



# Water Resilient Cities in Africa

## City Level Institutional Comparisons of Landscape Based Stormwater Management in Dar es Salaam and Addis Ababa Cities

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**Water Resilient Cities in Africa Project**  
**City Level Institutional Comparisons of Landscape Based Stormwater Management in**  
**Dar es Salaam and Addis Ababa Cities**

## **1.0 Background to the Report**

For many urban dwellers in sub-Saharan African cities like Dar es Salaam and Addis Ababa, the problem of poor stormwater drainage systems is worsened by unprecedented urbanisation and the inability of public agencies responsible for the development and management of especially physical infrastructure to keep pace with rapidly growing population and increasing needs. Lack of adequate financial and human resources worsens the problem particularly where the construction of expensive large-scale or even small-scale stormwater drainage systems have been viewed as the solution to the problem of stormwater. But more critically, climate change and climate related hazards such as floods have further compounded the problem of stormwater management overwhelming many local government authorities and urban dwellers alike.

Urban dwellers are overwhelmed in their residential areas particularly those living in informal settlements. About four out of every ten non-permanent houses in the developing world, Dar es Salaam and Addis Ababa included; is located in areas threatened by floods, landslides and other forms of disaster risks. Lack of basic infrastructure services such as stormwater drains in most of these settlements further puts the settlements and the inhabitants at serious risks due to the environmental and public health related threats. In most areas, local coping and adaptive capacities are often only palliative measures subsequently when large-scale disasters strike, many among the poor suffer huge losses some of them irreparable. For instance in Tanzania, councils and municipalities do not have the mandate for adaptation or disaster risk management and hence cannot develop the requisite knowledge and planning and service operations for disaster risk management and adaptation (Vedeld, Kombe et al, 2012). Most actions are centralised in central government offices thus alienating the possibility of local level institutions to participate effectively in disaster risk management and adaptation.

Using the landscape to manage stormwater is a sustainable solution for stormwater management. Furthermore Landscape based Stormwater Management (LSM) offers synergies addressing other challenges such as improved water supply, enhanced green structure for urban agriculture, and possibilities to improve decentralized options in informal areas with a potential for a more-inclusive decision-making process. This project explores the opportunities and barriers for ‘landscape based stormwater management’ by analyzing technical, institutional and livelihood aspects for the best solutions to be developed and tested in pilot sites. This report responds to the research aspect that dwells on analysing the institutional aspects inherent in transitioning towards LSM. The main objective is outlined below.

### **1.1 Main objective of the research**

The main objective of the research is to identify opportunities and barriers, from an urban planning and institutional point of view, for the adoption and implementation of LSM and its integration in urban planning and how to facilitate inclusive stormwater management practices. The specific objective or task which for this report is to investigate and outline the institutional set-up and governance of stormwater management, flood risks and green area management at city level, the linkages between them and how they are integrated into urban planning.

### **1.2 Methodology**

The main objective of the report is to analyse the institutional set-up and governance of stormwater management, flood risks and green area management at city level in Dar es Salaam and Addis Ababa cities. In addition to outline the linkages between them the aim is to assess the levels of governance and the power relations thereof.

This report has been jointly prepared by the Dar es Salaam and Addis Ababa team through literature review, information from various government and research reports and those reports produced in the WGA projects such as the Baseline Report, PhD students’ work. Interviews with key stakeholders such as the Dar es Salaam City Council, Kinondoni Municipality, DAWASCO and relevant ministries in Dar es Salaam were consulted as well as the Ministry of Water Irrigation and Energy, Addis Ababa Water and Sewerage Authority (AAWSA) in

Addis Ababa. Interactive discussions were also held with CBO heads at local/site levels; grass root administrative units, resident members and community dwellers.

### **1.3 Analytical framework**

Institutions are defined as “the rules of the game in a society, or more formally, the humanly devised constraints that shape human action” (North 1990:3 cited in Bandaragoda, 2000). Bandaragoda further discusses institutions and points out that institutions “set the ground rules for resource use and establish the incentives, information, and compulsions that guide economic outcomes” (Bandaragoda, 2000:4). Institutions can be both formal and informal furthermore they do not have to be organizations but can constitute established ways of dealing with societal or developmental issues. For instance the ways in which households address stormwater at household level (Healy, 1999). Hence in the case of stormwater and green infrastructure management; an investigation of institutions that govern these services would be important so as to map the “the way things are done”. In other words, the responsible organizations, their structures, activities and actors as well as any impediments/challenges that might affect innovations in SWM and GI. According to Bandaragoda (2000), institutions comprise:

- Policies and objectives
- Laws, rules and regulations
- Organizations, their bylaws and core values
- Operational plans and procedures
- Incentive mechanisms
- Accountability mechanisms; and
- Norms, traditions, practices and customs.

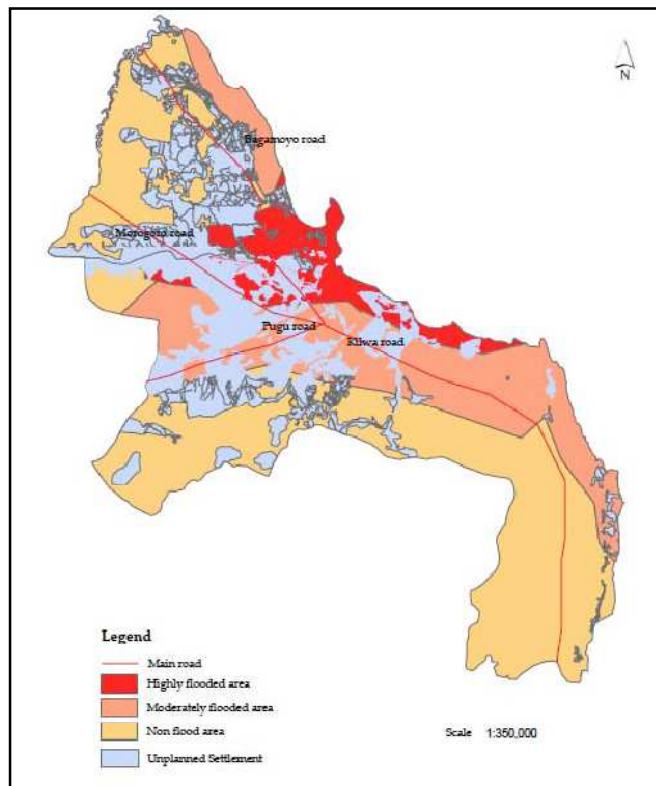
For the purposes of this report; the institutional analysis will dwell on key organizations, policies, laws and regulations related to SWM and GI in Dar es Salaam and Addis Ababa.

## **2.0 The Magnitude of Flooding Incidences and Stormwater Management**

It is well-documented that flooding incidences are further aggravated by the built environment. In developing countries, the built environment actually obstructs natural or even man-made drainage channels because of haphazard housing development, poor waste collection and “inadequacies in drainage and flood protection for urban centres” (Satterthwaite 2008:5).

