Mtaa): Unstructured interviews with the director of Msasani Ward Office and the official of Bonde la Mpunga sub-ward office Walking tour of the Bonde la Mpunga community, guided by Meki and Yeshua
Friday, 5 th May, 2017	Conference in the hotel with different institutional actors: Presentations by

	<p>Dr. Mlengi Mgendi about climate change and disaster management and responses</p> <p>Dumpsite manager, Richard Kishere, about solid waste management</p> <p>The official from Administrative of Housing and Land about housing policy in Tanzania</p> <p>An urban planning advisor to the city council about the city's master plan</p> <p>Semi-structured interviews with the actors above, Tim and other CCI staffs and representatives of communities</p>
Saturday, 6 th May, 2017	<p>Site visits to 2 communities:</p> <p>Sunna:</p> <ul style="list-style-type: none"> • Invite 2 children to use the drone to overlook Sunna and Msimbazi River • Unstructured interview with CCI staff, Meki <p>Msasani Ward (Bonde la Mpunga Mtaa):</p> <ul style="list-style-type: none"> • Unstructured interview with the Mtaa leader, Mr. Gasi • Semi-structured interview with random people living in the community, and the sub-ward official
Sunday, 7 th May, 2017	Free day
Monday, 8 th May, 2017	<p>Presentation/video preparation</p> <p>Visit NEMC office with CCI staff Meki and interview with Principle Environmental Management Officer, Carlo Mbuta</p>
Tuesday, 9 th May, 2017	<p>Presentation/video preparation</p> <p>Visit Ardhi University:</p> <p>Presentation by</p> <p>The flooding group about the research work</p> <p>UFZ and AMRA representatives about CLUVA project</p> <p>Ardhi about recent institutional reforms</p> <p>CCI director, Dr. Tim Ndezi</p>
Wednesday, 10 th May, 2017	<p>Presentation/video preparation</p> <p>Site visit to Vingunguti Ward (Msimbazi River):</p> <p>Visit the toilet project in Vingunguti done by CCI</p> <p>Structured interviews with households</p>
Thursday, 11 th May, 2017	Final student presentations and feedback
Friday, 12 th May, 2017	Final debrief and trip review

Annex 2 - Main Insights from Interviews and Conferences

Unstructured Interview with Emmanuel Osuteye (DPU) - 28th April, 2017

Location: London, UK

Interviewee: Emmanuel Osuteye from DPU via Skype call.

- Main causes of flooding in Sunna: lack of maintenance of Msimbazi River, where dredging of river is taking place along the banks.
- Category of risk: intensive (Less frequency, once or twice a year, but heavy damage and costs)
- Impacts: blocked gutters leads to contamination of water, pests, sewerage overflow; poor construction of roads; land use development, infrastructure and ecological consequences.
- On-going projects: scoping research between CCI and MRFN; CCI and DPU on risk and informal settlements in Vingunguti and Msasani Bonde la Mpunga wards.
- Comments: CCI has strong engagement with Ward level government. Weaker links with municipality and national level government.
- Temeke Municipal Council: CCI has previously completed project engagement with Mayor. He has acknowledged UCL's works in UN Habitat.

Unstructured interview with Mtaa leader in Vingunguti – 4th May, 2017

Location: : Vingunguti, Dar es Salaam.

Interviewee: : Rohmu Gasi, Mtaa leader.

Interpreter: : Edwin

Flooding issues:

- Causes are because of low elevation of Dar es Salaam and obstructions to the drainage system by unattended solid waste.

Problems for the community:

- People lose their material possessions due to overflowing and regression of water flow in two smaller channels that drain in the Msimbazi River.

Land issues:

- Since 2005: property licenses to provide evidence of property rights and tax recollection. The application to this license starts from the community leaders, who recognise the owner of any given house. It then passes through the Mtaa leader, who then sends it to the ward level, finalising by the approval in the Municipality after a surveyor approves the origin of the claim.
- Even though this system has worked for 84% of the 2,500 houses in the area, it can be blurred by licensing houses in hazardous areas
- Time: it takes about 2 months to process.
- Cost: as an example 300/m² costs TZS 10,000 each year.

Institutional Structure:

- Mtaa coordinates a development committee in 5 areas (WARISI): security; environment; thefts; disasters; and statistics.

- Issues from the community are presented to the Mtaa committee or leader. If they cannot be solved by the community, the leader of the Mtaa voices it out in the Ward Development Committee (WDC), for which he is part of. If the ward can't find solution it is taken to the municipal level. If it still can't solve the problem, the municipality can either send it to a Member of Parliament or directly to the Ministers. All this process can take up to 1 year since the issue is arise to the resources are channelled down.
- The issues range between infrastructure (eg: repairmen of small bridge) and basic services provisions.

Unstructured interview with in Vingunguti – 10th May, 2017

1. First person interviewed:

- A woman living in Vingunguti for 20 years who has been a federation member since 3 years ago.
- She has become a beneficiary of the second phase of the toilet project. The money for the toilet was from the JENGA fund and she must reimburse the loan, although she hasn't started yet. She is part of a collective group of 20 people who are also still negotiating how to pay back the loan.
- The loan was 300 000 shillings and it was reduced to 258 000 shillings which she expects to pay back in three years.
- She works as a food seller and she saves up to 1000 shillings per day.
- The biggest challenge she has to face is the dumpsite, which has grown as a measure to control the enlargement of the canal size and to avoid the flooding they started to place the garbage as a barrier to the water.

2. Second person interviewed:

- Divorced woman living for 4 years as an owner as she has inherited the house.
- She lives with their children and some tenants.
- She is a member of the Federation for 3 years now and also she is part of the toilet project and she has benefited from the second phase of the project. The money for the toilet was from the Jenga fund and she must reimburse the loan, although she hasn't started yet. She is part of a collective group of 20 people who are also still negotiating how to pay back the loan. The second phase of the toilet project took three years, and part of them were upgraded and other built.
- As an owner, she pays the garbage collection fee, however there is not collection of solid waste.
- She is in the process of negotiation to pay back the loan and she expects to pay 290,000 shillings for the toilet.
- She has to pay 2000 shillings per month for the toilet project and 2000 shillings for the utility fee for DAWASCO.

Unstructured interview with Meki Mkanga, CCI – 6th May, 2017

Location: : Magomeni Sunna, Dar es Salaam.

Interviewee: : Meki Mkanga, CCI.

- Meki's role is to collect data from the MRFN's 18 communities, once a month. Data includes flooded houses, displacements, assets lost.

- Mapping activities had allowed collaboration with NEMC and Municipal Council to rent machinery to dredge the river in 2015. Excessive dredging has caused a basin in front of Sunna, increasing the risk of returning water from the sea.
- No clear definition of green belt proposed in the DMDP and the 2012-2032 Masterplan.
- Organised savings group in the community and supported by CCI are addressed to upgrade skills and generate income. Collaboration with Small Industries Development Organisation (SIDO) and Ardhi University in entrepreneurship workshops.
- No interaction with the Disaster Risk Management Desk in the municipality.

Unstructured interview Mtaa leader (M. Sunna) – 6th May, 2017

Location: : Magomeni Sunna, Dar es Salaam
 Interviewee: : Salumu Hamisi, Mtaa leader
 Interpreter: : Nico

Mistrust of Municipality and National Government by the Mtaa

- Land Act of 1999 which declared the 60m buffer zone of hazardous land and the demolition in 2015.
- Government waited until after people had already built their homes and then demolished.
- The wealthier people living within the buffer zone were unaffected by the demolition.
- Compensation is necessary to allow those affected to restart their lives, but the government does not want that to happen, in the case of the demolition and the World Bank project.
- A noticeable strain and mistrust that was express by the Mtaa.
- He mentioned they he is voluntary and does not get any resources or tools from the government to conduct his everyday duties, like other Mtaas do.
- People are living in this area because it is affordable.
- Municipal leaders follow up to check that no one is building within the buffer zone.

