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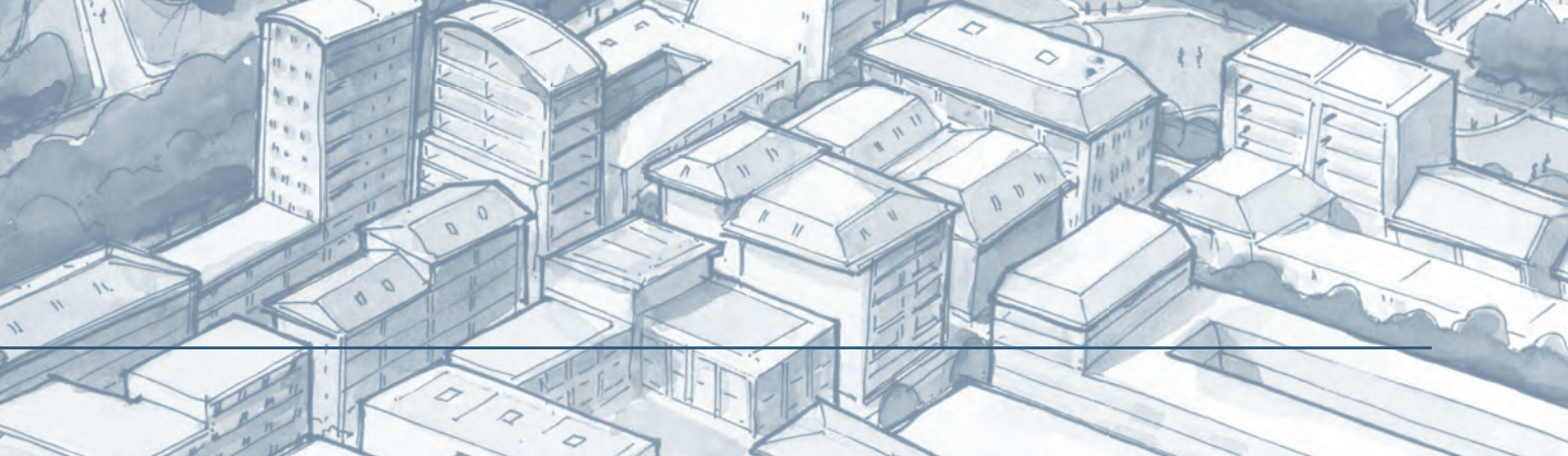
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The Msimbazi Opportunity

Transforming the Msimbazi Basin into a Beacon of Urban Resilience

Volume C Appendices



Client:



President's Office – Regional Administration and Local Government



Financier:



Contractor:



The Msimbazi Opportunity

Transforming the Msimbazi Basin into a Beacon of Urban Resilience

Volume C Appendices

Acknowledgements

Responding to the call of Vice President of Tanzania, Honourable Samia Suluhu Hassan, to pragmatically address the recurrent flood risk in Dar es Salaam, the Msimbazi Opportunity Plan was developed through a participatory design process, known as a 'Charrette', that was undertaken from January to August 2018. It is the result of the invaluable time and dedication of more than 200 people, from 59 institutions and communities, across 30 working sessions.

This unprecedented approach benefited from, and was championed by, Selemani S. Jafo (MP) Minister of State, President's Office Regional Administration and Local Government and January Y. Makamba (MP) Minister of State, Vice President's Office, Environment and Union Affairs.

The collaboration and consensus building achieved through this process would not have been possible without the sustained efforts of the Dar es Salaam Metropolitan Development Project team within the President's Office for Regional Administration and Local Government, led by Engineer Davis Shemengale.

Through committing to the delivery of a unified solution to one of Dar es Salaam's most pressing challenges, the Charrette brought together stakeholders from the Dar es Salaam Regional Administrative Secretariat, Dar es Salaam City Council, Ilala Municipal Council, Kinondoni Municipal Council, Ubungu Municipal Council, DART, DAWASA, DAWASCO, Ministry of Lands Housing and Human Settlements Development, Ministry of Water and Irrigation, Ministry of Works, National Environmental Management Council, Wami Ruvu Water Basin Authority, Prime Minister Office – Disaster Management Department, TANESCO, TANROADS, Vice President's Office, Ardhi University, Korea Eximbank, Department for International Development, National Land Use Planning Commission, Private Sector Representatives, Tanzania Forest Service, National Housing Corporation, Tanzania Meteorological Agency, Non-Government Organizations, and critically Community Representatives from Hanasif, Idrisa, Mchikichini, Kigogo Kati, Kigogo Mkwajuni, Msimbazi Bondeni, Magomenu-Mapipia, Mikumi, and Suna subwards among others. A full list of participants can be found in Volume C.

A flagship of the Tanzania Urban Resilience Program, the Charrette process was coordinated by Nyariri Nanai (Senior Engineer) of the President's Office for Regional and Local Government, and Eric Dickson (Senior Urban Development & Disaster Risk Management Specialist) and Edward Anderson (Senior Disaster Risk Management & ICT Specialist) of the World Bank.

The Charrette process was facilitated by a consortium of Max van der Sleen (Ecorys), Remco Rolvink (DASUDA), Bas van de Sande (CDR International), and Christina Geoffrey Mandara (WEMA Consult). Detailed review and comments were provided by a World Bank team comprised of Amy Faust (Urban Development & Resilience Consultant), MaryGrace Lugakingira (Urban Planning Consultant), Mussa Natty (Engineer Consultant), Nyambiri Kimacha (Disaster Risk Management Consultant), and Larissa Duma (Urban Ecology, Environment, and Sanitation Consultant).

Special thanks are due to UK aid for their generous funding and support, without which the visionary outcomes of the Charrette process would not have been possible.

Through the collective contributions of such a wide and diverse set of stakeholders, a unique opportunity lies ahead to transform the Msimbazi Basin into a beacon of urban resilience.

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APPENDIX A: LIST OF PARTICIPANTS IN MSIMBAZI CHARRETTE DESIGN PROCESS

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Humanitarian Open Streetmap

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Busoro M Pazi
Callist Peter Kundy
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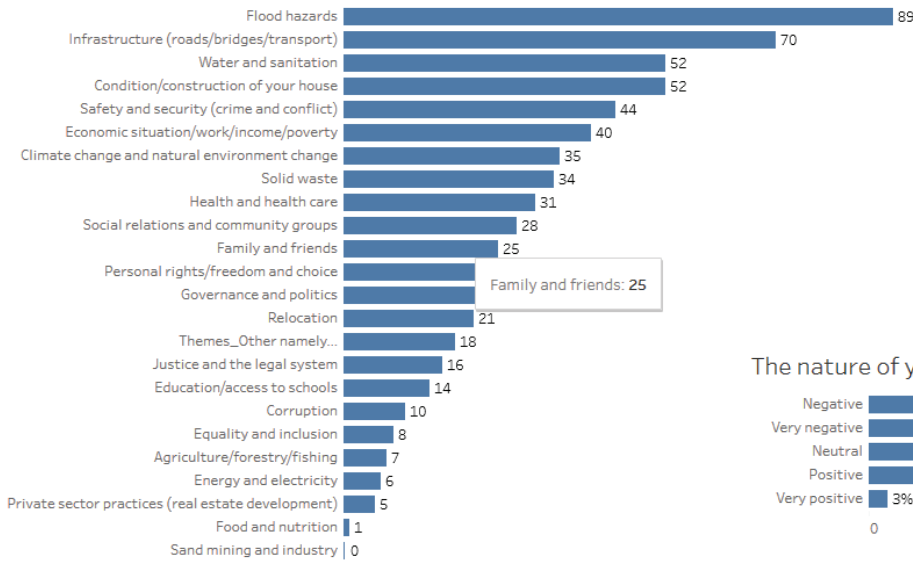
ORGANISATION	NAME
Magomeni, Mapipa subward	Godwin Cathbert Issa Kondo Sekate Mgaya Magango
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Tanzania Green Building Council	Ipyana Moses
Tanzania Freight Forwarders Association	Waheed Saudin
Tanzania Green Building Council	Ipyana Moses
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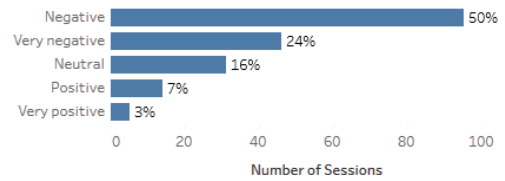
APPENDIX B: STORY BOARD SUMMARY OF THE FINDINGS OF THE COMMUNITY SURVEY

My story is about...(up to 5 answers)



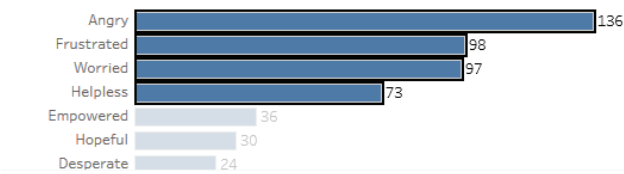
(1) The main assumption is that flood hazards are of major influence in livelihood dimensions. Floods were the main theme in only 14% of narratives. There is an enormous variety of themes in the day-to-day discourses.

The nature of your story is...



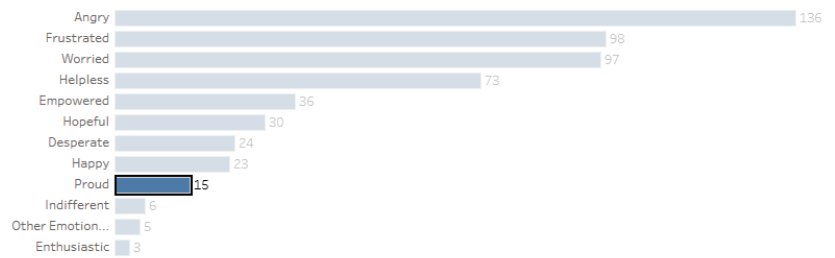
(2) Likewise the worry was that demolition would be the main theme, but that was not the case. Demolition was mentioned in 10% of the stories.

Emotions



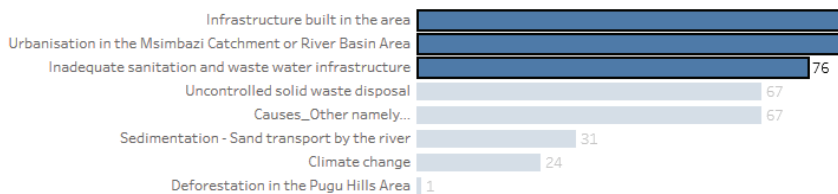
(3) Twothird of the study sample feel either angry, frustrated, worried or helpless.

This story makes you feel...(up to 3 answers)



(4) 20% of the study sample feel either empowered, happy, hopeful or proud.

The causes of what happend in my story are related to...(up to 3 answers)



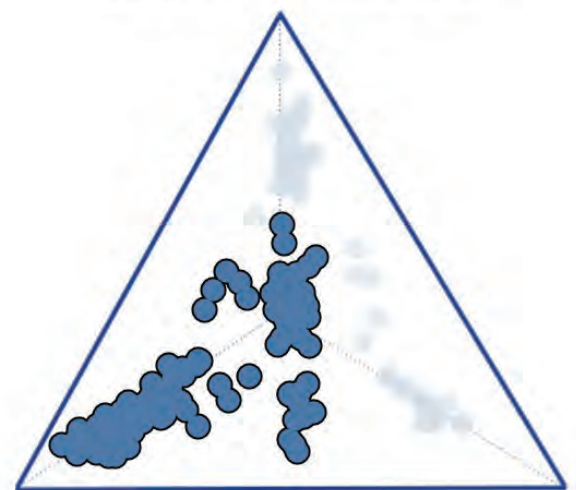
(5) Community members are a good source of knowledge about history and causes of events.

How will the situation in your story be in 2020?



(6) Half of the study sample expect that the future will be much worse for them.

Good relations between community members



Good public services, healthy and safe environment

Good economic opportunities (earning opportunities nearby, house as an asset)

(7) 60% of the study sample find good public services and a healthy and safe environment important.

SenseMaker: survey on community resilience

The analysis of the data collected is presented below in story board form and gives an interesting and valuable insight into the subjects that are important for the communities, their vulnerability to various hazards and risks and the resilience of the communities in the Msimbazi Lower Basin Area. The interviews lasted an hour on average and were supported by a Mobile phone app. In order to avoid bias the people were asked the following questions:

- Can you tell about something that happened to you that makes you either happy or frustrated about living in your neighbourhood (Mtaa)?
- What happened? What did you do?
- What makes you happy or frustrates you? Why?
- What could improve your situation?



(8) Despite the high level of frustration there is also respect for the government especially in the Mkunguni A Mtaa.

Relocation to a safe place outside the Msimbazi river basin in the future is...

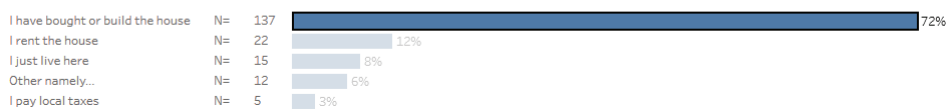


(9) 59% of the study sample desire resettlement

When was your house build?

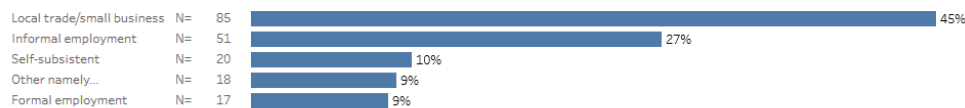


What is the tenure of the house you live in?

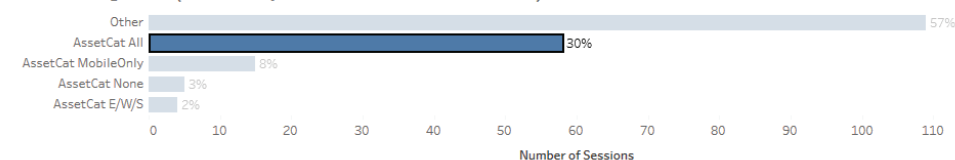


(10) 72% of the study sample has a claim of right of their house. 81% of the houses were build after 2000.

What is your main source of income?



Asset Categories (Electricity, Water, Sanitation, Mobile)



(11) 30% make a decent standard of living (having electricity, water, sanitation and mobile phone) from small and informal business

The SenseMaker survey was conducted from 12-16 February 2018.

In all 17 Mtaa's of the Msimbazi Lower Basin. In total 191 people were interviewed. The survey was conducted by Ecorys in cooperation with Sense-Guide.

FIRST STAKEHOLDER WORKSHOP

Msimbazi Valley Flood Mitigation Initial Stakeholder Workshop **21 – 22 February 2018** **Protea Courtyard Hotel Dar es Salaam**

Background

PO-RALG with support from the World Bank and DFID is coordinating a multi-stakeholder design process (a “charrette”) for developing a detailed plan for flood mitigation in the Msimbazi basin. This process, which is expected to take place from February to June 2018, will result in (i) a Strategy and Management Framework to mitigate flooding through measures that consider the wider Msimbazi Basin, and (ii) a detailed plan for the lower Msimbazi flood plain. Because of the complexity of the Msimbazi and number of stakeholders, a charrette approach is being used to facilitate agreement between actors and provide a foundation for detailed design work for flood control infrastructure and environmental improvements to be financed by the Tanzania Urban Resilience Program (TURP).

An Initial Stakeholder Workshop took place on 21 & 22 February 2018 at the Protea Courtyard Hotel, Dar es Salaam. On the 1st day 54 persons participated; on the 2nd day 48. Participants included national ministries, regional authorities, municipalities, mtaa chairpersons, and community members.

The agenda for the two days is attached to this document as Appendix A. The invitation letter from the World Bank is attached as Appendix B. The presentations prepared for the workshop, the records of the work done and the participation list has been forwarded by e-mail to all participants in two batches on Thursday 22nd and on Friday 23rd.

Day 1 Summary

The morning session was devoted to: (i) setting the scene (PO-RALG); (ii) explaining the background and objectives of the project (World Bank); (iii) getting to know each other; and (iv) explaining the Charrette, method and main principles:

- Reframing;
- Understanding Complexity;
- Deep democracy; and
- The ACCA process: Awareness / Comprehension / Commitment / Action.

Eng Davis Shemangale (World Bank Projects Coordinator at PO-RALG) in his opening remarks outlined the complexity of the Msimbazi challenges including: flood risk reduction, environmental rehabilitation of the river, city park development and building resilient communities. Moreover, he emphasized the importance of finding a unity of purpose around which the stakeholders can build a comprehensive multi-stakeholder solution to which all could commit.

In the getting to know each other session, each participant was asked to write down: (i) name; (ii) organisation or Mtaa; (iii) the main problem perceived; (iv) the mandate of their organisation; (v) the contribution they could make to the Charrette process; and (vi) the issue they expected to be discussed in the coming days. These individual profiles were pinned on the walls of the room and everybody was asked to read them all. This action was instrumental in allowing the group to understand the diversity of the people in the room and the complexity of the situation. The reframing exercise made the participants aware of the fact that different

people see different things and that one's own point of view is not the only reality. This was a step towards appreciating the wisdom in the views and experiences of the other members with different backgrounds in the group.

The morning was concluded with a multimedia exploration of the Wider Msimbazi Valley and a review of the causes for the apparently increasing flood risk, identified in the many good studies performed thus far on this subject. Seven dimensions of this complex problem were discussed: Urbanisation, Erosion, Infrastructure barriers, Solid waste, Sanitation, Climate Change and a Vulnerable living environment.

In the afternoon, the group was divided in 7 sub-groups and each sub-group discussed measures that could contribute to flood mitigation and adaptation with reference to three conceptual alternatives: (i) Hard engineering solutions to try and stop the flooding; (ii) Minimal interventions focused on reducing damage to lives, assets and livelihoods, and (iii) Building with nature, by accepting flooding as unavoidable, and adapting to this with a range of measures to improve the social, economic and spatial value of the lower Msimbazi river area (e.g. wetlands/ city park).

Outputs from the group work have been distributed to participants, and will be used in preparing the next workshop.

Day 2 Summary

Because of late arrivals of many participants the 1st session of the day started 30 minutes later than planned. This fact was used to explain the "Terrorist Line" concept in the Deep Democracy method for resolving tensions. The idea is to listen to each other, and address tensions as soon as they arise. On the smallest level this was illustrated with: "Next time Be On Time". In the session: recap of the previous day, three key expectations for discussion were highlighted: (i) the validity of the Charrette process; (ii) the solid waste problem; and (iii) sensitizing the most vulnerable communities to the Charrette process and deliverables.

The Validity of the Charrette approach was discussed and confirmed. The complexity and seriousness of the problems were recognised by all. The sentiment in the room was that enough time has been spent on studies and discussion. It is now time for action; and the Msimbazi Design Charrette initiative and approach is seen as a catalyst for action. The Ministry of Lands commented that the Charrette deliverables should include/align with land use regulations. The Vice President's Office commented that the charrette will: "need to cover all the Msimbazi Valley from its origins in the hills to the river mouth; Every designated representative is responsible for feed back to its organisation or Mtaa".

The solid waste problem was discussed as one of the seven themes in the morning session in regard to the issue of sensitizing the communities.

The remainder of the morning was used for discussing the elements of a Strategic & Management Framework for the Wider Msimbazi Valley and the Gazetted Area in the Lower Msimbazi Basin Area. The discussion was organized on the basis of seven themes, under which the relevant long list measures identified the day before were grouped: 1) Conveyance or retention; 2) Land use planning; 3) Mangroves, Wetlands, Landscape and Forests; 4) Solid waste

as value; 5) Flood Resilient Communities; 6) The Blocking effects of Roads and Bridges; and 7) Climate Change. This proved a very productive session. The preliminary results are shared with all participants via email. In the 1st Charrette scheduled for 19 & 20 March these themes will be further explored for their potential as elements of the framework for the wider Msimbazi valley.

The afternoon session had two elements: Building Resilient Communities; and Visioning the Future. The Communities session was organized in the form of a Parliament style debate. It started with real stories from the community members & Mtaa representatives. These stories were collected through a questionnaire in the week prior to the workshop. The debate - conducted in Kiswahili - was animated and gave room to all participants to express their views, concerns and grievances in the safe environment of the charrette. The group debated with passion, humor and in a way that acknowledged the validity of the different perspectives and points of view.

The session was a highlight and memorable. Eng. Mussa Natty, World Bank consultant and moderator of this session summarized the conclusions as follows: "We need to work together towards the common goal of resilient communities. Nobody should be blamed for what happened in the past. Not the Government and not the communities. There are so many reasons, and developing resilient communities is a complex task. For the Government an optimal solution is a not expensive solution. But for the communities it is important to know whether they can stay in their neighborhood or have to go elsewhere. We need to know how many people are affected. We need to keep talking to search for solutions to which we all can commit. This requires reframing. The Government needs to look at this more from the communities angle; and the communities needs to accept more that the government tries to find good solutions for the communities within the regulations that exist".

The day ended with four short sessions: city parks from around the world were shown as inspiration; The road map of the Charrette project with the time line was set out; and each of the 8 tables was asked to write a newspaper headline imagining the date march 2028. Two examples: Msimbazi River Park: A place to meet and greet; and Msimbazi from Hazardous to Honeymoon Valley.

The workshop was closed after a positive feedback session in which both Mr. Charles Msangi (PMO) and Dr. Freddy Manyika (VPO) commented that the Charrette process is a catalyst for delivering decision making on action for reducing flood risks.

Outcomes

- Stakeholders agreed to participate in the charrette process as a team going forward over the coming months
- Participants gained an understanding and awareness of the charrette process and expectations/outputs expected by June 2018.
- Participants contributed main issues and recommendations from their institutions, communities, and technical specialisations, which will be used to design the next workshop,

Next Steps

The step in this process is the beginning of the Charrette design workshop series. The first workshops are planned for on 19/20 and 22 March. A formal invitation will follow shortly. For more information see the Next Steps Road Map presentation (PPT) which is included in the materials send to the participants.

Msimbazi Design Charrette №1
19 - 20 March 2018
Protea Courtyard Hotel Dar es Salaam

DESIGN
CHARRETTE
№ 1

These notes are written for the participants of the Msimbazi design charrette № 1, which took place on 19 and 20 March. The notes give a short description of the work done in working session № 3 and give the results produced in unedited form. The purpose of the note is to help the participants to update their organisations on the charrette process and which potential ingredients of the Msimbazi Strategy and Management Framework have been discussed.

On Thursday 22 March the charrette process will continue from 9:00 – 16:30 at the same location, Protea Courtyard hotel (Barack Obama Drive). For that meeting the consultants who support the charrette process will provide a summary of the work done thus far, and participants will work together on governance and institutional arrangements on the proposed measures for managing the wider Msimbazi basin.

The purpose of these working sessions of charrette № 1 is to improve our understanding of the themes, functions and main elements to build the Strategic Framework to manage the Msimbazi Valley in the coming 30 years.

Themes

In the Initial Stakeholder Workshop in February we discussed a series of dilemmas related to themes that were identified during the problem analysis of the Msimbazi river valley. The themes reflect what needs to be done to assess solutions for the situation. These are: Flood reduction interventions; Resilient communities; Mangroves, forest & wetlands; Waste management; Water and sanitation; Land use planning; and Climate change.

Functions

At the start of the Charrette №1 we worked in groups to identify the (potential) functions of the Wider Msimbazi River Valley for Dar es Salaam and Tanzania in the past, present and future. We subsequently scored these functions based on a discussion on their functionality or disfunctionality. All tables produced sheets with sometimes over 20 function descriptions. The facilitators summarized the most mentioned and highest ranked functions and ordered them in the following list:

1. Discharge stormwater
2. Sand mining (coordinated, at scale and commercial)
3. Cleaning the river from
 - a. Solid waste
 - b. Chemical water pollution (+no more new industry)
 - c. Waste water
4. Biodiversity and ecosystem
5. Irrigation for agriculture
6. Public space uses for playground, sports, gatherings (City Park)
7. Infrastructure connections
8. Human settlement (if not exposed to flood & pollution)
9. Urban edge development potential

This list was used as the basis for the working session on the ingredients/elements of the strategy component in the Strategy & Management Framework.

Pathways

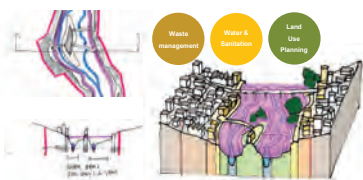
Before we can get to a shared understanding of the elements that should be in the strategy framework, we need to explore what direction solutions might take when we think them through, how they fit together or not and whether we think solutions are an essential element in the overall strategy. The facilitating team introduced the principles of the three development pathways prepared. The pathways are strongly related to the themes earlier mentioned. The six main themes can be linked to the approach with which we can look at how to solve the problems of the flooding.



The first pathway has the title 'Acceptance' (of flooding) and is related to the central question 'what is needed to get people out of harm's way and to build resilient communities along the river basin. This pathway is strongly related to the theme of the 'Resilient communities'. Interventions might be minimal, but the maximum result in retaining their livelihoods for those who are affected by flooding.



The second pathway is focusing on 'Protection' including long term measures to reduce flooding. The discussion here focussed on what technical interventions can be applied to keep "dry feet". The workshop discussed 'Flood reduction interventions' and 'Mangrove, forest and wetlands' in which a whole series of measures can be thought of for the entire river catchment area. The aim was not to discuss detailed solutions at this point, as that will be part of the next phase in the charrette process on the detailed plan for the lower Msimbazi, but what potential list of interventions might work at what place along the river in upper, middle and lower catchment area.