## 2.1 Dar es salaam

In Dar several types of flooding are generally experienced; namely coastal flooding, which is the inundation of land areas along the coast caused by sea water above normal tidal actions, river flooding (riverine flooding), where the river rises to an elevation such that it overflows its natural banks causing inland flooding; from heavy rainfall and from the obstruction of natural and man-made stormwater drainage systems that aggravate flooding,



**Figure 1: Dar es Salaam: Flood Hazard Areas (Source: START, 2011)**

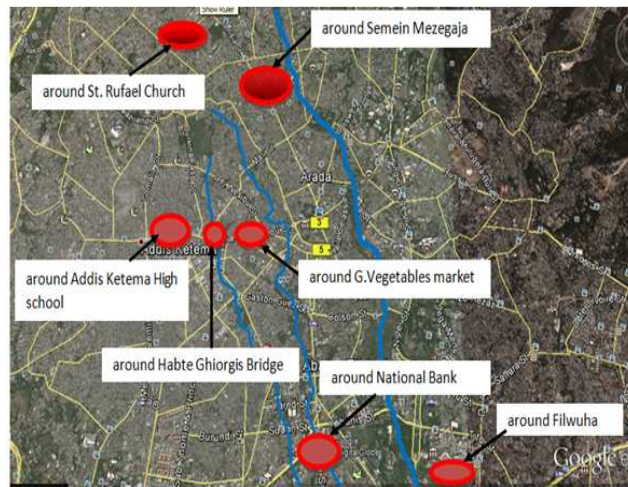
Areas that are often affected by floods in Dar es Salaam include most river valleys such as Kawe (Mnyamani areas), Kigogo, Mzimbazi, and Keko Valleys. Other areas prone to floods are mainly low-lying, flood plains and wetlands which have been encroached upon by home builders. Such areas include, Msasani Bonde la Mpunga, Jangwani, and parts of the City Centre. Other areas prone to floods, sea level rise, coastal erosion of sea rise and Coastal erosion include Kunduchi and Bahari Beach. The impacts include destruction of investments such as hotels, residential premises and infrastructure particularly roads.

In December 2011, the city was hit by the worst flooding in years after heavy rains and about 40 people died and thousands of men, women and children were displaced as well as the destruction of roads, bridges and houses (Vedeld, Kombe *et al*, 2012).

Indeed, green structures such as parks, gardens and areas with urban farming play important role in enhancing resilience of cities against floods primarily because they increase water retention and percolation capacity; however in Dar es Salaam many green structures have been eroded due to urbanisation and subsequent encroachment of informal residential development into green areas for e.g. in the Mbezi Catchment area, residential development can be found right along the river banks.

## 2.1 Addis Ababa

In Addis Ababa lack proper records on flood incidences, the available records are unreliable, although torrential flooding infrequently occurs within various parts of the city. In Addis Ababa; the length of flooding incidences often remains from mid- June to early September.



**Map 1: Locations in Addis Ababa city prone to flash and river floods**

The main types of flooding in Addis Ababa include river flooding and stormwater run off from steep slopes. Information obtained from the Ministry of Labour and Social Affairs demonstrates the following flooding incidences:

- In 2005 seven major incidences were occurred affecting 362 households and 1302 family members
- In 2008 nine incidences have occurred that affected 131 households along 352 family members.



- In 2009 317 households and 647 family members were affected registered among six incidences.
- By 2010 the City report reveals about 147 persons were affected and 39 residential houses were damaged.

The flood incidences in Addis Ababa have been exacerbated by informal housing occupation and agricultural practices particularly in high sloping areas like the Jemo mountain chain, Repi hills and little Akiki Riverbanks.

### **3.0 The Institutional Environment for SWM at National and City level**

In order to mitigate the impacts of poor stormwater management systems; the natural response of many institutions has been to implement engineering measures such as widening and deepening existing storm drains or constructing new ones. However, given the technological and financial constraints; this approach has proved to be too expensive and affordable particularly for resource starved but rapidly urbanising cities like Dar es Salam and Addis Ababa. Therefore increasingly, countries are searching for other options; i.e. sustainable and cost-effective approaches that are based on sustainable urban water management. The challenge to SUWM is among other things, institutional multiplicity including the problem of integration and coordination of various institutions and disciplines such as engineers, urban planners, environmentalists, economics, social scientists, and politicians; indeed weak institutional arrangements for urban stormwater drainage exacerbates the management problem (Parkison & Mark, 2005). Synergies between municipalities and other tiers of government and non-government actors are key to implementing sustainable stormwater solutions (Simon and Leck, 2012).

Dar es Salaam and Addis Ababa have distinct institutional settings and contexts. Dar es Salaam has a status of a City Council within a local government structure. The council consists of three autonomous municipalities implying that the municipalities are not coordinated or accountable to the City Council. Below the municipal councils there are two administrative units namely the Wards and *Mtaa* (sub-wards). The City and the three municipalities are overseen by the Prime Minister's Office, Regional Administration and Local Government.

On the other hand, Addis Ababa has a city government status within a federal structure and organized in a three tier government structure comprising the federal government, regional government and local government. The City can issue bye-laws and policies pertinent to its jurisdiction in coherence with the framework of the federal policies and laws in this respect, the city authority can make decisions that concern stormwater management including adopting LSM as these are matters within its jurisdiction.

Comparatively Dar es Salaam city and its municipalities there is less autonomy primarily because the councils are not autonomous as they ought to be (LGRP, 1998). That is in Tanzania, would the central government is yet to fully devolve powers to the local authorities to decide on local matters. In this respect the federal system in Ethiopia enjoys more autonomous status of self-governing regions implying that the governance structure seems to offer more flexibility and opportunities to mobilise resources required for LSM. This does not mean that in Dar es Salaam LGAs are not free to adopt or make decisions on how to improve stormwater management in there localities. What this suggests is that they are constraints or fewer opportunities particularly with reference to resource mobilisation.

### **3.1 Dar es salaam**

#### **3.1.1 Organisations at National level**

Documentary review indicates that there are about eight (8) ministries/organizations that are directly or indirectly related to issues of stormwater management and green infrastructure in Dar es Salaam at national level. They include central level governmental departments and ministries as outlined below.

- i. ***The Vice President's Office – Environment:*** This government department is responsible for the formulation of policy, laws and regulations related to environment as well as the coordination of environmental and climate change matters across government levels. The department is also an overseer for the implementation of national and international environmental protocols of which Tanzania is a signatory.
- ii. ***The Prime Minister's Office – The Disaster Management Department (DMD)*** is responsible for the formulation of policy and legislative framework; resource mobilization and allocation; disaster risk management, coordination and monitoring of disaster activities within the country. The DMD is also responsible for research and

planning on disaster risk and management in collaboration with higher learning research institutions.

- iii. ***The Prime Minister's Office – Department of Urban Development and Department of Infrastructure Development:*** Apart from policy, legislative and resource matters, the department in the PMO's office is also responsible for management and monitoring related to urban and infrastructure development within local authorities in the country.