Complex system to obtain documentation for land tenure

- Land of Certificate, Property Tax Demand Note, Residential Licenses, Certificate of Housing - none of these protected people from the demolition
- They do not give people any power
- Before Sunna was developed, it was farming land. Farmer sold their land, then it was resold and only one person has the original land title.

Lack of Adequate Infrastructure and Public Services

- The second bridge that was built in 2013-2014 is too low and causes more flooding.
- This debris and sand that block the flow under the bridge was cleaned but only on the side where the BRT depot was built.
- Water and electricity was provided to this area as it started to grow in population, but after the demolition, the government has told DAWASCO and DAWASA not to return to the area. So some have remained without these services.
- Mostly illegal pickers collect waste in this area because the other more formal options were not effective due to high fees.

Issues with the World Bank Project

- Although this project may improve the river flow under the bridge, the community will not benefit because they most likely will be evicted.

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- Local government has been intervening in the potential compensation process, and the Mtaa believes this will affect whether or not community members will receive compensation

Interview with Habiba Mondaba (M. Sunna) – 8th May, 2017

Location: : Magomeni Sunna, Dar es Salaam
Interviewee: : Habiba Mondoba
Interpreter: : Nico and Maureen

Most of those who left Sunna settlements after the 2015 floods relocated to Ubungo and Mabwepande area.

Would have loved to stay as she understand the value of the land Sunna being strategically located to within the city to City Centre, transport services. She also mentioned she is aware that the 60M boundary from river is currently under discussion to be reduced to 15M boundary, in which case her chances of staying increase as she believes will be safe. Shared wish to leave Sunna, provided adequate compensation is given to her. (Though the 1998 Masterplan has a different explanation of the hazardous boundary that uses grid lines drawn from Mkwanjuni where the boundary is drawn from the centre of Msimbazi river and follows a straight line instead of the flow of the river)

Also, shared that her and some federation members are interested and currently in search for brownfields sites within the city as greenfield site are not able to maintain dwellers livelihoods, loss of customers, social networks and poor access to services and facilities.

The proper steps to be taken in relocation following a compensation are expressed by Habiba as follows:

- 1st form is given to residents that states that eviction from current location is required for various. And 90 days given for discussion within communities where negotiations proceed on the process of relocation and minutes shared municipality officials.
- 2nd form, follows a publication in the newspapers government magazine. After which the documents showing discussion held between municipalities and communities.
- Certification from World Environment Board then marks the area as hazardous
- After which period of 2 – 3 years is given for the community to relocate with help of the municipality

Unstructured interviews in Msasani Bonde la Mpunga – 4th May, 2017

Location: : Msasani Bonde la Mpunga, Dar es Salaam.
Interviewee: : Mr Singo, Ward director.

- Since 2014, the Dar es Salaam Metropolitan Development Project (DMDP) and surrounding drainage upgrading system has improved flooding mitigation in his ward territory.
- A non-specified area in Bonde la Mpunga which was deemed hazardous, after the DMDP, the status was removed after flooding was no longer considered as the criteria of the site.
- Garbage fee is charged to residents, and cross subsidize basic maintenance for drainage within his wards.
- Disparity on quality of services provided based on fees paid by richer and poorer areas in the ward.

- The fees are decided based on the Mtaa level by the sub-ward committee members. The city council only provides the guidelines to setting up the fee collection system.

Location: : Msasani Bonde la Mpunga, Dar es Salaam.
 Interviewee: : Mtaa leader.

- The Mtaa encounters high water table, and 20 minutes of rain can trigger flash floods within the same road.
- Main economic activity is comprised of private business owners such as shop owners. Of the employed, $\frac{3}{4}$ population comprise of women who sells buns and fried fishes.
- Maintenance and enforcement of non-compliance of building permits issued at Mtaa level. Mtaa to coordinate waste management, infrastructure, maintenance and urban services.

Interview with NEMC – 8th May, 2017

Location: : Regent Estate Plot, Dar Es Salaam.
 Interviewee: : Carlos Mbuta, Principal Environmental Management Officer.

Definition of Hazardous Area:

- Hazardous area (or buffer zone/environmentally sensitive area) varies according to ministry, location and purpose of development: 60 meters from centre of river and natural water resources - NEMC, under Environmental Management Act 2014; 150 meters from centre of storm water and irrigation sources - Ministry of Water and Irrigation.
- NEMC is reconsidering to allow application within 60m and 150m buffer zone located beside coastal and riverbank area for vertical development i.e. apartments, to “increase accessibility” to these natural water resources.
- NEMC recognises the buffer zone is used for eviction and demolition of buildings, due to political influence.
- Political interference in the interpretation of land laws (Land Management Act), i.e. DMDP did not comply to 60-meter buffer zone, and conditions by NEMC were breached - Sand debris thrown into Msimbasi River, widening of road and bridge, and EIA report did not meet requirement as a consequence of that.
- When morphology of river shifts, NEMC considers highest water mark and determine distance from one point to the next (eg: Msungu River)

Urban Planning:

- Temporary displacement, allocation of open space (green belt) and dysfunctional master planning cited as justification for eviction of “unplanned” illegal settlements.
- Demarcation of flood-prone area as a hazardous area can therefore be prioritized for relocation purposes.
- Enforcement and monitoring of 60 meter buffer zone guideline by NEMC is through submission of planning permission/ development proposal reports under the environmental impact assessments.

Current Priorities and Partnerships with Agencies and Communities:

- Research and Planning: NEMC currently working with Ministry of Land, Housing and Human Settlement (MLHHS) and local universities to develop hazardous areas in Tanzania.
- CCI proposes research collaborations with NEMC to input social livelihoods and social planning perspective in this project. NEMC to consider this collaboration

Assessment of pesticide pollution in Msungu Mountain, affected by endosulfan chemicals, and pest management system and mitigation towards surrounding settlements within Dodomi Municipal Council area: NEMC proposes CCI look into the communities living within this area and consider embarking on community based projects in this area.

Environment, Education and Awareness:

- Enforcement and Compliance: Implementation of all policies must be aligned with MLHHS, Ministry of Water and Irrigation and NEMC, as well as City Councils. Other challenges include capacity building and training programmes between communities, government agencies and private sectors.

Solid Waste (SW) Management:

- Local government responsible to day-to-day enforcement of garbage collection, education, training and awareness programmes of recycling these resources.

Questions for focus Groups in Sunna – 3rd May, 2017

Location: : Sunna
Interviewees: : the whole group

Questions for Focus Groups

- How long have you lived here?
- What does your association do?
- How long has it been active in the community?
- What has been the most successful activity/ event/ program of your association?
- What do you see as the biggest challenge(s) in your community?
- What do you appreciate most in your community?
- Do you work with other groups?
- Do you see flooding as a problem in your community?
- How does flooding affect your work? Your family? Your home?
- How does rainy season affect your community?
- What do you do when it is about to flood?
- Do you have a warning when it is about to flood?
- What changes have you seen in the community in recent years?
- Do you see yourself in this community for your whole life? Where will you be in 5 years? 10 years?
- Where do you do your shopping?

Questions for Women and Men

1. Basic info
 - a. What is your 24-hrs task/daily life routine?
 - b. How long have you been living here?
 - c. Who do you live with?
 - d. What do you work for living? Where do you work? How long does it take from your home to where you work at?
 - e. Is your housing in ownership or tenancy?
 - f. What do you like the best of your community? What do you think the challenges of your community?

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2. Flooding
 - a. Do you see flooding as a problem in your community?
 - b. How does flooding affect your work in different time of year? Your family? Your home?
 - c. seasonality -- Does rainy season affect your work, eg how many bananas can you sell in different time?
 - d. What do you do when flood happens? How do you deal with flooding, before and after?
 - e. Do you have a warning when it is about to flood?
 - f. What do you think of the causes of the flooding? What do you think that could be done to solve the problem? How can you be involved?