The third pathway is 'Integration', in which a clean and green place for human activities is the central ambition. We need to discuss what approach for the strategy fits best. With the themes of Waste management, Water & Sanitation and Land use planning the discussion is about what elements or interventions can be defined to develop a safer, cleaner and more useable living environment and still take into account that we are planning and working in a flood plain area. In carousel-setting of sessions of each 45 minutes the participants worked in their group on one pathway delivering lists of notes and sketched maps before moving to the next table and focus on the next pathway. In three rounds all participants have captured all perspectives of how to approach the strategic level.

Process: Funnelling of elements to build the strategic framework

The group has listed their elements by presenting them to each other. Subsequently, these elements were selected and re-arranged on the wall by forming clusters of related elements with respect to solutions, measures and to be developed issues. The result is a step by step collective result by the group of participants of what should be given priority in the first concept framework for the Msimbazi river basin. This process was done in one day and gives a clear direction to what we should work on mutually to come to a firm agreeable result.

Working collectively on re-arranging and clustering the selected elements from the pathway sessions. For further reference "the wall" is reproduced below:

The clusters of elements for building this strategy resulted all up the wall as in the images above, and are summarized in the following list:

1. Flood solution (Storm water discharge function)

1.1 Potential measures at river and riverbank

- Flood reduction by cleaning and aligning
- Secure the border of the flood plain: agree and demarcate the flood line
- Riverbank improvement
- River training along the river system and banks
- Riverbank protection
- Deepening the river channel
- Clean lower basin for retention
- Improve gradient from river to sea
- Take tidal sea levels into account
- Measures to protect the river flow (dikes, embankment, culverts, storm water drain, outlets)
- Construct dikes to redirect water back to river
- Construct embankments at the lower basin
- Dam upstream
- Stop discharge at flood time 1.2 Sedimentation / sand
- Erosion control by trapping of sand from the upper basin
- Sand trapping and commercial sand mining (at the sand trap and specific areas)
- Sand mining
- Reduce the riverbank erosion
- Study and define the sedimentation kind (sand, chalk, mud, etc.) 1.3 Bridges and culverts
- Opening of Selander bridge
- Selander bridge opening (relief culverts) and dredging the lower part of the basin
- Improve bridges
- Build bridges instead of culverts
- Raise road levels and widen drainage structures across the valleys 1.4 Flood management plan
- Management of flood plain area containing: Resettlement within the flood plain;
- Sensitization and awareness of the community; Empowerment
- Awareness raising and education about flood risk

2. Water harvesting for water use and for regulating the discharge flow

- Water harvesting at household level (rooftops)
- Water harvesting retention reservoir (consider Sukita and Kinyerezi)

3. Reforestation

- Forestation upstream and along the riverbanks
- Planting against erosion upstream to reduce rainwater runoff increase
- Pugu hills reserve replant
- Plant trees along the river
- Protect the river

4. Biodiversity

- Mangrove replant scheme along Selander bridge

5. Solid Waste

5.1 Physical

- Control position of waste (community & industrial)
- Increase capacity of waste collection
- Increase waste collection
- Make collection points
- Provide collection point facilities (and accessibility for collection)
- Awareness programme
- Clean the river first and then have an awareness programme
- Empowerment how to manage
- Ban plastic bags
- Integrated solid waste management programme
- Awareness, policy, enforcement, penalties
- Enforce law of waste

6. Sanitation and waste water

6.1 Sanitation

- Waste water treatment close to community
- Decentralized waste water systems
- Improve toilets
- Dispose properly
- Reinforce law
- Connecting sewerage (DAWASA)
- Alternative sanitation solutions
- Shared septic tanks
- Public sewers
- DEWATS
- Manage sanitation/waste water for settlements and industries within the flood plain

6.2 Industrial waste water

- No industrial waste water pollution
- Industrial waste water should be reinforced by law or close the factory
- Manage sanitation/waste water for settlements and industries within the flood plain

6.3 Organization

- Education and sensitization to raise awareness
- Identification and enforcement waste water and sanitation
- Waste management authority
- Sewerage treatment in Dar; what system and what location of the plant?

7. Settlements

7.1 Resilient settlement

- For strategy and management purposes it is relevant to make a distinction between communities and houses located in the upper valleys, middle valleys and Lower Msimbazi Basin. Moreover, the gazetted area will be treated separately in the SMF
- The objective is that in the long term all people living in unsafe areas relocate
- Human settlements in safe areas or in areas where protection measures make sense are ok, otherwise relocate planning principles for relocation: 1. Respect land use guidelines 60 or 30 meter lines from the river; Respect the customary (house ownership) rights and respect sustainable livelihood conditions

For relocation: three cases:

- Relocation not urgent, responsibility of the households themselves with a temporary licence to stay where they are until they need to move
- Relocation urgent. E.g. unsafe in the gazetted area, people willing to move if they receive money for their damages
- Relocation urgent, people want to stay in their Mtaa, willing to move to safe area and social housing in the Mtaa (apartment/high rises – sub-title option)
- Resettlement/compensate those who are vulnerable to flooding
- Resilient settlement is: outside 60m from riverbank is good; within 60m see what measures fit best: compensate; within 30m move out (middle catchment area) retain the right to livelihood
- Relocate to nearby locations
- Develop high rise buildings near the flood plain
- High rise buildings and densify
- Resettlement near the original site
- Safe settlements in the area 7.2 Restrictions
- Stop further individual developments in the valley (land reclamation; buildings)
- Limit and clean up encroachment
- Restrict housing in Pugu hills (in and outside the reserve) 7.3 Organization
- Inventory at Wajumbe level of landlords, households, tenants
- Sensitization of the community on this project
- Relocation should consider tenants
- Biometric identification

8. City Park

8.1 Functions for the park

- City Park
- Msimbazi ground is part of the city park
- Green protection
- Recreation
- Sports
- Public activities 8.2 Building
- Relocate, social rent housing, high rise building in the neighbourhood, compensation by landlords to tenants
- Social housing and high-rise also to make investment in park realistic
- Gazetted area can be based on the boundaries indicating vulnerability to flood
- Make a green network
- Gardening, but non-edible when polluted water used for irrigation

9. Mobility

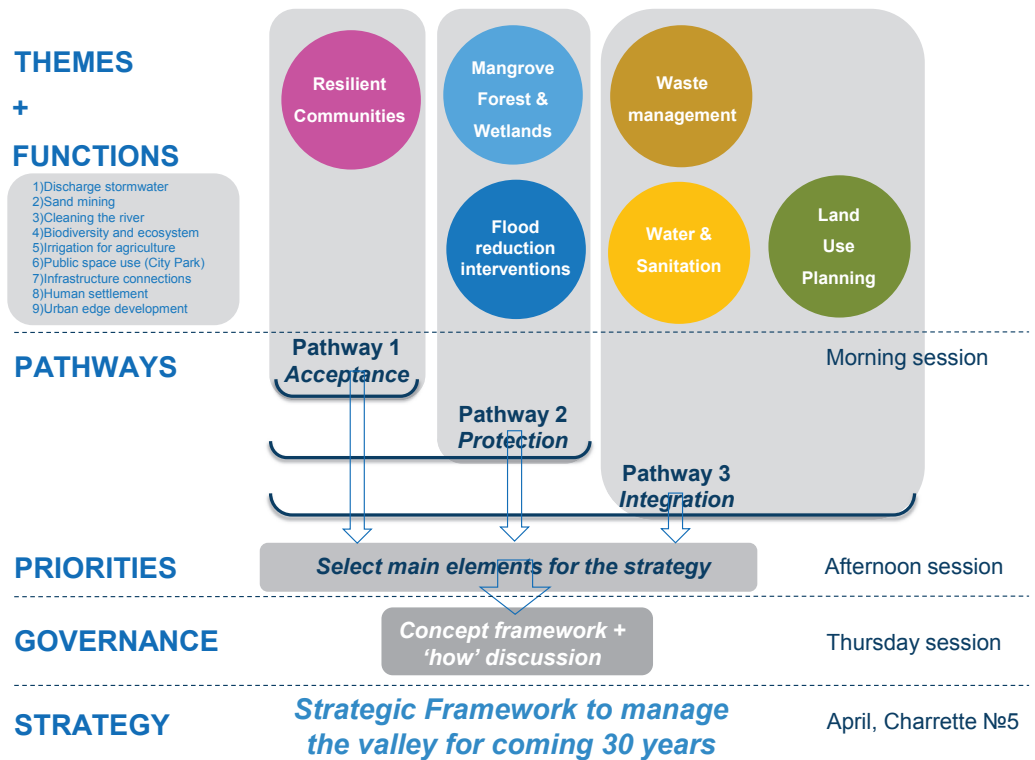
- NMT (non-motorized transport)
- Connectivity
- Bridge to connect Hananasif with Muhimbili
- Integrating Mobility and land use
- Walking and cycling will help on the congestion on main roads like Morogoro road

10. Organization

- Create a management authority for the river Msimbazi

- Existing committee structure to be taken into account 'Msimbazi coastal sub-catchment' committee under the ministry of water

A summary of the process how we got here and what are next steps is represented in this diagram:



The consultant will organise the above information in a more concise strategy framework as the basis for the work during the next charrette event on Thursday 22 March.

The following charrette №2 is on Thursday, in which the focus will be on the 'how' question: How do we formulate the elements of the strategic framework? How are the governance and institutional aspects going to be arranged regarding the clusters of topics, solutions and measures that we all find so important?

After this Thursday session we will have a draft framework and understanding of the management side of the framework. Then in the charrette workshop in April the draft Strategy and Management Framework for the Msimbazi river will be shared and ready for a dialogue with all stakeholders on commitment and linkage for a further detailed planning level of the lower basin area.

Msimbazi Design Charrette №2
22 March 2018
Protea Courtyard Hotel Dar es Salaam

DESIGN
CHARRETTE
№ 2

Charrette № 2 concluded with a presentation by representatives of each table of their findings. These findings are summarized below:

To finalise the stakeholders design process of the SMF, Charrette no. 5 is planned for the end of May 2018. At that event the stakeholders are expected to build on the work done in charrette no 1 and 2. In practical terms this means that the stakeholders will be tasked: (i) to further develop the SMF framework and draw up a list of non-contentious and contentious issues; and (ii) commit themselves and their organisation to support the realisation of the SMF. The result of that charrette will be used by the consultants to help prepare PO-RALG a cabinet paper on the SMF with a listing of contentious and non-contentious issues.

The next step in this series of six design charrettes, is to explore in more detail what the contents can be of a 1st investment project focused on flood protection and environmental rehabilitation in the lower Msimbazi Basin; the area between Kasawa Road and Selander Bridge. This content of Charrette № 3 is scheduled for 16 and 17 April. During that charrette the generic measures of the SMF will be detailed further and the “HOW” with reference to statutory responsibilities, inter-institutional cooperation/ management for implementation as well as feasibility aspects will be investigated by the stakeholders.

Summaries of the work done at the tables

Table 1. Human settlement

Within the population living inside the Msimbazi valley in flood prone areas eight different types of physical-socio-economic conditions were identified. A part of these are in locations without serious exposure to risks. Others are in place which could be made safe with engineering works that would not reduce the river’s discharge capacity. The others live in locations which cannot be made safe now or in the future; and the perspective is that they will have to relocate in the short, middle or long run. For these people the SMF for the Msimbazi Valley should offer some new policy initiatives. Three policy principles were considered valuable for the design of the SMF: (i) No further demolitions/forced evictions; (ii) An integrated solution per specific location/ward level which can be enforced and executed in a short time span (close the door and know where to go); (iii) Compensation for house owners/landlords aligned with international relocation standards as also applied by the World Bank; (iv) Put humanity in your heart, recognize the right and plight of the people who have lived in the valley for a long time, and provide them with the support they need for voluntary relocation. The table recognized that the majority (The sense guide interviews indicates 65%) would leave and move out (to parental homes/ children if they got their compensation in the form of a cash. 35% does not want to move out of their communities and would accept a new place to live/relocation in their ward. For financing of the “voluntary” relocation two options were discussed. The government is obliged to compensate in the case of demolition (700 demolished houses in 2017); this is confirmed in a letter from the governments human rights commission). The government does not want to create a precedent, with this payment. A second source of compensation could be project development alongside the valley or inside the gazetted area.

For the latter case the idea was discussed to establish a professional investment organization, with access to land preparation development fund, with two tasks: (1) to develop the land allocated for the investments in the gazette area into valuable real estate; and (i2) to attract investors. As part of task 1 the development organization would buy out/compensate/provide social housing alternatives for the people identified as eligible.

Table 2. Gazetted Area

Gazetted areas in Tanzania are publicly owned, and Ministry of Lands is responsible for the demarcation in cooperation with the municipalities. The human safety in the Msimbazi River Basin is the main principle for the determination of the boundaries of the gazetted area. The identification of which areas are hazardous (unsafe) can be done in different ways: (i) modelling flood extents; (ii) analysing the extent of historical flood events; or (iii) a combination of both. At the table, a GIS model was used to show how different flood extents affect the number of buildings/houses within the flooded area. During the session two examples were presented by beamer and compared: a T100 yr modelled flood extent and the 2011 flood event. This showed big differences also at sub-ward level.

This helped the stakeholders understand the link between the flood hazard extent and the hazardous area. In this context it became clear that the current 'safety ruling' of no houses within 60 or 30 meters of the high water line, is not implementable for large parts of the Msimbazi River Valley; and therefore is not suitable as a design principle for the gazetted area boundaries. Instead one should define an acceptable risk level (say once in a hundred years (T100yr) and model the maximum flood extent for that occurrence, and make this the basis for setting the boundaries of the gazetted area.

The existing gazetted area was published in May 2011 (Government Notice No. 27 - 05/08/2011). Coordinates of GN No. 27 have been defined, and a conceptual plan has been prepared. However, the gazetted area has not been demarcated in the field by markers. There are no markers and as a result the gazetted area is not adequately known to the different administrative levels (e.g. wards and sub-wards). Hence, there is no enforcement. Moreover, the current demarcation lines are not suitable for implementation, because the boundary is not accurate enough and is crossing buildings and infrastructures. The Ministry of Lands informed the stakeholders that it had, therefore, decided that the existing gazetted area requires a revision.

The 60m buffer regulation (a law) was discussed extensively. This law says that households within this buffer have to leave the place (a means to enforce people to relocate legally). Also an alternative – a 30m buffer was discussed. The stakeholders concluded that within the framework of a gazetted area (special planning zone) this regulation could be improved upon and/or replaced by a new approach for protecting people from flood hazard. The GIS information mentioned above was relevant for reaching this conclusion. Another important considerations was that implementation of this guideline will take substantial procedural time (different stakeholders need to be involved to deal with law amendments), and it is not really fit for purpose as it does not consider topographical features.

Stakeholders acknowledged that land speculation was a hazard prior to the boundaries of the gazetted; and agreed that in the revision process land speculation should be reduced. In principal, within the gazetted area transfer of land ownership (selling or buying of land) is not allowed. Besides envisaged guidelines/plans to reduce land speculation within the boundary,

the revision of the gazetted area for a City Park of Dar es Salaam should be based on the following criteria:

- Flood hazard areas
- Terrain elevation
- Alignment of coordinates to linear topographical features (e.g. roads and drainage)
- Incorporation of additional area for accommodation of resettlement and/or commercial activities.

Table 1+2 Governance

In the afternoon session the members of tables 1 and 2 formed one larger group to discuss governance issues. In the work instruction drawn up for the table, the theme was defined as follows: “Governance for feasible economic, social and environmental development in the Gazetted City Park area and bordering areas; The feasibility of different institutional set ups for an integrated coordinated development process including: land use planning and PPP investments to strengthen the functions of the Msimbazi River Valley and the Lower Msimbazi Basin area/city park”

The Ministry of lands emphasized that the main purpose of the gazetted area/city park was to protect people from flooding. The zoning/functions within gazetted area will be identified during the planning phase, if necessary after the gazetted area has been determined. This implies the gazetted area boundary should allow for some flexible (spatial) planning within the boundary. It was considered important that the process of setting new boundaries of the gazetted area was started with as a target to complete this by June 2018.

The stakeholders identified three levels of governance:

- The wider Msimbazi catchment area;
- The Gazetted “city park” Area; and the
- Lower Msimbazi Basin Area

For the catchment area (280m²) an authority was considered appropriate with a focus on rebuilding the water retention capacity in the catchment area (thus reducing peak levels of the flood events) over the coming 30 years, thus counteracting the negative effect of uncontrolled urbanisation. This authority (or inter-ministerial committee) would promote/champion/enforce existing laws and regulations and new regulations on land use, and building regulations (water harvesting) reservoir for water use, and other measures supporting flood risk reduction and environmental rehabilitation in the catchment area. For the Gazetted “city park’ Area, a separate planning zone authority was considered important for a coordinated approach to flood protection and river rehabilitation.

For the Lower Msimbazi Basin Area, different governance options were briefly mentioned, including the scope for a professional project development and management organisation, dedicated to land preparation, investment mobilisation and funds mobilisation. It was agreed to further explore the governance options and different agency models (and learn also from experience abroad) and assess them on their suitability for the Msimbazi valley challenges in the next charrettes.

Introduction to Table 3 to 5 on Integral outline of SMF elements

The tables 3 to 6 worked all on the same integral outline list of the Strategy Elements (result of

Charrette 1) for the Strategic and Management Framework (SMF). The activities at the table consisted of three rounds of dialogue:

- Round 1 (45 minutes): Strategy Elements: Check point by point on the strategy elements (what is integral part of the Strategy); Does vision, objective, principles and interventions fit the insights of the participants so far? What changes are essential (details will be done later) at this outline level? Is the list complete in topics? The result of the review of the list of Strategy Elements is the base for the SMF.
- Round 2 (45 minutes): Institutional Network: Discuss at every type of intervention who is responsible and to what other organizations it might link
- Round 3 (45 minutes): Business Case(s): How do the key stakeholders mentioned at round 2 are expected to realize this. What is needed in terms of institutional aspects; make it concrete and put activities on the side line if it is already that clear. For the most concrete and vivid parts of the group's dialogue you can mutually make a business case set-up.

Round 1 is based on the Strategy Elements list also attached in one of the appendices of this report. The alterations and additions by the groups at the various tables will be comprised to one comprehensive Draft Strategy and Management Framework.

Round 2 gave an overview of the parties that need to be involved in the various elements to be developed in the Framework. This is more than a list. The organograms will be part of the institutional paragraph of the Strategy and Management Framework.

Round 3 gave new concrete insights zooming in on the business case opportunities for the various strategy elements. As a first set-up and insight in what this will mean for the development of the area we include a short description of the business cases developed at table 3 to 5 and presented at the last plenary session of charrette 2.

Business cases related to Biodiversity (Table 3)

The group discussed Biodiversity related businesses. Business cases discussed include Biotourism, Botanical gardens, tree seeds, herbal medics, composting and beekeeping:

1. Biotourism
Fees to be charged to people entering the forest for camping, recreation or touring
2. Botanical Garden products
Apart from fees charged to visit the botanical gardens there will be several products from the gardens on sell in shops. These include flowers and art works and Tree seeds and seedling.
3. Herbs
Plants has been the basis for medical treatment in Tanzania and it is believed that 60% of Tanzanians rely on herbs for treatment. Allocate a special zone within the valley where local herbs will be grown and sold.
4. Composting
All forest debris and bio degradable kitchen waste will be composted and the compost manure be sold.
5. Beekeeping
The forest provide a variety of flowers for bees to make honey. Residents will be trained and equipped with proper skills for beekeeping.

Business cases related to City Park (Table 4)

The business cases at table 4 were related to the City Park development. What kind of business could be developed in the park in relation to functions serving for recreation and tourism? The other aspect of business case approach in relation to the City Park is how the large area of the park, the water conveyance and retention functions and the natural qualities could be established in terms of investment cost and maintenance cost? In order to achieve this the park should be managed as one entity.

1. City Park Agency

In order to establish a city park at all, a new institutional body should take care of the area and be responsible for its success and management. Currently the area is divided by all kind of boundaries: Municipalities, wards and subwards. To overcome the complex division of a park by various authorities a City Park Agency should have the operational control and be able to develop certain areas within the park commercially in order to pay for the public amenities and their maintenance.

2. Commercial functions vs public amenities

The lower basin is only a portion of the full river valley, but still the area defined as the Lower Msimbazi river basin from Kawawa rd to the ocean outlet at Selander bridge is huge. With the investment money available to take flood control measures and to clean up the most excessive river blocking elements the much needed safety measures are taken, but that doesn't deliver a park yet. Therefore other, larger and more continuous available budget is needed. This could come from renting out or selling recreational business spots in the City Park area. Functions that might fit and might be interested have been named by the participants:

- Amusement halls
- Wedding garden
- Music hall
- Festival terrain
- Funfair
- Sports clubs
- Pet garden
- Show gardens

These, and other functions, will not dominate the park space, but could be arranged as clusters in the park. The commercial parties are entities within the organisation of the City Park Agency and are responsible for a part of the investment and yearly operational budgets.

Business cases (Table 5)

Several business cases around river maintenance were discussed. First a long list of business cases was discussed after which the business case of sediment control was discussed in more detail.

Long List

- Fee for park functions
- Water harvesting upstream
- Market rents/fees
- Fish ponds
- Multi stakeholder user committees with user fee
- WIFI in the park

- Grass and cattle grazing
- Commercial development of the river edge
- Sorting and recycling dredged materials
- Sport centre at the park with fee
- Land rent of horticulture
- Organic manure

Sediment Control

Sand mining can be controlled by a River Basin Authority who determined where one can mine, how much one can mine and where to store the mined material. There is currently a high demand for sand in Dar es Salaam and there are many people willing to mine and retail sand. In collaboration with the municipal council the following ingredients for a flourishing market could be established:

- Controlled mining by licensed companies who pay a use fee and employ people from the communities
- A central market place for sand (close to the source) at which retailers can buy sand for further distribution. These retailers can also employ people from the communities.
- Final sell to end-users by retailer for 6000-1000 TZS per m³.

Msimbazi Design Charrette №3
18 & 19 April 2018
Protea Courtyard Hotel Dar es Salaam

DESIGN
CHARRETTE
№ 3

Outcomes of Charrette № 3

Charrette № 3 was implemented during a two day session at 18 and 19 April 2018. The objective of the sessions was for the stakeholders to create awareness on the design elements of the Detailed Plan for urban development at the Lower Msimbazi River Basin.

The results of Charrette № 3 were:

- A comprehensive mapping of potential functions in the Lower Msimbazi River Basin;
- Different options for resettlement at Msimbazi river to allow the development of Msimbazi river basin as a city park were developed;
- Discussion initiated on a resettlement strategy;
- A set of solutions for the key existing and newly planned infrastructure bottlenecks;
- General measures identified to improve the water quality;
- Understanding of the impact of the mangrove and wetlands and the feasibility of revitalization the mangroves and wetland;
- Flood reduction measures identified for the the upper and middle catchment area;
- Required flood protections and mitigations and associated priorities identified in the lower basin;
- An institutional set-up to develop and manage the Msimbazi River Basin.

Charrette № 3 consisted of four working session with six or seven thematic tables. For each table a selected group of stakeholders was invited to join the discussion. At day 1 there were six tables focussing on:

1. City park elements
2. Resilient communities
3. Existing and newly planned infrastructure
4. Ecosystem revitalization
5. Flood Protection
6. Resettlement Options

At day two there were 7 tables focusing on:

1. City park elements
2. Resilient communities
3. City park elements
4. A. Water Quality / B. Security of infrastructure
5. Upper & middle valley measures
6. City Park Operations
7. Resettlement options

Sub-ward leaders, community members of the flood prone Mtaa's in the Lower Msimbazi Basin, and experts were invited to provide their inputs on the tables City Park Elements and Resilient Communities. The other tables hosted a group of experts to discuss a specific issue in detail. To advance the stakeholders design process of the Detailed Plan, Charrette №. 4 is planned for the end of May 2018. At that event the different flood intervention alternatives will be presented and a series of alternative integral plans based on these flood interventions are

presented. The stakeholders are expected to assess the integral alternatives on different criteria, develop arguments on the advantages and disadvantages of each alternative, to present these at a plenary, and come to a prioritisation among the alternatives. The result of that charrette will be used by the consultants to prepare the draft detailed plan, which will be presented during Charrette № 6 at the end of June.

Summary of the Thematic Sessions

City Park Elements with Community leaders input

Day 1 - session 1 with Mtaa Leaders/Chairpersons:

Key interventions mentioned:

- Widening and deepening of Msimbazi river from Jangwani Bridge to Selander bridge
- Raise both Jangwani bridge and Kawawa bridge over Sinza river
- New edges made with a continuous profile of trees and a road/street
- Some locations at the edge get new housing for current inhabitants of flood prone areas
- Raise Busdepot in order that water can flow through underneath
- Cross-river drainage from higher edges to river should be improved
- Raise parts of former Jangwani Playing Grounds
- Msimbazi Bondeni should become a green environment
- The Waste Water Treatment Plant cannot be imagined by many at the projected location, but some also say that it just has to comply to very strict guidelines to fit in the city park environment and rules and regulations on mainly safety are key.