The other central government institutions that are directly or indirectly related to SWM and GI include:-

- i. **The Ministry of Works and Infrastructure** like other central government institutions oversees the policy and legislative frame work related to the setting of standards and monitoring of quality compliance in the construction, rehabilitation and maintenance of roads as well as the supervision and monitoring of preliminary and detailed designs of trunk and regional Roads. The plans and strategies of MoWI are implemented through Tanzania Roads Agency (TANROADS).
- ii. As far as SWM is concerned, **TANROADS** was set up in July 2000, as a semi-autonomous agency under the Ministry of Works. It is the road authority for the maintenance and development of trunk and regional roads in the country. This implies that all major stormwater drainage channels are built and maintained by TANROADS. The road authority for other categories of roads falls under the Prime Minister's Office –Regional administration and Local Government (PMO -RALG). TANROADS implements road projects through its regional offices. One of the roles and functions of TANROADS is to carry out/commission research in support of operations where necessary; this is an avenue where LSWM can be introduced and advocated so that it can be mainstreamed even at trunk/regional road construction levels.
- iii. **Ministry of Lands, Housing and Human Settlement Development. (MLHSD):** Is the government ministry responsible for land matters in the country. It is responsible for policy and legislative frame work, formulation of guidelines, resource mobilization and allocation and preparation of general plans in collaboration with respective local authorities. It has a role of scrutinising and approving general and detailed plans prepared by Planning or Local Government Authorities. In Dar es

Salaam, uses policies such as the Human Settlements Development Policy (2000) and urban planning guides and regulations and standards to regulate matters that concern General Planning and Detailed Planning Schemes. This includes matters that relate to designation and protection of public open spaces, recreational areas and hazardous areas from encroachment. While LGAs and professionals such as urban planners do not have control over the natural causes of floods, they may contribute towards effective management of flood disasters by protecting natural flood plains, wet lands and protect other green structures through the preparation of General Planning Schemes and Detailed Planning Schemes and their subsequent enforcement. The challenges worth noting here concern the lack of cross-sectoral coordination and collaboration among key actors e.g. between plans prepared by the Ministry or LGAS and those of sectoral actors such as TANROADS.

- iv. **The Ministry of Water:** Responsible for policy formulation, planning and coordinating water activities e.g. the development of water projects; the grant of water user rights and overall water use within the country. In Dar es Salaam the Ministry has three authorities with varying mandates. These are: (i) Water Resources Division responsible for management of all water resources including water catchment areas, rivers and river valleys. Ruvu/Wami Basin Authority which is responsible for the case study catchment area; the Mbezi River.

### **3.1.2 Organisations at City level**

As noted earlier, the City is divided into 3 municipalities, namely Kinondoni, Ilala and Temeke. The key public institutions responsible for stormwater drainage systems and green structures include Dar es Salaam City Council, the Dar es Salaam Water and Sanitation Authority (DAWASA), the Dar es Salaam Water Supply Company (DAWASCO) and the three municipal councils. DAWASA is the owner of water infrastructure within the city. It is responsible for policy implementation, resource mobilization; prepare plans and construction of infrastructures for potable water supply and sewerage systems within the city, and law enforcement the distribution and use of water. It is also the responsibility of DAWASA to explore and establish new water sources in order to meet water requirements for the city. The Dar es Salaam Water Supply Company (DAWASCO) is the agency responsible for water

distribution, management and maintenance within the city. It is also responsible for water billing and law enforcement on water use.

The Dar es Salaam City Council (DCC) is mainly responsible for coordination and provision of some key cross-cutting public services as described by Local Government Act (Urban Authorities) 1982. The specific functions are to: coordinate the functions of the three municipalities regarding cross-cutting infrastructure; prepare city wide frameworks for the purposes of enhancing sustainable development; promote cooperation between DCC and the three municipalities

Regarding the stormwater management, the City Council is responsible for resource mobilization, planning and designing of stormwater drainage systems in collaboration with Municipal Councils. The City is also responsible for emergency operations in relation to flooding and other emergency services in collaboration with other key stakeholders including government institutions, private or community organisations.

At Municipal level there are four Departments which are directly concerned with the stormwater/flood management and green structures. These are: Department of Urban Planning, Urban Agriculture, natural Resources and Environment; the Department of Works; Solid Waste Management Department and Health Department.

The *Department of Urban Planning, Urban Agriculture, Natural Resources and Environment*: is responsible for development control and preparation of detailed land use planning schemes basing on the master plan and strategic urban development planning framework. This is done through urban planning section. Other roles include zoning of different land uses and green structures such as open spaces, river and ocean buffer zones, hazard lands, residential areas, industrial areas, urban agriculture areas, quarry sites, solid waste disposal sites and commercial areas. Through Agriculture Section the department also has a role of educating urban dwellers on productive urban agriculture, the importance of planting trees which are compatible with soil erosion and sensitizing local communities on rain water harvesting. Furthermore, the Environmental Section is responsible for environmental management and enforcement of 2004 Environmental Act.

The *Department of Works* has the role of planning, designing, construction and maintenance of stormwater drains and local roads within the municipality. Talking about road construction

includes the construction of side/lateral stormwater drains along the respective roads. The Municipal Road Engineer is the in-charge of all local roads with their respective stormwater drainage systems while the Municipal Drainage Engineer is the overseer of planning, construction and maintenance of stormwater drainage systems within the municipality including the case study areas. The latter has also a role of identifying flood prone areas, their causes and propose solutions to the cause. The implementation of the plans depends on the availability of funds. However, in areas that need immediate action, the municipality can repair/maintain the drainage system(s) within the minimum budget allocation in collaboration with the respective ward and sub-ward. Often local communities are mobilised to contribute in cash and in kind.

The *Department of Solid Waste Management*: The department is also responsible for solid waste collection and community sensitization and the overall law enforcement regarding solid waste management. It is important to point out that only ...% of total waste generated is collected. This implies that most of the waste is left uncollected or crudely dumped in open drains thus obstructing stormwater runoff. The Health Department is responsible for public health matters such as suitable construction of sanitation facilities at household level; suitable on-site disposal methods etc as well the enforcement of health bye-laws particular to a locality and community education and sensitization. It is the responsibility of this department to supervise the proper use of stormwater drains and river valleys as well as education on the effects of crude disposal of solid waste and liquid waste. Unlike other basic infrastructure sectors such as water, roads and solid waste systems, stormwater management in Dar es Salaam does not have sector specific regulatory instruments policies laws or regulations.