Draft Questions for Youth (Age: 12 to 19)

1. Ice breaker
 - a. Games
2. Questions (split by age, no gender)
 - a. Introduction
 - i. How old are you? How long have you lived here? Where do you live?
 - ii. What do you like about your community? What do you dislike?
 - iii. What's the place in the city and the community that you like the most? (Parks, open spaces, public spaces?)
 - b. Present livelihood
 - i. Do you go to school? Where do you go to school? Does flooding affect your route to school? If you don't go to school? Do you miss school because of flooding? If not affected by flooding, why would you skip school?
 - ii. Do you work? What kind of work do you do? Do you help out at home? Does flooding affect your work?
 - iii. What do you do for fun? Do you spend time with your friends? Do your best friends live in this community?
 - iv. When you travel
 - v. outside your neighborhood what mode of transportation do you use? Do you use the BRT?
 - vi. How often do you go to downtown/Kariokoo? How do you get there?
 - vii. Where do you and your family get water from? Where do your parents get food from?
 - viii. Do you get sick often? Do you visit the hospital? Do you visit THE hospital?
 - ix. What do your parents do?
 - x. What do you know about the Federation? What does the Federation do? Is your mother/father a member?
 - c. Flooding and environment
 - i. Do you or did you use to play in the river?
 - ii. Do you do laundry in the river? Do you bath in the river?
 - iii. Have you noticed any change in the river?
 - iv. When was the last time it flooded?
 - v. How does rainy season affect your community?
 - vi. When it rains, how does water/flooding affect your house?

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- vii. What do you do when it is about to flood? How do you prepare? Do you have a warning when it is about to flood?
 - viii. What do you do when it floods?
 - ix. How do you manage garbage? What do you do with the plastic bags that you use for the supermarket?
 - d. Future livelihoods
 - x. What changes have you seen in the community in recent years?
 - xi. What would you like to do when you finish high school? or in the near future?

Focus group - Women Group

Ten women in their fifties (except two of them in their thirties), were interviewed in Magomeni Sunna. Four of them have been living in Sunna for 20 years; 4 of them for 10 years; 1 of them for 25 years and another for 30 years. Only two of them were owners of the land and the rest were either tenants either they were living in someone's home. Their income comes from food selling and small business. Most of them live with their children reflecting the precarity in their situation when flooding occurs. Women and men deal with flooding when it happens, although women fear when men are away home as they need their strength to start taking their things out of their homes and place them in the roofs while they cope with the house flooded. Normally children are sent to the neighbour's home, schools or mosques in order to protect them for the diseases that they have to commonly face due to the flooding consequences: fungus, diarrhea, urinary tract infection, malaria, etc. It is important to highlight the importance of the neighbor's in the community as they always help each other's in disasters' situation: hosting someone's children or cooking the food to sell afterwards.

According to the women, the flooding comes from the river, but they claim that the main reason is the lack of infrastructure and the functioning of the drainage system damaged by the poor solid waste management in the area. The measures taken by the residents when flooding happens, vary from putting sand sacks to absorb the water, to provide a channel to permit the water to go directly from the home to the river and in some houses the flooding cannot be avoided. The impacts of flooding are economic, social, health problems, and family and friends' disenfranchisement.

They do agree that if they were given the option to move to another place proposed by the government where they will be given a house and a place to live, they will go and leave Sunna as they are so tired of the flooding situation and the damaging consequences in their lives. However, they have pointed out that even if they move they will keep on commuting long hours to Sunna as their jobs are in this area.

Within the focus group of women interviewed none of them have been given the chance to move to Mabwepande. Only the most 'vulnerable' residents have been resettled, although the government told some of them that for the third phase they were going to be resettled, nothing has been solved since that time.

Focus group - Men Group

Most of the interviewees live with their immediate families, except one, he is single. The majority of participants generate their income with small activities around their house, and offer services to the community, such as repairing bags. Others work for security companies.

From the men's experience, in case of flooding, lasting usually five hours, they interrupt their business activities and return once the water goes back. Generally, families, which are more affected than others, are able to stay at neighbor's house or temporarily move to relatives elsewhere. Depending on the location of the house, some community members can return at an earlier to their places than others. During flooding people try to guide and watch their properties, in order to prevent robbery and protect their assets.

Regarding the causes of flooding, people understand that industrial, agricultural activities upstream, such as construction, lead to a blockage of the river stream, as these discard their waste in the Msimbazi river. Others make communities, living uphill, responsible for throwing their household waste in the river.

Moreover, most of the participants agree, that due to shifts in leadership, the flooding situation has worsened over time. Earlier, governmental programmes have addressed this issue, and included cleaning the river and collecting waste from river banks. Another aspect which was raised, is the particular location of the Sunna settlement, as it represents a confluence from the Msimbazi and Ngombe river. From the men's perception, the floods occurred in 2011 and 2012 were undoubtedly the most significant ones. Through the extension of the Selander bridge in 2014 another cause of flooding was exacerbated, the remaining sand. The same experience was made after the construction of the close by located bus depot, where sand and stone, which were not used, were left behind. One participant states, that to him floods are caused by the fact that both rivers do not have their original river depth, as a result of a lack of cleaning and erosion of the river banks. He believes that this is a municipal obligation and therefore the government should take care of the state of the river.

About health issues, the participants report, that people received medical assistance (red cross intervention), but only once, after a major flooding event. Basically, what is needed during flooding periods are medicine, water, food and simply shelter. With regards to solutions for the future, the interviewees are convinced, that the government should enforce policies, which include a regular river cleaning, as a form of flood prevention. Nonetheless, they are fully aware of the fact that there appears a conflict of interests, and local and national authorities take advantage of flooding events. By and large, they consider the Sunna settlement not as a future place for their children to live in.

Focus group - Youth Group

Twelve young people attended the focus group led by our group. Two of them were 20 and 25 years old and the rest of them were aged between 12 and 19 years old. Six of them have been living in Sunna for 8 years and the other six for 1 to 3 years. In relation to their education, seven of them were still attending school, while the others were working in informal jobs such as agricultural work, construction labourer, food selling and street vendors.

All of them are fully aware of the flooding issue and their consequences as well as the health and environmental repercussions of the hazard. Moreover, they have enumerated the several diseases they have suffered over the time due to the pollution of the water: fungus, malaria, diarrhea and urinary tract disease, among others. For the ones living in Sunna for several years, they clearly stated that the flooding situation has worsened in the later years. One important thing to highlight is that only one of them was willing to continue living in Sunna because of family responsibilities, whereas the rest of them won't envisage a future in the settlement.

Annex 3 - Walkthroughs

Sunna along the Msimbazi river – 2nd May, 2017

- Multiple perceptions of risks, its causes and impacts (short term vs long term)
- Understanding of the environmental dimension of flooding (sand, sedimentation, SWM, infrastructure impact), health dimension and the overall situation of poverty faced by informal settlers.
- Federation members very proud of their Savings.
- Land is an underlying element where flooding problems/challenges meet.
- History of places; 1958 and 2011 major flooding; not mention of 2015.
- Unclear responsibilities, resources and institutionality regarding multi-level DRR.
- Policy focus in first response (main mechanism implemented after 2011)
- Local government is responsible for compensation: TZS 13 billion, proposal to repay through property tax.