Key programme mentioned: (From North to South):

- Fish ponds
- Mangroves revitalized and extended land inward; more sea water in when sediment gets out
- Wetlands
- School in Hananasif including awareness/cultural centre
- Agriculture just north of Morogor rd: Palm trees
- Casino or commercial function at edge of Sunna.
- Petting zoo at Sunna
- Jangwani Playing Grounds will hold Market place, market hall, sportfields and play grounds in a classic park setting
- Mwinyimkuu will redevelop at the edge Waste collection point, social spaces and an amusement park
- Elements on the redeveloped lands of Bondeni are flower garden, shaded places, lawn and fields and festival stage close to Mtambani



Figure 1: Image of the Sketch Plan for what the participants of session 1 together identified as the desired future integral development of the Lower Basin of the Msimbazi Valley

Day 1 - session 2 with Mtaa Leaders/Chairpersons:

Key interventions mentioned:

- Msimbazi River dredged (wider and deeper) from Kawawa rd to Selander bridge
- Raise Jangwani bridge and lower part of Morogoro road including
- Msimbazi Bondeni area also river training with a dike to protect urban area; urban renewal in current low areas
- A sand trap with commercial sand mining just before Jangwani bridge.
- New reinforced edges along Idrissa, Dossi, Sunna and Hananasif accommodate new buildings (high rise) and also at Charambe (mixed housing in higher density) to accommodate citizens.
- Inclusive new area with housing, market place, waste collection points, a new access road along the edge and trees/green.
- A connecting footpath along the river with crossings over the river and connections to the edges.

Key programme mentioned (From North to South):

- Mangroves and wetlands
- Mixed housing in higher densities at the edges of Charambe and Hananasif
- Footpath along the river with bridges to cross
- Landscaped park with public places to sit shaded; flower garden and classic park north of Morogoro rd
- Playground and football fields at the evicted housing area of Sunna
- Reforested slopes of new edges at Sunna, Idrissi and Dossi
- Park security unit in the central area near Sunna/Hananasif
- New functions at the new made edge at Sunna, Dossi, Idrissi: High rise housing, market place, primary and secondary school, waste collection points
- Large city market place, sportsfields, festival grounds and music stage just south of Morogoro rd. at the
- area known as the former 'Jangwani Playing Fields'
- South of the Jangwani Playing Fields a classic park and market development at the renewed edge of Ilala Kota.
- Playground and sportfields at Jangwani Bondeni replacing the unplanned settlements partly. The other
- part should be regenerated with medium rise building in high density.
- In this area is also space for a commercial entity providing an amusement park



Figure 2: Image of the Sketch Plan for what the participants of session 2 together identified as the desired future integral development of the Lower Basin area of the Msimbazi Valley.

Day 2 - Session 1 with Mtaa Leaders/Chairpersons:

Key interventions mentioned:

- 1st priority for everybody is open up the river: restoration of Msimbazi river (dredge – widen, deepen, clean, maintain)
- What is needed to achieve priority 1:
- Clear plan in deliverables
- Create ownership
- 50% of people want to stay. 50% want to leave
- Replacement to other locations via government plans
- All people in the valley should go to make place for water and park, etc.
- When the flood prone zone is demarcated then
- compensation to all community by potentially moving into new buildings (high rises) in the area
- When that is not wanted financially compensation
- Sustainable is maintain!!!
- Raise Jangwani bridge and make a strong dike of Morogoro rd.

Key programme mentioned (from north to south)

- Mangroves
- Wetlands
- Agriculture (palmtrees)
- Biodigester at former sunna housing location (clean the river)
- Wetland area north of Morogo rd
- Wedding park and sanitation facilities north of Morogo rd.
- Playgrounds and classic park at Jangwani Playing grounds
- Bondeni area Highrises at new edge.
- Market place for international traders at Jangwani rd
- Amusement park
- Waste collection point
- Mbuyuni lower area transformed into flower garden with festival stage
- Football fields just after Kawawa rd bridge down south (new intermediate level edge) at location where houses should be removed.
- Boardwalks and bridges to safely can cross the river
- Retention ponds up stream o Kawawa rd bridge



Figure 3: Image of the Sketch Plan for what the participants of session 1 together identified as the desired future integral development of the Lower Basin area of the Msimbazi Valley.

Day 2 - Session 2 with Mtaa Leaders/Chairpersons:

Key interventions mentioned:

- People need to be safe so:
- Priority #1: widen and deepen the river
- Priority #2: Raise and widen the bridge: make it a one span bridge
- There are stones under the Jangwani Bridge: remove them
- Open up all water channels. Also on both sides of the Jangwani Playing fields
- Raise the terrain of Jangwani Playing Fields
- Train the river at Bondeni: give half the low area to the river; create an new urban area in the other half; with higher densities and proper functions
- New bridges and linkages on either side of the valley need to be made
- Mbuyuni needs to be developed in a high density and well-functioning city neighbourhood
- Drainage from neighbourhoods to the river should be improved

Key programme mentioned (from north to south)

- Mangrove forest revitalized
- New bridge Hananasif to Charambe also for pedestrians
- North of Morogoro rd: lawns, fields, wedding garden, flower garden, music stage and amusement park close to the BRT
- Park functions should be accessible from newly created edges with high rise, market places infrastructure and waste collection points for each ward
- Yangwani Playing Fields are mainly for new sport fields
- Area of Bondeni is a wetland.
- With river interventions at least half of the bondeni area could become safe and medium to higher density housing will cater for the inhabitants that need to go
- Mbuyuni gets housing at a newly protected area between the two rivers: Higher density and high rise, market hall, super market, school, commercial activities.
- At the lower part just south of Kawawa bridge a park can be made at the Mbuyuni side

City Park Elements with Technical Expertise Input

Key interventions mentioned:

- Proper investigation of what is causing blockage/accumulation of water in the area between Kawawa Road (Mkwajuni Bridge), Morogoro Road and Selandar Bridge
- Dredging deeper and wider channels - also in the mangroves
- Introduce more tidal flow
- Raise Jangwani bridge and increase span length
- Where and if possible, leave the lower basin; the lower basin is not suitable for human activities

Key program aspects mentioned:

- In case of resettlement; densification in valley edges is possible but with max 3 storey buildings
- Planned bridge between Muhimbili hospital and Hananasif should connect motorized and un-motorized transport (hence pedestrians and cyclers)
- Muhimbili – Hananasif bridge should have a point where pedestrians and cyclers can go down to the valley, where they can continue on boardwalks



Figure 4: Image of the Sketch Plan for what the participants of session 1 together identified as the desired future integral development of the Lower Basin area of the Msimbazi Valley.



Figure 5: Image of the Sketch Plan for what the participants together identified as the desired future integral development of the Lower Basin area of the Msimbazi Valley

- Boardwalks as main mobility means in the lower basin area between Kawawa Road (Mkwajuni Bridge), Morogoro Road and Selandar Bridge
- From Morogoro road further upstream the boardwalk can change into a path on top of the valley edges
- Valley edges can be established by reshaping the basin valley profile (cut/fill) and by stabilization measures in the edges (soil retaining measures, erosion prevention measures)
- More formal recreation activities should be planned at and around the Jangwani Grounds. This place can be used for sports as well as for events like concerts and fairs. Informal recreation activities can take place in the lower basin area between Kawawa Road (Mkwajuni Bridge), Morogoro Road and Selandar Bridge
- As dredging deeper and wider channels in the lower basin will be one of the main flood mitigation measures, salt/brackish water will be able to flow further into the basin again, which will create better living conditions for the mangroves further upstream again
- Flora-culture as one of the main urban-agriculture activities
- Growing of setaria as cow-food
- Roads with walkways should have trees for shade (canopy roads)
- Mangroves important to maintain if high biodiversity levels are to be pursued in the City Park.

Resilient Communities

The main outcome of the session was to allow the group members within the Charrette to develop different options for resettlement at Msimbazi river to allow the development of Msimbazi river basin as a city park. The options include resettlement of community within the existing settlement by providing densely multi-storey structures; cash compensation; and land and cash compensation. Other outcomes include the need for improving infrastructure and capacity building of the utility and community on the solid waste management and waste water for the affected communities.

The group members had three tasks to work upon. These include discussions on possible options for resettlements of community living in informal settlements; and discussions on the activities that could improve and enhance effective and efficient solid waste and waste water along Msimbazi river and within new areas where people affected by resettlement would be experienced.

The key outputs of the session identification of possible options for resettlement which are: resettlement of community within the existing settlement by providing densely multi-storey structures; cash compensation; and land and cash compensation. Other activities for improving solid waste management within the settlements include to advocate for each Municipality to have its dumping; to advocate that each ward should have its own truck for solid waste; Municipalities should be more responsible for ensuring solid waste are collected; hygiene education and capacity building should be provided to the community; Inco parting by-laws and reinforcement to the defaulters, and finally initiating recycling and compositing programs. The activities for improving waste water includes: the need to advocate for the utility to expand the waste services to more new areas; the need to consider innovative sanitation solutions such as the DEWAT in areas where utility's sewerage services is unavailable. Other activities on waste water include the need to consider community sensitisation and waste water re-use.

Resettlement options

Day 1 – Defining the Resettlement Strategy

During day 1 of Charrette N03 the objective was to discuss the principles for resettlement and compensation and to preliminary define the steps towards the implementation of a resettlement strategy. The group confirmed that the principle for resettlement is that people should be kept out of harms-way. The group stressed the importance of the question “ how to define vulnerability, i.e. when is somebody in harms-way”?, but did not reach consensus on the matter.

The group discussed a first set-up of an Resettlement strategy defining the different type of Project Affect Persons (PAPs) and what their respective compensation should be. Subsequently, the steps towards implementation of the resettlement strategy were defined:

1. Identification of PAPS & discussing the possibilities of the government funding for the resettlement strategy.
2. Preparation of a Resettlement Action Plan (RAP), and;
3. Finally the implementation of the RAP
4. Enforcement of RAP, including:
 - a. Sensitization/awareness rising
 - b. Marking boundaries(with concrete and sign poles)
 - c. Changing and harmonising bylaws.

In identifying the PAPs the group stressed that there will be an interaction with the impact of the flood reduction measures. Measures taken the upper, middle, and lower basin will affect the inundation period and depths of flood events and hence the number of PAPs. The presentation of the flood modelling results in the next charrette is, therefore, considered as an important milestone.

Day 2 – Continuing the Discussion

A small breakout group of social and mapping specialists worked together on Day 2 to deepen the technical discussion of resettlement issues. The group first discussed lessons learned from past resettlement and demolition exercises and why these have been ineffective at finding a lasting solution for vulnerable households in the valley. Several factors were pointed out, including lack of government budget for enforcement to keep people from returning once evicted, and lack of coordination between municipal and national institutions in carrying out resettlement actions (e.g. identification and tracking of affected persons). The group recommended that a future resettlement strategy for Msimbazi be done carefully in a phased, organized and coordinated approach, starting with the most at-risk households based on the results of ongoing flood modelling and mapping exercises. Recent maps that pinpoint at-risk settlements were used during the session, but it was agreed that more needs to be done in order to define the most vulnerable settlements that are unlikely to be spared flooding regardless of interventions (which will depend on flood modelling), and quantify an approximate number of households.

The group’s main task was to further develop stakeholder inputs from the previous workshops in order to deepen the analysis of resettlement options and strategies to better understand the feasibility, eligibility, and considerations for various options (including cash compensation, in situ resettlement, land-for-land compensation, and livelihood support). The team did not reach a conclusion from the session given time constraints, but agreed to schedule a working session on May 7th so that the analysis and strategies can be presented back to stakeholders for dis-

cussion in the next charrette, as well as later discussions with higher levels of government and politicians. As a whole, the result of the technical working group on resettlement is anticipated to form the basis for an overall resettlement framework for the Msimbazi basin that will be agreed among stakeholders and guide the eventual preparation of a Resettlement Action Plan.

Existing and Newly planned Infrastructure & Industries

This session had a threefold objective in evaluating the impact of existing and newly planned infrastructure on floods. At first important existing and planned infrastructure in the Msimbazi lower basin was reviewed.

Thereafter the group evaluated the impact of planned and important existing infrastructures on floods. Finally, alternative sites for Waste Water Treatment Plant (WWTP) were discussed.

Overview of newly-planned infrastructure

Hananasif bridge

The bridge will improve mobility since city centre it currently only has few access point. The City Park design should consider the bridge so as people who are coming and going can have easy access to the Park. It was suggested, that this can be achieved by establishing park and ride facilities in both ends of the bridge.

The bridge design was discussed as it has to be reviewed to accommodate the park. Firstly, the bridge needs to be high as the park as some park facilities could be underneath. Also it needs to consider non-motorised mobility.

The New Selander Bridge will be an alternative route to the northern parts of the City. It is considered to not have a significant impact to the current flood levels in the Msimbazi valley

Jangwani Waste Water Treatment Plant

DAWASA has already conducted a feasibility study for a possibility of a WWTP at the Jangwani area, this preliminary study concluded with an assurance that the chosen location is good for the WWTP. Some of the key factors considered by the study include the availability of free land, no resettlement or compensation issues. Another important factor considered was the area being at a lower level to allow free gravity flow for most of different City Areas that will be served by the facility. Important note was given that the financial time line for the WWTP project is overdue, more delays without considering the loan rescheduling could jeopardize the project implementation.

In other cities around the World and specific in some of the Korea cities they have managed to design, construct and operate underground WWTP within the City parks. It was agreed that if alternative sites can be earmarked in time DAWASA are willing to relocate. A serious review of the WWTP location was suggested, as its current location is not preferred for several reasons:

- Could become another bottleneck for the flood reduction efforts.
- It might be incompatible with the city park design
- Blockage of water could make floods in other areas more severe.
- It was decided that the consultant that will be hired by WWTP project for detail design should work closely with Ecorys. DAWASA will be in contact with Ecorys team with other flood modelling consultants to assist in modelling the optimal WWTP location for compatibility with the city park.

Overview Existing Infrastructure

For the Selander Bridge, the level of the Bridge is considered adequate as the high tidal levels do not (yet) pose an issue. On the other hand participants recommend, that the existing bridge columns and banks, which are always impounded by floods from, the river are reinforced. As a resolution, more openings or a straight aligned channel were suggested to allow smooth passage of Msimbazi water along Alli Hassan Mwinyi Road.

Regarding the Morogoro road and Jangwani bridge the issue is that the river is full of sediments and solid waste, for which openings of the bridges get blocked. In events of rains this result that the Jangwani bridge and Morogoro Road get overtopped by the water flow. To resolve this issue several suggestions were made:

- Dredging
- Lift up the Bridge and Road level to allow smooth flow of water at the Valley – if possible construct a fly over for the entire Jangwani stretch.
- Clean the river to removing solid waste
- Clean up all river tributaries and make study on volume of water that flows in Msimbazi
- Introduce and enforce proper Waste Management Programme for the entire catchment.
- Reinforcement of the river bank
- Widening of the river to reduce the sediment velocity

The mangroves in front of Selander Bridge are cluttered with sediments and solid. On the one hand this hinders the water outflow into sea, causing flooding upstream. On the other this blocks the salt water intrusion from the ocean, for which the mangrove forest is slowly declining. To resolve these issues it was suggested to open up the river channel by professional mangrove management cleaning and to remove some of the mangroves, furthermore, the sediments along the river channel should be cleared to allow river water to flow towards the sea outlet and also allow more sea water to flow through the valley during high tide to boost more mangrove growth in the valley. Finally, one could dredge to the level of the original river bed removing the amount of sediments into the river.

The Kigogo Yanga road blocks the flow of water from Ilala kota to Msimbazi river, as the road was constructed without adequate openings. During rainfall the road becomes a bottleneck in the river, causing the water to be retained at the Jangwani area, increasing the flooding in the area. To resolve it was suggested to increase the size and number of bridges and culverts, increasing the water flow.

Discussion on Alternative Sites For WWTP Three additional alternative sites for the Waste Water Treatment Plant were suggested to the present suggested by the DAWASA feasibility study. These sites are Suna closer/along the Jangwani Bridge, Buguruni near the existing DAWASA's Oxidation ponds and at Jangwani behind BRT depot. There is some around placing the WWTP in area behind BRT depot, as it will require a significant resettlement effort.

Mobility Security of Functioning Infrastructure

This session had the objective to discuss the solutions to ensure mobility security for the existing infrastructure, which steps would need to be taken, and who would be responsible for this.

In cases of heavy rainfall, mobility infrastructure becomes flood impeding the traffic flow. To resolve this issue a range of measures were proposed by the participants for the existing Bridges and the Dart station.

To address flooding of the DART station and the bridges in the Msimbazi Valley, the following measures were proposed. The participants also indicated who would be responsible to implement these measures,.

Activity	Responsible Institution
• River - widening/training/ dredging	TANROADS
• Retention Ponds/ Dams	MoWI, WRBWBO
• Channelization	TANROADS
• Sand mining / sand traps	Municipalities, WRBWBO and Private Sector
• Hananasif –Muhimbili e.g. design review and compatibility and park ride Jangwani bridge raising, sedimentation	PO-RALG-DART-TARURA and LGA
• removal and bank stabilization & Vegetation	TANROADS
• Upstream Reforestation	TFS & LGA
• Selander bridge opening new river	TANROADS
• channel to the ocean	TANROADS
• Msimbazi Solid waste Management Programme	LGAs, NGOs (CCI, Nipe Fagio etc)

Water Quality

This session had the objective to discuss the key source of water pollution, what options there are to resolve these issues, and which steps need to be taken.

The sources of water pollution at Msimbazi basin was classified into different levels; Domestic, commercial and industrial setting. An overview of the pollution sources was discussed:

- Domestic sanitation including grey water and black water
- Commercial setting like Abattoirs e.g. Vingunguti
- Leachate from old landfills (Vingunguti and Tabata)
- Industrial (Chemical, textile, breweries, edible oil, soap industries and food industries)
- Transportation/run off e.g. Fuelling, Garage and petrol station
- Urban agriculture e.g. chemical fertilizers pesticides
- Improper Solid waste management both domestic and industrial
- E-wastes like electrical devices computers and mobile phone

To address these issues the following measures were proposed by the participants:

- Create Community awareness on solid waste management and wastewater management.
- Construct a WWTP e.g. bioreactors and incineration and DEWATS
- Establish recycling industries e.g. energy plant and compost manures
- Law enforcement by the municipality, NEMC WRBWBO and community police and ward environmental committee
- Construct and rehabilitate the sewerage drainage systems.
- Control of urban agriculture along the basin using extension officers

- Develop & improve solid waste management system items of collection, transportation and disposal.
- Install a bio reactors for the Vingunguti Abattoir.

The following steps were formalized to realize this set of measures:

- A multi sectoral committee is established to ensure, monitoring, inspection, law enforcement, etc. this will include the engagement of i.a. PO, VP, NEMC, WRBW, LGAS, TFS, and TBS and should strive for clear task division between all the respective entities and communities.
- The coverage of the DAWASA WWTP is extended to cover the valley;
- CBOs, NGOs, and the Media collaborate to establish sustainable community awareness campaign supported by the respective LGA on the site.
- Compliance of industries with effluent discharge standards
- Vingunguti e.g Abattoirs-Illala Municipal council to develop bio reactors to treat waste

Ecosystem Revitalization

Discussion on this topic aimed at understanding the impact of the mangrove and wetlands, feasibility for revitalization and (measure) for mangrove/wetland management on the river system and floods. The discussion concluded that it is possible and feasible to revitalise the Msimbazi ecosystem. In order to have focused discussion and outcome, the discussion was focused in four key aspects as presented in the next sub sections.

Functionalities of the Ecosystems

As part of the Msimbazi ecosystem, the mangroves and wetlands plays many positive impacts. While these positive impacts are not necessary reducing floods, they add value for other functions of the ecosystem. The recognised key functions of Mangroves are; water pollution detoxifier in the river system, trapping of solid waste, breeding ground for different species birds, animals and marine creatures, source of traditional/ herbal medicines, source of energy and animal feed, hosting of anthropogenic activities such as tourism and fishing. Further, the mangroves act as wind breaker of the strong coastline winds.

Understanding of the Impact of the Mangroves on the River System

During discussion it became obvious to the team that mangrove contribute to magnitude of floods to the lower part of Msimbazi valley/catchment. This is apparently so due to presence of finger roots of the mangroves which provide the mangrove with high ability of trapping solid waste. The trapped solid waste traps sand, which results in the sedimentation of the mangroves and eventually reducing the river channel. this subsequently worsening the floods.

Feasibility of Revitalization or Preserving the Wetlands and Mangroves

It was noted that mangroves in the Msimbanzi basin are currently more protected than the wetland. Feasibility of revitalizing/preserving the mangroves is easier than that of wetland. Most wetlands in the Msimbazi are currently not managed regardless the fact that the area was gazetted in 2011. It is however worth noting that both wetlands and mangroves can be revitalized and preserved. It was clear during the discussion, that in order to revitalise them it will require significant effort on several aspects which includes:

- Wetland/mangrove protection by enforcement of respective laws;
- Expanding the mangrove/wetland coverage though reforestation and restoration respectively;

- Research and study to understand mangrove/wetland requirement and challenges;
- Awareness creation on importance of mangrove/wetland in the Msimbazi including demarcating their boundaries and;
- Implementing solid waste clean-up programs in the entire catchment area, including the mangrove and wetlands.

Developing Options for Mangrove Revitalization and Management

The current situation shows that mangroves are heavily affected by sedimentation. It was noted that some of the mangrove are almost submerged by sand. Like discussed above, mangrove have several benefits. Therefore, three ways of revitalising them and increasing their potential were recommended:

- Regular cleaning and removal of solid waste in the catchment;
- Increasing the water/waste outflow from the catchment by introducing relief culverts alongside the Selander Bridge;
- Design of eco-tourism to commercialise the mangrove.

Upper and Middle Valley Measures

The objective of the discussion on this session was to identify measures which if implemented in the upper and middle catchment of the Msimbazi catchment will significantly help on reduction of flood in the lower part of Msimbazi basin. The discussion concluded that there exist measures if implemented can significantly reduce the floods both in the middle and lower part. Such measures are presented and discussed in the following sections.

Measures in the Upper and Middle Catchment Relevant for Flood Reduction in the Lower Basin

A number of measures were identified during discussion. Most of these measures aimed at runoff retention and sediment reduction from the river system. In fact, sediment and runoff amount was termed to be the major causes of the floods observed in the lower part of Msimbazi valley. Thus, any measure which will retain runoff and prevent/reduce sediment reaching the lower basin will significantly reduce floods.

From this understanding, measures for sediment reduction were suggested to include Reforestation, enforcement of the 60 meters buffer zones for the river system, River bank stabilization, and installation of sand traps systems. Alternatively, the runoff reduction measures were identified to include installation of retention reservoirs, revival of natural retention wetlands and formulation of by laws that will ensure inclusion of rain water harvesting system from roof tops.

Relevant Locations for Potential Effective Measures

With identified measure and by making use of both the flood risk map and the Google map, the team was able to locate the potential area where the proposed measures can be implemented. It is worth noting however that detailed design stage may recommend more appropriate locations for these measures. As a desk decision, the locations were proposed as follows:

- The locations for the sediment reduction measures was suggested to have reforestation at Pugu and Kazimzumbwi forests and in areas which have bare land and loose soils particularly along the river banks.
- The enforcement of the 60 meter buffer zone law was suggest for the entire river system.
- Sand traps and river bank stabilization were recommended around Sukita and Vin-

gunguti areas respectively

- For runoff reduction measures it was suggested to have retention reservoir at the Sukita area.
- Also the revival of the natural wetlands along the river system such as the Vingunguti wetland was suggested as it has currently been eliminated by turning the wetlands into a dump area. It was noted that there are many wetlands which have been filled up by either land reclamation or waste dumping.
- The rainwater harvesting by law should include every house located in the catchment area.

Timing of Measures

The timing will range from short term/Immediately to long term depending on the nature of the proposed measure and the urgency of the flood situation in the catchment. In fact the detailed design of each measure will determine the duration it requires to be implemented.

Detailing the Steps to Implementation

Given the suggested measures, it is obvious that several steps will need to be followed. Based on the foregoing discussion, the measures require the formulation of new bylaws (RWH from roof top), enforcement of existing laws (NEMC 60 meters buffer zone), programs design (e.g. reforestation), and detail design of project components (e.g. retention reservoir, sand trap, river bank stabilization etc.). Also, for the implementation to be successful a solid management system is required. The suggest management structure is presented in the next sub section.

Insights in Institutional Responsibilities

The suggested measures are cross cutting and hence they have touched a range of authorities. Definitely these authorities will need to be involved and the bylaws/laws governing them will need to be enforced for the measures to work out successfully. The authorities include NEMC, which originated the EMA act 2006. The EMA is the custodian of the 60 meters buffer zones for Tanzania river systems. As Tanzania is managed through river basins system (In case of the Msimbazi, the Wami – Ruvu) it is governed by the water resources management act (WRMA 2006). So implementation of any measure will need to be approved by according to this act. Reforestation will need to be done under Tanzania Forest Service who are governed by the 2002 Act. Again, because the Msimbazi is located in town and it goes across several local government authorities (LGAs), then the formulation of bylaws will need to involve all the LGAs. And for the land matters, the Ministry of land and human settlement will be need to be involved.

Flood Protection

During this session the flooding issues have been discussed following a vulnerability assessment, prioritisation of protection requirements and associated identification of flood protection and mitigation measures.

Qualitative Assessment of Vulnerability to Flooding in the Lower Basin

In the detailed plan are the exposures were roughly divided into i) infrastructure and ii) settlements. A vulnerability screening has been performed by classifying the various infrastructures and settlements with a low, medium or high vulnerability.

Morogoro Road, Jangwani Road and the bridges crossing the Msimbazi River and its tributaries are the most vulnerable infrastructure assets. Of the bridges Jangwani Bridge gets flooded

most frequently, and clearly is the most vulnerable infrastructure asset within the detailed plan area, leading to the worst mobility disruptions.

In the detailed plan area the worst hit settlements are located in the sub-wards Msimbazi Bondeni, Mwinyimkuu, Ilala Kota, Mtambani and Mbuyuni (mainly the subwards located between Morogoro Road and Kawawa Road), of which Msimbazi Bondeni has the highest number of households that get flooded.