### 3.1.2 Policies

**Table 1: National policies related to stormwater management**

	<b>Policy</b>	<b>Functions</b>
1.	The Local Government Reform Programme (LGRP 1998)	To implement and operationalise decentralisation by devolution (D-by-D). The programme aims to enhance good governance (authority, accountability, transparency) and improve service delivery.
2.	National Land Policy (1997)	Encourages promotion and optimal use of land resources, and facilitates broad - based social and economic development without upsetting or endangering the ecological balance
3.	National Environmental Policy (NEP) of 2004	Framework for overall sectoral and cross-sectoral coordination of environmental management activities in various related government departments. The policy called for

		enactment of environmental framework law and establishment of environmental standards (of which have been put in place)
4.	The National Water Policy (2002)	Develops a comprehensive framework for the sustainable management of the water resources in the country. The policy provides for beneficiaries participation in water supply schemes and addresses cross-sectoral interests in water, watershed management and integrated and participatory approaches for water resources planning, development and management.
5.	National Human Settlements Development Policy (2000)	Vision of the policy is to promote well organized, efficient, healthy, safe and secure and aesthetic human settlements. Among other things to improve the level of the provision of infrastructure and social services for the development of sustainable human Settlements and to the protection of public open spaces, recreational areas and hazardous areas from encroachment.
6.	The Draft Urban development and Management Policy (2011)	Overall objective is to facilitate urban centres to achieve economically productive, spatially functional, socially equitable and sustainable environment. Among other things the policy promotes the involvement of local authorities to designate, demarcate land unsuitable for urban growth (e.g. wetlands, river banks, low-lands) and protect them from encroachment.
7.	National Forestry Policy (1998)	The policy aims at enhancing the contribution of the forest sector to sustainable development and the conservation and management of natural resources. The Policy encourages ensuring ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility, and enhancing national capacity to manage and develop the sector in collaboration with other stakeholders
8.	The National Disaster Management Policy (2004)	The main objective of the policy is promote safe livelihoods i.e. with minimum disaster interruptions to socio-economic development.
9.	The Tanzania 2025 Development Vision	The Tanzania Vision 2025 aims at achieving a high quality livelihood for its people attain good governance through the rule of law and develop a strong and competitive economy. Specific targets include: (i) a high quality livelihood characterized by sustainable and shared growth (equity), and freedom from abject poverty in a democratic environment

### 3.1.3 Laws and Regulations

**Table 2: Laws and Regulations related to stormwater management**

	Legislative environment	Objectives
1.	The Environmental Management Act Cap. 191	Among the major purposes of the EMA are to provide the legal and institutional framework for sustainable management of the environment in Tanzania.
2.	The Water Resources Management Act No. 11 of 2009	The Act provides for institutional and legal framework for sustainable management and development of water resources; outlines principles for water resources

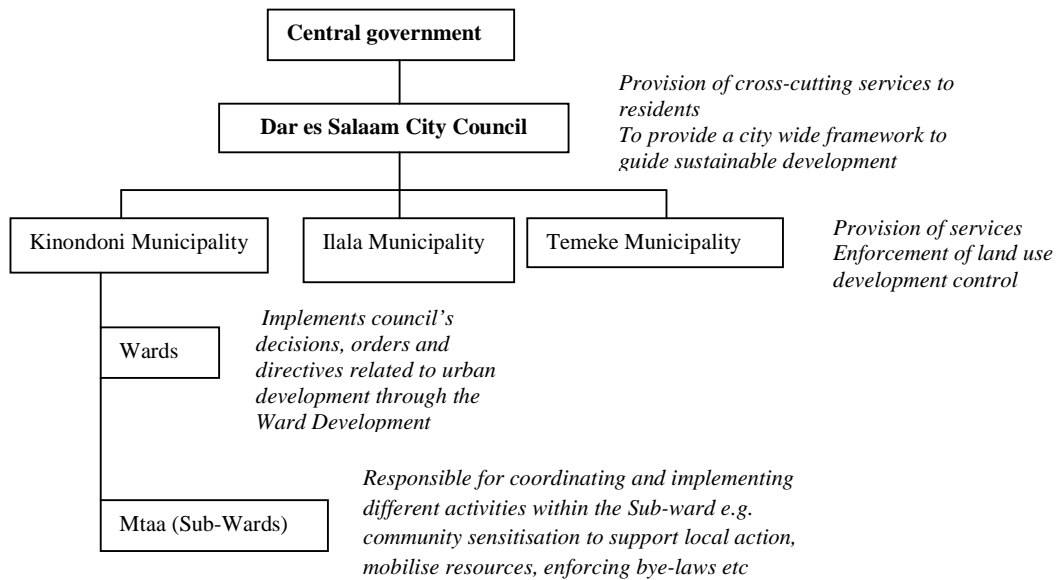
		management; for prevention and control of water pollution; and provides for the participation of stakeholders and the community in the implementation of the National Water Policy.
3.	The Water Supply and Sanitation Act No. 12 of 2009	Provides for the sustainable management, operations and regulation of water supply and sanitation services; provides for establishment of water supply and sanitation authorities as well as community owned water supply organizations.
4.	The Land Act No.4 of (1999)	The Acts relate to land-use planning processes and land-use management and guidance to land ownership in Tanzania.
5.	The Urban Planning Act (2007)	The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. Expropriation of land for water infrastructure development and associated activities in urban areas shall comply with the provisions of this law. Under Section 3, among others the law seeks to improve level of the provision of infrastructure and social services for sustainable human settlements development.
6.	Local Government Acts No.7 & 8 of 1982	The Act gives authority to local governments to regulate matters that are local.
7.	Land Use Planning Act (2007)	The Act provides for the procedures for the preparation, administration and enforcement of land use plans. Among the objectives of the Act is to facilitate the orderly management of land use and to promote sustainable land use practices. Water and stormwater development projects that affect land use and livelihood shall comply with the provisions of this Act.
8.	Dar es Salaam Water and Sewerage (DAWASA) Act, 2001	The law establishes and governs DAWASA whose goals are to provide reliable, affordable and sustainable water supply and sewerage services to all categories of customers in the DAWASA designated areas; and to provide acceptable sewerage services so that public health and protection of the environment are improved.
9.	Public Health Act No. 1, 2009	Provides for the promotion, preservation and maintenance of public health.
10.	<b>Regulations and by-laws</b>	
11.	Water Quality Standards Regulations, 2007	Sets the baseline parameters for minimum water quality standards and provides a framework for environmental protection.
12.	Community (ward/sub-ward) bye-laws	Provide a framework for the protection of community health (maintenance of plot/street level stormwater drains; solid waste management, general cleanliness of the environment.
13.	Other norms	Digging of drains to channel water; rain-water harvesting, planting of bush, plants that “absorb” water in wet/flood areas at sub-ward level. .



### 3.1.4 Governance

Urban governance refers to the manner in which political, social and administrative actors and authorities interact and fulfil their mandates in the urban territory (UNHABITAT 2008). It includes both formal institutions and informal arrangements. A key characteristic of good urban governance is respect of the rule of law and maintenance of processes of constructive engagement of the government with stakeholders, through effective participation of stakeholders sharing a common interest and dialoguing so as to draw consensus.

**Figure 1: The Governance structure of Dar es Salaam City**



As hinted earlier, Dar es Salaam City Council comprises three municipalities however the municipalities are independent and somewhat operate autonomously. The City Council does not have any administrative and statutory arrangements to facilitate coordination particularly where there are issue that cut across the metropolitan region and public society at large such as the conservation and preservation of river catchments that traverse across municipal boundaries. The grassroots level in particular does not have an effective platform/framework for decision-making (Vedeld, Kombe et al, 2012).

