The Other Side

The final publication of Interplay of Cultures Zanzibar Studio 2018 introducing an intertwined network of architectural development proposals for the future city center of Zanzibar, Ng’ambo – The Other Side as one would say in Swahili.
“Whenever you cross a line in Ng’ambo you discover something new. Because there is no street pattern, you end up going left, right, left, right – and suddenly you come to a beautiful view with a small tree. That’s the kind of surprise I want there to stay. Ng’ambo needs to achieve a little bit of modernity while holding on to those unique unexpected experiences that come from the meandering street patterns and small, warm and welcoming public spaces.”

–Dr. Muhammad Juma, Director of the Department of Urban and Rural Planning of Zanzibar
This is the story of 13 Aalto University students and three teachers of ten different nationalities from the fields of architecture, design and business traveling to Zanzibar with a shared goal; to gain a deep understanding of Ng’ambo, a neighborhood in Zanzibar City that has been chosen to become the new city center for the capital of an island inhabiting 1.5 million people in total. What you see here, is the result of five months of research, field work, data analysis and project development guiding the reader through ten individual urban development proposals for Ng’ambo. Although individual, all ten projects located on the same study area are deeply intertwined, just like the city in real life.
Acknowledgements

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The Other Side

Interplay of Cultures is a pedagogical entity and an interdisciplinary design studio at the Aalto School of Arts, Design and Architecture, focusing on architectural design in developing countries. The course aims at community empowerment through participation and sustainable design solutions, with cultural understanding as the starting point.

First initiated in 1993, the Interplay of Cultures Studio has since operated under many names, professors and teachers at the Department of Architecture. The basic pedagogical approach, however, has remained: the importance of relevant background information as a framework for learning, and a field trip to a different cultural context in a developing country, where the design tasks are situated.

In the context of the Interplay of Cultures Studio, the field trip is an essential component of the course. It is an experiment of stepping out of one’s comfort zone, a journey towards the essence of human interaction, towards understanding the common ground we all share and are part of. The field trip exposes the challenges of the architect’s profession, as one need to find out the maximum amount of information in a limited time frame, to digest not only the cognitive knowledge, but also the overwhelming sensory experience of climatic variables, noise and sounds, smells, colours and differences of tempo in how people organize their everyday life. Out of these experiences grows an embodied cognition, which allows for a variety of design projects to grow.

In 2018, the Interplay of Cultures Studio headed to Zanzibar, through the connections created by Helena Sandman and her research in New Global, which is an interdisciplinary innovation and action research project at Aalto University. 13 international Aalto students engaged in affordable housing and public buildings, flooding and resilience, public space, green infrastructure and community engagement through built environment, in collaboration with local residents and city authorities. As teachers, we feel privileged to have witness the group collaborate and independently take responsibility of their learning, and of the co-development and presentation of their projects. This book is a joint endeavor of everyone in the group, to share their knowledge and understanding of the context in Ng’ambo area, within the City of Zanzibar.

In 2018, Aalto was the first Finnish university to sign the international UN Sustainable Development Goals Accord. It is a valuable commitment in its potential to make visible and promote the efforts towards global sustainability. This book is one of those efforts to better understand our globalising world. It is the latest edition in a series of publications, presenting the projects and ideas of the Aalto Interplay of Cultures Studio students, based on their intense background research, grass root field work, and design skills. It is the outcome of a learning experience that forged them into a group of friends, able to work together.

During the field trip, amidst of the abundance of information, we sometimes simply sat down to make a hand drawing. The moment one needs to focus into a drawing, allows for landing to the site, to internalize the proportions and qualities that otherwise go easily unnoticed.

We hope that this book would give the reader similar insights we found on our trip to Zanzibar.

Saija Hollmén, Taru Niskanen, Helena Sandman
### Glossary

**Affordable housing**
Housing that is deemed affordable to those with median household income.

**Baraza**
Semi-public, fixed seating space commonly forming a concrete bench on the roadside of a private house next to the front door.

**Connectivity**
Act of bringing people, services and locations together through built environment.

**Densification**
Urban areas growing denser as more people move from rural areas to cities.

**Flood resilience**
Methods and means to prepare for and manage issues related to flooding caused by heavy seasonal rain.

**Green Corridor**
Plan created and conducted by Dr. Mohammed Juma, Anthony Folkers and the Green Corridor team to plant trees and other greenery alongside the main roads forming the center axis of Zanzibar City.

**Handprint**
The counterweight to environmental footprint; act of reducing the environmental load by creating positive regenerative impact.

**Human scale**
The physical dimensions, capabilities and limits based on which humans interact with their environments.

**Micro-utopia**
Micro-utopias are temporary manifestations of an ideal civic culture where participants test an aspirational political concept, process or social interaction.

**Michenzani buildings**
Michenzani is an area in Ng’amo characterized by large Plattenbau-style concrete block buildings built with the aid of East Germany in the late 1960s and early 1970s after the revolution of Zanzibar.

**Ng’amo**
Part of Zanzibar City that was originally referred to as The Other Side due to a creek separating Ng’amo from the historical center and the UNESCO World Heritage Site Stone Town.

**Pole pole**
Swahili saying encapsulating the easy-going lifestyle on Zanzibar, meaning slowly, slowly.

**Public furniture**
Benches, stools and tables located in public areas offering space to sit and relax for anyone passing by.

**Resilience**
The ability to recover from or adjust easily to misfortune or change.

**Sea level rise**
A sea level rise is an increase in global mean sea level as a result of an increase in the volume of water in the world’s oceans.

**Sheha**
The city of Zanzibar is divided into shehias and each one of them is locally governed by the head of the community, sheha. Literal translation from Swahili for sheha is a chief, leader and storyteller.

**Shehia**
Local governance area in the city of Zanzibar. The four quarters in Ng’amo formed by the central axis roads are divided into 13 shehias and each one is governed by a sheha.

**Urbanisation**
Urbanization refers to the population shift from rural to urban areas, “the gradual increase in the proportion of people living in urban areas”, and the ways in which each society adapts to the change.
Part I Introduction

“Karibu, Zanzibar!”

—Smiling passer-by in Ng’ambo
Interplay of Cultures 2018 in numbers

21 days of field work on Zanzibar

19 team members including 13 students and 3 teachers from Aalto University as well as Dr. Muhammad Juma, Ali and Selly from the Department of Urban and Rural Planning of Zanzibar

10 final architectural projects – independent, yet deeply intertwined and connected at the same time

5 months in total of research, field work and project development

3 main focus areas concerning environmental resilience, community empowerment through public space and affordable housing for future urbanisation

1 final publication

Zanzibar Studio 2018

In January 2018 shortly after the new year had started, our team of 13 students and three teachers from ten different countries and three different disciplines or architecture, design and business, was brought together by Interplay of Cultures, an architectural design studio that was held for the first time already in 1993.

The Project

The Department of Urban and Rural Planning of Zanzibar (DoURP) assigned us to work with themes concerning the development of Zanzibar City area and specifically the future city center to become, Ng’ambo. The main focus areas appointed to our team, covered issues related to environmental resilience in seasonal flooding, community empowerment through public space and affordable housing for future urbanisation. The main purpose of this cooperation was to create a fruitful environment for learning, understanding and coming up with new ideas.

Ng’ambo – meaning The Other Side in Swahili – is the buffer zone between the historical center of Zanzibar City and UNESCO World Heritage site Stone Town, and the rest of the urbanised area. Stone Town has already reached its limits in terms of capacity, as the urban population on Zanzibar increases. As a solution to dealing with the densifying urban area, Ng’ambo which constitutes of around 4000 one family houses, the Michenzani apartment block buildings from the 70’s and a few newer multi-story buildings, is to become the modern city center to help distribute the urban pressure within Zanzibar City and develop it into a polycentric capital for the island.
The Other Side

Part I Introduction

10 Urban Development Proposals For Ng’ambo

This publication is divided into six parts based on the core themes of this cooperation. The main focus areas appointed to us by DoURP for this project, shift perspectives between natural, public and private environment. Starting from the largest scale of studying the effects of global changes in climate, we worked our way closer and closer to the details of everyday life in Ng’ambo. Together, ten individual projects presented throughout the publication, form a network of ideas and proposals on how to keep developing the area of Ng’ambo that’s set to become the new modern city center for the capital city of Zanzibar. Before diving into the proposals, Part II guides the reader through a brief history of Zanzibar and Ng’ambo and discusses the background research relevant to all projects.

Team of Interplay of Cultures 2018

Contributing Aalto University Instructors

Contributing members of the Department of Urban and Rural Planning of Zanzibar (DoURP)

Special thanks goes our partner students from State University of Zanzibar.
Environmental Resilience

In the last three years, Zanzibar City has experienced severe floods in several areas. Heavy rains and accelerating uncontrolled urbanisation are some of the major contributors to this issue. Zanzibar City is geographically low and lies close to sea level. Despite of being unsuitable for construction, many areas including wetlands and retention areas have been urbanised. Before all effects of global warming are even known, there are many areas in the city that repeatedly struggle with flooding and blocked drainage every year during the three-month rainy season.

Future urban planning needs to provide a clear understanding of the factors that affect the environmental resilience of the city. The task of the students working with this issue was to study areas most exposed to flooding and propose architectural solutions to make Zanzibar City less vulnerable to the seasonal change in precipitation. As a result, one of the projects brings together findings from thorough environmental assessment of Ng’ambo and discusses the importance of conserving and protecting local ecosystems such as the mangrove forests on the northern coast of Zanzibar City.

Part III of this publication introduces the first project Flood resilience (p. 55), discussing the environmental future of Zanzibar and concluding the research with an environmental assessment of the studied area. The study aims to raise awareness of the importance of ecosystem services in flood control, coastal protection and climate change mitigation.

Community Empowerment Through Public Space

Zanzibar City should be compact, livable, walkable and inclusive. Public space is an important part of urban Zanzibar today, and the improvement and preservation of public space in the new town centre is of importance for the cultural heritage of the place. Public spaces represent not only particular urban environmental qualities, but also accompanying patterns of social activities and behaviours. The aim of the government of Zanzibar is therefore to enhance the richness and value provided by public space. As the goal is to increase the enjoyability of the city by bringing in more green in outdoor retention areas.
Housing for Future Urbanisation

Zanzibar Government is searching for solutions to solve the challenge of housing provision. There is a prevailing tendency of fast urban sprawl with gentrification and gated communities and exclusive neighbourhoods, yet the aim is to have an inclusive city with mixed neighbourhood and preserved urban cultural heritage. New materials and methods for construction would need to be incorporated, as there is a lack of sand on the island and concrete construction.

As the future city center, Ng’amo will also need a number of institutional and public buildings. There are existing ones that need up-grading, and new public and mixed-use buildings will be needed as well. The government of Zanzibar has an ambition to make Zanzibar city a vibrant hub of culture for East Africa. The newly signed project of Green Corridor (p. 48) is an example of that ambition. Built environment is also an important contributor in developing Zanzibar City into a compact, walkable and inclusive urban area. Students working with these issues, studied the qualities of public spaces using different public life study methods, with the goal of understanding how people use public space in Zanzibar, and aimed at coming up with development proposals for new public buildings.

Part IV of this publication introduces projects resulting from researching the cultural qualities in the public spaces around Ng’amo. Four individual, yet tightly interlinked projects aim at connecting inhabitants through green infrastructure and empowering communities by enabling cultural activity in the public built environment. The vibrant foundations for the projects located within the city, grow from the strong roots of the second project of this publication, The Green Network (p. 87). On the very base layer on the map lies a network of trees and other greenery lingering their way through the winding streets of Ng’amo and creating connections between homes, culture and commerce.

The third project, a chain of Community & Culture (p. 119) builds on top of the train of trees layer, with the goal of embracing the rich cultural mélange of Zanzibar and engaging the communities through built environment. The chain of four cultural concentration points resulting from the studies of the students, culminates in the fourth project, Zanzibar Culture Center (p. 139). The main culture center is proposed to be located next to the mint colored old Central Bank of Zanzibar, the curious specimen of the early 21st century Zanzibar architecture. Scaling down from a culture center of 500 people, the fifth and last project revolving around public environment introduces a design of the Furniture of Culture (p. 139) to be used in open spaces and made utilizing recycled local materials.

Wooden crafts in the making

Two women sitting on the top-floor outdoor hallway of the Michenzani apartment building
structions will be a challenge in the future. How will the future housing solutions keep the vibrancy of a Swahili community within a new envelope of modern materials, comfort and function?

Zooming even closer in to the everyday life of Ng’ambo, Part V presents proposals for sustainable future urban development incorporating the existing inhabitants of the neighbourhood. These projects assess future private housing from regulatory, flood-resilience, urban farming and cultural heritage points of view. The sixth project uses Rules as Tools (p. 179) for creating a system of guidelines for more sustainable future construction. The result is an attempt to put Ng’ambo back on the right path by making it a more safe and livable area with the help of eight guidelines. By creating a system for the government officials and inhabitants to operate within, these guidelines aim at paving the way for better planned future construction.

The seventh and eight projects regard the issue of flood-resilience. These projects explore a new typology that is both resilient to floods, and offers new possibilities to the urban structure of Ng’ambo. Exploring the ways of dealing with flood prone areas, The Footprint (p. 211) discusses possibilities for alternative land use combined with a public programme assessing the issue of flooding from the perspectives of water retention, infrastructure, community and commerce. Housing on Stilts (p. 229) explores ways of turning elevation into a possibility for dealing with the issue of flooding while taking advantage of the space unfolded beneath a house during the more dry seasons.