Prioritization of protection/mitigation requirements and associated identification of flood protection and mitigation measures:

1. Widening and deepening of river channels in the lower basin between Selandar Bridge, Morogoro Road and Kawawa Road (Mkwajuni Bridge). This to increase discharge of backwater into the ocean.
2. Raising deck level and increasing span length of Jangwani Bridge. This to reduce backing of water by Morogoro Road/ Jangwani Bridge
3. Relocate high vulnerability settlements between Morogoro Road and Kawawa Road to higher, safer places within the sub-ward or neighboring sub-wards (densification of urban fabric)
4. OR re-plan and re-develop this area rigorously, including flood protection measures
5. Diversions of Msimbazi River channels. This to increase discharge capacity.
6. Protection of BRT depot
7. Relocation of BRT depot

All participants commonly agreed that in the lower basin (detailed plan area) the flood issues should be resolved with a downstream-to-upstream approach. This basically means that measures will be taken from downstream to upstream sequentially. This is the only way to structurally, integrally increase the conveyance capacity in the lower part of the Msimbazi River catchment area.

Effect of the planned WWTP on flooding in the detailed plan is uncertain/ not known, but needs to be tested through flood modelling.

Resettlement Issue

During this session it was emphasized that in the area between Morogoro Road and Kawawa Road there are planned and unplanned areas. According to DCC the people living in the unplanned areas have the right to live at those places, whereas in the planned areas the dwellers do not have the right to inhabit the place.

When re-settlement is considered, the distinction between planned and unplanned areas is key in determining an appropriate approach and plan for re-settlement.

Flood Modelling Runs for Charrette No 4

Between charrette 3 and charrette 4 modelling runs should be performed. The identification of measures as described above should be used as a basis to incorporate interventions in the hydraulic digital models. The measures should be tested sequentially from downstream to upstream.

City Park Operations

The gazetted area in the lower Msimbazi river catchment area will need an integrated de-

velopment and operation and maintenance of the area. Integrated in the sense that different functions need to be developed and managed in a coherent manner based on the Strategic Management Framework and Detailed Plan. This coherency will be almost impossible to achieve when different functions (flood protection, mangrove and wetland revitalization, leisure, housing etc.) would be developed by the various individual stakeholders (3 municipalities, Ministries, DART etc.). For this reason, it is important that these planned infrastructure or facilities are coordinated, developed and managed by one institution or unit. During the second day of Charrette N03 stakeholders discussed and outlined a potential institutional structure which could be established in the short term (next year) and medium term (within 2-3 years) at table 6.

Institutional Structure

Three potential models were discussed by the participants:

- Public area development agency model (a non-profit independent organization), which directly funded by budget line of a respective and with an income from concession fees. It is essential that the agency has an independent status and independent own multi-annual budget (for sustainability reasons). This public agency can have PPP arrangements (concessions, land lease) with private parties which are responsible for development and operation of facilities. In many countries publicly owned and operated ports are examples of this model.
- Private area development company (for profit). Such a company can have equity participation of private investors and would not have to comply with public procurement law.
- Public-private area development (joint) venture for land development with equity participation of government and private investors. This type of model has the advantage that the involved public and private parties can bring in equity or land.

Due to various reasons (i.a. land ownership and coordination mandate) the first model was considered as most favourable by the participants.

Subsequently the group discussed how this agency should look like and how it would be set-up. Under a respective ministry an independent professional authority will be initiated to coordinate and manage activities in the valley (the Msimbazi Development Authority). This authority will report and be supervised by a steering committee consisting of representative of all the relevant ministries and the presidents and vice presidents office. A Technical advisory committee, consisting of the relevant agencies, authorities and local government parties would further be established for consultation. The Figure on the right gives an overview of the organizational chart as discussed by the participants.

The Steering Committee would be responsible to coordinate the management of the larger Msimbazi catchment area with the different governmental entities. Under the supervision of the steering committee, The Authority would be responsible to develop and manage the special planned gazetted area.

On the one hand this authority would be to coordinate the activities of the different ministries and agencies represented in the steering and technical advisory committee on the other it will have the mandate to:

- Flood protection/mitigation planning and preparation, implementation and maintenance (in lower, middle and upper basin area);

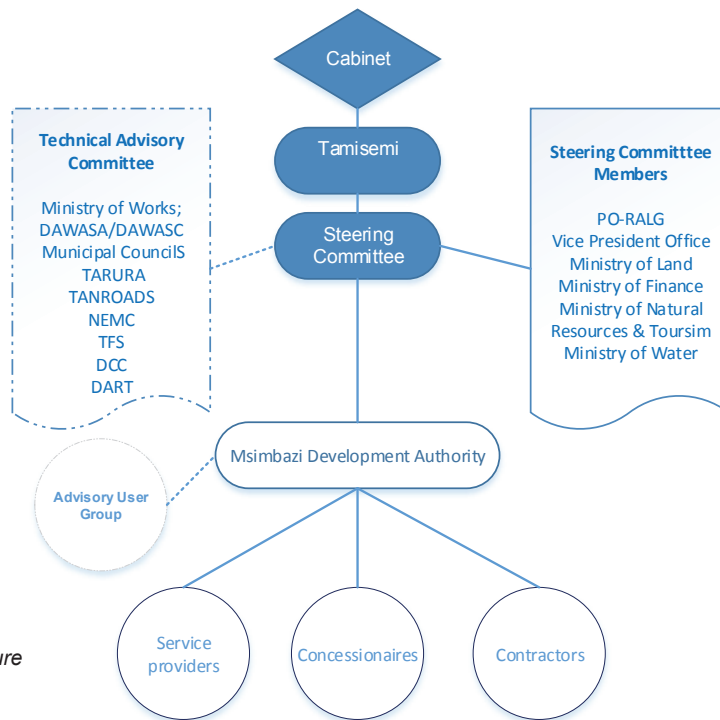


Figure 6: Organisational structure for management of the Msimbazi

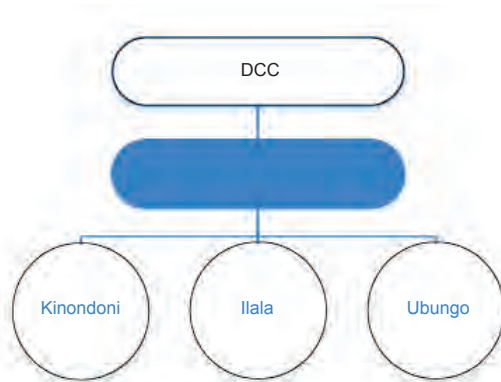


Figure 7: Structure of PIU

- Implementation of the detailed plan for the lower basin gazetted area;
- Management & maintenance of the gazetted area;
- Planning of the gazetted area;
- Develop and sustainable financial model for development and management of the gazette area (including attraction of investors/ concessionaires).

It is foreseen these activities will be conducted by engaging with service providers (e.g. for maintenance, security, legislation enforcement services), concessionaires (e.g. for commercial activities, real-estate development), and contractors (e.g. for works, maintenance).

Steps towards Implementation

In the short run it was proposed to start with setting up a PIU. This is quicker and easier to establish compared to the Development Authority, as this first has to go through and comply with national procedures to establish such an instruments. This procedure, the establishment and staffing of the Development Authority as instrument will require at least 2-3 years. Therefore, in the short run a solution is needed to coordinate the implementation of the most urgent flood reduction measures issues to. For this reason, it is proposed to at first establish a project implementation unit (PIU) to coordinate and contract these works. Logically, this PIU would be hosted by the Dar es Salaam City council and contains representatives of all three municipalities to ensure efforts are streamlined.

Once the Development Authority will become in to place, the PIU would be integrated in the Authority to ensure continuity in the management and development of the area.

Conditions and Risks

Participants of table 6 identified the following conditions before Development authority could be successfully established and implemented:

- There is a clear high level champion is needed (Minister, other);
- Legal instrument for the authority is in place;
- Flood risks are reduced;
- People are resettled;
- Boundaries of the Gazetted area are implemented;
- PIU staff should have sufficient capacity to be transferred to the Authority.

Subsequently the following risks were identified for the PIU or Development Authority (DA):

- DCC might not allow the PIU to transform to a Development Authority;
- Budget allocated for the DA (or PIU) might be too low. In order to mitigate this risk, a proper feasibility study should be undertaken before the establishment of the DA.
- The financial viability and sustainability of some concessionaires (facilities such as the market place, leisure or sports) might be insufficient. In order to mitigate this risk, feasibility studies should be arranged by PIU or DA before approval of development of specific facilities.
- A large flood event occurs which damages some functions significantly.
- Insufficient capacity in PIU or DA to prepare and implement the contractual arrangements with the concessionaires. In order to mitigate professional staff is attracted and capacity building included in the planning.

DESIGN CHARRETTE № 4

Msimbazi Design Charrette №4
12 & 13 June 2018
Protea Courtyard Hotel Dar es Salaam

Outcomes of Charrette 4

Charrette 4 was implemented during a two day session at 12 and 13 June 2018. The objective of the sessions was for the stakeholders to comprehend the flood modelling measures and results and understanding the three integral Alternatives for the Msimbazi Lower Basin area. Therefore a series of presentations were given to bring all participants at the same information level and to explain the backgrounds of the flood modelling, the results and the choices that have been made to come to the three alternatives as input material.

Results of Day 1

Agenda of Day 1

1. Welcome, Introduction & Opening words
2. Update on the charrette process (special attention for three themes: resettlement, institutional, boundary)
3. Presentation Flood Modelling Results & Principles for reducing Flood Risk
Tea break
4. Presentation Alternatives and Q&A
Lunch
5. Table sessions: Understanding Alternatives and scoring on Criteria
 - a. Carrousel round 1
 - b. Carrousel round 2
Tea break
 - c. Carrousel round 3
6. Review and compare Ranking of Alternatives by each group

Flood Modelling results

The presented flood modelling results, based on the modelled event of heavy rain fall and floods of October 2017 (categorized as a once every 10 year event) gave the following main conclusions:

- Measures tested gained substantial reduction in flood hazards
- Interventions A, B, C and E are recommended to be prioritised (A: dredging - deepening and widening - river between Selander bridge and Jangwani Bridge; B: Raising and widening Jangwani Bridge; C: dredging -widening – the river between Jangwani bridge and the confluence with the Kibangu river; E: Culverts under Morogoro road at Jangwani Playgrounds)
- Some areas remain dry during the entire event
- But.. very difficult to keep dry feet everywhere during the entire flood event
- However, the tested flood risk reduction measures provide the potential for further spatial development of the Lower Basin

After a round of Q&A it was concluded that these outcomes are accepted and could be taken as base for the further discussion on integral spatial alternatives for the plan of the Lower Msimbazi Basin area.

Three Alternatives

After the presentations in the morning, the alternatives were looked at in more detail in small groups. Each group had 30 minutes to discuss one alternative and rank it via the multi-criteria list at a summary sheet. After three rounds all groups had seen all three alternatives in more detail and had gathered insight in aspects on technique, spatial division and layout, amount and areas of functions, etc.

The groups were then asked to have another look at their scores and notes per alternative and discuss which one was ranked favourite and why. This appeared rather difficult still in most groups. Some extra time was added for this and presentation of the group results were moved to the start of day 2.

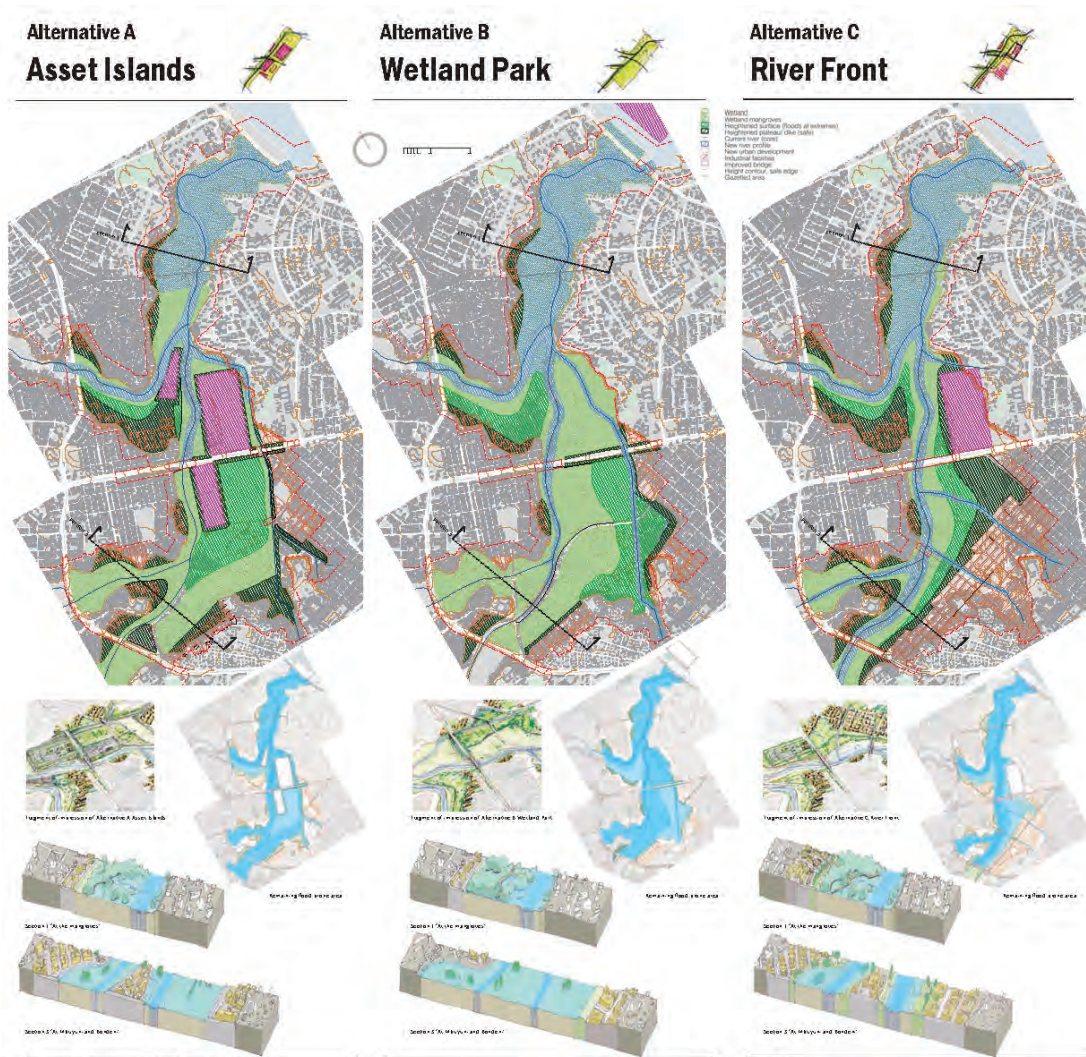


Figure 8: Three Alternatives

Results of the Group Rankings of the Three Alternatives

Agenda of Day 2

1. Welcome
2. Presentation per group of Group Ranking, main Criteria & Arguments for preferred

alternative

3. Initial Result of all sessions gives direction for Preferred concept for the Detailed Plan
Tea break
4. Group work on adjusted and added elements to the preferred alternative
Lunch
5. Presentation of groups on their list of additions on the preferred alternative
6. Definition of the Concept for the Detailed Plan and list of projects/elements to be deepened
7. Groupwork on projects/elements and detailing aspects
8. Summaries by each group on their recommendations on detailing aspects
9. Next steps
10. Group photo and closure

After opening day 2 with the presentations by each group on the scores on the criteria and their group discussion on arguments, the following result of preferred alternative were as follows:

Group 1: ex aequo Alternative B / Alternative C Group 2: Alternative C

Group 3: Alternative B Group 4: Alternative B Group 5: Alternative C Group 6: Alternative B

What are the Implications on Settlements and the Need for Urban Development Areas

This ranking and sometimes passionate plea for favouring one alternative over the other resulted in the need for a plenary discussion on why to choose B over C or vice versa. One of the main reasons appeared to be the aspect of need for resettlement. During the discussion it came to light that not everybody understood the implications of the interventions to prevent areas from flood. Since the flood model shows the outcome that in the lower parts of the valley still flood can be expected and should be incorporated in the plans for the future, it is necessary to relocate all those living in these areas. There is no alternative that can prevent from that. The differences in the alternatives are the location of measures and areas that are going to be raised to create new edges with safe ground levels for new urban development. Also the amount of new urban development proposed in the alternatives needed another round of clarification. Some of the alternatives mainly cater for resettlement locations for households in the current unsafe areas, other alternatives had a much higher number of potential dwellings in which also new population could be accommodated. By discussing this in more detail and showing the map overlays of the various alternatives with the current situation and the marks from the Rumani Huria surveys all participants could see that relocation is a need in every alternative and can't be avoided and by creating safe areas by raising ground levels in a kind of terraces also those located in the new safe areas need to be relocated (at least during the works and development of new housing).

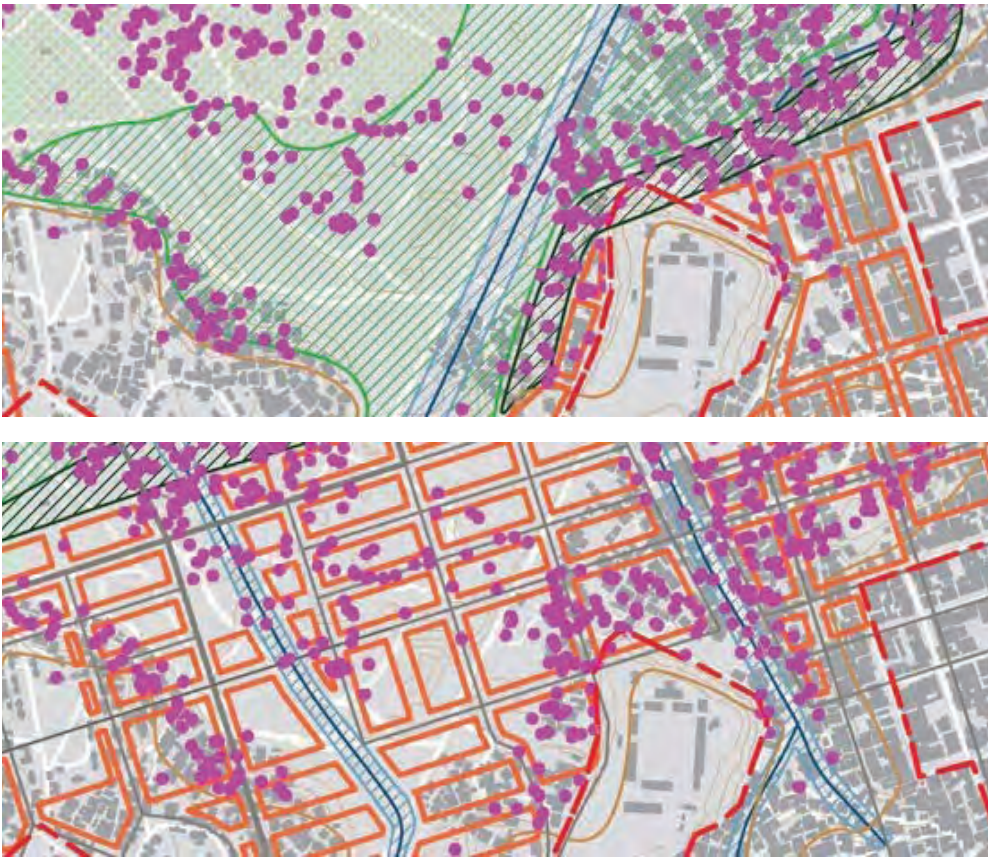


Figure 9: Two fragments of Alternative B (above) and C (below) with existing buildings (grey), plan contours (three green colours for levels of new terraces; orange for new urban development blocks) and purple dots for where Rumani Huria have noted flood effects in the past by inhabitants. In the top image all households marked by purple dots need to be relocated because of continuation of flood risks in the future. In the bottom one the same area is raised integrally to create a safe new urban area, but therefore the households in the purple dots also have to be relocated, although when new housing is realized they could return back to the same area because housing is provided in this alternative.

Adjust and add to Alternative B

A second round of group work was executed after this clarifying discussion. This time with the objective to take Alternative B as base model and discuss where, how and why urban functions could be added to this alternative. Mainly looking at Alternative C for this, but elements of Alternative A (Asset Islands) that would make sense to the group could be introduced to the preferred Alternative as well.

The results of the groups were reported at the start of the afternoon session. While each group presented their additions and altering of the Alternative B Wetland Park model notes were taken by the facilitating team and a concluding sketch was made of what the Concept for the Detailed Plan for the Lower Msimbazi Basin Area should be according to the insights of the groups. The participants were asked if the sketch and the explanation represent what they expect the lower basin to be in the future. This was confirmed with a few, but key, notes:

1. The location of the Waste Water Treatment Plant should further be studied on effects on its surroundings and discussed with responsible parties and weigh it against alternative location at the shore.
2. Dart Bus depot seems not feasible in its current position in the valley. Alternatives should be studied and discussed with responsible parties.

3. The infill, planning guidelines, inclusion of resettlement and identity of the urban development areas within the plan should be deepened and clarified.
4. Technical details on river dredging, maintenance and management to sustain the flood control solutions have to be elaborated.
5. Emphasizing the Lower basin originates from its blue and green qualities a detailed plan on rehabilitation of Mangroves and wetland environment need to be made.
6. The institutional arrangements towards consistent implementation of the developed Detailed Plan must be set-up.

In the last session of this Charrette 4 the defined fields for elaboration were worked on by expertise groups. The fresh result of our Concept for the Detailed Plan was now taken as base for all groups to detail their projects/elements/fields of focus. All participants choose the subject closest to their profession and knowledge to contribute to.

Result Concept for Detailed Plan

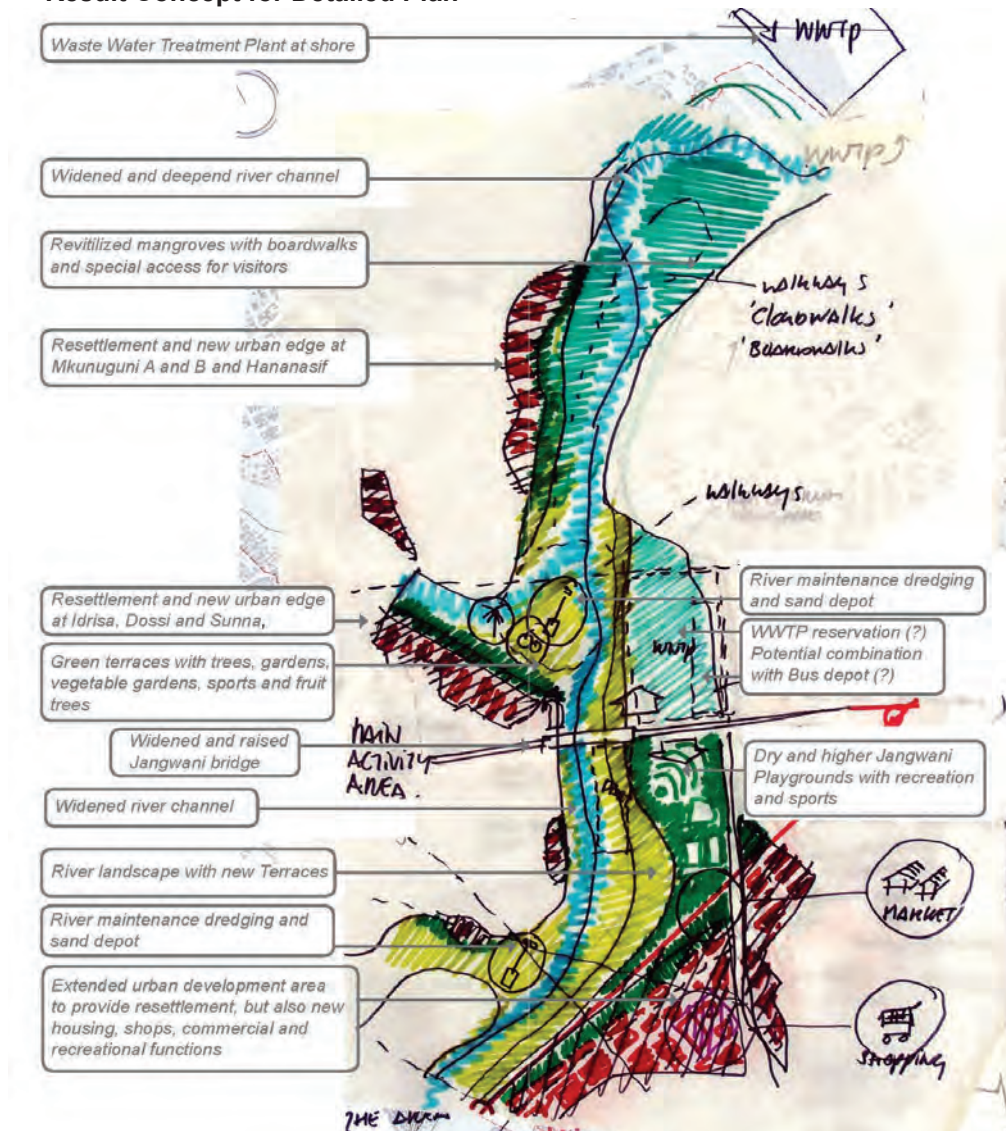


Figure 10: Sketch of the agreed result Concept for the Detailed Plan Lower Msimbazi Basin area, with various discussion options and aspects to be detailed and deepened in coming stage, 13th of June 2018

Results of the first detailing of Project/elements

(Group 1) Waste Water Treatment Plant

The team on this specific topic looked into more detail into two locations:

- a) North of Morogoro rd. between the river and the Muhimbili hospital
- b) North of Alli Hassan Mwinyi rd at the shore

a) North of Morogoro Road between the river and the Muhimbili hospital

The original proposed site for the facility was picked just a little bit more towards the west, closure to the river. By moving it closer to the existing eastern ridge of the valley the facility can be put a little bit more elevated and has to be protected only on two sides (west and south) instead of all around the installation as in the original plan presented by DAWASA.