Magomeni Sunna in the settlement – 3rd May, 2017

- We had a walk-tour guided by several local women in the Sunna settlement, including the area where demolitions took place in 2014
- We encountered a poor condition of community roads and very narrow alleys.
- In case of flooding, there is a guest room which accommodate evacuated residents' charges 7000 TZS per person per night. However, if guest pay monthly, the cost will be 20,000 TZS.
- The morphology of the land in Sunna reflects how the flooding affects the community. The terrain in Sunna is high on the South and low in the North. In the North, therefore, the houses especially the ones near the river are more affected. Astonishingly, there are still some houses storing water from last year's flooding.
- Most houses in the North were demolished, however there are still people living there. We encountered a household living under the roof, in the top floor of her house because her house was full of water.
- Basically, there are no solid pavement in the North, there is only water and mud. A heartbreaking image was a schoolgirl we met coming back from school, with her shoes in hands, crossing the flooded paths.

Msasani Bonde la Mpunga – 4th May, 2017

1. Sub-ward leader of Bonde La Mpunga – Mr Asaba
 - 1656 house structures. Majority tenants.
 - People have lived here many years (himself since 1968).
 - Biggest challenges: poor infrastructure and environment is not good.
 - Where he lives there is not much flooding, but other people are still affected even with the drainage system (although it has been minimised).
 - Very few are permanently employed but they are privately employed. Some have shops, food/veg stores, groceries, women often do food/fish vending.

-
- When they do renovations, they have to get the Mtaa to first come and check if it's okay, it's then taken to the ward level.
2. Walk-tour with Meki and Yeshua:
- At Bonde La Mpunga (Oyster Bay), Two ladies signalled to Yeshua to say that the waters are from latrines (toilet) and advised us to be careful walking along the streets, while walking barefoot themselves.
 - Within 2 hours of light-mid heavy rain, flash flood flow in the area was right above ankle knee level. In this aspect, flooding situation is worse than Sunna Community.
 - Women (some with young children) and young adults were mostly present in the village at point in time, selling samosas, fruits and vegetables and grocery stores - no signs of slowing down business.
 - Water and electricity supply was provided throughout, which is better compared to Sunna Community, but still different context in terms of land and housing titles.
 - Segregation is quite obvious as this community is very closed to a residential area for the middle-class where there are a lot of newly built gated houses.

Vingunguti – 4th May, 2017

1. Mtaa leader Mr.Rohmu Gasi and one of his department assistant
 - relating to Flooding issues
 - Causes:
 - Low elevation of Dar es Salaam
 - Obstructions to the drainage because of unattended solid waste
 - Problems for the community:
 - People lose their material possessions
 - Overflowing and regression of water flow in two smaller channels that drain in the Msimbazi River.
 - relating to Land issues:
 - Since the 2005 there has been a form of registry called property license that is used for providing evidence of property rights in one hand, and in the other of tax recollection.
 - The application to this license starts from the community leaders, who recognise the owner of any given house. It then passes through the Mtaa leader, who then sends it to the ward level, finalising by the approval in the Municipality after a surveyor approves the origin of the claim.
 - Even though this system has worked for the 84% of the 2.500 houses in the area, it can be blurred by licensing houses in hazardous areas (the discussion of what is hazardous area will be settled by the time of this letter, hopefully).
 - It costs certain amount of money and takes about 2 months to process.
 - As an example 300/m2 costs TZS 10,000 each year.
 - relating to Institutional Structure:
 - The other responsibilities of the Mtaa leader are: daily services; giving letters of recommendation; coordinating security and waste management. This is done by coordinating a development committee in 5 areas (WARISI): security; environment; thefts; disasters; and statistics.

-
- Whenever something happens (some issue in the community) the case is presented to the Mtaa committee or leader. If they cannot be solved by the community, the leader of the Mtaa voices it out in the Ward Development Committee (WDC), for which he is part of. If the ward can't find solution it is taken to the municipal level. If it still can't solve the problem, the municipality can either send it to a Member of Parliament or directly to the Ministers.
 - All this process can take up to 1 year since the issue is arise to the resources are channeled down.
 - The issues ranges between infrastructure and basic services provisions.
 - When asking what was the timber for, the response was that it was for repairing a small bridge close by. The resources to buy the timber came from the MP.

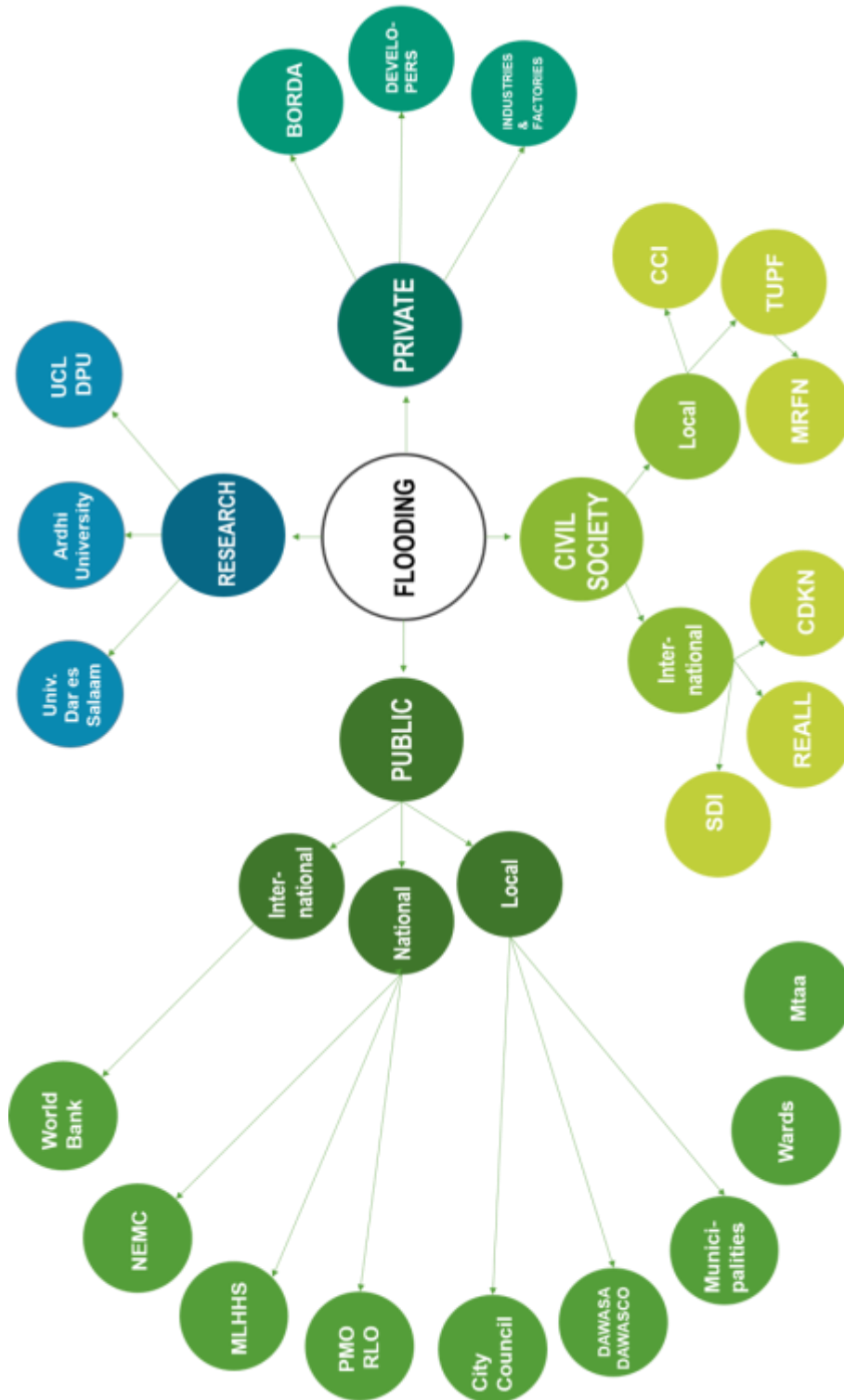
Mabwepande resettlement – 6th May, 2017

Those settled in the Mabwepande area following the 2011 flooding that was a Dar es Salaam large scale disaster. Resettled by the government initiative.