Progressing from the flood-resilience perspective to enhancing greenery in Ng’ambo area, the ninth project Green Community Housing (p. 247) proposes organic urban farming as means to develop community-based living systems and make most value of common space as a community resource for economic development opportunities. Finally, the tenth project regards private housing from the perspective of preserving and recovering elements of the Swahili cultural heritage. Gongoni Cluster (p. 267) ties the project portfolio presented between these covers with a proposal of a mix-used small habitat operating as an activator for economic traffic in the area while assessing the issues caused by densification and lack of green spaces.

Part VI of this publication concludes what we found out about Ng’ambo through all of our research and project development as a team throughout the whole five-month studio.

On a rare occasion Karume road – one of the two the main road running through Ng’ambo – can be seen this quiet.
Preparatory courses

Fall Semester

January
Background research in Finland

February
Three-week field trip to Zanzibar

March
Data analysis and project development

April
Project design

May
Final review & Sustainability Revolutions MAYDAY Exhibition 2018

Timeline of the Studio

Fall Semester 2017
Preparation for the five-month studio started already in the fall semester of 2017. Over the first two periods of the year, all students took part in courses taught under the names of State of the World and Development (2 cr) and Sustainable Built Environment (6 cr). The two recommended preparatory courses aimed at giving the students background knowledge of the main principles on global governance and environmental policies as well as the international actors in the field of sustainable development. The goal of participating in these courses in the fall was to create an understanding of the vulnerability of built environments and fundamentals of main technologies and sustainable infrastructures in rapidly developing world and finally strengthen the students’ ability to explain connections and linkages between different sustainable technologies and infrastructure systems in built environments.

Five-Month Studio
The studio itself was spread across a period of five months starting from January 2018 and culminating in this publication combining all findings and results of the course together in one covers. In between, we travelled to Zanzibar, collected as much data onsite and online as possible, adjusted our projects a million times and finally ended up with ten independent proposals all regarding Ng’ambo with their own point of view. The works of the course were showcased in the Sustainability Revolutions MAYDAY Exhibition 2018 at Aalto University in late May.

In the very beginning, the only thing we knew was that we were going to travel together to Zanzibar to research the issues given to us by the Zanzibar government officials. Our background research started in January as we were brought together from different backgrounds and unified by the same motivation to take on the task given to us, we slowly started diving into a world completely unknown to us. Through preparatory lectures about the religion of Islam and its relation to architecture in Muslim countries, as well as short introductions to resilience and systems-thinking, we began to form an image of the place we would be soon travelling to. We studied about the history, the culture, the food, even the very basics of the language, but no matter how well prepared we thought we were (or weren’t), Zanzibar still swept us off our feet.
“The first thing I remember from the arrival on Sunday is the heat and the vibrancy of all the colors – coming from Finland that, at the time, is mostly colored with different shades of snow and darkness, this all feels very different. The whole afternoon and evening feel like a hazy dream caused by the tiredness, but here and there is a small glimpse of what this journey will turn out to be – and that is something that makes me feel extremely excited and privileged.

Waking up and spending the first entire day on the island of Unguja, Zanzibar is less of a culture shock than I was expecting – it is more of a temperature shock and just general tiredness of the journey. Even though I do not understand Kiswahili (and there is a sense of outsidership to it), I feel endlessly welcomed: our imagined realities (or cultures) are certainly different, but as humans we are, in the end, all the same; creative, sentient, intricate, social and intimate beings. This is something that makes me carefully think of the development cooperation framework that this course has, and how it is so crucial to keep in mind the depth of all words and realities.”

Take and photograph of the flying “kangas” from Rosa Väisänen’s travel journal on Zanzibar

The Field Trip 28.1.–17.2.2018

By the time all of us had made it alive to the dinner table in the courtyard of our hostel on our first night in Stone Town, one of us had already found his way to the hospital, another one had lost her purse and close to everyone had given their ankles for the mosquitoes’ appetite and were recovering from a major physical shock caused by the sudden change in climate. On the day most of us left Finland to travel to Zanzibar, the temperature had just dropped to –20°C, so it was no surprise our bodies felt a bit disoriented facing the 30-degree tropical humid heat.

We were welcomed not only by the heat of the burning equatorial sun, but smiles shining even brighter everywhere we went. “Kari-bu, Zanzibar!”, we were wished again and again as we walked down the streets of Stone Town. “Asante sana!”, we soon learned to reply in unison, and as the dust rose from the surface of the burning pavement as the dalla dallas rushed rattling down Karume road, we started tuning in with the place and exploring the place we had travelled thousands of kilometers for.

Over the first days, we were warmly greeted by the Director of the Department of Urban and Rural Planning of Zanzibar, Dr. Muhammad Juma, as well as many other professionals involved in various projects on the island. During the first week we were also introduced to our other partners from the department, Ali and Selby, who ended up walking around Ng’ambo with us day after day being an enormous help with sharing their knowledge about the culture, translating words we didn’t understand and guiding us to places we couldn’t have found ourselves. We also got to meet and discuss with our collaborating students from the State University of Zanzibar (SUZA).

Drawing from our visit to the permacultural education center in Fumba
Soon after arriving to Zanzibar, we were also introduced to one of the most central concepts of the lifestyle – pole pole – as schedules and time-tables vanished like smoke in the air, and improvisation became more of a rule than the exception. What we also learned quite fast after settling down, was that pole pole works. There’s a well-thought reason why you don’t rush with things when it’s 35 degrees outside and the sun is roasting down from a bluebird sky.

The field trip was ultimately about not knowing anything about a place but diving right in anyway. It was about walking around capturing what we saw and trying to digest all the sensory experience Ng’ambo was throwing at us. It was zooming in to the vibrant and colorful life of Ng’ambo and exploring the endless twists and turns of the winding streets full of smiling people with endless amount of stories to share. Day by day, we got more and more comfortable in the colorful, vibrant environment loud not just in sounds, but sight and taste as well, and getting a better grasp of the place. Our heads were filling up with questions as the burning desire to know and understand more kicked in.

On the other hand, the three weeks went by in a blink of an eye, and on the other it felt like a lifetime. It is virtually impossible to put all the experiences we gained through connecting with the place in such a unique way into words without doing injustice to the memories. Connections with the new friends we made, warm-hearted conversations with the people we met and the unpredictable coincidences that led us from a place to another, were carefully packed into our bags as it became time to leave. Even after the sunburns on our skin faded away and the blazing brightness was traded for the pale mid-winter light, we knew we would carry this glimpse onto The Other Side with us for life.
Good Planning

Makes for Great Cities

Interview by Emmi Lonka and Rosa Väisänen

We got a chance to meet with Dr. Muhammad Juma, the director of the Department of Urban and Rural Planning of Zanzibar, during his visit to Finland in late March. Far from the light and warmth of Zanzibar on a dusky late-winter Monday evening, we discussed everything from urban development on Zanzibar to the importance of living in the present moment.

Please Dr. Juma, tell us about what you do.

“I was appointed to be the director of the Department of Urban and Rural Planning of Zanzibar in 2011. The department is responsible for use of land use, special development and urban development for all of Zanzibar. One of the things we have focused on over the past years, has been engaging in international cooperation and encouraging foreign professionals and students to come to Zanzibar to do research and give us new ideas. We then use that research for our development work. Catching up with global development and the level of long-term professional planning is an important part of our strategy. The issue of capacity in terms of finance and human resources – people who can plan and design – has been a challenge. We’re a small team working hard to create sustainable plans for developing not only the current urban area, but the whole of Zanzibar in the future.”

What do you look forward to most from international cooperation?

“For me, there is inspiration everywhere. There are good things in every country. It’s just a matter of how we look at things. No country is perfect, and no country has it all, but there are many things to learn from anywhere you go. Purposely, I’ve decided to bring in influence from abroad to come to my department and to create new kind of thinking. Over time these collaborations will contribute to building the local capacity on Zanzibar. And I hope someday the tide will turn. Someday we will return the favor and travel to anyplace you go. Purposely, I’ve decided to bring in influence from abroad to come to my department and to create new kind of thinking. Over time these collaborations will contribute to building the local capacity on Zanzibar. And I hope someday the tide will turn. Someday we will return the favor and travel to anywhere you go.”

How do you see the urban areas on Zanzibar developing in the future?

“I see some similarities between Singapore and Zanzibar. Both are small islands, but Singapore has succeeded in making the city compact and sustainable despite of the extremely dense population. We can’t fight development and we can’t fight urbanization. There is no point in fighting a war that you have lost anyway. The best option is to do what you can to make it sustainable.

The biggest potential in the sustainable-long-term urban development of Zanzibar lies in catching up with planning. By focusing on creating building and construction regulations we can start creating lasting reference for future and union, not just within Zanzibar City, but also within the whole group of islands. We have to work hard to convince the people who make decisions, to make good, bold decisions. They are the ones who can shape the future of our island. And to do that we have to do research, we have to do something to give them evidence. We have to be prepared with well-reasoned arguments and answers when it comes to making large scale decisions in developing the growing urban areas. Research, deep understanding and thorough planning are key in keeping up with sustainable development in all areas. If the planning is not leading you, you have a problem. We have to work hard today to have right answers for tomorrow’s questions.”

What do you think are some of the biggest challenges in sustainable development?

“One of the biggest challenges in sustainable development is the speed of things. The world is moving so fast and as planners we always have to be two, five, ten steps ahead of everyone else. We have to be ahead of the game to be able to give convincing and reliable research-based evidence of what works and what doesn’t. We have to have the answers already before the people who make decisions have even thought about asking the question. If you are behind the decision-makers as a planner, you have already lost the debate. Good planning is when people sit down together to think and create a good system. And it’s all about navigating yourself in the right spot inside of that system.”

How far ahead do we need to plan?

“The growth rate of Zanzibar is very high, but we shouldn’t panic. The fight is not to say we shouldn’t urbanize. The fight is to make sure we do it properly. Planning is never finished. By the time you reach the goal of your plan, you already have ten other ones far in the future. That’s ultimately what planning is about – staying ahead of the game and therefore yourself, too. As planners its our responsibility to make sure that the facilities serve those bold, good decisions. Planners create the wheel and decision-makers keep the wheel rolling. My goal is to create sustainable systems for others to continue their work within. So let’s calm down and let’s plan it better, so that we can urbanize in a good way.”

“Planning is never finished. By the time you reach the goal of your plan, you already have ten other ones far in the future. That’s ultimately what planning is about – staying ahead of the game and therefore yourself, too.”

What kind of a role does Ng’ambo play in the future of Zanzibar City?

“We need to expand the current city center. Stone Town is the beautiful historical city center of Zanzibar, but it cannot grow any further. Ng’ambo will complement Stone Town as the modern city center. Before being appointed as the director of urban and rural planning, I worked as a planner in Stone Town Conservation Development Authority. Stone Town is...”

Interview by Emmi Lonka and Rosa Väisänen
Many developed countries have lost important parts of their cultural heritage as a result of modernization and rapid development, but Africa still has it. In Europe, the life of you and your grandma are two different worlds, but in Africa, the life of me and my grandma, is not that different. We have a rich, diverse original resource of all the authentic cultural heritage, and therefore we still have a chance to hold on to it. We have a chance to keep developing while carrying that heritage in the core. I'm just a bit worried that the youngsters don't want to keep it. The modern way of thinking very geometrically and efficiently is one major threat to preserving traditions. Is there something about Ng’amo that you would like to retain despite of the transformation towards modernity?

“Whenever you cross a line in Ng’amo you discover something new. Because there is no street pattern, you end up going left, right, left, right – and suddenly you come to a beautiful view with a small tree. That’s the kind of surprise I want there to stay. Ng’ambo needs to achieve a little bit of modernity while holding on to those unique unexpected experiences that come from the meandering street patterns and small, warm pubic spaces.

While the street pattern in Stone Town is mostly Islamic— we call it medina— narrow streets between tall buildings, Ng’amo has a very vibrant open life, street life. Stone town is much more private and introverted. In Stone town most of the interaction happens in the Islamic style courtyards that can’t be seen unless you’re invited in. You really notice how built environment effects on the way people interact with each other; whereas Stone Town is an old historical city center with Arabic influence in architecture, in Ng’amo, social interaction happens right there on the street. You can feel the life around you just by walking around, taking a turn and adventuring the streets.

The lively open life is a true character of Ng’amo. Ng’amo is very unique, because people aren’t building walls around their properties. It’s still open and welcoming, whereas many other areas have become just faceless concrete fences hiding the homes behind them. In Ng’amo you have interaction all the time. So by all means, modernize it, densify it, compact it, but keep that quality of open life.”

“So by all means, modernize it, densify it, compact it, but keep that quality of open life.”

Do you hope to achieve something in particular during your time in the department?

“I’d like to see at least some of what we’ve started to be continued. I’d like to know I’ve created such sustainable systems that they keep thriving even after I’m gone, but it takes time to make people understand. Being a part of building a future with opportunities and freedom of choice is what motivates me the most.

We have to be inspired with the energy of doing things, making changes and giving people better life of transformation. I’d really like to see young people saying “Yes! Let’s do it, let’s continue to make a change.” And they do seem to be wanting the change more and more. I’d like to know I’m working towards something that’s going to last. The Michenzani apartment blocks are a good example of effort in the history. Ng’amo would not be a pleasant place to live if all buildings looked like the Michenzani, but they tried and that’s most important.

We are all part of the same revolution, but someone has to be brave enough to initiate it. We have to start somewhere. I’m happy that we are in this together. It might be difficult but being exposed to new ideas and cultures and different ways of thinking is important. We constantly inspire each other and that’s why we need to keep cooperating with people from diverse backgrounds to grow that portfolio of influence we have in the office.”

What would you say to someone who has an important goal they want to work for?