The disadvantages of the location are also there. It is close to the hospital and a very dense area of Kariago; smell and environmental risks are in close vicinity of many people and facilities. Another negative point is its position to be either low elevated and flood prone or higher elevated with need for pumping installations to pump the sewer-inlets into the facility. If not a 100% safe flood might cause the plant costly damage and spoil the environmental qualities and uses of the wetland and mangroves down stream of this location. Cleaning both the facility and the area might be costly too. This option of the WWTP location is also located on potential expensive land (when made safe and protected from floods) in the heart of the city.



Figure 11: Two Waste Water Treatment Plant Options: Left option a) at Morogoro rd; Right option b) at the shore.

b) North of Alli Hassan Mwinyi Road at the shore

The location at the shore is at the lowest point of its surroundings. All sewer-outlet into the facility can be made by natural gradient. Although reclamation is needed, the foreshore of the bay is very shallow, therefore this implementation cost might be much lower than the extra costs on operation difficulties of location a). The surrounding shores of the bay are indeed on either occupied, but in terms of numbers this location causes an effect on a much smaller amount

of people. In case of a system failure, uncalculated flood or alike, pollution of the facility to its surroundings is wasted away much quicker because of its location in the tidal ocean system. The project can be combined to seek cost and construction benefits with the proposed new Selander bridge. Between the reclaimed land for the facility and the existing shores a subside sea climate will be a potential place for extension of the mangrove eco system from the other side of Alli Hassan Mwinyi rd. Furthermore the off shore reef breaks the waves so extreme weather doesn't have much effect on this bay.

Disadvantages are also to be mentioned for this location. The technology of building a reclaimed land facility like this is not available in Tanzania yet. The effects on all environmental aspects of the ocean ecosystem need to be studied and excluded from mayor risks to both the facility as the natural habitats. The installation will have effect on the natural beauty and open view on the ocean.

Conclusion by the team was that option a) has more effect on the Msimbazi Lower basin area, the quality of the park and the impact on the project and its investments and operations. Therefore it has been advised to further engage with DAWASA and DAWASCO on the options and there effects and see if a further scoping study on all effects of both locations can give closure on the decision of the best suitable location of a Waste Water Treatment Plant facility.

(Group 2) Dart Bus Depot

The specific topic of the existing Dart Bus depot in the Lower Msimbazi Basin area was discussed with representatives of DART, TANROADS, and DCC at a working group table. The focus of the discussion was on options for keeping the Jangwani depot where it is, or where it could shift if it's relocated.

These are the options we discussed:

Option 1:

Stay in Jangwani and deal with flooding through operations, meaning shift buses out when there is a flood risk. The hope is that future drainage improvements will reduce floods but would have to deal with flooding for at least three years.

Option 2:

Stay in Jangwani and add flood control measures such as a dike/walls, pumping facilities, ramps for the buses to enter, etc.

For Option 1 and 2, we discussed that DAWASA's proposed Jangwani WWTP would increase the depth and duration of flooding at the current depot area according to the flood model, so this would need to be taken into account in any protective measures.

Option 3:

Remain in Jangwani temporarily, and shift Phase 1 buses to a new location. The space could then be used for public parking, which is especially necessary if public park facilities are improved in the area as well as provide daytime parking for BRT passengers (this could provide a revenue source for park operations), and the current office could be used for park operations, environmental education, etc.

Alternatively, the whole facility could be demolished for expanded green space but this could be viewed as a waste of funds. There was an argument as to why the buses should move if the

space would still be used for other purposes, but the counterargument is that the flood risk to the buses is financially much higher than using the area as a regular parking lot.

Now within option 3, we discussed three possibilities of places within the Phase 1 corridor that could be viable for shifting the bus depot:

Option 3.1 - Ubungo bus terminal:

The Ubungo bus terminal is currently under construction. Compensation (2.7bn Tsh) has already been paid so no additional resettlement is needed. There would need to be a change in the design to include things like bus bays, fueling station, service/washing areas, etc but it isn't too late to modify it. Because this area is too small to fit all the buses, this could be combined with a space owned by DART in Gerezani - this would be used for overnight parking only. They think between those two spaces all the buses could fit. This seems like it would be the fastest option.

Option 3.2 - Ubungo flyover contractor camp:

This is a very large area currently used as a staging area for the contractor building the Ubungo flyover project. The location and size are ideal, but since it's being used it may not be available for 2- 3 years - however since construction will gradually phase out it could be available earlier at least in part. While the land is currently used by government, it's actually been owned by Twiga Cement for quite some time, though they've never developed it. The group seemed to think that the government could either acquire it or negotiate with Twiga. This option might take a little longer, but if they can secure the land would probably be the most suitable given the size and location.

Option 3.3 - acquire new land:

This option would involve acquiring new land somewhere along the corridor and re-settle households and businesses in the plot. The group recommended that maybe the TOD study would have some insights into suitable areas, and maybe combine with a PPP arrangement for ancillary developments. This would probably be most onerous and expensive given the need to pay compensation.

Since the BRT system is expanding, it might also be worth looking into combining 3.1 and 3.2 since there will surely be a need for space as new phases come online and the government may as well secure it now.

With any of these options, it provides an argument for why the depot was placed temporarily in the floodplain - there wasn't space elsewhere along the corridor at the time, and the buses can shift once that space becomes available. And if the current Jangwani depot is kept for public use - but public use that has a reduced impact from flooding - it can both retain the sunk costs of the infrastructure but also recover costs through parking fees and other potential uses.

(Group 3) Urban Development Areas

For the urban development areas defined in the Concept sketch of the Detailed Plan a series of development guidelines have to be defined. The group have defined in their session the following principles:

a) Land use

The base for establishing these guidelines is the land use map and the approved legislation to enforce rules and guidelines when new areas on the valley edge are going to be implemented. The base principle for the land use of these urban development areas in the plan is a common understanding of mixed use zones. The concrete detailed infill of the new urban blocks need to be done at local level with engagement of local stakeholders of that specific neighbourhood

and awareness of developers and planners of the actual target groups of the developments. The mixed land use sets a framework in which variations in infill can be made. Combinations of functions like housing, small commercial use at the ground floor and public services incorporated in the urban block then can all be feasible.

b) Zoning and relation with the River and City Park

All projected development areas are related to the green valley space. Whether it is the mangrove forest, wetland area, recreation and sports space or city park the new urban development creates everywhere a new edge adjacent to this great spatial asset. Therefore the frontage of the urban blocks face the valley and have public space lining pavement along the buildings and access to the

street, zone for public services (water, power, sewerage, solid waste collection points) with footpaths and robust green space with tree lanes at the edge level. Then one level lower the intermediate terrace level houses gardens, vegetable gardens, sport and play facilities and a mix of vegetation.

Towards the river the intermediate terrace lowers to the wetland level connected to the newly aligned river bed. This generic section is everywhere the same in principle, but the variations are made in width of the various zones and the infill of both functions and vegetation. Each public space adjacent to the urban development areas get there own identity. Sometimes developed newly, sometimes a continuation of the existing neighbourhood.

c) Block rules

The urban blocks need to be efficient and in a rapidly growing city as Dar es Salaam making smart use of space makes sense. At the same time the target groups for many of these building blocks need to be considered well. Building multistory apartment blocks only works when a mix of units is offered in the affordable categories and with added value opposite existing housing. One should think of bedsitters and one room apartments with shared facilities starting from rent of 50.000 shilling.

Therefore the common block medium rise up to 4 or 5 stories maximum to avoid cost and mainance for elevators and extreme safety measures for fire prevention and so on. Also the social aspect and how the urban block is inhabited by its community is important. The corridor in the block, staircases and relations to entry, street level and a shared courtyard space for instance can make the difference in a coherent and balanced living environment and one with many troubles. Also the use and set-up of the ground floor is extremely important. The groups suggestions are to have open spaces at ground floor for shops, flexible spaces for kiosk and workshops and even for parking. Ownership and mix between dwellers and commercial users is important. The block rules are in this case not only spatial guidelines, but also legislation for social, financial and ownership issues.

d) Various neighbourhood characters

A quick scan in the groups work already clarified that all urban areas defined have their own character. Although the generic section toward the park and valley is the same conditions for establishing a new neighbourhood part in for instance Mkunguni B is completely different then Mtambani or Ilala Kota. Density of the existing parts, connectivity to the city, existing inhabitant groups, relation to the valley and especially the functions and character of the renewed valley spaces when the Detailed Plan concept gets implemented; all these and more will influence the choice of modest building heights or pushing for extremes, mix of functions or mainly housing,

parking solutions only in the street or also at building level, space for offices and commercial functions or only

some ground floor kiosks and shops, etc. The block rules per Urban Development area need to be set out specific in order to match the characters of the existing and/or desired new areas.

e) Resettlement arrangements within the urban development area guidelines

Last but not least the resettlement arrangement within the new urban developments is a key factor to take into account. Partly it has to do with the right size, type and price of units for people that need to resettle and make the choice to relocate within the new development in the area where they use to live. This issue of target group and provide for the right size and price of unit also has been addressed under c) block rules. Another aspect however is the financial arrangements and how resettlers are dealt with. Clearly not one shoe fits all. There are home owners, renters, smaller units, families and singles or smaller households, but also multiple unit or building owners in the current situation. For each of those that make the choice not to be financially compensated and leave the area, but to stay and occupy a new unit, a fitting and realistic arrangement should be offered. In case of building owners, who also gain income by renting out (part of) their property, the new blocks might be partly organized as a cooperative in which one block is co-owned by multiple people. The Tanzanian law already provides for that, but a detailed arrangement need to be made for this.

(Group 4) River Maintenance

Up till now there always has been a division between measures to fight the floods and the potential of sand mining because of the sedimentation in the Msimbazi. In this session the group has bridged this divide by concluding that 200.000 to 300.000 m³ sediment annually needs to be cleared out of the Msimbazi river bed as long as up stream measures as controlled urban development and reforestation haven't the ability yet to prevent the huge amount of sediment coming down to the lower basin area. This sediment situation needs to be controlled in order to maintain a free flowing river which remains its conveyance capacity consistently. This means the total amount of 300.000 m² needs to be taken from the lower basin within a scope of approximately 250 operational days a year. Potentially this can be done in the area down stream of Morogoro rd in a wetter condition by amphibious machinery and transporting sediment in barges. In the upstream areas excavators can be used in combination with the amphibious machinery when needed and dredged material will be transported by road.

For the construction phase of the terraces it needs to be investigated what the most suitable logistics could be to transport the excavated/dredged material to the envisioned terrace locations. It is very likely this could be different methods per terrace. Dumper trucks are very likely the most suitable equipment for this purpose. An important consideration is whether the transport from the sand/silt depots takes place through the valley (over the valley floor), or whether transport takes places via existing roads to the neighbourhoods on top of the ridges (where the material can be tipped from the ridge into the valley). Among others, important evaluation criteria are i) accessibility/bearing capacity of the flood plains, ii) transport and material re-handling economics and iii) environmental and social impact.

The construction of the terraces should match the identity of a wetland and green natural environment in the lower basin. This river park identity can be emphasized by green terraces. In order to support the slopes of the Vulnerable slope (A), hidden construction for protecting the

slope against severe weather conditions (B), long term result (C)

terraces a hidden protection can be built in while constructing the terraces. The group launched the idea of using the huge amount of concrete rubble coming from demolition of all buildings in flood prone areas. The crunched material is ideal to build a hidden protection prevent the slope from breaking down completely in extreme water conditions.

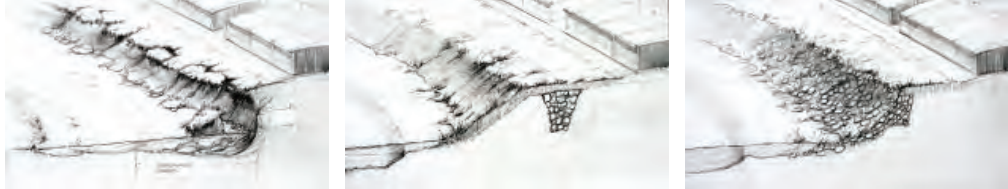


Figure 12: Vulnerable slope (A), hidden construction for protecting the slope against severe weather conditions (B), long term result (C)

(Group 5) Mangrove and Wetland

The participants of this expert group were tasked to review and add to the design of the Mangroves and Wetlands element in the Wetlands Park Alternative selected as the basis for the further elaboration of the Detailed Plan concept with additional functions. This was the 3d time that they met as a specialist group (representatives of RAS – Environment, DSM; TFS Mangroves – Kibiti, WAMI, Ruvu-Morogoro) to discuss this subject, and following observations and recommendations were made:

a. Observations

1. The members endorse the choice of the Wetland Park Alternative as the basis for the further design of the detailed plan for the Lower Basin.
2. The biodiversity and eco-service functions of the Mangrove Forest were discussed in the previous charrettes. These justify the strategic choice to go beyond conservation & preservation and aim for rehabilitation and expansion of the natural habitat for the Mangrove Forest and Wetlands.
3. The Mangroves and Wetlands form the heart of the green lung for Dare es Salaam and a growing Mangrove vegetation cover will become an increasingly important eco-service asset to reduce the heat stress in the city (Positive Climate Change Adaptation effect)
4. To effectively protect the Mangroves and wetlands, a Regional/Municipal Park status within the boundaries of the special planning zone could be considered for this section of the Lower Basin.
5. The area reserved for the Mangrove vegetation (forest) and for the saline water wetlands can cover the major river plain area between Selander Bridge and Jangwani Bridge. Stream upwards from Jangwani bridge sweet water wetlands can be developed in the river plain. On the sea side of Selander bridge the natural habitat for Mangroves is good.
6. At this point it is not yet know how far the high tide line of the ocean could move upstream after completion of the dredging works for widening and deepening the main river channel. This will effectively determine how far the Mangrove forest can be expected to grow back upstream.
7. The heavy sedimentation of the Msimbazi river has resulted in burying the air roots of the mangroves and this “asphyxiation” negatively affects the health of the trees. Now it is unknown how this problem can be handled.
8. A second “health” factor is water pollution. The untreated sewage/sanitation & metal

traces and pesticides from industrial effluents and agricultural run-off carried by the Msimbazi waters are partly treated by the root action of the Mangroves. But currently the concentrations are very high¹ for this “natural water treatment” function of the mangroves and wetlands. For the future health of the habitat, effective action on the water pollution issues is therefore a prerequisite.

9. Biodiversity, Nature conservation, nature recreation and nature education can be closely aligned in the Wetlands Park Alternative. The Ministry of Natural Resources and Tourism supports to provide (restricted) public access to the Mangrove Forest and wetlands, through a system of footpaths, nature trails, hanging bridges, and boating.

b. Information gaps

Community records and Earth sat photos show that Mangrove forest has retreated over time. Little is known about the number of species, the number of mangrove trees, and their vitality. Data should be available from a remote sensing survey along the whole coast of Tanzania. In this context it is recommended to invite the Mangrove specialist(s) from the Institute of Marine Science, University of Dar es Salaam to charrette no.6.

c. Detailed design recommendations

1. Extend the boundaries of the Msimbazi Social planning zone beyond Selander Bridge in to the ocean (North/West of the Ali Hassan Mwinyi Rd)
2. Indicate the possible extent of the Mangrove Forest
3. Develop a full circle footpath on the river plain which various access points from the Mtaa’s bordering the Mangrove and wetland areas. The route should touch on the Suna vegetable plots and allow various crossings
4. A river boat trip starting at Selander bridge (beach) to the high water point and back)
5. Plan for several nature education centers where nature guides etc.
6. Initiate a “quick scan health survey” of the Mangroves ASAP. Invite a few national and international experts to visit the area with the task of assessing the health of the Mangrove vegetation and advise on the key measures for “saving the mangroves” and the scope for developing a health Mangrove and Wetlands Park area as proposed in the Detailed Plan
7. Subsequently start a planning study for the Mangrove and Wetlands Park
8. Initiate (or integrate) a long-term research programme to monitor and guide the development of the Mangrove and Wetlands Park
9. Include the Mangrove and Wetland Park as a priority project in the 1st implementation phase of the Detailed Plan

(Group 6) Institutional Arrangements

Participants of the table further developed the ideas from Charette number III regarding the institutional setting. In that Charette it was argued by participants to establish a Program Implementation Unit (PIU) in the short term and in parallel prepare a legal instrument (Development Authority with a legal mandate for developing and managing the gazetted area) which could be established in 2 years. The PIU would then transform into the DA, once the DA is established. Participants confirmed some goals and conditions for the institutional set-up:

- The institutional set-up should allow for long term development and implementation and operation & maintenance of the detailed plan (development program) for the gazette area (and in the longer term even the whole river basin).

¹ 1 Mrutu, A. Nkotaga, H.H. & Lulo, G.B., Spatial Distribution of heavy metals in Msimbazi River Mangrove Sediments in Dar es Salaam coastal zone Tanzania, University of Dar es Salaam; International Journal of Environmental Science, Volume 3, No.5, 2013. Research article ISNN 0976 4402

- The set-up should provide a legal mandate to develop and maintain the area in order to prevent potential with the plan conflicting developments in the area by some stakeholders or land title owners;
- The set-up should enable proper coordination between the relevant stakeholders;
- The set-up should enable a financial model for long term financial sustainability (to cover inter alia long-term maintenance costs for the area).

a. Establishment of PIU (short term)

Participants refined the PIU set-up from Charette number III and developed a proposal for the organigram and the composition of the Steering Committee and the technical Advisory Committee. In below organigram the structure as agreed among participants is shown.

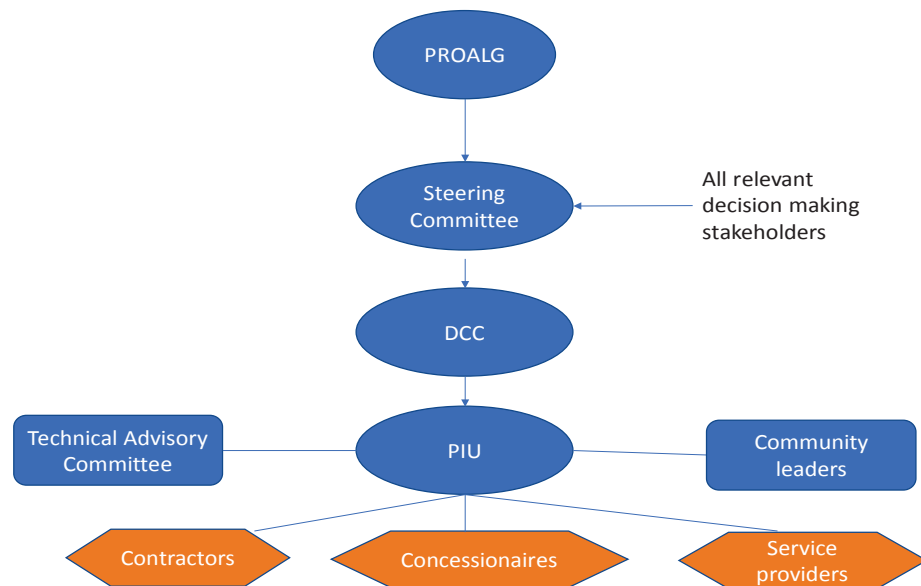


Figure 13: Proposed set-up (organigram) for PIU

From the organigram it can be seen that the PIU will be hosted by the Dar es Salaam City Council (DCC). PROALG will be the leading institution and secretariat of the Steering Committee. Minister or Secretary of PROALG is proposed to be the Champion of the plan. The Steering Committee will consist of relevant institutions for development and implementing the foreseen measures in the detailed plan. The steering committee is a decision making body coordinating between these institutions with representatives at decision level. The Technical Advisory Committee will consist of more operational technical experts of the relevant institutions. Staff of the PIU will consist of seconded staff from the municipalities and the Ministries and some newly recruited staff (especially with land development or commercial background). The PIU will develop the documents for procurement and contracting for various developments including licenses or concessions for land or facility development to concessionaires.

Regarding the most urgent flood risk measures (dredging A, B, C), this could be organized for the sake of quick implementation directly under the relevant authority with mandate for these projects (Ministry of Water or Works).

Steering Committee Members (proposal)

- PROALG
- Ministry of Land

Ministry of Water
 Ministry of Environment / VPO
 Ministry of Works
 Ministry of Natural Resources and Tourism
 Prime Ministries Office (PMO)
 Ministry of Finance
 DCC
 Municipalities

Technical Advisory Members (proposal)

Tanroads
 DAWASA
 DAWASCO
 Housing Agencies
 NEMC
 TFS
 WAMI
 Water Board
 Ardhi University

b. Establishment of Development Authority

The ideas to develop a Development Authority (with a legal mandate to develop and maintain the basin area) from Charette III were reconfirmed by participants. Although in Charette III participants opted for a public model, the participants in this Charette opted for a public-private partnership (PPP) model. The most important reason was the possibility to attract private finance for pre-financing costly land developments. This possibility to attract private finance (equity by private investors/ shareholders) is almost absent in a completely public model (although debt service costs could be lower in a purely public model).

Participants sketched below organigram.

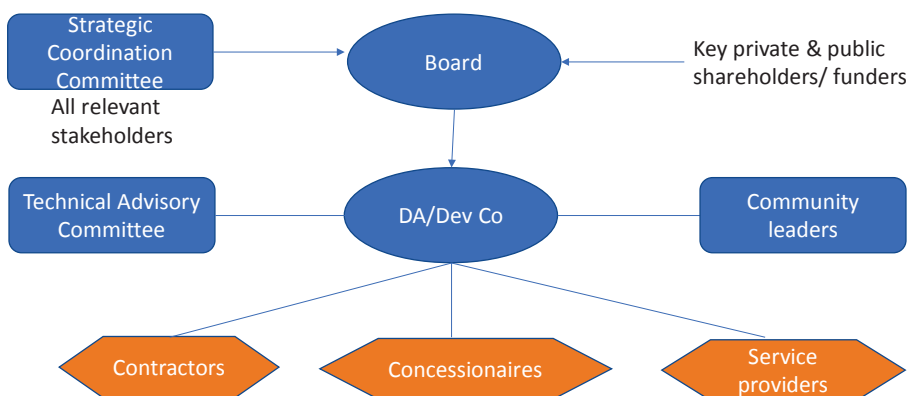


Figure 13: Organigram of Development Authority

The Development Authority / Development Company would be steered and supervised by a Board where key shareholders/ contributors are members. Relevant stakeholders (non-contributing) are in the strategic coordination committee (which is basically the successor of the Steering Committee of the PIU structure).

c. Funding

Participants agreed that a long term financial model is needed to create a financial sustainable set-up which allows for funding long term maintenance and re-investment costs. Without such a model there is a serious risk that facilities in the river basin will not be well technically maintained and will deteriorate in the longer term. This is also one of the reasons that a Development Authority or PPP Development Company is proposed with an independent budget (separated budget from the Ministries or municipalities involved). The Development Company (PPP venture) would then be funded from below sources:

- Public budgets (agreed upon contributions from PROALG, other Ministries, DCC, municipalities, agencies);
- Private finance (from private shareholders in the company, loans/bonds);
- Income from land title concessions or license fees from concessionaires (housing developers, restaurants, market place etc.);
- Grants from donors (especially in start-up and first years) (World bank, DFID, KfW, NL government DRIVE etc.).

The idea is that the Development Company should become as much as possible self-sustainable based upon income from land titles, concession fees etc.



Figure 14: Sketch impression of a bird's eye view at the end of the Charrette to capture the discussion results in one image at the central area of the Lower Basin.



Figure 15 Group photo at the end of the Charrette day 2 with the sketch impression amidst the participants

Msimbazi Design Charrette №5

2, 3, 5, and 6 of July 2018

World Bank Office Dar es Salaam and local offices various partners

DESIGN CHARRETTE № 5

Introduction

Charrette N05 consisted of seven meetings held at 2,3,5, and 6 July. The meetings were aimed to get commitment from different stakeholders for the DRAFT Msimbazi Strategy and Management Framework (MSMF), detailed plan and to collect additional inputs to finalize the document. An overview of the meetings is provided below.

- 02-07-2018, afternoon: Institutional Framework (World Bank, PO-RALG)
- 03-07-2018, afternoon: TFS -Ecosystem services and biodiversity –mangroves and upstream reforestation, MSMF Strategy No 06
- 03-07-2018, afternoon: Sedimentation, MSMF Strategy No 2
- 05-07-2018, morning: Municipal directors, MSMF Strategy no 10
- 05-07-2018, afternoon: Technical feasibility, MSMF Strategy No 1, 2, 3, 4
- 05-07-2018, afternoon: NEMC Environmental compliance, Strategy No 7
- 06-07-2018, morning: Private Sector Engagement and Real Estate Development

This report provides a summary of the discussions and outcomes of the seven meetings. Summary of main outcomes:

- Institutional Framework: The PIU and potential Msimbazi Special Planning Authority are best situated under the permanent secretary of TAMISEMI and the Technical Advisory Committee should directly advise these two bodies.
- Ecosystem services and biodiversity –mangroves and upstream reforestation: TFS interest and responsibility is at the end (mangrove forest) and the beginning (Pugu hills) of the catchment area. The organisation has therefore a crucial role. TFS is already conducting reforestation schemes and aims to strengthen these efforts. TFS is open to remove some mangroves to widen and deepen the river as long as this is done carefully and creates good conditions for extending the Mangrove Forest.
- Sedimentation: The general experts opinion is that sediments in the Msimbazi river will be of sufficient quality to develop terraces with. However, hard evidence in terms of sediments samples are currently still lacking.
- Municipal director meeting: The Msimbazi MSMF and Detailed Plan were well received during the meeting. The meeting concluded that the PIU would have to be established under the DCC. The Boundaries of the Msimbazi Special Planning zone should be gazetted and embedded in the new Dar es Salaam Masterplan.
- Technical feasibility: The construction of terraces is considered feasible although the sediment quality first needs to be tested. Moreover, the group was confident that the proper contractors and equipment would be available once the works are contracted and that materials are available.
- Environmental compliance: Five topics were discussed in the meeting: 1) water quality, 2) Special Planning Area Boundary, 3) Resettlement, 4) DART Bus depot, 5) WWTP. Regarding water quality, the lack of monitoring, enforcement capacity and co-ordination between different responsible parties were mentioned as key hindrances to upkeep the water quality. Regarding the other points NEMC agreed to the principles presented in the MSMF and Detailed Plan but stressed that an official standpoint on these issues could only be given once the plan is formally submitted to their office.