### **3.1.5 Institutions at Mbezi River Catchment in Dar es Salaam**

The Mbezi River Catchment area comprise six administrative wards of Kawe, Goba, Mbezi Juu, Mbezi, Saranga and Makongo. These Wards and their Sub-ward units are essential administrative structures of the Kinondoni Municipal Council. In fact, sub-ward areas such as Ukwamani in Kawe ward, Goba in Goba Ward or Mbezi Luis in Mbezi Luis Ward are the smallest administrative units of local government, Kinondoni Municipal Council included. They are also critical units of democratic governance within the decentralized local government system in Tanzania. Municipal Councils are inf act constituted by elected Councillors from each Ward. At ward and sub-ward level there are both elected and appointed leaders. Functionally, the ward (i.e. Kawe, Goba or Mbezi Luis) receives and implements council's decisions, orders and directives. At Ward level the Ward Development Committee (WDC) is the organ which discusses all issues that relate the ward development including issues that concern preservation of green structures, fragile ecosystems and management of floods. WDCs are chaired by their respective Ward Councillors, the Ward Executive Officer (WEO) is the secretary to the committee. The Sub-ward Chairpersons and some professionals from the Municipality such as Community Development Officers and Health Officers are members of the WDC. It is also ought to be noted that the ward is the key link that bridges the municipality and Sub-ward or local communities. This means information dissemination, land development matters, funds allocation and other matters from the municipality are presented in the WDC. All plans or concerns from local communities/sub-wards to the municipality are forwarded through the Ward/WDC.

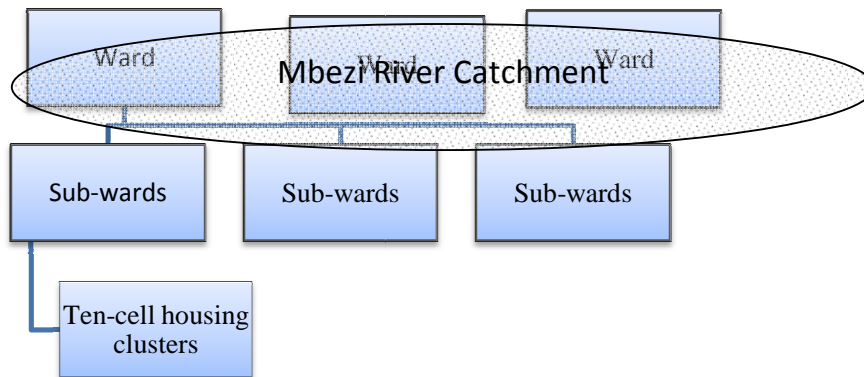
At sub-ward level, the Sub-ward Committee is chaired by the Sub-ward Chairperson while the Sub-ward Executive Officer is the secretary to the committee. The members to this committee are community representatives elected by the community members. Similar to the ward level, the various operational committees at sub-ward level constituted from the elected of the Sub-ward Committee. The Sub-ward Committees are responsible for coordinating and implementing different activities within the Sub-ward. The Sub-ward units are composed of various small units namely ten cell units and zones or branches. Each of these have elected leaders. The leaders are essentially political representatives. Normally, Ten cell leaders support and link sub-ward with individual households. They also help implement and promotion of development activities or agenda agreed upon at sub-ward level. These grassroots units may therefore be critical player in matters of institutional concern such as

safety, health, floods and stormwater drainage issues. The key roles of the sub-ward unit include:

- i. Mobilise resources when needed (it could be in form of money, food or shelter);
- ii. Promote and sensitize local communities to support local action geared toward solving emerging problems especially after disaster such as flooding after heavy rains;
- iii. Enforce all national laws and municipal by-laws;
- iv. Monitor the day-to-day activities in their localities such as cleaning stormwater drainage systems and report to Ward and eventually to the Municipality in case there is damage or unusual situation.

In so far as the Mbezi River Catchment area is concern, each of the six Wards mentioned earlier and their respective Sub-ward units are responsible for aforementioned functions. While functionally these roles are discharged within the administrative boundaries or jurisdictions, the extensive nature as catchment area raises several governance questions.

**Figure 1: Institutional structure for SWM at Catchment level**



## 3.2 Addis Ababa

### 3.2.1 Organisations at National level

In Addis Ababa the key national level institutions/ministries related to SWM matters include the Federal Ministry of Water, Irrigation and Energy Resource (MoWIER). The Federal Ministry of Water, Irrigation and Energy Resource (MoWIER) is in charge of the water sector policy formulation, planning and water resource development use. It is also responsible for formulation of water resource regulation policies as well as implementation of large scale irrigation projects. Besides, it carries responsibilities of building the capacities of regional water resource development and prepares plans for the proper utilization of water resources of the nation. Also, it supervises Basin Development Departments that are responsible for conducting studies and research on natural resources and existing river basins of the country.

### 3.2.2 Organisations at City level

There are different sectors at city level that have role, duties and responsibilities related to water management. There was no single institution that coordinates the stormwater management at city level. As per the CLUVA study the City Government of Addis Ababa acknowledges the gap and established a Flood Vulnerability Prevention and Reduction Sub Process Unit under the Bureau of Housing and Construction and a steering committee at city level to be led by Bureau of Housing and Construction.

The **Addis Ababa Water and Sewerage Authority** (AAWSA) is among the key institution which was established in 1971. AAWSA is an essential sector of Municipal organization that works towards sustainable provision of potable water to Addis Ababa's urban population. Also, the Authority undertakes collection and treatment of liquid waste. AAWSA is accountable to the board of directors who are accountable to the city mayor.

In order to render efficient services; AAWSA is divided into eight sub-sub operational offices across Addis Ababa City, namely: Addis Ketema, Akki Kaliti, Arada, Gulele, Gurd Shola, Meganagna, Mekanissa and Nefas Slik Lafto districts to render efficient services. The principal functions of the sub offices are the provision, connection and maintenance of minor water and sewer channels. Furthermore, AAWSA administers three major reservoirs including Dire, Gefersa and Legedadi located to the north east and west of Addis Ababa in Oromia Regional State whereby 129 bore wells were constructed to meet the water demands of the Addis Ababa City. Currently, three of the wells have ceased functioning because the filled up due to upland flooding. The malfunctioning wells are located in the middle of the lower slopes of the City near Mekanissa and on Little Akaki River. The liquid waste collected is disposed off at two sites namely; Kotobe (Eastern) and Kaliti (Southern) parts of Addis Ababa. Only the Kaliti facility has a waste water treatment plant, whereas Kotebe facility is sewage lagoon and dry bedding. There is also onsite sewage lagoon and dry bedding in Mickey Leyland condominium site, which is also run by AAWSA.

The **Addis Ababa Road Authority** is an institution at city level is which is responsible for protection of roads and drainage against flood; the construction of roads as provided by Regulation No 7 of 1997. The Authority constructs asphalt, gravel, cobble stone roads and roadside drainage structures.

The **Addis Ababa Environmental Protection Authority** is also a key actor that primarily plays a role to ensure environmental protection standards are fulfilled and also undertake river bank and watershed rehabilitation projects. Additionally Office of the Mayor, Building Permit Control Authority; Urban Plan Institute; Cleanness Administration Agency; Fire and Emergency Prevention and Control Agency; Beautification, Park and Cemetery Development and Administration Agency and Bureau of Labour and Social Affairs have important role in adopting LSM.