“Open your senses and grasp what is around you. Be where you are and take time to feel the presence. There are beautiful things happening right there around you. You just need to see them. Whenever we start going too fast, we lose touch with ourselves and reality. Prejudice is something that prevents us from seeing things the way they really are. It cuts us from understanding and grasping the essence of reality. We all need to live at the present moment and let go of prejudice. It helps to grasp.”

Interview by Emmi Lonka and Rosa Väisänen
Part II Understanding Ng’ambo

“Zanzibar City Centre Local Area Plan is directed towards sustainable management of land resources, protect and promotion of the natural and cultural environment and heritage, enhance the safety of the community, support sustainable socio-economic growth, and improve the transportation system, amongst others.”

–Department of Urban and Rural Planning of Zanzibar, Ng’ambo Local Area Plan (2014, 7)
The Other Side Part II Understanding Ng’ambo

One of the most famous historical sites in Stone Town, The House of Wonders, was built by the Omani sultan as a governmental reception center for foreign visitors in 1883.

History of Zanzibar City

Zanzibar is located in East Africa forming a semi-autonomous territory as a part of the United Republic of Tanzania. The name Tanzania originates from the time of the revolution in 1964 as the names of the former colonial territories Tanganyika [Tan] and Zanzibar [Zan] were mixed into one.

Colonial Impact in the Early Years

The Zanzibar archipelago is formed by two main islands Unguja and Pemba. According to the Revolutionary Government of Zanzibar, Unguja holds most of the population and urban areas such as the capital area of Stone Town and Ng’ambo, while Pemba stills has a much more rural character (RGoZ, 2013). Colonialism in the XIX and XX centuries all over the world has been a controversial theme in terms of urban and society development of the former-ruled territories. “British colonialism imposed its writ on a dynamical African society, seeking to regularized and rationalized its urban development into Eurocentric ways” (Bissell, 2011). In East Africa, and specifically in Zanzibar, the long story of colonialism by the Portuguese, Omanis, and British has marked and defined the foundation of its contemporary conditions, the disorder and dysfunction of the urban tissue has its attributed to Western rationality and colonial power (Bissell, 2011).

The nowadays historical center of Zanzibar City, Stone Town, was established in the 10th century (Kukkonen, 2018), and began to expand in 1690 with the rise of the Omani power along the East African coast. Thanks to the East Indian Trading Company, Zanzibar started to develop as a commercial concentration point because of its central location for ships stop on their way to India. The island became significant in size and power as an urban center only in the early mid-nineteenth century, by which time the British influence had become quite strong (Myers, 2003).

Zanzibar was the capital of the Omani empire that ruled the entire East Africa, and an expansive commercial empire supported at the time by the British crown. Trading conditions and the status of capital turned Zanzibar into a cosmopolitan full of immigrants mainly from Africa, Arabia, and India. As a result, variety of influence from Arabic, Indian and European culture is still very much present in Stone Town in architecture, cuisine, art and music. In the year 2000, Stone Town was declared as a UNESCO World Heritage site because of its historical and artistic relevance.

By 1890, Britain claimed Zanzibar as a protectorate and during the decades of power, tried to achieve a master plan for the city. It has been suggested by historians that those efforts failed as they never could grasp the complexity of the city scape (Bissell, 2011), nevertheless, the Omani history and occupation had already defined Zanzibar’s spatial organization greatly (Myers, 2003). Zanzibar became then divided into two main areas, where it has been suggested that race and status had its implications in the built environment and its organization. On one hand Stone Town – or “the city of proper” – the influence and ideas or British colonial aesthetics are powerfully evident in the urban image, while on the other, the city splits off to a much more traditional Swahili cityscape in Ng’ambo (Bissell, 2011).
Ng’ambo, literally meaning “the other side” in Kiswahili, began to settle in 1850, largely by African and Swahili slaves, servants and peasants, but with no pejorative distinction. Ng’ambo is – or was – curiously located on the other side of a tidal creek that divides the peninsula where the city of Zanzibar was founded (AAM, 2015). By today the creek has dried out from water and been replaced by one or the main city roads that still serves as a separator between Stone Town and Ng’ambo.

During Ng’ambo’s first seventy years of settlement between 1850-1920, the residents were “allowed to do just as they liked” in most matters of architecture, design and development. “By doing as they liked” the residents of Ng’ambo articulated and manifested their own system of planning and design. This highly informal and unregulated system was enhanced by the British colonialism and structures of power (Myers, 2003). Soon after the British domination began, Ng’ambo and Stone Town started to be considered as different entities, through colonial policies, and the enhancement of the slum-like area (Folkers et al, 2016). In some ways, Ng’ambo could be considered the historic forerunner and archetype for the “other sides” of many cities that were developed under British colonialism in Eastern and Southern Africa (Bissell, 2011).

Even though there hasn’t been a plan for developing Ng’ambo area in the past, urban areas tend to develop regardless according to spatial patterns determined by biophysical, social, and economic factors as well as spatial policies and interactions (Kukkonen et al, 2018). Ng’ambo grew following the strategies in African colonial cities of non-involvement and informality, determining its current situation until today (Bissell, 2011). After Zanzibar had won its independence by the revolution in 1964, it became a post-colonial inheritor city being reframed by the power structures that were never meant to be left there to control them (Bissell, 2011), but that regardless became an inevitable part of the social structures. Since 1964, the whole island of Zanzibar has grown five times its size. The urban population has grown considerably as well (Myers, 2003), because of the freedom of movement that the revolution brought for its society (Kukkonen et al, 2018).

Ng’ambo used to be separated from Stone Town by a creek, but by today the water has dried out and the river has been replaced by one of the main roads of the city. Photo from Ng’ambo Local Area Plan (2014, 14).

Ng’ambo in the late 19th century. Photo from Ng’ambo Local Area Plan (2014, 11).
Post-Revolution Urbanisation

Zanzibar City growth rate has increased in post-revolution times leading to problems in the governmental land system delivery and causing rapid sprawl of informality in the outskirts of the city. The development of the spatial structure of Zanzibar City remained quite steady until the 1980s. However, after entering 2000s, the expansion rate has been an impressive 40% of growth from 2004 to 2013, meaning 3.8% of urban growth per year. It was said that if Zanzibar continues to grow at the same rate, the population will reach over one million by the year 2025, and by 2050 the city would have expanded 89%, seriously affecting its surroundings and increasing social environmental problems (Kukkonen et al, 2018). However, today in 2018, the total population of Zanzibar has already reached 1.5 million.

Since the 20th century, Zanzibar and Ng’ambo together have become the biggest and densest Swahili city in the world (Folkers et al, 2016). According to the UN, nowadays Zanzibar like all Sub-Saharan African countries, are facing the fastest population growth and urbanization rates in the world. According to Zanzibar growth phase, most of its development is now happening outside of the city center, filling the outskirts with an increasing proportion of poor people. The demand for new housing and roads has rapidly increased over the past forty years. Ng’ambo is the spatial and functional hub of Zanzibar City hosting the most land and intensive uses. It is supported by the sub-centers of Tun-guu, Bububu, Fumba. All centers are planned to be connected by Corridors serving as primary transportation routes.

Urban sprawl increases the amount of informal settlements, slum-based, unplanned growth of informality with insufficiency of sanitation, power outages and over transportation, which increases travel times and enhances the need of a car as transportation. The lack of building and construction regulations have resulted in a heterogeneous cityscape where housing plots are independently controlled by the private owners and have therefore little to none coordination in terms of the use of the space. Densification process of existing and planned low density neighborhoods and development of large scaling projects will be required.

These conditions of urban growth have a significant impact on the environment and ecosystems, and they have also resulted in serious challenges in the lack of planned housing and public infrastructure, congested traffic, and urban encroachment of forest and agricultural land (Kukkonen et al, 2018). Furthermore, the quality of living inside dense urban areas is generated out of informality. Considering Ng’ambo’s history with this kind of development, formalizing and regulating Ng’ambo is still a challenge to be solved.
The Other Side

Existing plans for the future city center

Until the 21st century, Zanzibar has been well known for Stone Town, but not so much for Ng’amo – yet. Various other projects have been established to develop Ng’ambo as an urban area and to revive its urban and historical relevance lost during the colonialism.

The fast expansion of the urban tissue has forced Ng’ambo to address the challenges discussed in order to keep developing the whole Zanzibar further. Ng’ambo has gotten severely overcrowded over time, with a very dense urban organization of single-floor housing packed in an area that grows to feel smaller and more slum-like without being an actual slum yet. Research has demonstrated that out of the tested planning policies, establishing new urban centers could have the biggest impact on directing urban sprawl (Kukkonen, 2018).

Despite attempts to establish Ng’ambo as a vital and recognized urban area, the colonial disconnection as the “other side of the city” has still remained strong. Reviving Ng’ambo has toured around different international cooperation, and after many attempts over the years, Ng’ambo has finally received renewed attention being designated as the future modern city center of Zanzibar City (Folkers et al, 2016). It is intended to reconnect the inhabitants with rich cultural heritage, history and natural environment as well as protect and improve the quality of inclusive residency in the city center by encouraging controlled area development to maintain the spirit of Swahili culture.

Our team traveled to Zanzibar to get to know Ng’ambo’s reality and understand the basis of the development into the future city center first-hand. In order to work side by side with the Department of Urban and Rural Planning of Zanzibar, we met and interviewed various stakeholders involved in the on-going development projects. These meetings lead us to discuss the current development of Ng’ambo with professionals from various fields. Some of the most beneficial insight for the current development situation we gained from meeting with The Green Corridor plan and African Architecture Matters (AAM) in Ng’ambo Tuirakayo plan director Anthony Folkers, World Bank commissioners in Tanzania, a locally operated NGO Sustainable East Africa, Lou van Reemst from the Bottle Up initiative and Franko Göhse from the Fumba Town and permaculture education center.

Most considerable ongoing development plans

Our research and project development was strongly supported by the existing and on-going development plans of Zanzibar city. Some of the most considerable development initiatives and plans relevant in terms of the future city center as well as our research of Ng’ambo include:

• Ng’amo Local Area Plan 2014
• The Green Corridor Plan
• Renewed sewage and drainage system proposed by the World Bank

These three plans and their relevance in the formation of the projects presented in this publication, are discussed more in detail in the following pages.
12 development policies of Zanzibar City Centre in Ng’амbo Local Area Plan

1. All new development initiatives should refer to Development Control Unit (DCU) for confirmation of policies and additional planning guidance.

2. All proposed spatial development (building, civil works, landscaping) are subject to Environmental Impact Assessment and Heritage Impact Assessment approvals.

3. Densification in terms of expanding existing footprints is not allowed, but vertical expansion to the maximum height specified per policy planning zone, is encouraged.

4. In defining new developments, establish partnerships with local actors for the creation of cultural places, incubator spaces and promotion of history.

5. Investment in and development of larger scale or complex commercial activities should be located in the proposed nodes of activity or along the interconnecting corridors. These developments should allow and support public open space and recreation, public services and adequate public transport transfers.

6. Pedestrian-oriented Neighborhood Centers to be located in the heart of the residential areas and serving local population of all age and gender.

7. Public and Non-Motorized Transport are to be given priority over (private) motor vehicle transport in Zanzibar City Centre. Zanzibar City Centre is to be interconnected with the Airport, Seaport, public transport routes and terminals into the periphery and rural areas.

8. Existing and new public services in Zanzibar City Centre should be welcomed and to be low-threshold and located in or in the vicinity of public open space, Nodes of Activity (Policy NGT-5) and Neighborhood Centers (Policy NGT-4).

9. Fences around public or private properties are to be of a maximum height of 1.5m, with a maximum closed wall of 0.5m height, the remaining part to be open grillwork or mesh.

10. Per each 1,000 inhabitants a safe and clean public children’s’ playground of not less than 100 m² needs to be realized.

11. No demolition of Sites of Special Historic Significance is allowed, unless in (supra) national interest. Any alterations to Historic Urban Landscapes of Significance are subject to approval by the Authorities.

12. Large solitary trees, tree lined streets and groups of trees in Zanzibar City Centre in public and private space are henceforth protected and cannot be removed.

Ng’амbo Local Area Plan

Ng’амbo Local Area Plan launched in 2014, is the most significant single initiative yet to create an inclusive redevelopment plan that links Ng’амбо’s past to the future and connects its roots to the urban changes Zanzibar is going through. The new Urban Policy aims to harness the positive power of urbanization in Zanzibar. Both the Local Area Plan and new Urban Policy are a part of the broader National Spatial Development Strategy (NSDS) (RoGZ, 2014).

Ng’амbo Local Area Plan developed by the Revolutionary Government of Zanzibar in collaboration with African Architecture Matters (AAM), sets the basis for developing Ng’амбо as the future city center in order to liberate the pressure from Stone Town as the only central urban area in Zanzibar (RoGZ, 2014). Ng’амбо’s transformation into a denser area in a smart, sustainable and resilient way will offer a better quality of life for its inhabitants while minimizing Zanzibar’s urban sprawl. Main focus of the plan is to create a polycentric metropolis. Stone Town will remain the historic center, because “Stone Town is the cultural and historical heart of the city” (RoGZ, 2014), while Ng’амбо will continue to grow as the modern city center.

Overall, the Local Area Plan aims to establish sustainable management of land resources, protect and promote the natural and cultural environment and heritage, enhance safety in the community, support sustainable socio-economic growth and improve the transportation system. The plans are categorized in High Priority Plans (expected to be commenced and implemented within the next 5 years), and Medium Priority Plans (10 years).
The Green Corridor Plan

The urban area on Zanzibar increasingly suffers from the lack of green in open public spaces. The remaining centuries-old mangrove forests in the north-east corner of Ng’ambo have been protected by the government and no cutting of remaining trees in the area is allowed. The Green Corridor is a plan conducted by the Dutch African Architecture Matters organisation. The plan is focused around the main axis roads passing through Ng’ambo with the goal of creating a boulevard of trees and other greenery that connects the east-side of Ng’ambo with Stone Town on the left. A new public transportation center has been planned in the east end of the horizontal axis road. Another recent initiative aiming to enhance greenery in the area, was conducted by a locally operated NGO Sustainable East Africa on March 25th 2018 as they organized a community tree-planting day in Vikokotoni area. The Green Corridor has been a central existing plan in the development of our projects, and especially The Green Network (pages 89–117) as well as Furniture of Culture (pages 159–177) have been developed keeping the corridor in mind.