- Private Sector Engagement and Real Estate Development: The meeting discussed whether Dar es Salaam could afford a 400 Ha city park, when the city needs space for its growing population. The consensus of the participants was that the presented plan represented a great opportunity for Dar es Salaam with the creation of valuable real estate around an iconic city Park. The private sector parties present all expressed support and willingness to engaging with the development of the area once the ground is prepared by the project. Concerns were expressed how the governance of the area will be arranged and how a stable investment climate would be guaranteed. In this context the proposal to create an area development corporation was commented on as: “yes that could work”. The meeting recommended to establish the Lower Basin as a special investment zone and to challenge the private sector to finance the needed investments.

Meeting Reports

1. Institutional Framework

- *World Bank*
- *PO-RALG*
- *Ecorys*

The institutional framework proposed in Charrettes 3 and 4 were discussed. The proposal was made to put the steering committee of the PIU and Msimbazi special planning board under the permanent secretary of TAMISEMI. Furthermore, it was proposed that the PIU and Special Planning board rather than the Steering Committee would consult the technical advisory committee. Hence, the organisation charts below illustrate the proposed institutional set-up.

2. Ecosystem Services and Biodiversity, Mangroves and Upstream Reforestation Strategy No 06

- *Tanzanian Forest Service.*
 - *Prof. Dos Santos A. Silayo, Chief Executive*
 - *Evarist Nashada,*
 - *Director of forest planning*
- *World Bank – Nyambiri Kimacha & Mary Grace Weber*
- *Ecorys - Max van der Sleen*
- *DASUDA - Remco Rolvink*

Summary of discussion

- “The problem of the Msimbazi affects us all”.
- “ I like the Msimbazi Framework because it is holistic”
- “yes we have a leading role to play from the top to the bottom”

TFS has great interest and responsibilities in ‘head and tail’ of the Msimbazi project: (a) Pugu Hills at the source of the river and (b) the Mangrove Forest at the end.

The Mangroves are protected by law. Specific by laws in cities protect trees from being cut. The protection and demarcation of the natural forests in Pugu and Kazimzumbwi is now in order and with help from the WWF replanting has started

TFS is committed to support the Framework and Detailed plan. Prof. Dos Santos agreed to help formulate a project for replanting 1400 with an indication of time required and costs. Fol-

low up contact on this issue is needed.

a. Pugu Hills from forest reserve to nature reserve (IUCN category):

- the upstream forest and forest reserve of Pugu Hills and Kazimzumbwi forest will be changed from Forest Status to Nature Reserve (IUCN category 1a) ; This has much more strict regulations and will support TFS in enforcing the forest area and protecting new and replanted areas.
- There has always been issues with land ownership and encroachment. Now all that is resolved TFS will be able to take full control. This will ease replanting schemes and protection and keep replanting schemes safe. Outside the official boundary it will remain very difficult though.
- The WWF is one of the supporting partners in recovering and replanting forest
- Besides the remaining issue of tree cutting outside the reserve, also change is needed for the long-term preservation of the reserve. Measures that can be taken are:
 - Make nature and forest relevant to people: TFS has the vision that eco-tourism could be a pro-active way of actually protecting the reserve.
 - Awareness programme in all Municipalities within the catchment area to protect all trees and forest. This is by creating insight in the effect of a 'tree-less' city and enforcement of law against illegal logging.
 - Institutional framework to support special guidelines and regulations to urban planning in the whole catchment area to provide for planting, percentage of green infill, water catchment measures and link this to the building permits. Also, enforcement of the right executions and penalties if implementation did not follow the building permit regulations on green aspects.

b. Mangrove Forest

- The Mangrove forest is currently under great threat and expectation is that this Msimbazi Project can strengthen partnerships in supporting the Mangroves and fighting against its diminishing state. Key measures which can be taken:
 - Clean out sediment layer
 - Get in salt sea water further
 - Clean the polluted soils
- An expert study need to be done how best to do this. The suggestion was made that TFS and the PIU (or parties that will form this) need to develop a TOR for this ASAP.
- It was clear to TFS, that in order to solve the flooding problems in an integral way some trees need to be removed to widen and deepen the river channel. There will be no objections against this as long as this done with a clear TOR for the dredging contractor and a proven experience by the selected contractor that they know the values and limitations of the Mangrove area and will handle this in the most careful way.

Interesting source of funding besides earlier mentioned WWF is the climate change fund REDD+ (Pilot) in Tanzania for reforestation. TFS, WB and Ecorys have agreed that TFS will write a 'one-pager' on measures on reforestation (species, price per acre, planning/pace and approach in- and outside of the forest reserve, etc.).

3. Sedimentation, Strategy No 2

- *JBA consultants*
- *Sering*
- *Word Bank*
- *PO- RALG*
- *Ecorys*
- *Wami Ruvu Basin Authority*

Key discussion points:

a. Feasibility of technical measures to mitigate sedimentation (dredging, sand traps, etc.)?

Sediment Quantity

- The concern is that most sedimentation and run off comes from upstream and will increase over the years. The measure to reduce run-off and sedimentation should be upstream, as terracing of 1 meter is nothing when these two increase.
- The timing of measures is key to combine upstream and downstream measures.
- There remains a large uncertainty about how much sedimentation is introduced. This is currently researched by JBA, which will publish its findings end of August.
- You might need to check alternative design which is less sensitive to sedimentation introduction.
- Experience of other project: More upstream there are also culverts which capacity (Catchment Lag time=15) is too small, because it was not designed on the basis of a situation which there is a lot more retention and infiltration capacity upstream. Now proposed to design the culvert at K=0.5 level. Reforestation is key here to increase the retention capacity.

Sediment Quality

- JBA is not commissioned to check the quality (only quantity) but will make recommendations.
- PO-RALG will share a report by WWS on sediment quality.

Measures

- JBA consultants will assess the proposed locations for the sand traps.
- JBA: Piping risk
- Regarding the composition of the sediment and usability for landscaping/terracing, there was a discussion, but the general impression is that the material is usable for terracing. Considerations are:
 - Two types of sediments are distinguished: 1) Black – seal and transfer to special dump site, this comes places that are unanswered; 2) usable for construction.
 - There is only fine material close to the sea. Most material would be usable in the river, as we see self-supporting river bank (vertical river bank).
 - Question is whether the material is non-cohesive (not too much clay) or not?
 - How to deal with plastics, are there technologies are available to separate sediment from plastic.

b. What can be expected in terms of the costing for these measures?

- PO-RALG will come up with some scenarios on costing: 1) material from Msimbazi; 2) material imported.

c. What would a sustainable financial model for river maintenance look like?

- Changes will happen sudden and dramatically. Maintenance schedule should allow for emergency works which is difficult to manage and to cost. Therefore, there is a need for an emergency fund linked to the PIU.
- There is a realistic threat that sedimentation is introduced not only in the floodplain but also in the recreational areas. Therefore, upstream sedimentation catchment is essential. Also, for the sustainability of the maintenance dredging.

d. Which parties could support in the implementation (both at cost and revenue side)?

- There will definitely be an interest, by the private sector when the opportunity comes forward. BAGRESA has even offered to do works for free

4. Meeting with the Municipal directors

- *Prof John Lupala – Director Urban Town Planning Ministry of Land*
- *Dennis Biseko – World Bank*
- *Filemon Mwakiwone – Director Town planning Kisarawe*
- *Mussa L Gama – Director Kisarawe*
- *Romanus Sanga – Town planner Kinondoni*
- *Dr. Henjekieze Patricia – Director DCC Kinondoni*
- *Sipora J. Liawa*
- *Mariam Mmampese – Town planner Kinondoni*
- *Nymabiry Kimbacha – World Bank*
- *Marygrace Lukakingira – World Bank*
- *Eng. Mussa Natty – World Bank*
- *Eng. Nanai Nyaniri– PO-RALG*
- *Eng. Emmanuel Ndyamulewa – PO-RALG*
- *Max van der Sleen - Ecorys*
- *Bas van de Sande – CDR- International*
- *Remco Rolvink – DASUDSA*
- *Koen Berentsen – Ecorys*
- *Winie Madulu – Nipe Fagio*
- *Straton Vincent - Nipe Fagio*

Questions, Issues and Suggestions on the Detailed Plan and MSMF

- The question was raised on how we will guarantee that the material for the terraces in not washed away by the next rain? The answer of the Ecorys team was that they will include images of techniques to do so in the plan.
- The question was raised on how issues in the PUGU hills will be addressed. The Ecorys team responded that there are indeed substantial sedimentation issues, largely causes due to events in the Pugu Hills. The response of the MSMF is to address these issues in the Pugu hills. One key activity in the MSMF is the reforestation of 1400 hectares in the upstream area.
- The suggestion was made to Install a dam/reservoir upstream to reduce the flood
- The suggestion was made to use TMA historic rainfall data for further flood modelling.
- The suggestion was made to provide a delineation of how the flood modelling is done and specify and calibrate the made assumption.
- The suggestion was made that the gazetted area with new/revised boundaries should be stating special planned area which includes all the urban development, not only for

City Park but for legal implications too.

- It was noted that it is very important to include the Msimbazi City Park in the Dar Es Salaam Master plan
- The question was raised whether there is any proposed height for terraces? The answer from the Ecorys team was that the first terrace will be 1 meter, second terrace 2-2,5 meters.
- Resettlement was noted as an important factor that needs to be resolved. In response
- it was explained that the community has communicated positive to the project and they are waiting for the implementation. This signal has to be send back to the government offices and it is key that further initiatives include the communities. The communities appreciated the project and say it already should be implemented.
- It was noted that PPP opportunities should be explored and that an economic feasibility analysis is to be conducted.

Discussion on the Governance Structure

There was a discussion to place the PIU under the of Regional Commission Office or DCC, as previously a unit was already proposed to oversee Msimbazi issues under the regional commission office. However, this was not implemented.

It was agreed by the members to be under DCC with the following arguments:

- It will ease the process of project execution as City Council will be overseeing the whole basin instead of each Municipality/stakeholder to champion the project its own.
- Through experience most of agencies established in Tanzania died soon after being given authority because they are not well capacitated to self-sustaining, so this should be taken as a lesson learnt for this PIU/the Agency that will be managing Msimbazi after PIU
- It reduces operational cost because it is within government system under DCC
- It should consider involving as much as possible all the key stakeholders from both regions (Dar Es Salaam and Coastal Region)
- PIU will be coordinating the stakeholders to perform their roles for Valley development as required or as it supposed to be by each stakeholder
- DCC will ensure/ manage the PIU properly for sustainable development
- We need stakeholders meeting to determine progress/operation and maintenance of the project
- PIU will be under DCC for initial stages, but once it starts generating some income then it might be discussed and decided otherwise accordingly (who will benefit what and how)
- PIU must be under DCC because we need to strengthen the existing institutional framework rather than establishing a new one
- The pros and cons of placing the PIU under DCC should be assessed in a feasibility study.

NOTE: For legal implications the area need to be gazetted again, and a process which can be facilitated by City Council and it is expected to take about a month up to its completion (John Lupala). Kindly remember to be including/mentioning all the key stakeholders in the framework such as Kisarawe Municipal Council. Prof. John Lupanda made the point that the finance for RAPs (resettlement action plans) should be in place before the Msimbazi Plan can be implemented.

5. Technical Feasibility, Strategy No 1, 2, 3, 4

- *Eng. Mussa Natty- World Bank*
- *Dr. Machibya -Ecorys*
- *Muindi Musyangi - World Bank*
- *Eng. Fredrick Nkya – World Bank*
- *Nanai –PO-RALG*
- *Remco-DASUDA*
- *Hilda Kigola –NULRP*
- *Bas van de Sande –CDR- International*

Notes from The Key Discussions.

a. In general, Is the terrace model technically feasible? Is the dredging/excavated material suitable for terrace construction?

- The dredged materials with in Msimbazi might be suitable for the terrace construction but we need to assess these materials and if we find that they are not suitable we can bring materials from the nearby place.
- But studies show that the materials are suitable/ sediments are suitable and can be used for construction.

Question: “These materials are mixed with the plastics; do we need technical support to remove/separate them or they can be used as they are?”

- It will be very complex idea to include them in the terrace as it will help to hold the soil and add the quality which might be very useful in making the terraces hard and last long.
- There should be made the decision on what should be done to remove/separate the plastics from the soil.
- “We need to understand first what the effects of these plastics are to still remain in the soil and be included in terrace building as construction materials, so maybe the consultants might have the best solution for this.”

b. What type of equipment can be employed to dredge the river channels and flood plains as well as filling of the terraces?

- We need Dredging excavator (specific excavator) which can be suitable to work at that kind of site.
- Also need trapping sheets (which covers the soil and protect it from erosion), can be used in those areas with steep slopes

c. What is the Unit Rate that is needed?

- The price is 15,000/20000 per M3 for excavating the site including the transport cost.

d. What will be the Costs of transporting the rocks (Quarries/Kokoto)?

- Yes, these are available, with about 150km distance away from Dar es Salaam, and actually most of the rocks materials found are Granites rocks.

e. Is the implementation capacity readily available?

- They will be available when the procedures are done, because the Government will find and provide the Contractors both international and internationally are allowed to come and work for the contracts.

f. Which parties could support in the implementation plan? To what extent does Tanzanian Contractors can support the implementation if this plan?

- We don't have experiment with this, but we know we might have the local contractors who could support this in Tanzania, but we have no confidence of recommending them here although most of the contractors are foreigner.

g. What is the cost of trees per Hectare?

- The cost varies from one species to the other and almost starts from for small tree 2000TZs/5000TZs.
- For the indigenous species normally costs about 32,000TZs for 1.5m long tree. But you need to specify Heights and the type/species.
- If we want to know total cost for the trees and the total numbers then we need to have the detail for the type of species, height and length of the area.

h. How much could the water Reservoirs cost, is it possible to have it in Msimbazi Valley?

- We are not sure proposing the cost for the reservoir, but we think that depends of the wideness and length of the reservoirs.
- We think is possible to have the reservoir somewhere along the Msimbazi river valley,
- Such as Sukita, Kinyerezi, Tabata, and the rest can be surveyed to check if they are suitable or not.
- The important thing to take from our experience for the successfulness of this project on implementation, we emphasise that we should encourage the stakeholder's participation like when we want to uplift the Jangwani Bridge it is better that TAN-ROADS should be involved.

6. Environmental Compliance, Strategy No 7

- *NEMC – Rose Salema Mtui*
- *World Bank – Marygrace Lukakingira*
- *DCC – Mwakigonda*
- *NEMC – Benjamin Mchwamlaka*
- *ILALA Municipal – Alfred Mbyopyo*
- *KMC – Mariam Mwakipese*
- *World Bank – Emanuel Hanai*
- *NEMC – Manchare Heche*
- *NEMC – Nice Mshana Cheche*
- *NEMC – Germana Ijiko*
- *NEMC - Blandina*
- *NEMC – Vedast Manota*
- *NEMC – Carlos Mbuta*
- *NEMC – Alfred Msokwa*
- *ECORYS – Koen Berentsen*
- *World Bank – Nyambiri Kimacha*
- *NEMC – Julius Edward*
- *NEMC – Jaffar H. Chimgege*
- *IMC – Theresia Dennis*
- *WAMI RUVU – Halima*

Key discussion points:

a. Water Quality

NEMC has a role to monitor and enforce water quality standards. Multiple issues have been mentioned which impede to do this effectively:

- Rapid unplanned urbanization impedes the installation of proper formal sewerage and drainage systems.
- An inventory of point sources of pollution is needed to know where most hazardous pollution is coming from and where priority action needs to be taken upon. Biological indicators (flora and fauna) can help to identify the sources of pollution. NEMC could partner with universities to do this.
- Point sources of pollution need to be addressed to keep the environment clean.
- Polluters need to be enforced. Issues that impede this enforcement are:
 - a. Lack of awareness of polluters
 - b. Enforcement is difficult due to a 1) lack of resources and 2) that some companies were established before the environmental management act came into place in 2004 and they had to put a treatment facility at site from the commencement of their business. Retrospectively it appears difficult to (enforce that) such a system is put in place. Also, wetlands can be installed to clean the pollution the issue here is that you need a very large surface. 3) Moreover, there appears an overlapping mandate for NEMC, the municipalities, and the communities in awareness creation and enforcement. NEMC call therefore for better coordination between the different parties.
- In all this one needs to consider what the water will be used for as this determines the quality that it needs to have.

b. Special Planning Area Boundary

NEMC agrees in principle with the special planning area boundary, but states that before official approval it needs to verify the boundary in the field.

c. Resettlement

Normally NAMEC does not do resettlement schemes, within the 60meters line Human activities are not allowed (this has a base in various environment management acts) . Also, resettlement it done by municipalities and ministry of the land. Land act 1957 it is illegal to construct, or any human activities or permanent nature not allowed. NEMC agrees with the principle to adopt the principle of only resettling people when they are in danger, but states that for a firmer commitment it needs to see how the plan will materialize in reality.

d. Location WWTP

NEMC cannot provide an official “yes” or “no” but sees the rational for the proposed location. Once the project will be submitted to NEMC it will assess it on its feasibility and provide a technical recommendation to the minister. Hence, a feasibility study is recommended.

e. Location DART

NEMC did approve the current location of the DART one some conditions which were stated to not have been met. Due to other developments the current location developed as it is now. NEMC cannot provide an official “yes” or “no” but sees the rational for removing the DART. Once the project will be submitted to NEMC it will assess it on its feasibility and provide a technical recommendation to the minister. Hence, a feasibility study is recommended.

7. Private Sector Engagement

Attendees

- Eng. Kityery Kamaky - ACBT
- Waheed Saudin – TPSF -TAFFA
- Sophie Mtaki –Watumishi Housing Company
- Ali A. Mufuruki –National Environmental Trust Fund
- Baraka Jeconiah– Association of Private Health Facilities in Tanzania
- Rehema Mtingwa– Private Sector Foundation
- Steven Dimitriyev – World Bank, private sector development
- Kambonah Mnjambe – National Housing Corporation
- Benedikt Mahona – PPF Pension Fund
- Adam Kimbisa –East Africa Legislative Assembly
- Mariam Mwampese – Kinondoni Municipal Council
- Ipyana Moses – The Institution of Engineers Tanzania / Tanzania Green Building Council
- Augustin Nestor Yamuno - Ecorys
- MaryGrace Lugakingira – World Bank
- Eng. Mussa Natty – World Bank
- Eng. Nanai Nyaniri– PO-RALG
- Nyambiri Kimacha – World Bank
- Max van der Sleen - Ecorys
- Bas van de Sande – Ecorys/ CDR- International
- Remco Rolvink – Ecorys/DASUDSA
- Koen Berentsen – Ecorys
- Obasi Ndelwa – TATO

During discussion following a presentation on charrette process and findings/recommendations to date, private sector representatives raised the following points:

- Concurrence that the inadequacy of storm water drainage throughout the entire river basin be taken into account when considering river flooding
- Concern about the water quality in the Msimbazi River, and the impact that continued pollution would have on proposed park activities. Possible mechanisms to improve water quality were discussed, which include the “polluter pays” principle, engagement with polluters, reviewing discharge and operating licenses, improved monitoring, and rewarding compliance.
- The economics of the proposal must consider not only the infrastructure needs of the park, but also the operation and maintenance. The real estate along the river edge is a good opportunity and one that is critical for ensuring economic feasibility, and the private sector is best suited to act as developers of this land, and this could be done through partnerships with the government which return the investment needed to cover the infrastructure costs. Private sector involvement is critical and offers the potential to make this a really transformative project for Dar es Salaam.
- The technical feasibility of the proposal (e.g. dredging, and terracing) should be carefully evaluated)
- The proposed park could become an icon for Dar es Salaam, which currently has little to attract tourists. This would be a unique, national treasure, and has the potential for attracting both local and international tourists.
- Safety of public spaces and lack of access to safety services such as fire and police

must be considered. There are many parks in Dar es Salaam that are closed off or underutilized - the reasons that people are not more actively using the parks that do exist must be explored and the lessons applied here.

- Economic feasibility was discussed in great depth. There were questions as to whether Tanzania could really afford this proposed investment. There appeared to be consensus that the new land that would come from the terracing would positively contribute to the financial feasibility.
- The group agreed that the land value around the city park would increase significantly
- It was advised that the plan be implemented in partnership with the DCC and Tanzanian Government. Make this a special investment area, with investment regulations for the specific area.
- This could become the new CBD of Dar es Salaam. There is an opportunity not a problem. Turn it into an investment opportunity, not to a public spending issue. This should not be made into a “government project”, as this will not be economically sustainable in the end. Government should create the conditions and the rest can be done by the private sector.
- Green building regulations should be applied (also for water discharge)
- Long-term contracts for continuous dredging are needed; local companies can partner with international partners with the needed equipment, but this is difficult with short contracts.
- There is an investment opportunity, but it needs to be clearly narrated: Why would somebody come to invest in the Msimbazi, there should be a niche? What is the story there? e.g. your ROI is expected to be (X) because (of 1, 2, 3).
- Once the area is dredged and developed, the private sector would be interested in buying the prime areas next to the valley. They won't be interested to engage in maintenance, that should be done by the government.
- A park with trees is very important especially because of the air pollution.
- It is important to with nature rather than against.
- The issue of gentrification will come in and will need to be taken into account
- We need to consider the accessibility to services for the people that are resettled.
- This project has the potential to breathe new life in the city: economically, socially, environmentally, and politically.
- Nobody has succeeded to solve the issue, even politicians did not see a resolution anymore. We should stop calling this a problem, but a large opportunity. Do the cost benefit analysis for the city, this will show the potential! For dredging the private sector will definitely be interested.
- Advance the idea of the Msimbazi Development Authority and Corporation, which can give licenses and incentives to attract big investments. We need to have a vision for the valley. Investors would like to have real economic assets. A vision for 100 years and then money is not a problem.
- There should be clarification on the mix of private and public investment.
- There is good potential only if investors are assured of a good investment climate. The investor would like to be assured that their investment will lead to a return. With changes in policy regime the private sector is hesitant. The governments need to provide guarantees.
- One question will be how to engage pension funds, given competing investment priorities and a shift away from real estate.
- To what extent is the City engaged? The political leaders are now preventing people

from getting moved. At this stage nobody knows what is going on and the

- mandates are not clear.
- Private sector is very positive, provided that there are set criteria for engagement and early on engagement. Don't involve them for minor work, but continuous engagement.
- This is a good project, but any investor wants assurance for their return on investment. What we need is a sales pitch. Especially when we see that regulations are not straightforward and are not adhered to, it does not provide right investment climate. A strong governance is key. What we need to think about is the relationship between private and the public sector - we are not competing.

Introduction

Charrette N06 consisted of one day, 4th of July and had the aim to present the Draft Detailed Plan, explain the steps taken from charrette N04 and the Preferred Alternative to the solutions to achieve the integral Detailed Plan. All participants of charrette N04 were invited, but also the Mtaa chairpersons of the 16 Mtaa's forming the lower basin area together. Most of them present in this charrette took part in charrette N03, when we started the collecting and exchange of preliminary ideas how to approach the Detailed Plan, what functions would be desirable and needed in the future and therefore be content of the plan. In the ACCA approach charrette N06 was to get commitment on the chosen direction, but of course participants also took the time to exchange our thoughts on how to understand the plans, ask questions and get clarity on what the plan actually entails.

Summary of the day

Presentations

The presentation series started with an overview of the charrette process. Both because this is the last charrette of this series and it is the introduction to the actual commitment on the most concrete level of the output of the process; the Detailed Plan and its measures we agree to have commitment on at the end of the day. The process why and how we got to that final result of the participatory process is important.

This was followed by a recap of charrette N04, also because not all participants of charrette N06 were present then, but also to recap on the outcome and as introduction to the remaining questions and topics that were task of the facilitating team to answer and incorporate in the Detailed Plan Draft. An extensive presentation was given on the changes made between Preferred Alternative and Detailed Plan based on the list of comments and additions made by the participants at the end of charrette N04.

Design steps and flood model testing was presented iteratively to clarify the linkages between the two to all participants. To those new to this charrette it was even more important to understand what the outcome of the flood model tests tell us and how we need to deal with this.

Finally the layout and land use of the area was explained and examples were given of what the City Park, Wetlands, Mangrove forest and urban development areas within the boundary of the Msimbazi Special Planning Area might look like in the future and how functions are accommodated. Some extra attention was given to the housing and build functions at the edges at the new highest terrace levels. To show and make sure everybody understands what the choices for these neighbourhood implies, but also to ensure that with the area for urban (re) development and the guidelines on the type of building appropriate even in an average density scenario there is more than enough opportunity to accommodate the households that need to be relocated because of flood risk or measures to prevent from flood risk in the area.