### 3.2.3 Policies

No	Policy Frameworks	Objectives
1	FDRE Constitution (1994)	Foundation for democratic rights of citizens and environmental management issues (rights to use natural resources stipulated under article 40, 41 and 49 of the constitution)  Stipulated structure, power and functions of federal government and regional states
2	Environmental policy of Ethiopia (1997)	Improving and enhancing the health and quality of life of all citizens and to promote sustainable social and economic development through sound management and use of natural, human-made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs.
3	Water Resource Management Policy (2000)	To enhance sustainable use of water resources, developing water resources for social and economic benefit, combat drought and manage water resources through efficient allocation and redistribution and to conserve aquatic environment
4	Urban Development Policy (2005)	Leading the growth of urban centres through planning so as to provide efficient services and to become habitable and role model for democracy and development centres through urban networking and creating strong urban-rural linkage and ensuring global competitiveness, good governance, balanced and rapid urban development
5	National Policy and Strategy on Disaster Risk Management (2013)	Reduction of risks and impacts of disasters through the establishment of comprehensive and integrated disaster risk management system within the context of sustainable development
<b>Federal plans and programs</b>		<b>Objectives</b>
1	Growth and transformation plan (2010/11 to 2014/15)	To become a country where democratic rule, good governance and social justice reign, upon the involvement and free will of its peoples, and once extricating itself from poverty to reach the level of a middle income economy as of 2020-2023
2	Climate Resilient Green Economy plan	To reduce green house gas (GHG) emission while fostering and sustaining economic growth to achieve a climate resilient green economy and middle income status by 2025
3	Climate Change Adaptation program (2009)	To achieve climate change resilient green economy by 2025

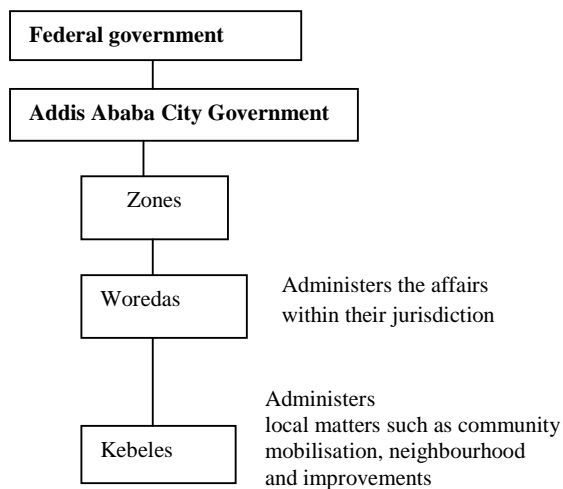
### 3.2.4 Laws and Regulations

	<b>Legislative frameworks</b>	<b>Objectives</b>
1	Environnemental protection organs establishment proclamation (2002)	To clarify mandates of federal and regional environmental protection organs
2	Environmental Impact Assessment Proclamation (2002)	To manage environmental effects, to harmonize and integrate environment, economic, cultural and social consideration into a decision making process
3	Environmental Pollution Control proclamation (2002)	To protect the environment through mitigation of pollution
4	Federal Environmental Impact Assessment Guideline	To establish consistent approach, procedures and process of EIA
5	Ethiopian Water Resource Management Proclamation (2000)	To ensure that the water resources of the country are protected and utilized for the highest social and economic benefits of Ethiopian people
6	Ethiopian Water Resources Management Regulation (2005)	Provision of detailed mandates of water permit and changes for using water
7	River Basin Councils and Authorities proclamation (2007)	To promote and monitor the integrated water resources management process in the river basins falling under their jurisdictions with a view to using of the basins' water resources for the socio-economic welfare of the people in an equitable and participatory manner, and without compromising the sustainability of the aquatic ecosystems
8	Awash Basin High Council and Authority Establishment Regulation (2008)	Promoting and monitoring the implementation of integrated water resource management process in an equitable and participatory manner in the Awash Basin
9	Urban Planning Proclamation (2008)	To establish a legal framework in order to promote planned and well developed urban centers and to regulate and facilitate development activities in urban centers and thereby enhance economic development of the country
10	Solid Waste Management proclamation (2007)	To promote community participation and ensure integrated waste management system
11	Addis Ababa City Government Revised Charter proclamation (2003)	To transform Addis Ababa to modern capital of the Government of the Federal Democratic Republic of Ethiopia and the seat of African Union and of the variety of international organization To give residents of Addis Ababa full power of self government To attract investment and to open up a way for economic development of the country To organize the city from the perspective of democratic principle and good governance as well as contemporary trends of growth and development
12	Forest Development Conservation and Utilization (2007)	Conservation and sustainable utilization of forests, satisfying needs of the society for forest products, enhancement of national economy through participation of concerned communities as well as harmonizing forest policies and programs
13	A Proclamation to Provide for Lease Holding of Urban Lands (2011)	To achieve efficient, equitable and well functioning land and landed property market, sustenance of robust free market economy and for building transparent and accountable land administration system that ensures rights and obligations of the lessor and the lessee To establish prudent and responsive land resources management system that would enable to sustain rapid growth
14	Condominium proclamation (2003)	To increase supply of housing and narrow the imbalance between the demand for any supply of housing, to increase efficiency of land utilization and to create favorable

	<b>Legislative frameworks and plans</b>	conditions to private developers and co-operatives
		<b>Objectives</b>
1	The Addis Ababa City Government Executive and Municipal Service Organs Reestablishment proclamation (2012)	To create compatible organizational structure of the executive and municipality services organs To determine power and functions of sectors of the City Government
2	Addis Ababa City Government Growth and transformation plan	To direct and align the city development priorities with the federal level GTP strategies

### 3.2.5 Governance

**Figure 2: The governance structure of Addis Ababa City**



### 3.2.6 Institutions at Mbezi River Catchment in Addis Ababa

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..... (Need more information from Addis)



## 4. Comparisons and Discussions

### 4.1 Institutional arrangements and functions

Alongside the physical, geomorphologic and climatic differences, Addis Ababa and Dar es Salaam have distinct institutional settings and contexts. Addis Ababa has a City Government status within the federal structure and is organized in three tier government structure as discussed in section 3.0. The City government in Addis Ababa is under a Federal Government and can therefore issue laws and policies pertinent to its jurisdiction consistent with the framework of federal policies and laws. On the other hand Dar es Salaam has a status of a City Council within the local government system consisting of three autonomous municipalities. While these municipalities are autonomous from the City Council, in general LGAs in Tanzania are more or less departments of central government as such they depend on Central Government subventions in many ways including resources to execute their functions.

However, there are a number of similar factors that are impacting stormwater and green infrastructure management systems in both cities such as the key role that *Mtaa*s or *Kebeles* can play in advancing LSM at grassroots level. This is a facilitating factor that can be tapped into when introducing new approaches to SWM or improving existing ones. They can act as a potential/driving force for improving the system. Constraining factors in both cities is the lack of a single institution to coordinate stormwater management. Whereas other services such as water supply and sewerage and sanitation have managing entities; stormwater management does not.

### 4.2 Coordination

It appears that in both cities there is hardly any cross-sectoral coordination particularly with regards to stormwater management. This is exhibited for example in Addis Ababa where the duties and responsibilities of some of the city level sectors are overlapping with federal level ministries and authorities which are likely to cause institutional conflicts and overlapping mandates. In Dar es Salaam the city and the Regional Secretariat has the same mandate of coordination as the city council.