The purpose of the Green Corridor plan is to increase the amount of greenery in Ng’ambo area by bordering the main axis roads and the surroundings of the Michenzani buildings with trees.
Renewed sewage and drainage system proposed by the World Bank

The Zanzibar Municipality has, according to the 2002 census, about 206,000 inhabitants of whom about 10% live in Stone Town, which is characterised by small hotels, restaurants, small shops and handicraft centres. In the beginning of the 1990’s several buildings in Stone Town were run down and dilapidated. Most of the drains were blocked by solid waste and storm-water could not be discharged into the sea. Problems in waste collection, sewerage and drainage structures endangered the sanitary situation of Stone Town’s inhabitants. Stagnant water was home to mosquitoes and infections with the increase of the spread of malaria. Drinking water was in danger of contamination by raw sewage. All of this had a negative impact on tourism and the economy as a whole. Under the background, the Zanzibar Municipal Council (ZMC) together with the German Development Bank (KfW) developed a programme to address jointly the linked issues of sewerage, drainage and solid waste - the Drainage Programme launched in 1993. The Programme developed by the World bank aims to contribute to the Zanzibar vision of 2020 of building a healthy society by enhancing sanitation and urban cleanliness.

In Phase I, implemented between 1994 and 1998, the aim was to improve the public welfare in the area, conserve the historic view of Stone Town, improve the quality of the Maritime environment, and to keep employment facilities in the tourism sector.

In February 2003 the KfW contributed additional 5 million for Phase II, as a continuation and expansion of the programme for the New Town area (Ng’ambo). It includes the extension, improvement of the sewerage and drainage system and the improvement of the solid waste collection and landfill sites and accompanying measures such as institutional support.

Phase III currently underway is seen as a follow up project after completion of the first two phases, the overall objective also encompassing the aim of improving public health as foreseen in the Zanzibar Vision 2020 by enhancing sanitation and cleanliness by improving the disposal of stormwater, sewerage and solid waste in the whole of Zanzibar City region.

In respect to Ng’ambo, our main project area, it aims to improve the already existing storm water drainage system to drain Mnazi Mmoja Playgrounds in the South of the area, as it has deteriorated to a stage where it is now not functional. As stated, the system must be given high priority in view of its value to the public as a venue of sports and recreation.

Zanzibar gets its heaviest rains from mid-March to late May and again in November.
Local area governance

One of our main aims during the field trip to Zanzibar, was to try to get a deeper understanding of the culture, and we found that by talking to the people and asking questions many topics we hadn’t considered before came up.

Our task for the studio was to design something for the Ng’ambo area and before we could do that we needed to understand who we are designing for, what the main issues are, and what the users of our design need. We found out that the neighborhood of Ng’ambo is divided into smaller areas, Shehias, out of which each one is ruled by a head of the community, Sheha.

The interviews started from the administrative point of view. We began our study by understanding how the community is organised and what the hierarchy within it was. What we found was that the smallest administrative unit of Ng’ambo are the Shehias. There are twelve in total and they are divided within the 4 quarters. Normally each one is directed by one responsible person called the Sheha, who is helped by a committee of ten people working on different administrative issues.

Recognising the existence of this territorial division, we took the opportunity to talk to the different Shehas to understand what their role in the community is, and to find out what they thought were the important parts of the culture to consider, and what their community might need. We had some organised, and some informal interviews with the Shehas, different stakeholders in the area, and members of the general public.

Through these interviews we found out that the Sheha is the connector between the government and the people. They have a cooperative role, work for the development of the community and are always in touch with all the people of the Sheha. They try to solve the problems that exist in the community by having small meetings on their own houses, recognizable by the Zanzibar flag at their entrance, or informal bigger meetings in the streets, schools or private halls. It was mentioned that the lack of meeting places makes the communication difficult, producing a lack of contact with some parts of the communities.

Talking with different Shehas allowed us to see the main necessities of the communities. We discussed different needs such as that for a meeting space where the different stakeholders could meet; NGO’s, Shehas and locals together. Empowering the community through improving the communication and the inclusiveness of Ng’ambo. Provide place for youth training as well as designing safer places for children, playgrounds for example. As well as supporting lost cultural activities such as dancing and music, which in the past used to be alive.

Through some more research, we found out about some existing initiatives by locals and foreigners in Zanzibar working to improve different aspects of it. We were able to talk to one of the leaders of the local Vikokotoni Community NGO: Manispaa Jamii Vikokotoni JMJV. Their initiative started as an empowerment project to clean the streets of Vikokotoni area in Ng’ambo and make money at the same time. They employed volunteers from the area who would collect recyclable waste which they would then store and sell. There was thought about expanding this initiative to other communities in the area, which they thought would require a lot more education and awareness through better communication with the community and Shehas.
Visiting the different parts of Ng’ambo and stopping in several public spaces to take in the atmosphere, we had the opportunity to meet with locals and talk to them about their communities and the culture of the area. It was generally men who felt more comfortable approaching us and having a conversation, which left us feeling that we have not yet heard a local woman’s point of view. With the help of Selly, our partner from the Department of Urban and Rural Planning office, we had the chance to talk to Aziza, a mother and local living in Vikokotoni. Talking to her gave us yet a different angle of thought than that mentioned with the Shehas. She told us about her enthusiasm of having her own business and the importance of being economically independent. According to her, there is a real need to create opportunities for women, where different skills are recognised and developed so they can be encouraged to have diverse businesses rather than the prevailing food business. We also had the chance to talk to some other local women in another area, where they felt it necessary to include in a design, a space where women can feel comfortable meeting, chatting and spending time.

Having the chance to talk to the locals in an informal manner through small chats and interviews, gave us a very interesting and important insight into another layer of the society and culture that is not easy to grasp for an outsider. Talking to people of different backgrounds also helped us in getting a more well-rounded view of the culture, hearing different sides of the story. Through these conversations we were able to pinpoint important issues and needs, which we can hopefully design for through respect and understanding of the local culture.

“Earlier, people were against change in the area, but now after community meetings and information, people understand the need for change and higher buildings”
—Sheha
Part III Natural Environment

“A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise.”

–Aldo Leopold
The aim of this study is to raise awareness of the importance of ecosystem services in flood control, coastal protection and climate change mitigation. It urges decision makers to take into account the total cost of any development proposal and to consider the environmental impact of it before granting permits.

Project Introduction

Zanzibar is a semi-autonomous region of Tanzania, whose economy is highly dependent on tourism and agriculture, which are both sensitive to changes in climate. As an island, Zanzibar is also under threat of future sea level rise caused by global warming. There are vast areas in Zanzibar City which already suffer from severe flooding during the rainy season in the spring. Inconsistent waste management exacerbates the situation by blocking drainage and preventing ecological systems from providing services such as flood control and storm protection, and simultaneously contaminates the environment.

There are comprehensive plans for the development of Zanzibar City to respond to the growing demand for housing and commercial activity. The population of Zanzibar is expected to rise from 1.3 million to 2.2 million during the next 25 years, and the rate of urbanisation to increase from an estimated 45% in 2012 up to 60% in the following 25 years. These developments put considerable pressure on the housing provision of Zanzibar City and urge rapid development. Answers have been sought from reclamation of land, but these plans have not included proper assessment of the environmental impact of the proposed reclamation.

This study looks first into the changing climate, ecosystem services, waste management and resilience both globally and locally in the context of Zanzibar. After this background research, the study dives into Environmental Impact Assessment in the shehia of Malindi and the adjacent mangrove forest north of Ngambo. First, the existing plans are investigated. In part based on these plans, three scenarios of development in the area are then assessed from the point of view of their environmental impact. Last, a proposal is made for ecologically and economically sustainable development for the area.
Climate Change

Storms become stronger, sea levels rise, temperatures get warmer. The climate is changing, and research suggests that the fault is in human action. This chapter looks into recent development in global warming and future projections both globally and locally in Zanzibar.

Recent global development

We are living in an era called the Anthropocene, where “humanity has become the dominant force of change on Earth” (Rockström 2015). We are currently changing our climate with the lifestyle we lead. Global temperature is warming, Arctic glaciers are melting, sea levels are rising, subtropical deserts are expanding, and precipitation is changing. Extreme weather events, like heat waves, droughts, floods, hurricanes, heavy rainfall and snowfall, are becoming more frequent and harsher. Human food security is under threat because of decreasing crop yields, ocean acidification is an accelerating problem and species go extinct.

In hopes of fighting against rising temperatures and sea levels and increasing emissions, the Paris Climate Agreement was ratified by almost 200 countries in 2015. It is the Accord sealed in the United Nations Framework Convention on Climate Change aiming at mitigating climate change by limiting global warming to well below 2 degrees Celsius compared to the pre-industrial global temperatures. (United Nations 2017.) To meet the needs of the future world population, according to Rockström (2015), we must shift from considering sustainable development separately in social, ecological and economic goals. We need to find an integrated solution in which the human development is not connected with the biosphere. In this paradigm, economy is used to achieve social goals within the limits of the Earth. This can be evaluated with the planetary boundary approach, which is based on the latest research on “tolerance levels of environmental processes that regulate the stability of the Earth system” (Ibid. 2015). The planetary boundaries and sustainability are closely connected to resilience thinking (see page 70). The concentration of greenhouse gases in the atmosphere has increased since the beginning year, and the war-torn Syria the only two countries outside the agreement. (Reuters 2017.)

Figure 1. Global emissions of carbon dioxide since 1850s. (Adapted from Center for Climate and Energy Solutions 2017.)

Figure 2. Global average near surface temperatures relative to the pre-industrial period. HadCRUT4 is a global temperature dataset developed by the Climatic Research Unit of University of East Anglia, and NOAA Global Temp is provided by the National Oceanic and Atmospheric Administration from the USA. (Adapted from European Environment Agency 2017.)

Figure 3. Global average sea level change. Estimations from satellite altimeter data and from coastal and island sea level measurements. (Adapted from Church & White 2011.)
of the industrial era in 1750 due to population growth, intensified agriculture, deforestation, energy use from fossil fuel sources, mobility and industrial processes (Figure 1). If emissions are not cut rapidly, by the end of the century the temperatures will have risen way over the target set in the Paris climate agreement. 3–5 million years ago when the concentration of carbon dioxide (CO₂) was as high as now, the temperature was 2–3 degrees of Celsius warmer and sea level was 10–20 metres higher than now. (World Meteorological Organization 2017.)

These increased concentrations of CO₂ have already resulted in the warmest years on record. According to the World Meteorological Organization (2018), 2015, 2016 and 2017 were the three warmest years recorded. 2016 was the hottest, but 2017 was the warmest without an El Niño event, which often boosts global annual temperatures. In 2017, the global average surface temperature was 1.1 °Celsius (1.2 °C in 2016) higher than in the pre-industrial era. Development in temperatures can be seen in Figure 2.

The global sea level has risen about 210 mm from 1880 to 2009 (Figure 3). Sea levels are expected to keep rising for centuries, even if greenhouse gas concentrations in the atmosphere are stabilised. Ocean heat content is rising and causing thermal expansion, which results in sea level rise. Melting land-ice (glaciers, ice caps and ice sheets) is another principal cause of sea level rise. (Church & White 2011.)

The era that preceded the Anthropocene lasted for 10,700 years. The Holocene, or the interglacial epoch, was beneficial for social evolution. The minor changes in average global temperature between plus and minus 1 degree of Celsius, have supported the biosphere as we know it. To guarantee future development, the conditions of the Holocene need to be preserved. (Rockström 2015.)

Impact of climate change on Zanzibar

Zanzibar’s economy is highly dependent on climate: climate sensitive activities such as tourism and agriculture make up a large proportion of the region’s GDP. According to Watkiss et al. (2012), climate change will have high economic impacts on the islands in the medium to longer term time span. Climate change will threaten coastal and marine areas, health, agriculture, tourism, infrastructure, energy supply and demand, water resources and ecosystem services (see more on ecosystem services from page 63 onwards).

Zanzibar is located in the tropical climate zone, where the temperatures are fairly constant throughout the year. The rainy season from March to May brings strong rains, and shorter rains are experienced in November and December. El Niño events lead to climate variability with floods and droughts. (Watkiss et al. 2012.)

Meteorological data from Zanzibar suggests that the climate of Zanzibar is already changing, and extreme events are intensifying. Temperatures have been rising with strong increases in maximum and average temperatures. Higher rainfall intensity events have been recorded in the beginning of the 21st century. (Watkiss et al. 2012.)

By 2050s, the maximum monthly temperature is projected to rise from 1.5 to 2 °Celsius and by the 2090s from 2 to 4 °Celsius. Rainfall regime will also change, but different climate models predict varying changes. Consistent trends include increasing rainfall during the rainy season from March to May and an additional increase in January and February. Another trend is decreasing rainfall during the dry season from June to October. The risk of floods will increase due to the intensification of heavy rainfall, and respectively, droughts will become harsher during the dry season due to lack of rainfall. (Watkiss & Muriel, 2012.)

There is a strong projected trend of rising sea level, which will have significant impact on many areas of the islands. Low-lying areas (areas under 5 metres above sea level, which are hydrologically connected to the sea) are under the most severe risk of flooding, major storm surges and high tides or becoming permanently covered by water. Natural upheaval and consolidation affect the relative sea level rise, but as there is not sufficient data on these trends for the islands, it is difficult to give an absolute estimate of the sea level rise in the area. (Watkiss & Muriel, 2012.)