Explanation and Notes of Additions, Adjustments and Clarification

After lunch groups were formed around 7 tables to discuss the Detailed Plan. All groups went through the same procedure and with the same topic. First a round to ask questions and to elaborate on understanding the plan was done. Then the facilitators started to take notes of comments by the participants. Comments should be placed under one of the three categories:

Additions to the plan, Adjustments of the plan or Clarifications of the plan.

At the end of the session each table presented their three lists and the facilitating team gathered and ordered them accordingly the three categories.

The following items are the result of this session and were:

Clarifications

- What will happen to people whose houses were demolished in 2015/16?
- Can people be assured that their proposition will be implemented?
- Are there footpaths in the plan?
- Is there a fund for maintenance and implementation?
- If the river sediments is not suitable for terracing, what will be the possible approach?
- Would terracing consider solid waste piles along Sunna (and elsewhere)?
- Is shifting of the busstop (different then the depot) needed at Jangwani?
- What happens if my house is located where high rise buildings have been proposed in the plan?
- How about the funding for all that is planned for now?
- Once the widening of the river channel is done will there be any construction of the river bank?
- The project will start at Pugu, but still the rain will be proceeding, why we should start dredging and widening at the lower part of the msimbazi river valley?
- Implementations of the project should be as quickly as possible
- First should dredge the river channel, but it is full of solid waste
- We are missing Kigigo in the plan
- What is allowed in the proposed zones?
- How should this be incorporated in the Dar master plan?
- Need to liaise with the Dar Master Plan
- Is there no engineering design that would allow for the depot to remain
- What will be mechanisms for development control and enforcement
- If Dart depot is going to be relocated, where should it go? This needs to be close to the city centre?
- Does Selander bridge not need another opening?
- How will fore seen challenges be addressed (crime, early warning systems)
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Adjustments

- Waste Water Treatment Plant further into the sea due ti objections from house owners in the area.
- Find another location for the Waste Water Treatment Plant
- Legend symbology is not reflective of the Tanzanian town planning colours
- Create more housing terraces
- Move the river around the DART bus depot over Jangwani grounds
- Widen the New proposed Jangwani road

Additions

- Security measures and enforcement in the mangroves and future park
- Protection of the Muhimbili Hospital against flooding
- Ponds in the wetlands for retention and landscape elements

- Include parking in the new urban blocks
- Parking area for the City
- Add walkways, cycleways and jogging tracks
- Add staircases and ramps in the terraces
- River terraces should have steps at the base like a stair case
- Dredge also into Sinza river; Ngombe
- Dikes along the bridge
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- Area needs to be gazetted so its fits within the legal planning framework 'Special Planning Area' appropriate classification under planning law needs to be adopted
- Precision on the study on sediments inside the current
- Study on sedimentas to determine its suitability for terraces cause of pollution
- Impact of river dredging on river morphology
- Develop new storm water drainage system from the residential areas to the main river Msimbazi
- Add water harvesting at house hold level; this helps to minimize the direct run-off to the river

Other notes

- Civil society should be involved because they listen to the communities and know the problem better
- Community of the areas should be engaged in the management
- Security should be prioritized and there should be police posts within the park
- We have everybody on board in these charrettes, but in future stages we need the investors, political leaders at higher levels

Agreed Commitment on the Detailed Plan

The list of points from these categories were briefly reflected on and concluded that they need to be answered more elaborate than could be done in the session itself, but that we could conclude that with the little amount and kind of adjustments suggested by the participants, that we have reached commitment on the Detailed Plan as it is. This conclusion was shared by participants, although we like to stress that the procedure of the final product and presentation to decision makers is still to come.

Answering the Questions

In this part of the report of Charrette 6 we answer the questions and remarks made during the session by the participants. Although a short answer was given on overarching topics of the list of items, we promised to elaborate on the points specifically in the report. Some of the answers are influenced by the new information and design insights that have been gathered by the evolving process in the last two weeks. On other items we have to point to the reports of the Strategy and Management Framework and Detailed Plan that are being prepared now and will be available from the end of August.

Clarifications

- What will happen to people whose houses were demolished in 2015/16?

In earlier stages of the charrette process there was already consensus that before new resettlement on better conditions and as part of the integral plan are carried out, that the still remaining unclear number of effected people from the 2015/16 demolitions need to be compensated

first. This is part of the Resettlement Action Plan (RAP).

- Can people be assured that their proposition will be implemented?

This question is understood as part of the relocation issues and the resettlement action plan. Therefore we can answer that for all buildings identified as part of the resettlement action plan appropriate options will be offered. Either compensation financially or the offer to move into a new build house in the area. The urban development areas in the plan will however be based on a mixed use and medium density principle and therefore won't offer single one story houses at the location, but apartments. Therefore the type of house offered might differ from the current situation for some.

- Are there footpaths in the plan?

Yes. On the maps during the discussion the footpaths and other secondary infrastructure didn't show so well, but they will be integrated more clearly in the Detailed Plan report.

- Is there a fund for maintenance and implementation?

- How about the funding for all that is planned for now?

There is a start amount for implementation from the TURP programme. The calculations have to be made in more detail, but a rough estimate is that the first set of key interventions to create the first level of flood protection can be implemented. Further development of infrastructure and park space need to have another investment fund.

Housing and other commercial functions need mainly be invested by private sector parties. Guidelines and the institutional setting are developed and will be part of the detailed plan to steer investment also to social and common amenities.

Maintenance isn't gathered for, but the charrettes and notes from various meetings have made it a clear priority to incorporate maintenance arrangements right away. Especially for maintenance of the river and its embankments and terraces maintenance dredging is essential and arrangement need to be made. River maintenance might be given as concession I which the private sector carries out the work for maintenance dredging needed and ordered by the responsible government bodies and can cover their cost by commercializing the yield of sediments to the market.

- If the river sediments is not suitable for terracing, what will be the possible approach?

The first professional impression at the type of sediments doesn't create that concern. Furthermore detailed geomorphological study is being carried out currently and on top of that the consultants team have the experience that the technical detailed design of the terraces will be constructed in layers in case sediments are less suitable the essential top and banks can be made with another type of fraction and soil type, while the core of the terraces and the largest part of the volumes will be made from the sediments in the valley. The technical design will detail this.

- Would terracing consider solid waste piles along Sunna (and elsewhere)?

The solid waste is a big concern. It is everywhere and where the team has seen and studied sections of the soil the plastics can be found in all layers of sediments. The improvised dumpsites at the valley edges, in Sunna, but you see them everywhere along the valley, need to be considered. The principle is to create a clean and safe environment, but that could sometimes also mean to isolate waste and create a thick and safe cover layer of clean soil to form the terrace. Especially park spaces could be made like this.

Extensive knowledge and experience worldwide is available. For housing areas this is not feasible and desirable.

- Is shifting of the busstop (different then the depot) needed at Jangwani?

The Jangwani bridge at morongor rd. will be replaced by a bridge between 200 to 250 meter longer then the existing. It will also be raised compared to the current road level with approximately 2 meters. This means that even when the current busstop is not on the new bridge it might be too low to match the new bridge. This technical detail study how the busstop best can be integrated will be carried out as priority.

- What happens if my house is located where high rise buildings have been proposed in the plan?

Identification of all buildings within the Special Planning Boundary have led to the following categories: Buildings effected by flood (50cm and higher flood levels at T10 test) and buildings that are positioned where flood measures need to be taken (e.g. terraces and alike). This means 2500 buildings are effected in these categories. This means the buildings should be removed and people need to relocate and offered resettlement. Then, indeed, there is also category of buildings that are in the urban development zones that are not within the two mentioned categories and won't need to relocate. The detailed urban plan of the urban blocks in the land use plan need to be designed that existing buildings can be incorporated or in negotiation between the real estate developer and the owner of the existing property redeveloped with mutual consensus. The land use plan and zoning regulation will not force people to change property or function. When a new building is proposed it should follow the regulation and be complaint with the zoning map and law.

- Once the widening of the river channel is done will there be any construction of the river bank?

The new river banks will be fully natural, have shallow slopes and are designed according to the dynamics of the river. Reinforcement of the embankment will be done at crucial areas with hidden protection to allow the natural green vegetation to do hold the soil.

Concrete solutions have been proven not to be sufficient, very expensive and hard to maintain.

- The project will start at Pugu, but still the rain will be proceeding, why we should start dredging and widening at the lower part of the msimbazi river valley?

The concept of starting interventions from outlet at the ocean and work step by step upstream is important and the only way the interventions will work and remain. It opens up the river and allow the conveyance of water at peaks with a sufficient profile that no longer would be blocked further downstream. If we would start the interventions upstream it would take to long to reach effective interventions in the middle catchment or lower basin where most people live in harm-sway because of flooding.

Important to stress. The project won't focus on lower basin only in the first phase. Indeed Pugu hills are important. A large reforestation scheme need to be started straight away I order to start re-establishing the natural retention at the source and upper catchment area.

- Implementations of the project should be as quickly as possible.

Agreed. First interventions of widening and deepening the river channel from selander to Jangwani bridge can start quickly. The detailed Plan report will set out a workflow for the full first stage so technical design and contractor documentation is ready to start directly.

First should dredge the river channel, but it is full of solid waste

Ideally solid waste need to be cleaned out from the dredges material. Depending on the use of the soil various categories can be defined and used in various ways. Solid waste that is selected from the soil needs to be collected, transported out and ideally separated and recycled, or otherwise treated at an official waste dump.

- We are missing Kigigo in the plan

The Detailed Plan area was defined till Kawawa road. That leaves all areas more upstream out of this first stage of implementation of interventions. Still the adjacent areas will also benefit once implementation is a fact, but areas like Kigigo should be incorporated in a second Detailed Plan from Kawawa road till Nelson Mandela road of further. With the knowledge on the remaining issues upstream from the current Detailed Plan area it is advised to start a detailed plan process for these areas.

- What is allowed in the proposed zones?

The land use plan defines the categories of uses of the various sub areas. These categories are not fully mono-use and include still a range of functions. For example; In residential areas there is not only place for housing, but commercial functions like local shops are also allowed. Zones exclude non-compliant functions that will disturb liveability or economic use; like heavy industry in a mainly residential area. Existing functions and buildings do not have to be allocated because there is a new zoning plan with a different land use. Only when new proposals for buildings or change of function are submitted the new land use will apply.

- How should this be incorporated in the Dar master plan?
- Need to liaise with the Dar Master Plan

As also mentioned during the charrette, this is absolutely an omission. The Msimbazi plan is a structural and important planning element and needs to have a place and be aligned with the overarching Dar Master Plan aspects. Connection will be made with the responsible team and will be informed about the concept and measures of the Msimbazi plan.

- Is there no engineering design that would allow for the depot to remain
- If Dart depot is going to be relocated, where should it go? This needs to be close to the city centre?

The bus depot of DART is very vulnerable and all of the tested flood model show that the current location will always be one of the first areas that will flood. Protecting it means high cost for dikes and alike, no 100% certainty it will be dry at all events, expensive drain facilities to pump out rain water at remaining 'bath tube' once the depot is fully protected by dikes or walls and rainfall can't go out, expensive ramps to have access for the rolling stock to the raised Morogoro road and Jangwani bridge, etc. Furthermore and maybe even more important on the long run; The Msimbazi needs room for water at more severe peaks in the future with embankments that provide safety for people and assets; a bus depot in the middle of the water doesn't fit in this principle, can't be guaranteed safe and is a misfit in a natural wetland setting with key green public space for Dar's society to sport, gather for festivals and more.

The DART depot could be located at any industrial area in the vicinity of the BRT network. It doesn't have to be in the city centre, as long as the rolling stock can be quick and efficiently be deployed onto the system. For staff and operators it is of course convenient to not have to travel far outside when a shift starts or ends. Another option though is to include DART in the rearrangements of the Msimbazi valley. Within the Detailed Plan there will be a proposal

to incorporate the bus depot at safe levels and integrate it with the City Park functions. The choice for which direction of solution will be chosen is up to the responsible decision makers.

- Does Selander bridge not need another opening?

Not for water conveyance of the river. A second opening and man made branche of the river might even disturb natural flow so much that in the mid and long run is very disruptive for the system and even causes other sedimentation patterns that might create obstacles by itself for sufficient conveyance.

- How will fore seen challenges be addressed (crime, early warning systems)

For the early warning system a team just started to investigate the best method and how to integrate the risk and hazard reduction at large for these urban areas. Crime is a very broad issues. Whether the design and interventions of the MSimbazi could change that is hard to say. Clear spaces, good public routes, quality and use of the public spaces create general ownership that in most cases lead to public protection because it is a space in the public eye. Specific areas like the mangrove forest need indeed attention for safety and enforcement to protect from prohibited use and hiding places for criminals. General police deployment in the larger area will remain a priority, but also the mental ownership of the renewed spaces in the Lower Basin by the local community and awareness to report and stand up against unwanted and unlawful use.

- What will be mechanisms for development control and enforcement

The governmental bodies responsible for parts of the Lower basin currently will form a Steering Committee and a Project Implementation Unit. This PIU needs to have a task in enforcement on ground and to guide and control along the development lines of the Framework we have developed in this charrette process.

- Clarification should be provided before implementation

This document is proof of that and further clarification could be given if needed in the coming period.

Adjustments

- Waste Water Treatment Plant further into the sea due to objections from house owners in the area.
- Find another location for the Waste Water Treatment Plant

A location study and feasibility in terms of exact soil situation in the shallow bay s needed to determine how far the plant could be moved out. A combination with the planned selander bridge might be efficient. Even when the Waste Water Treatment Plant will be realized at the location where we have positioned it in the Detailed Plan it will be much farther from housing and vulnerable functions then in its earlier position at Morogoro road. Nevertheless a further research to define its exact location and size need to be carried out under jurisdiction of DAWASA.

- Legend symbology is not reflective of the Tanzanian town planning colours

This is adjusted in the new version of the land use map to match the colour codes used in Tanzania.

- Create more housing terraces

The charrette process with a wide and very divers set of stakeholders have discuss this point

extensively. The outcome is a balanced lay out of terraces and urban development areas on some and only parts of the terraces. Reason to keep the amount housing areas limited is because the river needs space and the green parklike functions can deal with the new created controlled flood situations, but housing areas cannot. Furthermore the guidelines on density and housing typology and categories fitting the target groups have shown that a significant number of units can be realized in the almost 60 hectares defined for urban development areas. The plan won't be adjusted on this point.

- Move the river around the DART bus depot over Jangwani grounds

The river is currently at its natural position. Studies and experiences worldwide have proven that moving the central channel of a natural river can cause severe changes in sedimentation deployment. Furthermore the DART is at a too low level at flood events.; that won't change whether the channel is at the left of right side. Also the community have almost unanimously pointed out that the Jangwani grounds always have been a core gathering and playing place for the city. People like to see this back again in the plans.

The Detailed Plan have extensively incorporate the mentioned and desired functions of sports, festivals, gatherings, park space and walkways. Jangwani grounds is going to be safe and raised with the terraces and will give a very nice view over the river wetland with the river in its current position. The plan won't be adjusted on this point.

- Widen the New proposed Jangwani road

This will be changed in the plan. The new Jangwani road can indeed be a main street and the boulevard along the embankments and accessing the largest urban development area at Bondeni can indeed be widened to accommodate more traffic and become an access route.

Additions

- Security measures and enforcement in the mangroves and future park
- Security should be prioritized and there should be police posts within the park

Both police enforcement, but also community awareness and mental ownership of the new and renewed public spaces is important. A series of strategically spread functions throughout the park with enough visibility and people around helps. This can be extended with professional security measures, but the revenues of functions must justify this.

- Protection of the Muhimbili Hospital against flooding

The hospital has implemented protection measures currently themselves. Extending safety by having a terrace level in front will be considered.

- Ponds in the wetlands for retention and landscape elements

Retention is not a measure that fits the core objective for the lower basin. Once the larger volumes of water have entered the lower basin we want to get rid of it. The conveyance concept means a focus on the river channel widening and deepening. Still small micro-relief in the flood plain level of the lower basin area can very well serve as landscape elements, although retention or large recreational use it won't have here.

- Include parking in the new urban blocks

Yes. In the detailing of the Detailed Plan Urban Development Area special attention on parking provision and guidelines will be given.

- Parking area for the City

Parking in relation to housing have been mentioned in the point above, but general parking for visitors of the city centre, the park and events in and around the park and with the main BRT line adjacent might have a great function and attraction to provide for parking in the area close to the main infrastructure. Idea is to see if it can be combined with the bus depot construction and location when the integrated solution in the area is chosen as approach of removing the DART depot from its current vulnerable spot.

- Add walkways, cycleways and jogging tracks

Yes, this item will be elaborated in the detailed plan report and is important for the function and success of the City Park.

- Add staircases and ramps in the terraces
- River terraces should have steps at the base like a stair case

Yes, because of the main public park function of the core area at Jangwani, stairs and ramps for accessibility to bridge the elevation levels of the terraces are needed and fun to use.

- Dredge also into Sinza river; Ngombe

Up to Kawawa road this will be included in the plan. Upstream from Kawawa road there is a current set of interventions in the DMDP programme on drainage and retention in the Sinza area.

- Dikes along the bridge

The dikes won't work in this concept and the bridge and connecting road of Morogoro have to be raised.

- Concrete base and sides of the river to control river shifting, eg Magomeni Mapipa

Answered earlier also: The new river banks will be fully natural, have shallow slopes and are designed according to the dynamics of the river. Reinforcement of the embankment will be done at crucial areas with hidden protection to allow the natural green vegetation to do hold the soil. Concrete solutions have been proven not to be sufficient, very expensive and hard to maintain.

- Area needs to be gazetted so its fits within the legal planning framework 'Special Planning Area' appropriate classification under planning law needs to be adopted

During the charrette process the review and re-establishment of the gazetted area from 2011 have been undertaken. Now a clear border and area definition for the Special Planning Area is available and part of all the presented plans. The new more elaborate boundary is now in the approval process.

- Precision on the study on sediments inside the current
- Study on sediments to determine its suitability for terraces cause of pollution

Sediments will be studied in next stages in more detail on a range of aspects that might effect various technical feasibilities.

- Impact of river dredging on river morphology

Also this can be studied in more detail, but with the experts part of the current process already it can be assured that the course set out by this Detailed Plan is already well informed and feasible on this point.

- Develop new storm water drainage system from the residential areas to the main river Msimbazi

Neighbourhood per neighbourhood and especially the newly developed areas need to have better storm water drainage. So project by project and over time this can be established. Neighbourhood improvements on these type of interventions is not part of the Msimbazi project, however unquestionable important it is.

- Add water harvesting at house hold level; this helps to minimize the direct run-off to the river

At neighbourhood and even household level this detailed plan hasn't got the power to actually do this. It is mainly awareness and see if a trend can be created in which people start to collect rainwater at their plot and house for own use (gardens, flush toilet, etc). Whether it will be effective during the short heavy peaks is questionable. Especially when you think the rain barrels get full quickly and when the heavy rain follows after a whole period of rains the barrels are full and will overflow to the gutter. Still we will incorporate in the Framework level and the awareness part.

Other notes

- Civil society should be involved because they listen to the communities and know the problem better
- Community of the areas should be engaged in the management

Noted and based on the experience from working with each other during the charrettes very much appreciated and true about its effectiveness. Whether this advice will be followed by the decision makers is up to them.

- We have everybody on board in these charrettes, but in future stages we need the investors, political leaders at higher levels

Also noted. That stage starts now from August and it is important that it won't take long to get them involved and pro-active in collaborations. In the Framework document we pay attention to this aspect and also link it to the institutional setting we have created together and is written down for the report.

Second Stakeholder Workshop
28 August 2018
Julius Nyerere International Conference Centre Dar es Salaam

SECOND STAKEHOLDER WORKSHOP

Agenda of the day

09:00 - 09:15	Welcome, Opening
09:15 - 09:30	Introduction to the Msimbazi Opportunity Documents
09:30 - 12:30	Working session: Elaborating on the Next Steps for the Msimbazi Opportunity: 10 SCs
12:30 - 13:30	Lunch
13:30 - 13:45	Introduction to the afternoon session
13:45 - 15:00	Presentation of MSDMF & Detailed Plan
15:00 - 16:00	Defining & prioritizing the next steps (feedback)
16:00 - 16:20	Review of what we achieved together
16:20 - 16:45	Moving from Commitment to Action: The Way Forward
16:45 - 17:00	Closing remarks

Work session on next steps

Structure of the working session

Table 1: Larissa (SC № 1: Make room for eco-services and biodiversity)

Table 2: Machibia (SC № 2: Increase retention and rain water harvesting)

Table 3: Bas (SC № 3: Control sedimentation and erosion processes + № 4: Enhance the water conveyance capacity+№ 5: Protect against flood risks)

Table 5: MaryGrace (SC № 6: Displacement and Resettlement of people and businesses to safe locations)

Table 6: Nyambiri (SC № 6: Displacement and Resettlement of people and businesses to safe locations)

Table 7: Edward (SC № 7: Improve Msimbazi river water quality: Stop river pollution)

Table 8: Joyce (SC № 8: Improve solid waste management: Stop dumping in the Msimbazi)

Table 9: Remco (SC № 9: Develop a City Park in the Msimbazi lower and lower middle basin areas)

Table 10: Eng. Nanai (SC № 10: Ensure good governance of the Msimbazi opportunity)

TABLE 1: SC № 1 Make room for eco-services and biodiversity

Text suggestions/amendments:

1.1 Reforestation

Change title to be 'Reforestation and Rehabilitation'

Integrate the reality that rehabilitation and stabilization of some of the Pugu forest reserve slopes, for example, also needs to be done. If possible include buffer zone around reserves through reclaiming, rehabilitating, and reforesting bordering land (suggestion from group).

1.2 Resilient land use

It was suggested to include in here the potential for incorporating new land use management laws/frameworks surrounding buffer zones around parks/reserves (if it isn't already existing).

The main questions:

1. Which organization should take the lead; and who should be the champion for this SC?

- See table below

2. How would you prioritize the interventions within the SC?

		Priority	Responsible	partners	Resources	Time
1.1	Reforestation	-	TFS	MRTN	Money needed for: implementation, M7E, research on invasive species In-kind: expertise, tree nursery spaces, communications	-
1.2	Resilient Land Use	-	National Land Use Commission	Ministry of lands (MLHHS) Department of physical planning, and MOWI	Money: to compare laws here to others, for some external expertise, for information dissemination and to facilitate the process In-kind:- staff	-
1.3	Wetlands rehabilitation	-	MOWI and MNRT	WAMI RUVU	financial support, technology, human resources	-
1.4	Mangrove and wetlands park in the lower basin area	-	TFS	MLHHS MoWI	Money: Technology, human resources, research (on impact of pollution)	-

3. What resources (time and/or investments) are needed for this SC?

(Designated focal persons; budget; in-kind budget; process time decision-making)

- See table
- Timeline:
 - o Step 1: In parallel: Reforestation and rehabilitation: Do basic mangrove research and management plan development (no implementation), begin regulation process for 1.2
 - o Step 2: Plan for wetland rehabilitation for both 1.3 and 1.4 (once baseline mangrove plans done)
 - o Step 3: Begin the implementation of the plans for 1.3 and 1.4 concurrently as part of the 1st TURP funded project face 2018/19-2019/20)

4. Any other observation: political support, finance?

Add Reforestation initiative to the Afri-100 commitment which was recently made by Tanzania.

TABLE 2: SC № 2 Increasing retention and flood water harvesting

The main questions:

1. Which organization should take the lead; and who should be the champion for this SC?

- See table

2. How would you prioritize the interventions within the SC?

		Priority	Responsible	partners	HR	Resources	Time
2.1	Promotion of local infiltration and local retention in the river corridor	2	Lead Ministry MoWI Wami Ruvu river basin	KMC IMC NEMC NGO's, CBO's and community	TFS, NGO's Community	TBD	Short to long term
2.2	Upstream storage reservoirs	1	Lead Ministry MoWI Wami Ruvu river basin	VPO DAWASA	Consultant & contractors MoWI	TBD	Long term
2.3	Local rain water harvesting at riverine houses and buildings	3	KMC IMC	DCC NGO's, CBO's & community	Community, KMC, IMC, DCC	TBD	Medium to long term

3. What resources (time and/or investments) are needed for this SC?

(Designated focal persons; budget; in kind budget; process time decision making)

- Not enough info for cost estimates

4. Any other observation: political support, finance?

- Significant political and financial support is expected for 2.2 Upstream storage reservoirs
- Significant political and moderate financial support is expected for 2.3 Local rain water harvesting interventions.
- Marginal political and financial support is expected for 2.1 Promotion of local infiltration and retention.

TABLE 3: SC № 3: Erosion and sedimentation
SC № 4: Enhancing water conveyance capacity
SC № 5: Protect against flood risks

Text suggestions/amendments:

SC 3:

- Emphasize/prioritize silt traps upstream
- Improve explanation that with any intervention it is necessary to strive creating a balance/equilibrium in river morphology processes (erosion and sedimentation) on a large scale as well as on smaller scale levels

SC 4:

- How to keep dredged river channels open and stable?
- Investigate possible barrier effect of Selander bridge
- Clearer separation of short, medium and long-term interventions (e.g. intermediate interventions)

SC 5:

- Add that the 50cm threshold for determining acceptable flood risk is validated by the charrette process
- Emphasize that the 50cm threshold was mainly used for analysis of the existing situation, and the way of finding the need for resettlement
- Hazard vs. Exposure; risk based on inundation hazards does not need to be an issue. Has more to do with living safely with floods. Increasing resiliency

The main questions:

1. Which organization should take the lead; and who should be the champion for this SC?

Main problem for implementation of SC 3, 4 and 5 is the multi-multi actor situation. It was hard to define which organizations are to take the lead and who will be the champion. However, all agreed that the PIU should be within DCC. Besides this, PO-RALG should be responsible and should have the legal mandate to establishing the PIU.