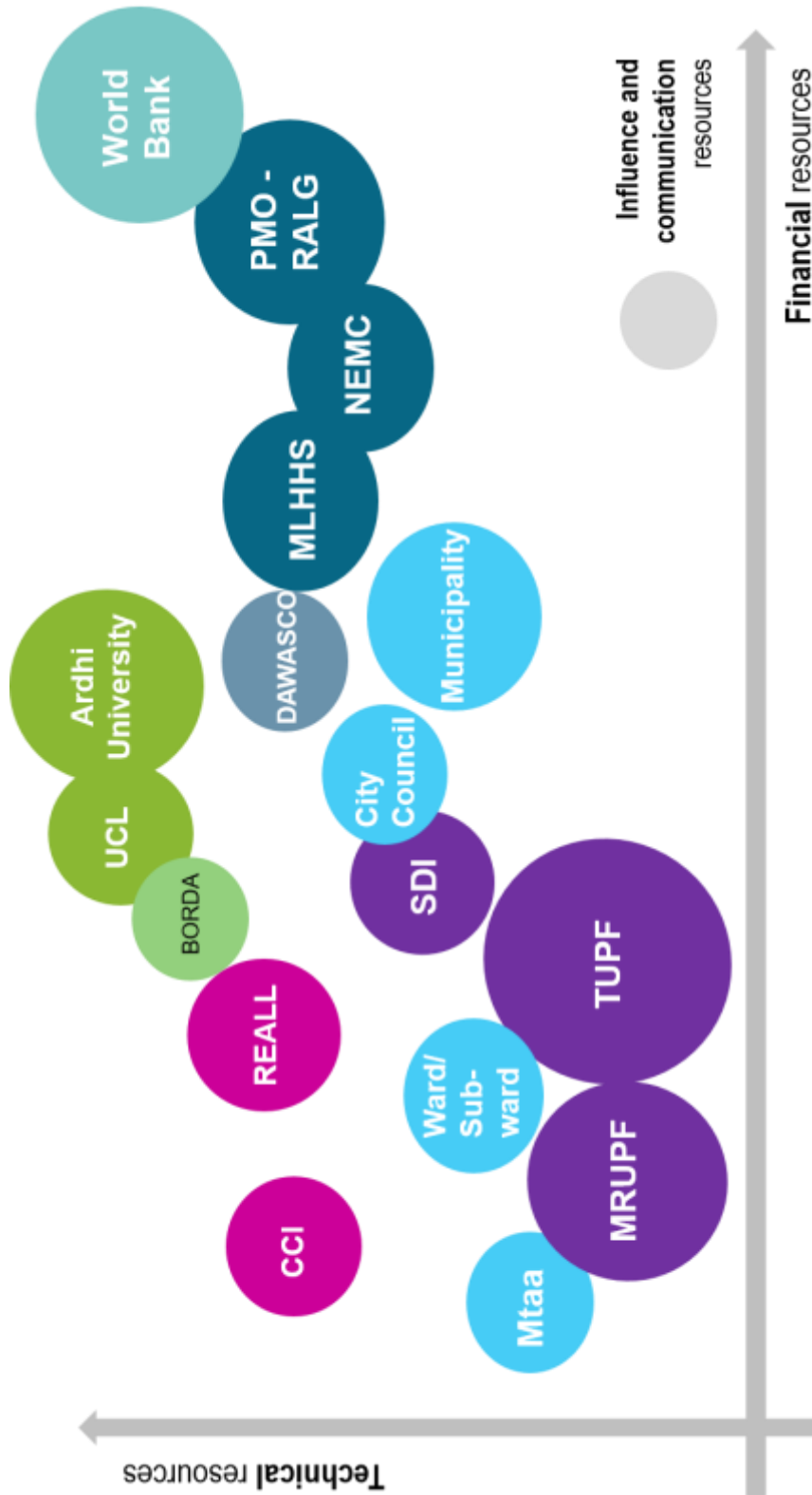
Project relocation took place in 2 phases within a span of approximately 1 ½ months. 1st phase (604 individual landlords) received promise of land, tents and materials for construction; 2nd phase (408 individual landlords) received promise of land, tents but no materials. 3rd phase is currently awaiting resettlement, have their names in municipals office (Habiba and other Sunna members are in this list. Additionally, expressed that n Sunna case it was not a willingness to relocate as was from other settlements but a forced decision from government which left an initial negative attitude towards Mabwepande casee). Site provision of school, hospital, police station and market. There is a belief that those not in Mabwepande are not there due to their willingness of not wanting to be involved. Which differs from Habiba's views as she says it is due to halting of resettlement of 3rd phase.

CCI's involvement with 5 federation members on a housing project, from 2015 for an agreed contract period of 3 years. Just few collectives committed as previous deceitful attempts by organisations discouraged Mabwepande residents from participating in CCI's housing projects. Initial loan given by CCI was 52,000 Tsh which was meant for 1st phase of project (foundation, walling and beam construction) which was increased to 105,000 Tsh (to cater for the roofing phase).