Apart from sea level rise, ocean acidification and the rising sea temperature pose a threat to marine ecosystems, especially corals. Ocean acidification and particularly sea temperature rise cause bleaching of corals, which will eventually decrease the number of snorkeling and scuba diving tourists. This will likely have a negative impact on the economy of the islands. Also coastal erosion, which is already in process and a threat to the sandy beaches of the island, will exacerbate in the future, unless preventive action will be taken. (Watkiss & Muriel, 2012.)

The maps on the next page show the impact of the IPCC’s global sea level rise projections in Stone Town and Ng’amo.
In 2100, low-lying areas under +3.0 metres will flood during rainy season.

By 2100, sea level has risen 1.5 metres. Current (2018) flooding areas will be constantly under water.

Sea level has risen 20 cm since 1900. Current sea level in 2018 is approximated at 0 metres. Sea level will probably rise another 30 cm by 2050 and further 100 cm by 2100.

Ecosystem Services

If ecological systems, like forests, marine habitats and wetlands, are protected, they provide surrounding human settlements with several services free of charge. This chapter demonstrates the numerous benefits of ecosystem services and dives deeper in detail to the benefits of preserving mangrove habitats.

Benefits from ecological systems

The term ecosystem refers to all living organisms in a certain area and to the way they interact with each other. People everywhere around the world depend on nature, and on the material and immaterial services these ecosystems provide to secure decent and healthy life for themselves. Recent decades have seen unprecedented changes to ecosystems caused by humans in their growing demand for food, energy and freshwater. Due to these changes nature’s ability to provide key services like purification of air and water has weakened. (Millennium Ecosystem Assessment 2005.)

Ecosystem services are material and immaterial benefits we get from nature and they are often divided in four categories: production, maintenance, regulation and cultural services. Production services include commodities like edible natural resources, such as berries, mushrooms and fish, and the produce of agriculture, fresh water, energy and raw materials such as wood and sand. Maintenance services comprise of for example sustaining biodiversity, water circulation, photosynthesis and carbon sequestration. Regulation services contain regulating the climate, creating subterranean water, neutralising floods, purifying water, regulating diseases, controlling erosion and pollinating plants. Cultural services benefit for instance science, arts, education, recreation and both physical and mental health of the citizens. (Suomen Luonnonsuojeluliitto 2015.)

Ecosystem services are often taken for granted. Because they are free of charge, they are not included in financial calculations or societal decision-making. They should, however, be considered in deciding on the use of natural resources and land-use changes. If ecosystem services had a price, it would be easier to determine when it is more sustainable to preserve these existing services instead of starting to produce them artificially. For instance, mitigating floods and controlling climate change would often be easier by preserving habitats that produce these kinds of
“Humans and nature are strongly coupled to the point that they should be conceived as one social-ecological system. This means that in our globalized society, there are virtually no ecosystems that are not shaped by people and no people without the need for ecosystems and the services they provide.”

Stockholm Resilience Center 2015

services. (Ilmasto-opas 2011, Suomen Luonnontuotantoprosessit 2015.)

Biodiversity, i.e. the variety and variability of living organisms, is a key factor in maintaining ecosystem services. Diminished biodiversity weakens the capability of various ecosystems to provide their services. Capacity to endure disturbances is better in a biodiversity rich habitat than in a species-poor one. Some ecosystem services, however, do not depend on biodiversity. For example, a habitat’s ability to prevent erosion is only dependent on the amount of the vegetation, not the diversity of it. (Ilmasto-opas 2011.)

Significance of mangroves in Zanzibar

Mangroves and wetlands provide several ecosystem services. Many of them fall under the category of regulation services, such as regulating the climate, creating subterranean water, neutralising floods, purifying water, regulating diseases, controlling erosion and pollinating plants. (Brander et al. 2012.) Planting mangroves in coastal areas is an effective way of controlling erosion, as the roots of mangrove trees hold the soil better intact. Mangrove restoration and replanting and seagrass replanting will result in soil better intact. Mangrove restoration and replanting and seagrass replanting will result in coastal areas. (Brander et al. 2012.)

Mangroves also provide some maintenance services, like sustaining biodiversity and water circulation, supporting photosynthesis and sequestering carbon. Mangrove forests and wetlands can also be utilised as recreational areas if their vulnerability is considered when planning this kind of usage. (Brander et al. 2012.)

Most of the ecosystem services provided by mangroves can be regarded as public goods, since the level of consumption by one beneficiary does not reduce the level of service for other people, e.g. flood control. As a result, mangroves are often undervalued in decision-making, and it is difficult to put a price tag on these services to help taking a decision on cutting down or preserving the trees. Thus, deforestation is a major threat for mangrove habitats around the world. In addition, mangroves are under threat of pollution and sea level rise, caused by climate change, increasing populations and development in coastal areas. (Brander et al. 2012.)

Some attempts have, however, been made to determine a value of the change in land use and thus ecosystem service provision. One such study was carried out in Southeast Asia to estimate the monetary value for mangrove ecosystem services. Brander et al. (2012) conducted the study using the value transfer method, i.e. transferring value estimates from several prima-ry site studies from around the world. One of these source studies was carried out in Tanzania, in Rufiji Floodplain and Delta, concentrating on the production ecosystem services (fuel wood and material provision) instead of maintaining and regulating, which are of more interest in the case of Zanzibar. Many other studies focused on the coastal protection provided by the mangroves, but hardly any included the value of cultural services, biodiversity or carbon sequestration. (Brander et al. 2012.)

According to Brander et al. (2012), mangrove ecosystem services are higher in more densely populated areas. This is because demand for services is higher and more people benefit from the provided ecosystem services. The study shows that a “10 % increase in population results in a 2.8 % increase in mangrove value per hectare”. Keeping in mind the expected population growth on Zanzibar (the population of Zanzibar is expected to rise from 1.5 million to 2.2 million during the next 25 years (DoURP 2014)), the value of the existing mangroves will be higher in the future than it is now. Also, growing GDP per capita has a positive impact on mangrove value: a “10 % increase in GDP per capita results in a 7.9 % increase in value per hectare” (Brander et al. 2012). This is in part due to economic activity being protected from flood and storm damage. Considering Zanzibar’s goal of becoming a middle-income country by 2020 and continuing to develop also beyond that time span, the value of the existing mangroves is even further increasing in the future.

Brander et al. (2012) also found statistically significant results in their study that show that the value of ecosystem services for coastal protection, water quality and fisheries are higher than the value of extracted mangrove materials. The results also suggest that intact contiguous man-grove systems are of higher value than isolated patches of mangroves, so it is advisable to keep mangroves together instead of fragmenting them into smaller areas.

At least 30 % of Zanzibar’s GDP is made up by the economic value provided by tourism, seaweed farming and fisheries. These coastal ecosystem services provide tourism revenues, shoreline protection and food, but are at high risk from both climate change and land-use change. Mangrove restoration as an ecosystem-based adaptation has real potential in Zanzibar in early climate change adaptation. In addition, shoreline stabilisation through revetment and shoreline protection by protecting and reinforcing coastal buffer zones, reforestation and wetland restoration should be implemented immediately in risk areas. (Watkiis et al. 2012.)

Land reclamation or urban development should not be considered in areas of vulnerable natural habitats, or in areas of high provision of ecosystem services, such as wetlands and mangrove forests. It is difficult to give an estimation of the total financial value of the preservation or loss of mangroves, but the future economic benefits mentioned before need to be considered. These benefits are only available, if the mangroves are protected. On the contrary, if the mangroves are cut down, these benefits will be lost and in addition, the services like flood control and storm protection need to be artificially manufactured, which has its economic cost. Thus, it is economically and ecologically more sustainable to take advantage of the natural benefits provided by ecosystems.
Waste Management

Oceanic waste is a growing problem and a significant part of it is caused by plastic: waste that is mismanaged or carelessly dismissed. At the current pace, in 2050 there might be more plastic than fish in the oceans. Mismanaged waste also causes flooding in blocked drainage, pollutes the environment and threatens ecosystems. This chapter dives into the worldwide waste problem in the oceans and local challenges in waste management in Zanzibar.

The plastic ocean

Every year, 78 million tonnes of plastic packaging is being produced, which amounts to 26% of the global plastics production. 14% of this total production is collected to be recycled, and another 14% are incinerated to produce energy. 40% of global plastic production end up in landfills and 32% are left outside the system, a part of them in the environment. If we continue this path, in 2050 the weight of plastics in the oceans may surpass that of the fish (the fish population is supposed to not diminish). (World Economic Forum et al. 2016.) The effect of the plastic waste is already visible. The plastics compose 50% of the global oceanic waste: there are plastic bottles, tooth brushes, cutlery, sandals, fishing nets, etc. floating in the oceans. (Cressey 2016.) Great Pacific Garbage Patch, an island of waste floating in the Pacific Ocean, is more than twice the size of France. (Cressey 2016.) The mass is 16 times larger than previous estimates, it is almost exclusively plastic and it continues growing. (Millman 2018.)

A large amount of the plastics that end up in the oceans originate from the beaches, from where they are caught by the waves or carried by the wind. In the ocean the plastics fragment into smaller pieces under the influence of the sun. These pieces of diameter smaller than 5 millimetres are called microplastics; the concept was developed by Richard Thompson from the University of Plymouth. The waste also originates for example from car tyres which leave particles on the roads, clothes made of synthetic fabrics, and certain exfoliating cosmetics containing micro plastic pearls. (Cressey 2016.)

According to Jambeck et al. (2015) between 4.8 and 12.7 million tonnes of plastics enter the oceans each year from coastal countries – the equivalent of 500 billion plastic bottles. Erik van Sebille from the Imperial College London instead found between 15 trillion and 51 trillion fragments of micro plastics floating in the ocean, accounting for a weight between 93,000 and 236,000 tonnes. The scientists are looking for the explanation for the difference between these numbers. It is assumed that the plastics that are lacking from the total amount are probably on the sea bed, and a part of them have also returned on the beaches. (Cressey 2016.)

The problems of plastic contamination in the ocean are multiple. The animals confuse plastics with plankton, which then accumulates in their digestive system, and ghost fishing gear kills animals caught in them. (Cressey 2016.) According to a recent discovery, the waste also facilitates the movement of invasive species. The plastics which float on the surface, can carry algae, invertebrates, and fish for thousands of kilometres. (Carlton 2017.)

Waste management challenges in Zanzibar

As an island, Zanzibar is both contributing to and suffering the consequences of the oceanic waste problem. Especially in Zanzibar City, the lack of proper waste management is prevalent and visible for both citizens and visitors. Freely roaming waste is prone to end up in the ocean either carried by the wind or open drainage water. These contributions add up to the storage of oceanic waste from where the waves flush waste back to the beaches. Littered public spaces like streets and squares, parks and beaches, are unattractive to city dwellers, citizens and tourists alike. In the New Town area in Zanzibar City there are 69 formal and around 70 informal waste collection points. According to municipality officials, formal collection points should be emptied daily, but 60% of waste is not properly collected. The inefficient and inadequate waste collection results in major leakage of waste outside the system and into the environment. Both surface water drainage and sewage flow untreated straight to the sea, which is a major health hazard to the citizens and pollutes the sea. If the storm water drains and sewer drains are blocked by waste, it causes flooding during heavy rain, which leaks contaminated water to the surroundings increasing the risk of spreading diseases.

Some action has already taken place in Zanzibar. Plastic bags were banned in 2011, and plastic bottles are often reused or sold to the mainland. Today 80% of solid waste is organic. In the shehia of Vikokotoni, there is a citizen initiative that has been cleaning the streets of their area every day since 2012. Vikokotoni Environment Society, or Jamii ya Mazingira ya jamii Vikokotoni in Swahili, is collecting, sorting, re-using and recycling waste and composting organic waste. They wish to raise awareness of environmental issues in their neighbourhood and the whole city.

As pollution is a major threat for mangrove forests and marine ecosystems, the waste management challenges need to be tackled and proper recycling of waste needs to be implemented in Zanzibar. Raising awareness among citizens is a crucial part in the solution, but technical issues concerning waste collection, separation and management need to be solved, too.
Waste collection point in Ng’ambo. Open waste disposal sites are prone to leak waste into the surrounding environment, for example carried by wind or animals.

If waste collection is not properly arranged by the municipality, citizens have poor options for the disposal of their waste. Polystyrene next to the Funguni Basin, which floods during rainy season flushing all this hazardous plastic into the ocean.

Carelessly disposed waste ends up blocking drainage, which causes flooding. Open drainage flows into the ocean, polluting the environment, killing animals and threatening the provision of ecosystem services.
Resilience

Resilience is a central concept when adapting to climate change or other natural phenomena is discussed. This chapter looks briefly into the definition of resilience, and how it is possible to build resilient systems in Zanzibar.

Absorbing disturbances

According to Stockholm Resilience Center (2015), resilience thinking is about finding ways to strengthen the capacity to deal with environmental change and identifying sustainable ways for humans to live within the Earth’s boundaries. Resilience is the long-term capacity of a system to deal with change and continue to develop. Walker & Salt (2012) define ecological resilience to be a system’s capacity to absorb disturbance and reorganise retaining essentially the function, structure and feedbacks – without losing its original identity. However, this does not mean that the system would have to remain identical: resilience is not about not changing.

The capacity for self-organisation has its limits, called thresholds. Thresholds are the boundaries that surround the environmental, social and economic premises where the system operates. Where a stable, resilient system can absorb disturbances and keep its identity, a small disturbance may push an unstable system over a threshold. When a threshold is passed, critical feedbacks change, which means that the system is permanently altered and functions in a different way than before. Environmental and social changes affect the resilience of a system. (Walker & Salt 2012.)