2. How would you prioritize the interventions within the SC?

Prioritization of interventions:

- Survey and Monitoring: E.g. River discharge, water levels in combination with rainfall. Measurement of river bed and flood plain levels by periodic survey campaigns, this to quantify erosion and sedimentation processes and reveal patterns/trends.
- Jacking up Jangwani Bridge: This mainly to resolve mobility issues in the short term (Morogoro Road), and to reduce flood hazards affecting the surroundings to some

extent.

- Silt traps upstream and midstream: Reduce sedimentation in the lower basin by catching sediment mid- and upstream. With sediment traps erosion and sedimentation can be controlled up- and downstream of the trap to some extent. Main advantage of a trap is concentrated accumulation of sand/silt which facilitates logistics of terrace filling.
- Dredging the channels in the detailed plan area: A deeper and wider connection to the ocean should be created.
- Flood early warning systems: In view of short response time of the river system (period between rainfall bursts and peak discharges in the river downstream), flood early warning systems are considered very important disaster response tools for both communities and mobility planning.
- Establish/implement PIU and required government structure for enforcement
Adopted statement during the session: 'Removing uncertainty, and implement no regret measures'

3. What resources (time and/or investments) are needed for this SC?

(Designated focal persons; budget; in kind budget; process time decision making)

- -

4. Any other observation: political support, finance?

- -

Ad 2, point 2: Jacking up Jangwani Bridge?

During the session jacking up of the Jangwani Bridge was proposed by independent flood risk consultants to the World Bank as an intermediate solution to reduce flood risk in the short term. As a stand-alone measure this could reduce hazards in the short term, but only to a limited extent. Based on the whole charrette process, including the flood modelling that has been performed, the charrette consultant team strongly advises to implement a New Bridge that is aligned with:

1. the dredging interventions (interventions A and C)
2. overall plan (e.g. terraces)
3. relocation of BRT bus depot

This means that the New Bridge should cater for both i) sufficient/acceptable hazard reduction with the BRT bus depot in its current location, and ii) sufficient/acceptable hazard reduction when the BRT depot is relocated and the terraces are implemented (room for the river and construction of terraces). The New Bridge should anticipate the future developments in the valley. An intermediate measure with limited effect for a limited period of time would be a misleading sign and waste of money in that regard.

Table 4 – This table's issue was taken up on Table 3

TABLE 5 SC № 6: Displacement and resettlement of people and businesses to locations safe from flood risks

Our table discussed displacement and resettlement

Overall, we agree with the content and the listed interventions. We have a few suggestions.

The main questions:

1. Which organization should take the lead; and who should be the champion for this SC?

The PIU should take the lead with the City Council including politicians at the city council, ward and Mtaa level as champions. The RAP itself should be prepared by a consultant or consortium that could include a company and a local NGO and the work should be overseen by a steering committee that includes the lower levels of government and community members.

2. How would you prioritize the interventions within the SC?

First: Intervention and priority no 1 should be to determine the budget and to look for the financial resources needed for implementing the resettlement strategy.

Second to add an intervention which calls for the enumeration of project affected persons; documentation of landownership, valuation and development of Resettlement Action Plans.

3. What resources (time and/or investments) are needed for this SC?

(Designated focal persons; budget; in kind budget; process time decision making)

This question is a bit technical and we thought it would be best answered by PO-RALG/DCC.

4. Any other observation: political support, finance?

Political support is important and needed from every level. There should be continued involvement from community and Mtaa representatives. Compensation is a very tricky issue and although the options identified are good the compensation process should be more robust that is detailed in the MSDMF. Specifically, there should be rules to govern how households decide on the compensation option and how they receive it. For example. More than just the head of the household should be involved, and multiple family members should be present when cash or other in-kind payment is distributed. Involvement of social workers to sensitize and assist the families to make difficult decisions; Possibly the involvement of lawyers who specialize in family law. It is also important to make sure that people who do resettle elsewhere go to safe and planned locations.

TABLE 6 SC № 6: Displacement and resettlement of people and businesses to locations safe from flood risks

Text suggestions/amendments:

- Suggestions – priority of resettlement should include both people whose houses were demolished in 2015/16 and people at most risk of being affected by floods. Should be 2019.
- The estimated cost of 4,500 USD per structure is unrealistic therefore it should be reconsidered, observing the current market value.

D1	Phase 1: MLBA between Selander bridge and Jangwani Bridge (500+269)	769	4500	3.46
D2	Phase 2: MLBA between Jangwani bridge and the Kawawa bridges	2338	4500	10.52

The main questions:

1. Which organization should take the lead; and who should be the champion for this SC?

- PO-RALG

2. How would you prioritize the interventions within the SC?

		Priority	Responsible	Resources	Time
6.1	Complete Flood model for the Lower Basin Area, also for MSPZ area between Kawawa road and Vingunguti.	6	PO-RALG	Funds, experts	Not more than 6 months from now
6.2	-Demarcation of flood safe zones within the boundaries of MSPZ	3	MLHHS D, DCC – PIU, PO-RALG	Funds, experts	Not more than 6 months from now
6.3	-Agree on the DRS principles applicable to MSPZ, estimate and mobilize the necessary finance.	2	MLHHS D, PO-RALG	experts	Not more than 6 months from now
6.4	Decide on a starting date of the DRS and use this to identify and register PAPs.	5	MLHHS D, DCC – PIU, PO-RALG	experts	
6.5	-Implement the RAP for the community members affected by the demolition in January 2016.	1	MLHHS D, PO-RALG		Before next Masika rain season – March, 2019
6.6	Align the RAPs with the step by step implementation of the flood risk protection projects.	6	PO-RALG		Depends on implementation of flood protection project

3. What resources (time and/or investments) are needed for this SC?

(Designated focal persons; budget; in-kind budget; process time decision-making)

• -

4. Any other observation: political support, finance?

- Capacity buildings for PAP - trainings, financial support – small credits

The consultants view

Cash handover is complicated and dangerous. We propose to use a charrette approach to design the SRS and compensation process i.e. the affected households design the process of the practical aspects of compensation. This needs legal support to draw up the documents. One must

document the compensation procedure with letter which specifies what the compensation covers, the value of the assets compensated, the compensation option, the receipt of the compensation, signed by a biometric identity – legal); and/or the time dimension of the compensation option. This is important if households select the option of returning to the area in a social housing context. This needs to worked out further.

TABLE 7: SC № 7: Improve Msimbazi river water quality; Stop river pollution:

The main questions:

1. Which organization should take the lead; and who should be the champion for this SC?

PIU in close coordination with ministry of water and irrigation (MoWI)

2. How would you prioritize the interventions within the SC?

The intervention carried out into two phases namely Phase One (short term) and Phase two (long term):

- Phase One should include Intervention 7.3 and 7.4
- Phase Two will include intervention 7.1 and 7.2.

3. What resources (time and/or investments) are needed for this SC?

No consensus was reached for this question. The key argument was without the political will it is very difficult to estimate the time and investment needed for this SC.

4. Any other observation: political support, finance?

For this SC to work there must be a strong commitment from the government both political and financial as well as financial support from international development partners.

TABLE 8: SC № 8: Improve Solid Waste Management: Stop dumping in the Msimbazi

The main questions:

1. Which organization should take the lead; and who should be the champion for this SC?

• -

2. How would you prioritize the interventions within the SC?

- 1) Awareness creation and capacity building (behavior change + willingness)
- 2) Law enforcement
- 3) Sort in source
- 4) Roles of community leaders
 - o Ensure people pay for waste collection fees
 - o Follow up: SP schedule
 - o Enforce: community police
- 5) Professional clean up first (Rivers, Open Space, Drainage system)
- 6) Environmental committee for Msimbazi valley (under Valley Authority)
- 7) Encourage monthly payment
- 8) Final disposal (infrastructure, management ability, more disposal and land fill)

3. What resources (time and/or investments) are needed for this SC?

• -

4. Any other observation: political support, finance?

- A total plastic bag ban is needed
- Regulatory and implementors, implementors and politicians should sit together to harmonize and synchronize the situation.
- Attract big investors in solid waste business cases
- Enhance the solid waste value chain management
- Introduce minimum standards for waste management for the 400 hectares city park zone and expand later with extension of the City Park in next stages

TABLE 9: SC № 9: Develop a City Park in the Msimbazi Lower Basin and Lower Middle Basin

Text suggestions/amendments:

- Text description of intervention 9.1 and sub-interventions are not formulated like intervention, but more like description of situation. Phrasing should be changed (group gave detailed suggestions).

The main questions:

1. Which organization should take the lead; and who should be the champion for this SC?

DCC: Existing organ that can do this work; Bind various municipalities; Has the law/position to

do execute and operate; The city director should lead this (is the champion) with assistance by the city planner(s).

2. How would you prioritize the interventions within the SC?

- No specific prioritization: All interventions are important, and they are in the right order in the document
- Community and Stakeholder input in all interventions of this SC are the true priority to make the City Park a success

3. What resources (time and/or investments) are needed for this SC?

- 9.2 to 9.4 interventions: All should start in 2018-2020 period. Then follow-up implementation and execution phase up to 2025. This fits political cycle with intermediate elections in 2020. This moment is a good moment to review the process
- Public participation should be catered for in terms of budget, so it can be well done in every elaborated design and implementation step of each intervention

4. Any other observation: political support, finance?

- Municipalities should budget and actively participate in part-interventions and take part in PIU and SC.
- Private sector investors need to be mobilized. Organize a business forum on Msimbazi opportunity.

TABLE 10: SC № 10: Good governance for Msimbazi Opportunity

The main questions:

1. Which organization should take the lead; and who should be the champion for this SC?

- Lead: PO-RALG
- Champion: Selemani S. Jafo (MP) Minister of State, President's Office Regional Administration and Local Government
- Support: PMO, department of the coordination of government business + National Land Use Planning commission in the ministry of lands (MLHHS)

2. How would you prioritize the interventions within the SC?

- PIU sets up criteria
- Technical advisory committee
- Send to steering committee for decision making
- DCC is coordinator of process

3. What resources (time and/or investments) are needed for this SC?

(Designated focal persons; budget; in-kind budget; process time decision making)

- -

4. Any other observation: political support, finance?

- PO-RALG to remain a key factor during implementation (execution) in coordination for sustainability of SC
- Government must allocate budget for SC to create a sustainable coordination of this SC and the execution of the project



Figure 16: Speech of Selemani S. Jafo (MP) Minister of State, President's Office Regional Administration and Local Government



Figure 17: Speech of January Y. Makamba (MP) Minister of State, Vice President's Office, Environment and Union Affairs



Figure 18: Second Stakeholder Workshop

APPENDIX D: PERSONAL STATEMENTS OF PARTICIPANTS OF THE SECOND STAKEHOLDER WORKSHOP 28 AUGUST 2018

Individual statements:

Table 1

“I will spread education to the community about the project.”

Straton Vincent

**“1. Disseminate strategic framework to TFS staff and management;
2. Implement Pugu/Kazimzumbwi Reforestation /Rehabilitation project; and
3. Rehabilitation of the saline (Mangrove) wetland & /sweet water wetland.”**

Everist Nashanda

**“To evacuate the community and tell them the whole plan how it is going to be.
Being ready for the change.”**

Habiba Mondoma

“Being a beneficiary I support the project. Show and disseminate the strategy to other stakeholders and my partners. To protect and preserve the forest & wetlands along the river bank.”

Lydia Ndibalema

“Pioneering establishing land use regulations, land use policy, land use planning.”

Jozeph Paul

Table 2

“I can provide technical support on town planning issues (space standards and by-law preparations).”

Alex Mwamaso A.

“I can help in the design of reservoirs particularly hydrological side of the design.”

Eng. Dr. Machibya Magayane

“To offer professional advise (urban planning) to the community to comply with the acts, bylaws related to the development of new Msimbazi Basin.”

Charles A. Mariki

Table 3 & 4

“Provide weather information for Flood warning. Awareness rising to the basin residents.”

Selemani M. Chillo

“Highly involvement in implementation of flood mitigation of Msimbazi valley from commitment to action.”

Halima Abballah

“Flood control by raising awareness on proper waste management along the Msimbazi River (eg. Communities living along the river).”

Anodi Mndikasi

“Continue working as a consultant to the World Bank on sediment issues, hydraulic issues, working out options to re-use the extracted sediments.”

Adri Verwey

“Provide consultancy services and advice on flood risk management.”

Scott Ferguson

Table 5

“As the Chairman of Kigogo Kati sub-ward, Kigogo ward, I’ll make sure that I supervise my people so that they can be loyal to our agreements concerning Msimbazi valley development; including prohibiting informal house construction without permits from the Municipal Council and stopping dumping waste into Msimbazi for preserving the river and avoiding floods.”

(translated from Swahili)

Dominic L. Mgomsa

“By using my position to act as a link between the community and the central government.”

(translated from Swahili)

Christopher Sebastian Rugema Lila

“I am the bond between the community and the government.”

(translated from Swahili)

Ally Sultan Hamed

“To facilitate gazettelement of planning area in the Government Gazette. Approval of detail planning schemes.”

Amulike A. Mahenge

“To be a good coordinator between people who I am leading and the other organisation.”

Elizabeth Masao (Chairperson Kawawa subward)

- 1. Support finalization of Detailed Plan and MSDMF document;**
- 2. Assist to mobilize financial resources needed for implementation;**
- 3. Advise/review development of resettlement action plan; and**
- 4. Collaborate with government to develop programs for building capacity for urban planning, implementation and strengthening development control.”**

MaryGrace Lugakingira

Table 6

“I’ll train all community members about the project, from now ... including those whose houses have been demolished and those living in hazardous area”

(translated from Swahili)

Salum Hamiss

“My contribution will be to cooperate with the technical/professional team to evaluate all the affected people of the plan so as to avoid persons who are not part (target) of the plan to emerge.”

(translated from Swahili)

Fatuma Bakari

**“ 1. Educate/ train people who will be affected by the plan implementation; and
2. Getting correct information about the plan implementation and involving the community”**

(translated from Swahili)

Reuben Ruhonrole

“By facilitating all land matters required from the Ministry of lands, especially in the Director of survey and mapping office.”

Hans Msemo

“To inculcate education to the society on the overall things, and to identify people with houses so that the inventory may not include those without houses. My phone number is +255 718”

(translated from Swahili)

Anna Mapunda

“I’ll educate to my people whose houses were demolished in 2015-2016 not to be disappointed, be patient since our government is in a promising process to wipe out tears from their eyes; so they may get their rights.”

(translated from Swahili)

Selemani M. Lada

“By giving technical advice on all matters concerning land in the Msimbazi special planning area.”

Benjamin Rodger Mwakigonja

Table 7

“I will enforce the water resource management act no 11, 2009 on discharge permit. Make sure all industries along the Msimbazi River have discharge permit and monitor the effluent to be on acceptable standards.”

Diana Kimbute

“I’ll personally go and educate my community about importance of Msimbazi river.”

(translated from Swahili)

Gungu Tambaza

**“ 1. I’ll volunteer to educate the society on the importance of environmental preservation; and
2. I’ll mobilize people to create groups for environmental issues coordination and management”**

(translated from Swahili)

Busoro M. Pazi

“Creating small groups for enforcing environmental law within my sub-ward.”

(translated from Swahili)

Anthony Joseph Sangrane

“I will go to my community to give the education on how to prevent the environment. Also I will be better providing the capacity building to my community”

Raphael Mchemvu

“I will make sure that awareness to my citizens in order to civilize them in order to wake up wherever the case in order to improve their lives.”

Dastan Elias Kikwasha

“Provide technical advices to local NGO’s / CBO’s working with local community within the valley on climate change adaptation and mitigation.”

Edward Honja

“Convene a meeting with community members and inform them about the importance of preserving the environment in water sources.”

(translated from Swahili)

Amin Iddi

Table 8

To raise awareness to the dwellers on how to stop dumping solid waste to the river especially plastci bags etc.

Alfred Mbyopyo

**“ Community awareness on proper solid waste management;
Law enforcement on solid waste management;
Provision of green infrastructure on solid waste disposal; and
Enhancing solid waste regeneration (reduce, reuse, recycle).”**

Grace B Mbena

“To ensure all environmental waste management tools are implemented.”

Mujuni Churchill

“Awareness creation on solid waste management.”

Mgana S.

“I make sure by law concerning solid waste enforced accordingly.”

Deodatus Kalinjuna

“I will work on awareness raising for the best waste practices in the Msimbazi Valley Communities. ”

Mamlo Dbdalgah

“I can help educating my society and by stop dumping solid waste. The education should start from society that dump the most.”

Miriamlisa Kasanga

“Stopping dumping of solid waste; planning areas for solid waste collection points; Educate local community on the impact of solid waste to the Msimbazi river valley.”

Emmanuel Richard

“To ensure all environment waste management tools are implemented.”

Mujuni L.

Table 9

“I will facilitate, lead the implementation of all interventions and activities by involving all stakeholders.”

Sipora J. Liona

“I will personally help by sensitizing people about this project and I will also provide advice to people who haven’t understood it yet in the society.” *(translated from Swahili)*

Henry Maulidi

“I will be the champion to make everything is going according to the plan.”

Margareth Mazwile

“Professionaly I am a town planner. I can participate in Detailed Plan design.”

Gerand Mango-Lecide

“In the whole process what I can help is my professional knowledge throughout the project duration.”

Michael Joel Majebele

“Consulting the community and all other stakeholders in creating self-ownership of the city park; Proposing good management practice of the park; Enhancing environmental sustainability of the park in terraces of cleanliness and waste management.”

Edwin Hema

Table 10

“I will be available to help this process in the future whenever required to provide my expertise and time to the course.”

Eng. Mussa B. Natty

“Being principle Land Administration Officer working with the National Land Use Planning commission I can help in land use and land tenure readjustments and restoration according to land use planning act of 2007. I once worked as City Resilient Officer for Arusha City Resilience under Rockefeller Foundation. We prepared City Resilience strategy I can use the experience to help this project of Msimbazi Charrette.”

Nyerembe D. Munasa

- “1. Mobilizing and influencing local government authorities and community to understand about the Msimbazi Project;**
- 2. Train and raise awareness on the sustainable waste management at Msimbazi River valley;**
- 3. Helping in gathering/collecting information needed before project interventions at Msimbazi River valley start. Researching on lower Msimbazi valley on the status/situation of mangroves and waste; and**
- 4. Public awareness creation on sustainable lifestyle & behavior change.”**

Wilyhard Shishikaye

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APPENDIX F: GLOSSARY

ACCA process: A concept based on group dynamics and change management theory. People can only move one-step at a time from denial to action. In an ACCA process, people are guided systematically through the process of Awareness: recognizing the existence and multiple dimensions of a problem; Comprehension of alternative approaches and solutions; Commitment to be best available approach/solution; and readiness to take problem solving Action

Design Charrette: Series of workshops in which the participants are a comprehensive group of stakeholders motivated to finding a solution for a multi-faceted and complex problem that directly influences their day-to-day lives, assets or livelihoods. The stakeholders commit themselves and/or their organizations to the actions designed as part of the solution. The “Charrette stakeholder team” is provided with all data and available information needed for developing the knowledge and insights required to design the strategies and management framework needed to solve the problem over time.

Deep Democracy: A conflict resolution approach used in the Msimbazi design Charrette process with as key question: What does the minority, which says NO want to add to commit to the process outcomes? (Lewis, 2008)

Flood hazard reduction: To diminish the hazardous effect of flooding, flood hazard reduction measures can be taken, aiming at reducing adverse hydraulic conditions like inundation depth, inundation period and flood flow velocities.

Flood risk protection: In comparison with flood hazard reduction measures, flood protection measures aim at protecting people, flora, fauna, assets against flooding. It is common practice to design such measures in accordance to predetermined safety levels.

Heat wave and heat stress: Heat wave can be defined as a situation in which the maximum temperature of a certain amount of consecutive days exceeds a certain temperature. Heat stress is a situation where too much heat is absorbed by a person, a plant or an animal and causes stress, illness or even death. Besides temperature, relative humidity is a parameter to gauge the magnitude of the heat stress (the higher the humidity, the higher the stress). CC scenarios for Tanzania indicate that it is very likely the temperatures in Dar es Salaam will continue rise, both due to increased urban development (hence, increasing heat island effect) and climate change (increasing temperatures in general). So, the observed increase in heat stress is expected to continue and increase further the coming decades.

Kata: Ward level of the Local Government structure. A Kata is divided into Sub-wards called Mtaa (or Mitaa when plural).

Landscaping approach: Integral approach to planning covering a balance in people, planet, and profit dimensions through a focus on the role of land and environment in shaping human settlement, behavior patterns and inclusive development.

Risk: In project management, risk is the chance that events occur which, are outside the control of project management, and may have a negative or positive impact on the expected results. Risks have a probability attached to it. This differentiates risk from uncertainty. Risk is

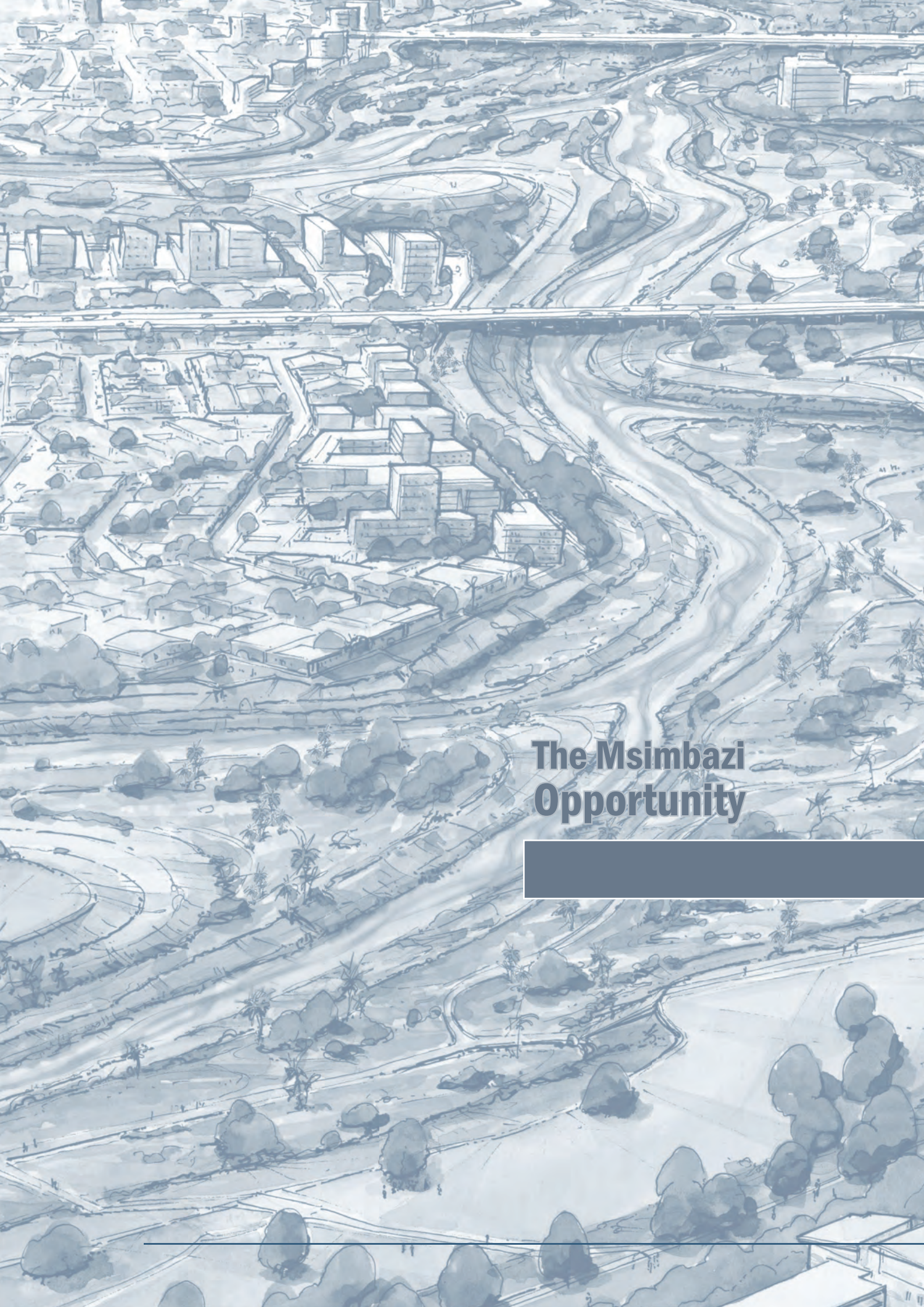
Special Planning Area or Zone: Area of which the boundaries are defined by the MLHSD and Gazetted. Within the boundaries zoning is used to define the functions that are allowed.

The Msimbazi Gazetted area covers a space of 26.8 square kilometers and covers the flood prone river plains and a stroke of adjoining dry land where special land use regulations apply.

Structural and non-structural measures. The term Structural measures is associated with engineering works, with creating fixed structures with concrete, steel, rock, asphalt etc. By contrast non-structural measures are of a flexible character using soil, water, vegetation and actions organized.

T10yr event: Flood event conditions with a return period of 10 years, which means that a T10 flood event has the probability to occur once in 10 years' period.

T100yr event: Flood event conditions with a return period of 100 years, which means that a T100 flood event has the probability to occur once in 100 years' period.



The Msimbazi Opportunity