Annex 4 - Key Actors Map

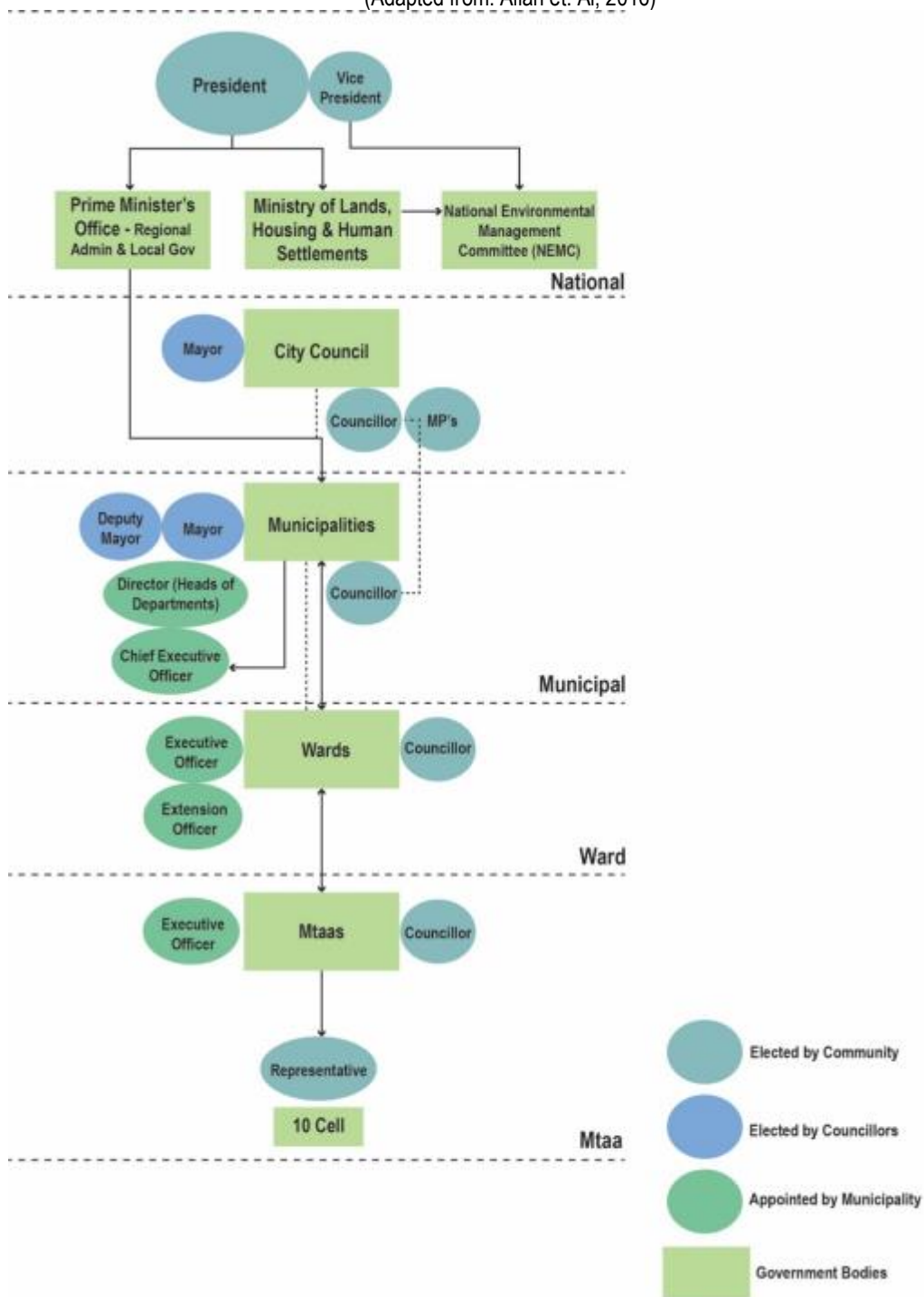


Annex 5 - Resource Assessment of Key Actors

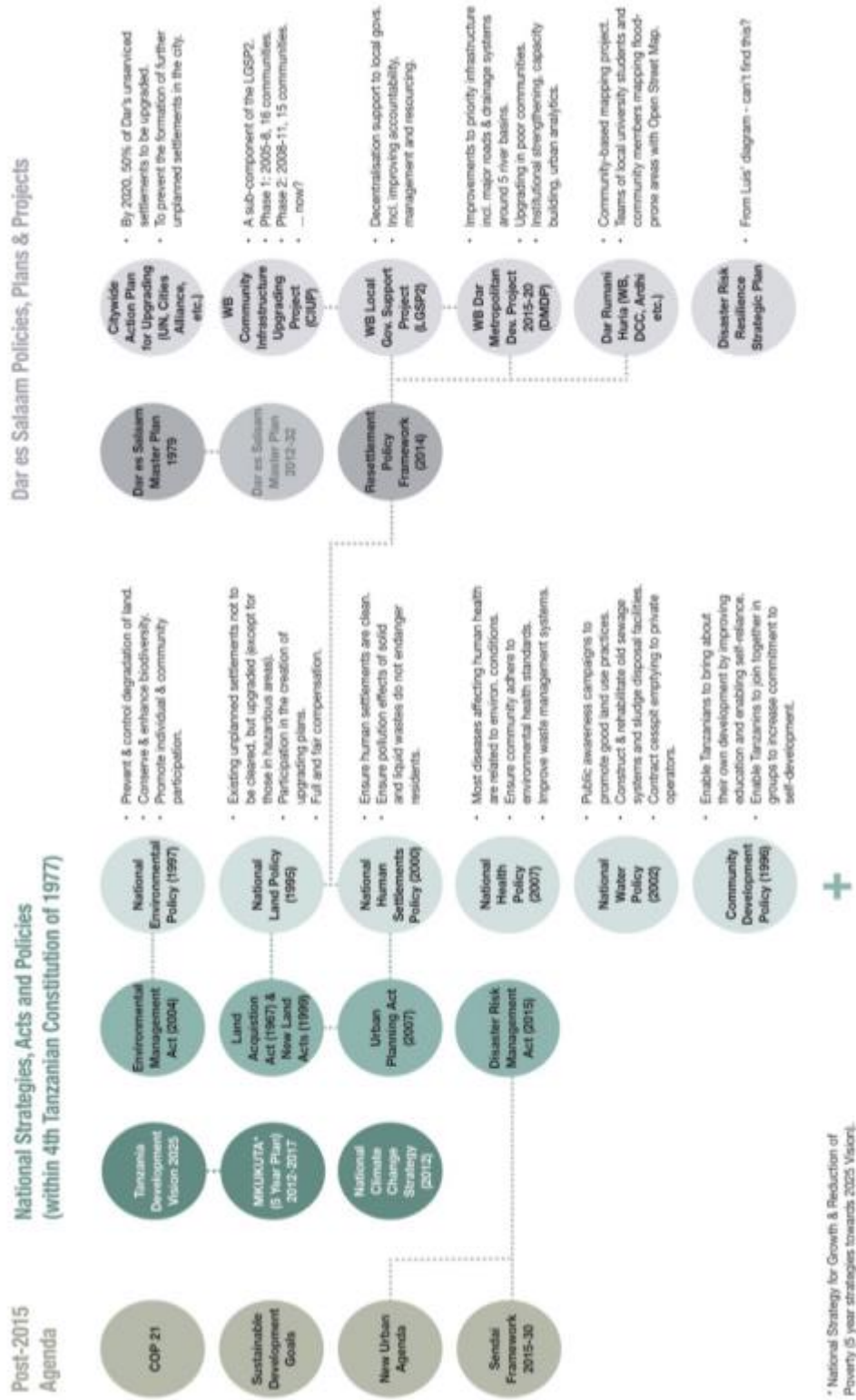


Annex 6 - Government structure

(Adapted from: Allan et. Al, 2016)

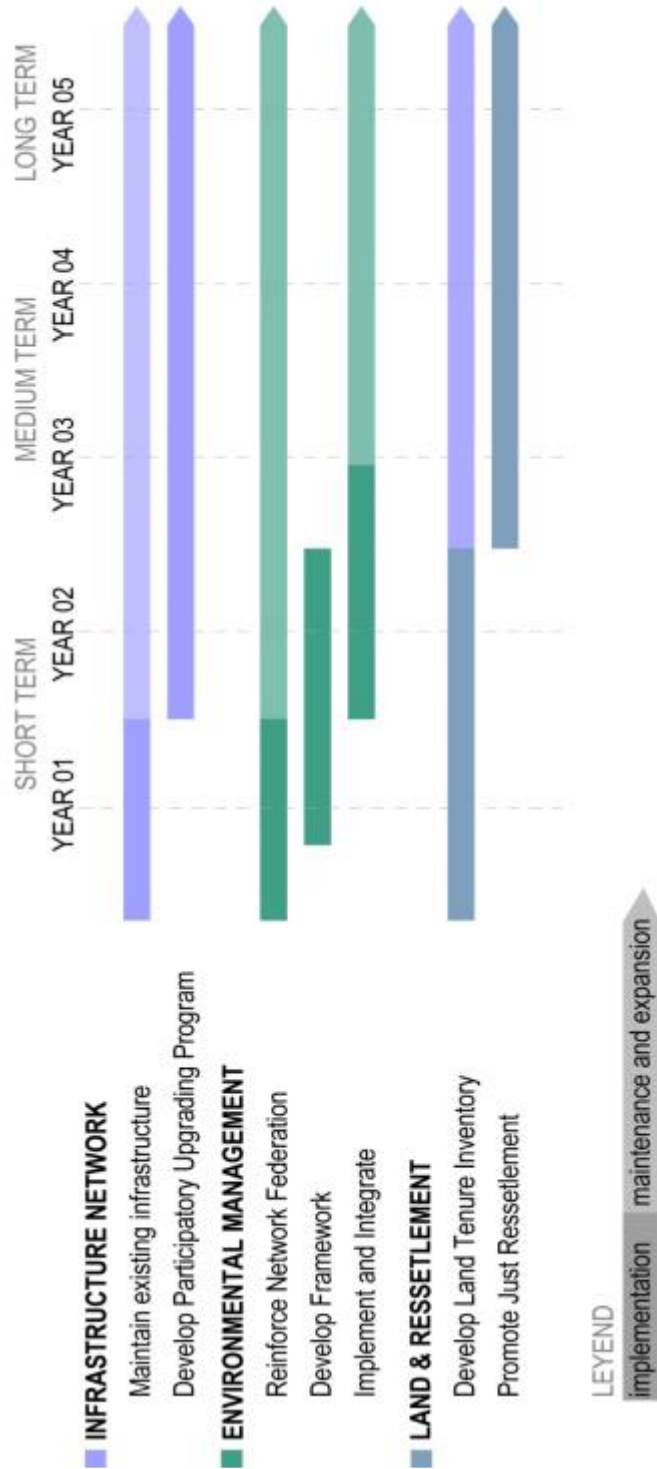


Annex 7 - Policy Map



* National Strategy for Growth & Reduction of Poverty (5 year strategies towards 2025 Vision).