Ways to improve flood resilience in Zanzibar. Protecting ecosystems is paramount, but ecosystem services can be supported by various methods.

Improving resilience in Zanzibar

As the sea level rise maps (see page 62) show, the Creek that previously separated Ng’ambø from Stone Town, is forcing its way back through storm surges and high tides. How thorough of an effort the humans try to make, nature will try and sustain its resilience by striving to get back to its natural state. Which once was a waterway, will strive to become a waterway again.

There are multiple ways of building flood resilience in Zanzibar. Already existing methods include for example building a collar around the foundation of a house, or a retainer wall around the access door, and placing the household’s belonging onto roof trusses or on top of ceiling boards (Golder Associates 2010). Other possible solutions would be constructing permeable paving, increasing the number of retention basins, using flat roofs to temporarily store water and lift the pressure from drainage, define buffer zones in urban planning according to projected sea level rise and storm surge or plan flood resilient housing in flood prone areas. One such solution would be a structure that allows water to flow underneath the building without damaging the structure or indoor spaces. Flooding areas can also be harnessed to serve as recreational parks both during and outside of rainy season.

As stated earlier, one of the most effective ways of building resilience is protecting and reinforcing ecosystems, which provide human settlements with several services. Ecosystems build both long- and short-term resilience. They provide crucial services in mitigating climate change, but also offer relief for flooding and protection from storms. In Zanzibar City the crucial spots that call for special attention and protection are the Funguni Basin and the adjacent mangrove forest. The situation there is discussed more profoundly next.

“Resilience is an attempt to create a new understanding of how humans and nature interact, adapt and impact each other amid change.”

Stockholm Resilience Center 2015
The Other Side Part III Natural Environment

Environmental Impact Assessment

Before implementing a plan, both the positive and negative environmental consequences of the plan should be carefully assessed to prevent future economic costs and problems. Environmental impact assessment is a tool to reduce or prevent the negative environmental impact of a plan. It should take place in the preparation stage prior to granting permits. This chapter evaluates the existing plans for the Bwawani area in Zanzibar City, and studies three future scenarios from the point of view of their environmental impact.

Existing plans for Bwawani area

Bwawani is an area in the shehia of Malindi in the northern part of Ng’ambo. Next to the shore there is the monumental, modernist Bwawani Hotel Complex, which is part of the Stone Town UNESCO World Heritage Site. It was constructed as part of Karume’s New Town scheme in the 1960s and 1970s, but currently it is underused and deteriorated. South of the hotel lies the Funguni Basin and north-east of the swamp there is a vast mangrove forest. The Local Area Plan (DoURP 2015) proposes various developments for the area, which can be seen collected in Map 1.

The Bwawani Hotel Complex is to be redeveloped into a central tourism and recreational area, into a proper landmark. The Funguni Basin is to be rearranged, conserved and upgraded into a flood retention area and nature reserve. It is the last remaining part of the Creek that before separated Ng’ambo from Stone Town, and thus Local Area Plan suggests the open water to be protected. Local Area Plan allows partial reclamation of the Basin, but presses for the need to sustain or compensate for the possible loss of the retention capacity of the Basin. The eastern part of the Basin is proposed to be a Green Conservation area, where development is prohibited. The Blue Mosque from the 1990s stands on a platform in the middle of the basin. A pedestrian boulevard is also proposed along the southern edge of the swamp.

In the Local Area Plan (DoURP 2015, 114) it is suggested to search into an extension to the Plan Area through land reclamation in the area just off the coast to the north-eastern edge of Ng’ambo. The proposed reclamation area could be harnessed for medium-rise “commercial activities, apartments, water retention and park, a new boat building yard and a new mangrove forest on the seaside” with room for a sewage treatment plant. A road is also proposed on the waterfront.

The proposed reclamation area is currently a dense mangrove forest, which provides several ecosystem services to the southern residential areas (see Map 2). These services and their economic benefits are overlooked in the Local Area Plan referring to the pollution by litter and sewage spill in the area. Contrary to the proposal in the Local Area Plan, instead of cutting down the trees and reclaiming the land, the forest should be restored, and the sewage taken under control. Extension to the Plan Area should be searched in an area with less vulnerability and less significance in climate change adaptation and flood control.
Map 1. Local Area Plan (DoURP 2015) proposals

- Stone Town WHS / Bwawani Complex
- Stone Town WHS Green Belt
- Mangrove forest
- Green conservation area
- Carpark concentration
- New port location
- Commercial & creative industry

Map 2. Drainage and sewage (Niras 2011) and ecosystem services

- Existing storm water drain
- Proposed storm water drain
- Existing sewer drain
- Proposed interceptor sewer
- Retention area
- Proposed sewage treatment plant

- Flood control
- Groundwater replenishment
- Water purification
- Reserve of biodiversity
- Carbon sequestration
- Potential for recreation

FUNGUNI BASIN
- Flood control
- Potential for recreation

MANGROVE FOREST
- Flood control
- Groundwater replenishment
- Water purification
- Reserve of biodiversity
- Carbon sequestration
- Potential for recreation

~8,000 habitants depend on the flood control services
~18,000 habitants depend on the flood control services
Assessment of three future scenarios

As the area around the Funguni Basin is currently being scrutinised for development possibilities, it is crucial to study the impact of plan proposals on the fragile environment. To compare the possible effects on the environment, three scenarios were developed in this study. The scenarios are loosely based on the ideas proposed in the Local Area Plan, but they represent the ideas of the author of this project.

Various methods can be used in assessing the impact of a development project. Some common tools are expert meetings, check lists, graphic diagrams and matrices. Matrices are especially useful in large scale projects. In the scope of this study, a simplified Leopold matrix was chosen to support the analysis. The Leopold matrix was developed in 1971 by Luna Leopold, and it has since been widely used in environmental impact evaluation. In a Leopold matrix, project activities are listed along the horizontal axis and environmental aspects along the vertical axis. A diagonal line divides the cells of the matrix. The left division of a cell describes the magnitude of the impact, and the right division the significance of the impact that the activity will have on the environmental aspect. If the activity has no impact on the environmental aspect, the cell is left empty. (Leopold 1971.)

Matrices are a flexible tool, which can be modified according to the project. In the project at hand it is crucial to be able to compare the different scenarios, which is why the project activities (such as mangrove felling, port construction or land reclamation) are not listed separately, but each scenario as a whole is considered one activity.

The following social and environmental aspects were chosen for the impact assessment: flood control, prevention of erosion, storm protection, biodiversity, housing provision, employment and economic cost. The magnitude of the impact of the scenarios is evaluated on a scale of 1 to 10. A negative impact is implied with a ‘−’ in front of the numeric value and a positive impact with a ‘+’. The significance of the impact is rated on a scale of 1 to 10. These values are then summed up to compare the scenarios (Table 1). The assessment is based on the preceding chapters, but also on subjective evaluation, and thus justification is provided here.

The first scenario, Full development (Map 3), assumes that the proposals made in the Local Area Plan are implemented. The proposed reclamation of land is approximately 35 ha, of which currently 25 ha is covered by mangroves. The loss of these mangroves is significant as it is, but the remaining 54 ha of mangroves will also become under pressure by the construction work and future commercial and residential use of the reclaimed land. In this scenario, the port is moved to the proposed location, which results in even greater loss of mangroves. The Local Area Plan allows up to 50% fill of the Funguni Basin, so in the scenario of Full development this option has been exploited.

The scenario of Full development has a harsh impact on the environment. As can be observed in Table 1, the impact is negative and has a great significance. The loss of mangroves leads to severe diminution in prevention of erosion and storm protection. Reclamation of land both in the mangrove forest and in the Funguni Basin weakens the flood control and reduces biodiversity. Housing provision increases, and the sketched commercial buildings would increase the economic activity in the area. Constructing such a vast area would increase employment both during and after construction. The economic cost of the scenario, however, is very high. The reclamation of land and constructing on such precarious foundation is very expensive. The return on investment is also unreliable, as the reclaimed land as a low-lying area is under future threat of storm surges, high tides, sea level rise and flooding. The loss of retention capacity and flood control would also need to be substituted, which brings more economic costs.

The second scenario, Prohibited development...
Map 4. Scenario 2: Prohibited Development

(Map 4), as a response to the Full development, adopts a critical stance towards all development in the area. Only the refurbishment of the Bwawani Complex is allowed, but no new construction in the area or south of Malindi Road are encouraged as they strain the vulnerable Funguni Basin and mangrove forest area beyond their capacity. The whole mangrove forest is protected as a Green Conservation area. Both the Basin and the forest are rehabilitated.

The aim of the Prohibited development scenario is to protect the environment to the fullest. However, if no reforestation or reinforcement of ecosystems is allowed, the goal remains unattainable. As Table 1 shows, the scenario has a positive impact on the environment, but its significance is lower than that of the other scenarios. Flood control and storm protection would be supported only by planting more mangroves and enhancing drainage, and by building a sewage treatment plant to prevent future pollution of the area. Prevention of erosion and biodiversity need to be promoted by planting varying species of vegetation. In this scenario, erosion is prevented by prohibiting development close to the shore, where construction would accelerate the process. Housing provision remains unchanged, and as there is pressure on demobilization in Ng’amba, prohibiting development results in a poor outcome in the assessment. This scenario does not affect employment, but it does not cause any economic costs, either.

The third scenario, Controlled development (Map 5), aims at responding to the increasing demand for housing while protecting the vital ecosystem services provided by the Funguni Basin and the mangrove forest. In this scenario, development in the mangrove forest is prohibited, and the Funguni Basin may only be harnessed for recreational use, though only without weakening the retention capacity of the basin. The Bwawani Complex may be refurbished, and the surrounding area developed without disturbing the natural habitat of the wetland. The area south of Malindi Road may be developed if the elevation of the area is considered and flood resilient housing applied when necessary (in areas below 3 metres from current sea level). The port is relocated to a location, where it does not disturb the coastal marine ecosystems to the extent it would in the proposed location in the middle of the mangrove forest. Relocating the port to a more northern location away from the busiest city centre would also create economically active clusters in a larger area.

The Controlled development scenario is both ecologically and economically most feasible and sustainable, as the assessment in Table 1 shows. Prevention of erosion and storm protection are supported by preserving the mangroves and planting more of them on the shoreline. Biodiversity is promoted by reinforcing the Funguni Basin habitat. Flood control is slightly weakened, because the new commercial and residential area south of Malindi Road strains the limited retention capacity of the Funguni Basin and the mangrove forest, and thus additional drainage may be required to control the flooding. Sewage treatment plant is located close to the shore to prevent future pollution of the ecosystems. Housing provision improves, but not to the extent of the Full development scenario. The scenario affects employment in a positive way both during and after construction and its economic cost is feasible. Economic investment is not as risky as in the first scenario, and because this scenario makes the most out of the ecosystem services, minimal costs need to be allocated to complementary measures.
Development Proposal

This study has investigated the global challenges of climate change, ecosystem service provision and waste management in the local context of Zanzibar. It has also looked into the possibilities of building resilience against external shocks and disturbances brought by these challenges, and assessed the environmental impact of different development plans. In this chapter all of this is brought together in a proposal of sustainable development in the Bwawani area.

Proposal and reference projects

Based on the Environmental Impact Assessment, the scenario of Controlled development was chosen for closer scrutiny. To study the probable consequences of climate change, the year 2100 was chosen as a starting point for the proposal. However, the principles of the proposal should be applied already now when the area can still be developed to adapt to the future challenges.

Year 2100 as a starting point means that the sea level is supposed to have risen 1.5 metres from the level of 1900. The Funguni Basin is constantly under water and many low-lying areas are prone to flooding due to a new baseline for high tides and storm surges.

Some ideas have been derived from the Local Area Plan (DoURP 2015) presented in the previous chapter. The Bwawani Hotel Complex is refurbished and developed into a modern conference centre. Trees are planted along the main streets and Malindi Road is developed into a high street with commercial and office buildings. A pedestrian boulevard is proposed along the northern side of Malindi Road.

To support the refurbished conference centre, a restaurant area is proposed along the northern shore of the Funguni Basin. Special attention needs to be paid to the waste management as it is located next to a very vulnerable ecosystem. A flood retention park is proposed in the Funguni Basin. A pier structure that connects the southern pedestrian boulevard and the restaurant zone on the northern shore would allow a controlled recreational use for the Basin. According to Karume New Town project, the western part of Funguni Basin was designated as a rowing lake (DoURP 2015, 95), and such activities could now be brought here.

Buildings north of the Malindi Road are demolished due to heightened flood risk. The existing mangrove forest is cleaned up, and new mangroves are planted in the demolished area to increase the coastal protection capacity of the forest. All the benefits of the mangrove restoration and replanting are observed in the chapter on ecosystem services. The new sewage treatment plant ensures that the marine ecosystem is protected from future pollution.

The Malindi Pitch is proposed to be developed into a housing area. Due to its low elevation, flood resilient housing typology must be chosen in the area. Recreational activities such as a football field and shaded seating areas would complete the area as part of the green network of the city.

The goal is to better connect the area to the rest of Ng’amo by improving the connectivity across the Funguni Basin and improving pedestrian access inside the area. The main aim...
of the proposal is to increase housing provision and economic activity in the area while protecting and reinforcing the essential ecosystem services of the area. Because detailed planning of the area is not in the scope of this project, a few reference projects are presented here to give an idea of the sought-after atmosphere.