According to interviews with Municipal staff in Dar es Salaam; weak institutional capacity is major constraining factor and a cause for inadequate stormwater management. Weak

institutional capacity caused by among other things; frequent reshuffling, poor cross-sectoral coordination, limited personnel and lack of resources. Interviews with the Kinondoni Municipal Engineer also revealed that the lack of integrative actions among relevant departments as well as adequate resources impedes storm water management actions across the City. In the case of Addis Ababa; too frequent organizational restructuring process along side with high staff turnover has resulted to loss of institutional memory and ultimately leading to weak institutional capacity. The weak capacity translates down to ward and sub-ward levels such that very little impact can be made in terms of guided stormwater improvements or even green infrastructure development let alone the initiation of new ideas. Such actions are left to the community on an individual and self-help basis such as those flood coping strategies undertaken in at the pilot site levels. Indeed even these actions are not coordinated or guided by local official leading to adverse environmental impacts at site levels e.g. vegetable gardening and the need for local water retention in the Mbezi river catchment.

#### **4.2 Relationships and partnerships**

In Dar es Salaam, the Local Government Reform Programme (LGRP 1998-2008) has among other things facilitated effective partnerships between the municipalities and the public e.g. the community upgrading infrastructure programmes which fostered involvement of residents in planning and implementation of infrastructure upgrading activities. However the challenge still remains in motivating local urban authorities to work in partnership with the community because many LUAs lack the necessary capacity and experience to work in partnership with the community unless actions are mediated through Civil Society Organisations (CSOs) who have the expertise and resources. The existence of local organizations and development committees such as Ward and *Woredes*, is an opportunity for working with the community at the project pilot level.

Partnerships between the municipalities and the private sector do exist in service delivery such as that of waste collection but the partnerships are weak and confined to outsourcing services rather than planning, installation or development of physical infrastructure. However during flood related disasters, Private Business Operators like shop owners, hotel owners, and individuals in the community do assist persons affected by floods, in cash and in kind.

But there are practices in public private partnership in green area development and greening of public spaces in both cities which can be considered as an opportunity for partnerships between the project and the community. In addition in Addis Ababa; the upper catchment rehabilitation of the City and the development of Gulele Botanical garden (which itself is within the Little Akaki River catchment) is an opportunity for better watershed management particularly which may have a positive impact on the selected pilot sites.

International partnerships do exist and both cities are members of the C-40 Cities Climate Leadership Group, which aims to strengthen networks between different cities in the world to share experiences on Climate Change. The link and partnerships between practice and research are significant; many researches and consultancies on settlement upgrading are done between universities and the community. For example the collaboration and cooperation between the City Government/Council with the EiABC of Addis Ababa and Ardhi University of Dar es Salaam on LSM opportunities is a case in point. This is a major opportunity for the improvement of stormwater management system in the cities. It helps to link practice with research which can both benefit through reciprocity and application of innovative ideas from research findings for the betterment of stormwater management and related systems.

### **4.3 Accountability**

Accountability as well as transparency in local government activities and actions are critical factors for sustained participation of local communities. In Dar es Salaam, the LGRP s emphasizes the participation of residents in decision-making particularly during periods of disaster such as the floods of 2011 in Dar es Salaam where decisions on emergency responses made at central government level were not relayed to Ward levels and as a result did not know how to assist (Vedel, Kombe et al, 2012). According to Parkinson and Mark (2005) when such actions take place; “*valuable opportunities for reducing urban risk are lost*”. Decisions particularly related to land use and land use changes are often not effectively communicated to residents thus provoking conflicts among the residents and local officials e.g. allowing a private business operator to build on open spaces without the “consent” or involvement of the community.



*Plate 1: Local stakeholder workshop May 8, 2014 in Addis Ababa to identify stormwater challenges*

Unless residents participate, it is difficult to enhance accountability of councils, municipality, and ward or sub-ward officials. In the same way, introduction of LSM involves various stakeholders, transparency is key to the effective participation of the community while many public officials tend to withdraw from engaging the public in decision-making since it is an expensive and time-consuming the community needs to be taken on-board from the start when new ideas are introduced. In fact several stakeholder meetings concerning LSM have been done in Addis Ababa and Dar es Salaam so as to secure the participation and commitment of the communities towards LSM as a new and sustainable idea for stormwater management. Actions at the catchment area in Dar es Salaam and Addis indicate that there are some local coping strategies for stormwater and flood related impacts and these need to be form part of future solutions.

#### **4.4 Urban Planning**

The Catchment areas of Mbezi River (Dar es Salaam) and Jemo River (Addis Ababa) clearly cuts across administrative, judicial geographical and social boundaries and therefore integrated land use planning is imperative. Informal housing development encroaching on the river banks is a problem. In Dar es Salaam, weak enforcement of laws and regulations regarding flood risk areas means that residents continue to build on hazardous land. Downstream Mbezi River Catchment at Kawe Ukwamani illustrates how encroachment into the river banks has expanded as poor people seek land to settle on. In addition economic activities upstream such as urban agriculture (keeping of cattle) and small-scale industries; and growing vegetables downstream compounds the problem of water pollution further illustrating how important integrated land use planning is. The control of land use in the river catchment areas and related flood risks requires coordination across the Wards and Woredas and even beyond the city boundaries. Where there is

limited collaborative planning; issues related to land ownership, culture and livelihoods are bound to delay if not obstruct new ideas related to LSM.

Prospective planning endeavours of the Awash Basin Council and the Basin plan preparation in the case of Addis Ababa is an opportunity for creating cooperation for urban planning and LSM related activities at the Basin level. Similarly the ongoing Master Plan preparation in Dar es Salaam with the elements of governance proposal for new structure is an opportunity that enables to achieve general coordination at city level.

## 5.0 Key Constraints in Dar es Salam and Addis Ababa

The following Table 5 provides a summary of the key constraints related emerging from the discussion above.

**Table 5: Summary of Key Constraints in Dar es Salam and Addis Ababa**

Institutional Level	Key Concerns	
	Dares Salaam	Addis Ababa
<b>City</b>	<ul style="list-style-type: none"> <li>– Poor vertical and horizontal coordination</li> <li>– Overlapping mandates at Central and local government levels</li> <li>– Fragmented planning</li> <li>– Disintegrated plans</li> <li>– Member of C-40 cities network</li> </ul>	<ul style="list-style-type: none"> <li>– Poor vertical and horizontal coordination</li> <li>– Overlapping mandates at Federal and City government levels</li> <li>– Fragmented planning</li> <li>– Ongoing efforts for IWM in place</li> <li>– C-40 cities network</li> <li>– MoU signed between EiABC and Addis City for WGA</li> </ul>
<b>Catchment</b>	<ul style="list-style-type: none"> <li>– Fragmented land use planning</li> <li>– Informal housing development/expansion</li> <li>– Livelihood activities that negatively impact on the environment along the catchment areas</li> </ul>	<ul style="list-style-type: none"> <li>– Informal housing development/expansion</li> <li>– Weak institutional capacity</li> <li>– Disjoint implementation practices</li> <li>– Water conflicts</li> <li>– Upper catchment rehabilitation activities</li> </ul>
<b>Site</b>	<ul style="list-style-type: none"> <li>– Issues of LSM are not discussed in the existing structures</li> <li>– PPP practices in greening</li> <li>– Existence of development committees at Ward and <i>Mtaa</i> levels</li> </ul>	<ul style="list-style-type: none"> <li>– Institutional conflicts</li> <li>– Weak institutional capacity</li> <li>– Poor enforcement of regulations</li> <li>– PPP practices in greening</li> <li>– Existence of development committees at <i>Woreda</i> and <i>Kebele</i> levels</li> </ul>