Annex 8 - Timeline for proposed strategies



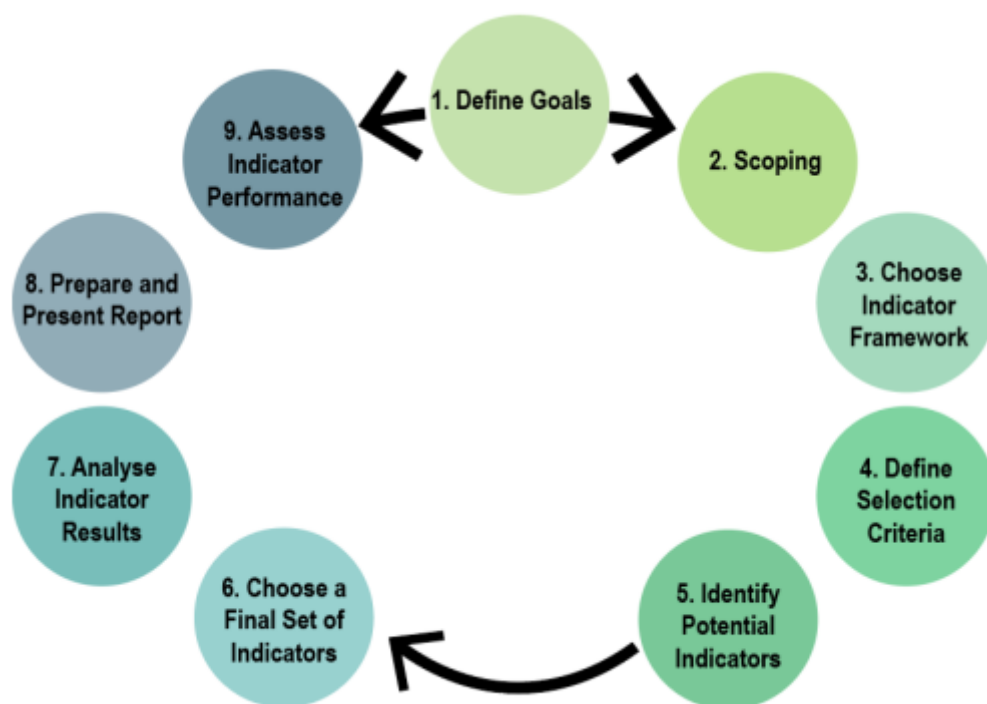
Annex 9 - Indicators

Community-based monitoring and evaluation offer a strategic tool for enhancing disaster risk reduction performance through escalating the relevance, effectiveness, efficiency, sustainability and impacts. All of them are OECD management criteria (ADC, 2009). Monitoring and evaluation practices require indicators that encompasses and help visualise the objectives and functions that communities, along with other actors, help devise and construct to improve their capacities. Indicators are therefore used to channel the measurement processes of data collection and consolidation to the goals and targets that are intended to evaluate.

The next diagram exemplifies the relation between the creation of indicators and the definition of the goals:

Figure 11 – Phases of indicator development

Source: Adapted from: Indicator design for flood vulnerability assessment (United Nations University Institute for Environment and Human Security, 2006)



The set of indicators can this way provide continuous learning processes that help integrate and increase the capacities of local communities in collaboration with external agencies.

Based on the multi-risk framework developed by CLUVA (2013), monitoring and evaluation have two types of indicators that will allow further analysis and assessment.

First Level Analysis: Physical damages

Indicators would focus to determine the size and frequency to measure the magnitude of the events.

Second Level Analysis: Social and indirect damages

Indicators would focus to determine flooding risks hot-spots and indirect consequences.

The set of indicators that communities would be able to discuss, create and participate in would therefore aim at unravelling the physical and social damages caused by the impact. This is necessary to provide a better “community-based resource management [that] is participatory in nature and takes a more holistic, integrative approach to the problems facing communities” (Senyk, 2005:1).

Next, are a set of example indicators that may help visualise the extent of how data-collection and consolidation practices from communities can be framed under the three proposed strategies:

Strategy	Indicator
Infrastructure Network	<ul style="list-style-type: none"> • Perception of community infrastructure: reliable - stable - safe - resilient (tangible and intangible infrastructure). • Performance levels are, as a as a minimum, maintained over time; e.g check-ups for blocked street drains, checking of water and sanitation service drains, maintenance roles and responsibilities of different actors. • Infrastructure efficiency and performance levels at different scales from individual, to neighbourhood, to mtaa, to ward. • Investment/improvements/knowledge production in communities, e.g improved health, reduced diseases, improved accessibility, improved designs and skill sharing.
Environmental Management	<ul style="list-style-type: none"> • Location and economic impacts of everyday flooding at household level. • Environmental awareness campaigns and implementation. • Extent of recreational amenities along the water bodies. • Energy and water conservation. • Number and percentage of people participating in clean-up campaigns.
Land & Resettlement	<ul style="list-style-type: none"> • Exploration of other possibilities e.g in-situ upgrading, resettlement as a last result. • Diversity and scale of vulnerabilities to flooding impacts. • Security of tenure, acknowledgment of varied claims e.g. customary, inheritance, 'informal' purchase. • Diverse forms/documentation/identifiers of ownerships or tenancy documentation e.g fingerprints, photographs, contracts.

Source: (Birkmann and Wisner, 2006; Bouch, et al, 2015; Terry, 2008)

Annex 10 - Precedent Setting and Proposed Work Agenda

Precedents Setting

- Impact Report 2014 by Cambridge Development Initiative (CDI)

CDI focuses on addressing the poverty and inequalities in slums in Dar es Salaam. Its objectives are to match the vibrancy of the slums with a greater quality of life and opportunities for all, “through stimulating the creation of social enterprises, increasing health access, improving the quality of education and spearheading low-cost sanitation solutions”.

In this report, CDI proposes a project, Kombo Affordable Sewerage Pilot (KASP), aiming to bring dignified and affordable sanitation to Dar es Salaam’s Vingunguti settlement. It is a pilot sewerage network using simplified sewerage technology, which has been widely successful in Pakistan and parts of Latin American for 30 years. “Simplified sewerage is a tripped-down version of conventional sewerage, consisting of shallow pipes and ground-level connection boxes between them”. This structure could be easily constructed and maintained that only little digging is required and blockage can be overcome by flushing water down to the connection boxes. As a result, the model could reduce up to 50% of the total costs.

Throughout the fieldwork, CDI was trying to mobilize the Vingunguti community to make KASP manageable. Also, with the help of CDI, the community set up the Kombo Sanitation Association (KSA), a committee that brings together representatives from each household. The tasks of KSA are to collect monthly fees and oversee ongoing maintenance of constructed sewerage.

The model of establishing a community-based maintenance team become the precedent setting for the proposed strategy one. Based on it, we realize that there are more potentials by assigning tasks to community federation members and households to maintain and monitor community-based small-scale infrastructure.

- The Sustainable Dar es Salaam Project 1992-2003 -- From Urban Environment Priority Issues to Up-scaling Strategies City-wide by The United Nations Human Settlements Programme (UN-HABITAT) and the United Nations Environment Programme (UNEP), 2005

This report introduces a participatory community-based and labour intensive infrastructure upgrading project in Hanna Nassif informal settlement. The community is lack of basic community services including water drains, which result in frequent flooding. This project takes an innovative approach in both its institutional set-up and the use of labour-based community contracting and community management.