The architecture studio C. F. Møller has designed a public nature park in Randers, Denmark, integrating climate resilience strategies. The park is designed so that it helps handling the increased stormwater levels. Water is collected from the surrounding areas and led through channelling to the park. In the park, water is first collected in purification basins, before being led to the nearby stream. The basins are designed as natural wet meadow areas: the technical waste-water solutions are designed to strengthen the natural qualities of the wet meadows. A pier structure allows the citizens to enjoy the natural environment and participate in recreational activities such as canoeing in the stream. (C. F. Møller 2017.)

Assael Architecture company has prepared a masterplan for a waterfront site in Lowestoft, UK. In their design, some houses are inspired by Dutch housing design. These buildings sit on stilts three metres above ground level. The houses are entirely flood proof and allow wildlife to flourish underneath. (Assael Architecture 2015.) Flood resilient housing solutions are studied in more detail in Part 4 in this book.

Place Dynamix has prepared design guidelines for a city boulevard in Sharjah, United Arab Emirates. In their design, pedestrian only sidewalks are separated by trees, and the sidewalks are equipped with seating and shade canopies. Public transport is promoted with public transport stops, dedicated cycle lanes and a jogging track. (Place Dynamix 2017.)
Conclusion and way forward

As climate change is threatening the provision of ecosystem services through rising temperatures and sea levels, there is no need for humans to exacerbate the situation by changing land use in vulnerable areas. Eliminating ecosystems that are vital for the survival of both natural habitats and human settlements has costly consequences both ecologically and economically.

As shown in this study, the Funguni Basin and the adjacent mangrove forest provide the northern residential areas of Ng’amo with several ecosystem services. Most importantly, they are crucial in the flood control and storm protection of the area, which will become paramount in the future. The protection of these ecosystems should surpass any development plan in the area. As an island, the land area of Zanzibar is limited, but potential reclamation should be searched in an area with less environmental importance than that of the Bwawani area.

Waste management and sewage treatment are some of the biggest challenges in the fast growing Zanzibar City. These challenges need to be tackled urgently to control the exacerbating waste problem in the oceans, environmental pollution and spreading of diseases during the rainy season. Solving these challenges is a suggested topic for further research and action.

The main ideas presented in this study are collected in the list below, which proposes four principles for sustainable and flood resilient planning in Zanzibar City. By building resilience against future environmental challenges, Zanzibar has the opportunity to keep developing and striving for its goals of growth. By protecting ecosystems Zanzibar can set an example of developing in an ecologically and economically sustainable way, and leading the way towards more sustainable global development.

Principles for sustainable and flood resilient planning in Ng’amo / Zanzibar City / Tanzania

1. Coastal buffer zone against erosion, high tides and storm surges
   Coastal buffer zones must be constructed by replanting mangroves and prohibiting development close to the shoreline to prevent erosion and protect from intensifying weather events. See chapter on Climate change.

2. Priority to protection of ecosystem services
   Preserving ecosystems and ensuring future provision of ecosystem services must surpass all development plans in ecologically vulnerable areas. See chapter on Ecosystem services.

3. Waste management and sewage treatment under control
   Waste management and sewage treatment must be taken under control to prevent future oceanic pollution, spreading of diseases and exacerbation of flooding. See chapter on Waste management.

4. Flood resilient housing typology in low-lying areas
   Flood resilient housing typology must be chosen in low-lying areas (under 3 metres above sea level) to increase human well-being and mitigate economic costs. See chapter on Resilience.
Part IV Public Environment

“First life, then spaces, then buildings – the other way around never works.”

–Jan Gehl
The Green Network is an urban scheme that reflects Zanzibar’s ambition to achieve a more walkable and inclusive city. It re-introduces lively green areas to the neighborhoods through improving connections to the surrounding city and the future green corridor streets.

Background

Today’s Ng’ambo includes a reasonable amount of diverse public and open spaces as they have an important role as recreation, sports and meeting spots in the everyday life of Zanzibar. However, most of these spaces lie within the low-lying areas of Ng’ambo, and open, green and inviting places are a lot less frequent in the four dense low-rise neighborhoods behind the Michenzani blocks. What is more, these spaces are often missing the qualities of good and safe urban spaces such as trees, natural shade, places to sit, street lights and sufficient paving and drainage.

As the future city centre densifies, these open and public spaces need protection and upgrading in order to maintain and improve spaces for public recreation, interaction and leisure. When designed to highlight the vibrant pedestrian life of the city and the natural environment and biodiversity of the whole island, these spaces can also support urban inclusiveness, safety, cultural heritage and overall resilience. By connecting these new spaces to each other, the surrounding nature and the future green corridor between the Michenzani blocks, the city gets a chance to expand the accessibility and opportunities of central metropolitan boulevards to the residential neighborhoods.

The Green Network project is based on studies of the qualities of public spaces and how people use public space in Zanzibar. By using different public life study methods, the project seeks to highlight the potential that these spaces already have. By including the existing good qualities and the spatial possibilities of these public spaces into future development plans, a truly liveable and sustainable city centre can be achieved even when the city grows.
Studies of Public Life

Interaction between life and space

Public life is an important planning dimension in imagining the present and future of any city. Studying the relation between public life and space in Ng’ambo can serve as an immediate tool for improving its urban spaces. In order to get to know Zanzibar’s public life, specifically Ng’ambo, site data had to be collected.

A series of observations, site analyses and tools based on Jan Gehl’s Public Life Studies was applied and in site data was collected.

First, site analysis was carried for determining potential key areas by using tools like walking, mapping, sketching, photographing, experiencing, observing and dialoguing.

Afterwards, a more systematic analysis method based on Jan Gehl’s Public Life Studies was applied and in site data was collected.

Mapping – Where and What

This tool is about marking where people stand and sit in a space. Mapping is helpful for spotting preferable locations for activities, attraction points, and human behavior in the space.

Tracing – Where

Drawing human movement provides a better understanding about people’s moving patterns in a specific area. Registering people’s movements helps defining human flows and traffic inside the potential nodes.

Test Walks – How

Test walks seek to recognize paths, tracking time and noting conditions of the trajectory. Natural conditions like shading, space organization, as well as human conditions like users, activities, public can highlight spaces as intersections and its potential.

Evaluating – Areas of opportunity

The Twelve Quality Criteria is a tool to determine the protection, comfort and enjoyment of a place. The tool is structured around three main themes that helps to determine the quality of a space.

- Protection
  - A person will avoid spending time in a place that lacks protection against cars, noise, rain, wind, and other natural conditions.

- Comfort
  - If a place lacks elements that make walking, standing, seeing, and conversing possible, the place will not be inviting to people.

- Enjoyment
  - Positive sensory experiences such as aesthetics of the surrounding environment, positive experiences of the climate condition, will invite people to spend time in such place.

Mapping – Where

This tool is about marking where people stand and sit in a space. Mapping is helpful for spotting preferable locations for activities, attraction points, and human behavior in the space.

Interaction between life and space

This dimension helps defining human flows and traffic inside the potential nodes.

Mapping in Miembeni Jiniti

Mapping in Miembeni Jiniti

Counting – Who and How many

Counting is about quantifying the number of people and vehicles in a space, here during 20 minutes. Subcategories such as gender, age, cars, motorbikes and bicycles is encouraged. Quantity data gives a glimpse on the nature of the place, its dominant users and busy hours.

Test walks seek to recognize paths, tracking time and noting conditions of the trajectory. Natural conditions like shading, space organization, as well as human conditions like users, activities, public can highlight spaces as intersections and its potential.

Evaluating – Areas of opportunity

The Twelve Quality Criteria is a tool to determine the protection, comfort and enjoyment of a place. The tool is structured around three main themes that helps to determine the quality of a space.

- Protection
  - A person will avoid spending time in a place that lacks protection against cars, noise, rain, wind, and other natural conditions.

- Comfort
  - If a place lacks elements that make walking, standing, seeing, and conversing possible, the place will not be inviting to people.

- Enjoyment
  - Positive sensory experiences such as aesthetics of the surrounding environment, positive experiences of the climate condition, will invite people to spend time in such place.

Mapping – Where and What

This tool is about marking where people stand and sit in a space. Mapping is helpful for spotting preferable locations for activities, attraction points, and human behavior in the space.

Tracing – Where

Drawing human movement provides a better understanding about people’s moving patterns in a specific area. Registering people’s movements helps defining human flows and traffic inside the potential nodes.

Test Walks – How

Test walks seek to recognize paths, tracking time and noting conditions of the trajectory. Natural conditions like shading, space organization, as well as human conditions like users, activities, public can highlight spaces as intersections and its potential.

Evaluating – Areas of opportunity

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- Enjoyment
  - Positive sensory experiences such as aesthetics of the surrounding environment, positive experiences of the climate condition, will invite people to spend time in such place.
Creating Connections

As witnessed in the public life studies, many of Ng’ambo’s open spaces are missing opportunities to enjoy the positive aspects of climate and sensory experiences - both very likely related to the disappearance of trees in the area. Due to the lack of enjoyable, shaded and green spaces within the neighborhoods and especially their major walkways, the main focus of the Green Network is to create connections through greening and linking the potential places. The re-profiling and upgrading of the main streets and the public open spaces that they connect aim at encompassing four scales of the city, and thus the Green Network is both about connecting the neighborhoods to the surrounding city and the connections and intersections that happen within.

The Green Network: encompassing four urban scales of Ng’ambo from its larger context to specific materials

As the city around and within the quadrants develops, the Green Network can bring the opportunities of the public spaces around the quadrants into the neighborhoods as well. Within the neighborhoods, the Network proposes both connections between the open spaces and improvements in the spaces themselves, as well as an understanding of how and by whom these spaces are used, how people move in them and what kind of potential they have. The smallest scale is about the details of these places: what kind of trees should be planted and where? What kind of materials and furniture create better urban environments? What other possibilities do these places have?
The Green Network Design

The design of the Green Network is an upgrade of the public space in the future city centre of Zanzibar, Ng’ambo. This design enhances existing and introduces new intersections of activities, spaces for services and business. Furthermore, it relates these places to the surrounding city through highlighting natural and interesting walkways to the outer parts and locations of the centre, the major arteries of the Green Corridor and to each other. The design aims to achieve a transformative impact for everybody, all inhabitants and visitors.

In addition to tree planting and paving, the upgrading process is also about sustainable infrastructure and understanding the need for inclusive public space that has possibilities to offer. The greening of the streets and the nodes can also include gardening, green walls and planters that can bring even more opportunities to the public life of the city: green elements bring life, diversity, enjoyment, shade, dust and water protection as well as chances to define spaces, create important meeting places and spots of activity. The ultimate goal of the Green Network is to make it an experience itself, a circle that goes around vivid neighborhood centres and invites both locals and visitors to experience the urban life that Ng’ambo has to offer.

The transformation of public spaces in the interior of the neighborhoods aims to encompass greenery as a first layer into a more complex transformation of public spaces. This small change allows an urban transformation that invites entrepreneurs, business and economic growth into the intersections, nodes and into the shehias.

Connectivity

The perception of Ng’ambo size in maps might be surreal, but in reality it is actually a compact area full of walkable possibilities. The Local Area Plan suggest for its development fewer roads in the interior of the neighborhoods, avoiding them to be crossed directly by car while prioritizing the Green Corridor in Karume Road and Mlandege Rd. This project enhances mobility by organizing the boulevard and offering the possibility of safe walking, biking and driving.

In the image we can see in continuous lines representing roads, while on dotted lines pedestrian paths are showed. Dark dots refer to bus stops in the area improving its connectivity to Stone Town. On top, potential sites were mapped in green, entangled in the mobility web of future Ng’ambo.

Walkability

Ng’ambo’s urban tissue displays all the potential to embrace pedestrian and biking culture. Its high density, narrow streets, unique identity, and organic layout offers the opportunity of unique pedestrian paths for all.

The Green Network intends to increase walkability now in the interior of the neighborhoods by organizing the space for the different types of vehicles, always prioritizing pedestrian paths and enhancing activities in its intersections.

The image shows the Green Network of the pedestrian paths and distances in minutes between nodes, as well as from bus stops. Over all, general display of nodes show walking distances no further than 5 minutes from each other, enhancing the possibility for active pedestrian paths into the shehias.

Potential of Intersections

The Green Network paths, along with the walkable characteristic of the neighborhoods, offer the potential for intersections. Intersections happen when paths between nodes intersect each other, creating a node in itself by being active spots on the way.

Intersections happen to have the characteristics of nodes with more flow of people commuting inside the Green Network. Observing the commercial activities in Zanzibar, these spots are ideal for boosting commerce and business. Offering activities and turning them into active spaces inside the network, such nodes can boost commercial activity that will not only improve the activity of the network, but can become opportunities for small entrepreneurs, bringing economic growth into the neighborhoods.

Neighborhood Nodes

Around Ng’ambo more that ten spaces have potential to become nodes. This publication will focus only in four by designing them more in detail, one node per quarter. The design will embrace two typologies of these spaces by their characteristics: road-like spaces and clear open spaces.

Designing the nodes is key for boosting activity and tourism in the new City Center. Node design can give identity and image into the shehias, becoming attractive locations. Attraction points will enhance the already existing Zanzibarian community feeling, and pride of belonging, enhancing urban commons and caring of the places. Overall nodes will offer different things to do as diverse activities that will bring together different users, maximizing hours of usage while generating sense of security.
Defining The Streets

The Green Network is a plan that can be implemented in today’s Zanzibar: the existing connections between the nodes can be developed even based on their current width, as proposed in the street sections. As the city grows especially upwards, the plan allows the network streets to be transformed to another type of street (check project Rules as Tools on pages 180–201 for further definitions).

The Green Network proposal includes all kinds of tree, bush and shrub species that grow on Zanzibar, varying in shape and size and thus selected based on the street widths.