## 6.0 Key Opportunities and possible champions (drivers)

The adverse social, economical, environmental and physical effects of flooding aggravated by poor stormwater management in both Dar es Salaam and Addis Ababa are appreciated by the community and stakeholders alike. Stakeholder consultations and interviews at city and site level attest to this. The recent large flooding incidents in Dar es Salaam and Addis Ababa have brought to the forefront the critical resource deficits that our institutions have to cope with disasters. An alternative solution such as LSM is what the cities need to address the problems of stormwater management. However given the infrastructure costs to implement LSM especially at city level, as well as other more pressing urban challenges that urban managers have to deal with; it is more likely that changes to LSM will be more meaningful if initiated from grassroot level. Mguni, Herslund and Jensen (2012) suggest that sustainable urban drainage systems (SUDS) may very well start-off as a niche level experiments in alternative approaches to flood risk management at grassroots level and than be scaled-up to higher institutional levels. However, the researchers also appreciate that without institutional support from authorities and improvement is complementary services such as solid waste management; such solutions can be short-lived.

In addition to the identification and implementation of new solutions; Mguni, Herslund and Jensen (2012: pp?) identify “*champions*”. These are stakeholders who “may set the agenda towards a discourse that supports transition towards SUWM and decision-making that prioritises sustainability and experimentation whilst also maintaining the momentum that leads to implementation.” The table below attempts two outline the possible solutions to transition towards LSM as well as the possible champions at city, catchment and site levels for Dar es Salaam and Addis Ababa. Emphasis is placed at instituting changes at site (pilot) level in line with discussion above.

**Table 6.1 Solutions and possible champions (drivers)**

<b>Level</b>	<b>City</b>	<b>Proposed Solution</b>	<b>Indicators</b>	<b>Potential Champions</b>
<b>City</b>	Addis Ababa	<ul style="list-style-type: none"> <li>- Assess the knowledge and capacity gaps in LSM</li> <li>- Provide tailored training &amp; awareness for filling the gaps</li> <li>- Promote policy and laws reviews</li> <li>- Identify and work with ongoing prospective endeavours</li> </ul>	<ul style="list-style-type: none"> <li>- Assessment of knowledge levels</li> <li>- Priorities aligned with LSM agenda</li> <li>- Policy and laws review plans</li> <li>- Partnership and Action Plan formulated</li> </ul>	<ul style="list-style-type: none"> <li>- Addis City Officials</li> <li>- Vice Mayor</li> <li>- Addis Ababa Housing and Construction Bureau</li> <li>- Finfine Surrounding Oromia Special Zone Integrated Development Plan Project Office</li> </ul>
	Dar es Salaam	<ul style="list-style-type: none"> <li>- Assess the knowledge and capacity gaps on LSM at the municipality and council</li> <li>- Provide tailored training for the gaps</li> <li>- Policy and laws review</li> </ul>	<ul style="list-style-type: none"> <li>- Assessment of knowledge and capacity levels</li> <li>- Assessment of the practice (LSM related priorities in plans, budgets)</li> <li>- Policy review plans</li> </ul>	<ul style="list-style-type: none"> <li>- Mayor</li> <li>- Drainage and Road Engineers</li> <li>- Town Planners</li> <li>- NGOs (like Enviro Care)</li> <li>- National Environmental Management Council (NEMC)</li> <li>- National Housing Corporation (NHC)</li> <li>- DAWASA</li> </ul>
<b>Catchment</b>	Addis Ababa	<ul style="list-style-type: none"> <li>- Create dialogue &amp; forums</li> <li>- Asses the gaps on LSM</li> </ul>	<ul style="list-style-type: none"> <li>- Information flow between key institutions</li> </ul>	<ul style="list-style-type: none"> <li>- AAWSA</li> <li>- Oromia Fin fine Surrounding</li> </ul>

<b>Level</b>	<b>City</b>	<b>Proposed Solution</b>	<b>Indicators</b>	<b>Potential Champions</b>
		<ul style="list-style-type: none"> <li>- Provide tailored training and awareness for filling the gaps</li> </ul>	<ul style="list-style-type: none"> <li>- Join working groups and committees for horizontal coordination</li> </ul>	<ul style="list-style-type: none"> <li>Special Zone</li> <li>- Awash Basin Authority</li> <li>- Gulele Botanical Garden</li> <li>- Sub City Administrations</li> </ul>
	Dar es salaam	<ul style="list-style-type: none"> <li>- Introduction of potential activities</li> </ul>	<ul style="list-style-type: none"> <li>- Practices- existing activities</li> </ul>	<ul style="list-style-type: none"> <li>- Ward Development Committees</li> <li>- Ward Executive Officers</li> <li>- Ruvu/Wami Basin Authority</li> <li>- DAWASA</li> <li>- NEMC</li> <li>- Media</li> </ul>
<b>Pilot</b>	Addis Ababa	<ul style="list-style-type: none"> <li>- Asses the gaps on LSM</li> <li>- Provide tailored training &amp; awareness for filling the gaps</li> <li>- Networking of key actors</li> </ul>	<ul style="list-style-type: none"> <li>- Assess knowledge and awareness level</li> <li>- Priorities aligned with LSM agenda</li> <li>- Joint working groups and committees</li> </ul>	<ul style="list-style-type: none"> <li>- Kolfe Keraniyo sub city</li> <li>- Woreda 2 and Nifas Silk Lafto sub city</li> <li>- Ketena Community policing</li> <li>- MekanissaUrban Agriculture Cooperative</li> <li>- Mekaneyesus Evangelical Seminary</li> <li>- Jemo Condominium Development Committees</li> </ul>
	Dar es Salaam	<ul style="list-style-type: none"> <li>- Promote mind set change</li> <li>- Introduce LSM at local level</li> </ul>	<ul style="list-style-type: none"> <li>- LSM being agenda on local committees</li> <li>- Existing coping strategies</li> </ul>	<ul style="list-style-type: none"> <li>- CBOs and NGOs</li> <li>- Mtaa development committees</li> <li>- Community engaged in urban agriculture</li> <li>- Media</li> </ul>



## **7.0. Future directions**

Future questions for addressing institutional challenges related to LSM in Dar es Salaam and Addis Ababa include:-

- i. How to coordinate actions and decisions on SWM across the administrative boundaries and entities.
- ii. How to handle conflicting decisions including those related to land use in upstream areas that may adversely affect SWM in the mid and downstream areas.
- iii. How to mobilise and coordinate resources and actors so as to facilitate LSM from community-based actions.

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