The specific features of the projects are:

Community participation through a Community Development Association (CDA) and involvement of residents in all stages of the project from planning to implementation, maintenance, operation and evaluation.

Design of infrastructure in collaboration and negotiation with the community so as to incorporate the existing built environment.

The use of construction techniques that maximize benefits to the local community such as labour-based methods and community contracting in the execution of civil works.

Implementation of the project through partnership between local community (community, NGOs, local government, research and training institutions) and international development partners.

The significant impact of this strategy is that a number of skills including community-based project management, accounting and artisan training were imparted to various residents that have secured jobs within and outside the settlements.

Proposed daily work agenda for community-based infrastructure maintenance team (IMT)

Based on the two aforementioned precedents, we proposed daily work agenda for the community-based infrastructure maintenance team (IMT) through the strategy one. The tasks of IMT should not be limited on collecting monthly management fees and overseeing maintenance work. After specific training and knowledge sharing process, such as enumeration, mapping, information collection, evaluation and assessment, here are some potential acts IMT could be capable to protect their homes and communities and to prevent further damages caused by flooding:

- Before the floods - in dry season
 - Raise community awareness of flooding through educational meeting conducted by federation members, CCI or other institutions
 - Enumeration, data and information collection, mapping, evaluation and assessment
 - Archive past flooding events
 - Map out flood prone areas in the community
 - Conduct risks assessments by identifying areas where might be affected by flooding and what might be damaged in a flooding event
 - Set up early warning system by using local and regional weather database, as well as past experience
 - Educate people not to dump waste into rivers, drains and sewers
 - Monitor and ensure that each household cleans their wastes in the drainage close by one's house before floods come.
 - Develop evacuation plans,
 - Specially need for the young, elder and disabled people who may not be able to evacuate easily.
 - Monitor drainage system weekly in the community one month ahead of raining seasons
 - Organize the IMT members to regularly clean and maintain drains and sewers in the community or adjacent to the community possibly
 - Help residents to connect drains under or close by their house to the main drainage system
 - Use simple sandbags or other anti-flooding materials to repair and fill the leak along the river bank temporary.
 - Protect tap water pipes from other contamination from flooding, such as raw sewage, animal waste and chemicals.
 - Ensure to protect each household's appliances and own properties, such as heating and electrical devices
- During the floods - in raining season

-
- Ensure that utilities are turned off in flooded areas to avoid unnecessary damage or risk of injury.
 - Plan for post-flooding damage assessments
 - Work with schools, Mtaa officials and federation members to ensure that normal activities can be continued as much as possible during the flooding.
 - Work with experts and professionals to provide additional help and counselling service to those who are most affected by the flooding.
 - After the floods
 - Conduct and archive impact assessments.
 - Assist people in returning to their homes and communities
 - Organize residents to rebuild damaged houses
 - Provide appropriate assistance to the youths, elder and other disabled groups who need additional help to recovery from the flooding
 - Draw lessons from impacts of the floods to prevent or mitigate these impacts in the future.
 - Assess drainage system, repair the damage and prepare for the next raining season

Annex 11 - Ecosystem Services Framework

Building from objective 1 -reinforcement of the MRFN by empowering communities-, the construction process of projects would be based on proposals led by the community who have not only taken steps to further their understanding of the everyday impacts of flooding, but have also taken part in the environmental awareness campaign while exploring the participatory tools to engage in the management of the environment.

Identifying ecosystem services as a first step of environmental management permits an entry point for the recognition of the relation between settlements and their environment. Likewise decreasing the challenges of mitigation measures that may shift vulnerabilities “from one social group or place to another; it also includes the shifting of risk to future generations and/or to ecosystems and ecosystem services” (Limthongsakul, Nitivattananon and Arifwidodo, 2017:54). This is especially important in the case of Dar es Salaam as the pressure that urbanisation, governance, land use change, and climate change would intensify the effects on environmental degradation in the future years. Ecosystem services have different values, ranging from the formation of protected areas, the value of the services provided by nature or the economic value of the resources found in these services (TEEB, 2010). Our group examines just two examples among several approaches to an ecosystem services framework:

Ecosystem-based adaptation are programs where community development and environmental protection are strengthened through an integrated approach to reinforce alternative economic activities while promoting the conservation of natural assets that can mitigate the impacts of flooding and environmental degradation (Reid et al., 2017). Improving the restoration of ecosystems, like vegetation of river banks can generate a better discussion, perception and awareness of these rich ecosystems while valuing people as “integral parts of ecosystems and that a dynamic interaction exists between them and other parts of ecosystems, with the changing human condition driving, both directly and indirectly, changes in ecosystems and thereby causing changes in human well-being” (Reid et al., 2005:5). Ecosystem-based adaptation actions involve proposals of vulnerability assessment, capacity building, piloting and implementation of programs or formation of protected areas (UNFCCC, 2012).

Green Infrastructure is another path of recognising the services provided by ecosystems while supporting the development of green economy and sustainable land and water management (European Commission, 2012; CLUVA, 2013).

Green infrastructure is a network of urban ecosystems that can help decrease the exposure of settlements to the direct impacts of flooding by interconnecting buffer zones as alleviation areas. Such areas have the form of urban agriculture, floodable parks and fish farms that can support drainage, infiltration and natural treatment of water while allowing human activities for employment and better quality of life (European Commission, 2012).

Although green infrastructures are a comprehensive approach to land planning and resources, the limitations can be found in their fragmentation, land use pressures and the implementation of practices like sustainable fishing or pollutant free agriculture in highly polluted areas around river-basins.

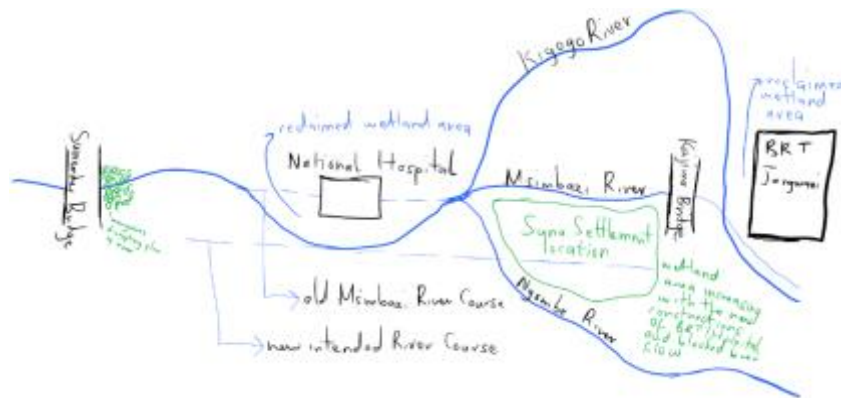
Annex 12 – Insights for Land and Resettlement Strategy

Interview in Sunna + drawing on sand + photo

The residents shared their views on how they believed that the 60M boundary from the Msimbazi river was skewed. Especially as they face evictions on one hand, on the other hand existing new construction such as BRT Jangwani and National Magomeni Hospital seem to be contradictory to the buffer zone, due to their proximity to the river. Additionally, low construction Kajima bridge and Surrender/Selandar bridge mangrove problem, and sedimentation/soil erosion due to developments within the city as major causes that have heightened flooding in the area.

Figure 12 - Showing the discussion of human causes of increased flooding in Sunna

Source: Flooding group, 2017



Interview with Kinondoni Municipal public affairs representative

Kinondoni Municipality public affairs representative description of 60M buffer zone planning that explains how BRT.

Figure 13 - 60-mt buffer zone as explained by Kinondoni Municipality official