Greening visualization for Sustainable East Africa
Tree Planting Day

Table of possible trees for the network, 1:500

<table>
<thead>
<tr>
<th>Tree types/height</th>
<th>20+ m</th>
<th>15+ m</th>
<th>8-12 m</th>
<th>4-6 m</th>
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<tbody>
<tr>
<td>Palms</td>
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<tr>
<td>Coconut Palm, Drum Palm, Borassus Palm, Date Palm</td>
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<tr>
<td>Betelnut Palm</td>
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<tr>
<td>Screw Palm, Frithal Palm, Traveller’s Palm</td>
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<tr>
<td>Shade trees</td>
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<tr>
<td>Fig, Indian Almond, Mh Luya (“European tree”)</td>
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<tr>
<td>Mansubani (Medicine tree), Mpalanca</td>
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<tr>
<td>Mvelia (Bead tree)</td>
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<tr>
<td>Mikosati</td>
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<tr>
<td>Fruit, spice, fragrance and flower trees</td>
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<tr>
<td>Jackfruit, Avocado, Tamarind, Mango</td>
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<tr>
<td>Tamarind, Java Plum, Clove, Mangifera</td>
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<tr>
<td>Christmas Tree, Orange, Mandarin, Lemon, Lime, Cashew, Frangipani, Mikalia</td>
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<tr>
<td>Rambutan, Guava, Papaya, Mbirimbi, Pomegranade, Banana</td>
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<tr>
<td>Shrubs and bushes: Jasmin, Melia, Lemosha, Seawiki Basil, Rose Fower, Henna, Hibiscus</td>
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Narrowest streets, 3-4 meters wide
• pedestrian, bikes
• paved, borders for planting
• can be widened when the city grows

Narrow streets, 5-6 meters wide
• pedestrian, bikes, (one-way car traffic)
• paved, planting zone between traffic lanes

Typical main streets, 7-8 meters wide
• pedestrian, bikes, (one-way car traffic)
• paved, planting zone between traffic lanes
• additional borders for planting

Wide streets, 9-12 meters wide
• pedestrian, bikes, one-way car traffic
• paved, planting zone between traffic lanes
• additional borders for planting

Wide pedestrian streets, 9-12 meters wide
• pedestrian, bikes
• paved, planting zones along the way
• can be developed more freely

Street sections, 1:200
Mkamasini

Mkamasini belongs to the Vikokotoni shehia in the north-west quadrant of Ng’amo. Its current main users for most of the day are men, while during some hours there are kids playing when finishing classes in the madrasa. Pedestrian flows cross the space by the middle. The space connects with a more busy Mtendeni St. Currently, the place is used as a parking lot because of its proximity to the Darajani market.

Counting

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<td>52</td>
<td>22</td>
<td>13</td>
<td>87</td>
<td>12</td>
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Twelve Quality Criteria

1:500

Gardening area

Public furniture (see project on pages 159–177)

Permeable pavers 30x30

Playground

Possible Future Community Center (see project on pages 119–137)

Madrasa

Round benches below trees

Gardening area

Kiosk

Kiosk restaurant

Public furniture

Proposed Mkamasini within the Green Network
Process
The process of Mkamasini as a pocket in the Green Network goes through three steps.
1. Mapping current activity situations. The madrasa, counting and mapping display a potential for a playground area.
2. Organizing the space’s mobility through greenery and urban elements. Greenery offers shade and lowering the temperature for a more agreeable space to enjoy positive aspects of climate.
3. Activities and business kiosks can pop out with shaded areas improving the space liveability discouraging its use as parking lot.

Top left. Current state.
Top right. Step 1: Organizing the space
Bottom left. Step 3: Activities
Kundemba + Misufini

Kundemba (top) and Misufini (bottom) are two road-like public spaces in the intersection between Muemba Ladi and Mlandege shehias in the north-east quarter of Ng’amo. Today, both spaces are mostly men-dominated in the main areas. Despite of its pedestrian flows, the space is currently disturbed by motor vehicles constantly crossing. By addressing mobility issues, organizing car traffic, and defining pedestrian areas, the opportunity to enjoy the space can multiply while diversifying its users.

Counting

Twelve Quality Criteria

Tracing and mapping in Kundemba + Misufini

Project by Andrea Esquivel Velázquez and Rosa Väisänen
Process
The process of Kundemba + Misufini as a pedestrian way in the Green Network goes through three steps.

1. Mapping current activity situations, the madrasa location, bike shop and current restaurants.
2. Organizing the space’s mobility through greenery and urban elements. Spots for playground and gardening are devised.
3. Current activities are enhanced and new activities are created around green and shaded areas. Kundemba can become a kiosk restaurant path linked to the Green Corridor.
Alabama

Alabama is located between Mwembeshauri and Miembeni shielias in the south-east quarter of Ng’ambo. Currently it is an important open space where various activities meet, from football tournaments in an improvised field, singing and dancing during the weekends, to motorbike repairing shops and even furniture selling. Common activities like fetching water from the water tower have created business around them. Even though the place is filled with possibilities, current cars crossing the space diagonally have hindered its potential.

12 Quality Criteria

- Football field
- Tree line - mobility organizer
- Public baraza
- Outdoor gym area
- Permeable pavers 30x30
- Connection to Green Corridor through buildings
- Possible Future Community Center (see project on pages 119-127)
- Water tower - Gardening
- Public baraza
- Kiosk
- Design specific public furniture (see project on pages 159-177)
- Playground area
- Round benches below trees
- Parking
- Car lane
- Tree line - mobility organizer

Tracing and mapping in Alabama
Current State

Mobility + Greenery

Activities

Process

The process of Alabama as a node in the Green Networks complements with the Green Corridor car lanes organization in three steps.

1. Mapping current activity situations, Alabama has already a playground and sport identity.

2. The pedestrian flows and activities in Alabama are enhanced by taking away cars from crossing the space. Organizing the space’s mobility through greenery and urban elements defines the football field, playgrounds area and the proposed community center.

3. Activities and business are enhanced by the greenery of the area and shaded areas in the space.

Top left. Current state.
Top right. Step 1: Organizing the space.
Bottom left. Step 3: Activities.
Bottom. Visualization of possible Alabama.
Kisimamajongoo + Gongoni

Kisimamajongoo (top) and Gongoni (bottom) are in the Kisimamajongoo shehia in the southwest quarter of Ng’ambo. Today these two areas are very active communicating the inner shehia to Karume Road as well as the Jamhuri Gardens. Currently the disorganization of traffic leaves little space for pedestrian areas. Organizing the cars and providing shade will create the atmosphere for business. Intersections such as this carry a great potential for entrepreneurs towards economic growth of the areas.

Tracing and mapping in Kisimamajongoo + Gongoni

Counting

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Twelve Quality Criteria

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Proposed Kisimamajongoo + Gongoni—within the Green Network

<table>
<thead>
<tr>
<th>Playground</th>
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<tbody>
<tr>
<td>Traffic protection - Bollards</td>
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<tr>
<td>Restaurant</td>
</tr>
<tr>
<td>Gardening</td>
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<tr>
<td>Tree line - mobility organizer</td>
</tr>
<tr>
<td>Car line</td>
</tr>
<tr>
<td>Permeable pavers 30x30</td>
</tr>
<tr>
<td>Front yard gardening</td>
</tr>
<tr>
<td>Possible Future Community Center (see project on pages 119–127)</td>
</tr>
<tr>
<td>Public furniture (see project on pages 159–177)</td>
</tr>
<tr>
<td>Water tower - Gardening</td>
</tr>
<tr>
<td>Kiosk - Restaurant</td>
</tr>
<tr>
<td>Mosque</td>
</tr>
</tbody>
</table>

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The Other Side
Process

The process of Kisimamajongoo and Gongoni as road-like places in the green network is based in organizing the space in favor of pedestrians.

1. Mapping current activity situations, Gongoni mosque plays an important role as an attraction point during prayer times of the day.
2. Organizing the space’s mobility through greenery and urban elements such as bollards and tree lines for defining cars lanes and pedestrian areas.
3. Pedestrian claimed areas offer the possibilities for this intersections to create business around them, benefiting from the shade provided by the trees and the people flow.

Top left. Current state.
Top right. Step 1: Organizing the space
Bottom left. Step 3: Activities
Sustainable East Africa

The on-site development of the Green Network can start in the nodes that are already active and changing together with inhabitants, local NGOs, public parties, current development planners and other stakeholders. As a part of the Green Network project, trees have already been planted to the locations of the planning area together with a local NGO, Sustainable East Africa, whose mission is to help East Africans in building a sustainable future. They achieve this by empowering motivated and committed local organisations to be effective and inspiring to others. The SEA vision is for all East Africans to be able to meet their own economic, social, cultural and resource needs sustainably - now and in the future. Their two current main partner organisations are Vikokotoni Environment Society (JMJV), a waste management project with a small nursery, and the Cultural Arts Centre, Zanzibar (CACZ), a network helping local artists and artisans to earn a living with their paintings and upcycled handicrafts.

Working together with JMJV and CACZ, SEA established a tree planting project in one of north-west quadrant areas, Vikokotoni. Following the motto “plant today, save tomorrow” they developed four project components to raise awareness of the importance of trees within the urban community. The central event was a tree planting day in the Vikokotoni area on March 25th, 2018. In advance of the day SEA went into two schools together with artists and explored the importance of trees in a creative way together with the students.

The tree planting itself included selecting appropriate trees for the different street sites. Assistance in this came from a Masingini Forest staff member, herself a resident of Vikokotoni; appropriate sites were researched and mapped as a part of the Green Network project; JMJV supplied the trees. On the tree planting day JMJV, CACZ, many members from the community and foreign volunteers joined together in Vikokotoni to plant trees throughout the whole area. The planting day and the April 1st fruit party that was organized to thank all participants and inspire a larger audience were both a great success.

As witnessed, even the smallest steps towards a more sustainable, inclusive and greener city are important: these kind of initiatives have the power to bring people together and create a sense of ownership of the city and its future. The Green Network that can be implemented today and from the bottom-up is there to make sure that the future city centre is open to all, made for and by its inhabitants.

Ways Forward

1. Identifying four locations for neighborhood activity centres
2. Greening process and planting with stakeholders
3. Centre development together
4. Encompassing infrastructure, paving, drainage, street lights, furniture
5. Reserving space for services and culture
6. Introducing playgrounds
7. Expanding the centres through connections to the major locations
8. Inclusive city centre for all

connectivity
economic growth
sustainable spaces
urban mobility
sustainability
accessible places
sustainable development

Project by Andrea Esquivel Velázquez and Rosa Väisänen
Community & Culture
Project by Hannin Alnimri and Anna Niubò Bermejo

A chain of community centres introduced in the four quarters of Ng’ambo. They act as connected nodes that aim to empower the communities by providing spaces for meeting, encouraging business, skill training and finally; a space for self expression and performance.

Empowering the Community
Our starting point in Zanzibar was to understand the culture, the people and what is important for them. Our time there was spent discovering Ng’ambo’s quarters, identifying their individual characteristics, and most importantly talking to the friendly locals. We tried to take into account the points of view of different stakeholders, starting with the community, the Shehas, and where possible other acting agents, such as the local NGO: JMJV in the Vikokotoni area. Through these interviews we defined an essential missing link; an unbiased, neutral meeting point available to all members of the community and stakeholders, where they can meet comfortably to discuss issues & opportunities for the enhancement of their areas. Designing this kind of space became central to our project, with the aim of strengthening collaboration through communication.

Skill Training
Another link that we wish to connect through our project is the work of JMJV to a wider range of people from the community. Talking to local women in the area for example, we understood their desire to have the opportunity to be economically independent through learning new skills and creating business. JMJV collects waste material to store and later sell. There is a lot of opportunity for this material to be up-cycled, and for the NGO’s work to be expanded to other neighborhoods. We wish to encourage that through providing a workshop space where new up-cycled products can be made and sold, hoping to create opportunities for re-skilling members of the community, raising awareness of such initiatives, and creatively using waste material. There would also be an urban garden using composting produced by the NGO, which we hope can be an idea implemented more as new residents are developed.
Youth Training and Activities
One of the places we also visited was the Stone Town Youth Centre, which offers courses for the youth such as language training and hotel management. They support new community initiatives and aim to tackle prevailing youth problems in the area.

We find it very important to provide such a place in all the different areas of Ng’ambo, aspiring to empower the youth through providing spaces for self-development, training, and improving skills.

Support Lost Cultural Activity
Through some research, and by talking to people of older generations, we discovered the old stories of Ng’ambo; when it used to be a diverse place where cultures met and shared their interests and activities such as dance and music.

The older generations are interested in listening to Taraab music for example, whereas talking to the youth, we found out their different interest in more modern music such as Bongo Flava.

In the community centres there is an aim to encourage local bands and dancers, reviving performance in the area again, both modern and traditional.

“Mixed tribes and communities used to play their music and invite whoever wants to join and watch, usually in open houses. Now people prefer more modern music, with loudspeakers.”

– Local Woman

Chain of Community Centres
The existence of the Michenzani blocks divides the Ng’ambo area into 4 physical quarters. Along the Michenzani axes are strong pulling forces of future centres; Stone Town to the West as the main entry point of the island and the tourist centre, the convention centre in the North, office district in the South, and the transport hub in the East.

These outward pulling forces leave the centre of the Michenzani cross, the centre of Ng’ambo, void of activity. We therefore propose a cultural centre to create an important district within Ng’ambo in the bigger urban context. This would then, through the green network, connect to a series of community centres; nodes in each quarter which connect to the delicate fabric of the individual districts and aim to serve their communities.
Four Scenarios of Feasibility

To identify the suitable sites for the community centres in Ng’ambo, we started with the proposed locations of community centres in the Local Area Plan. We analysed the different locations in terms of their activity levels, potential for development, proximity, and the suggestions by the respective Shehas of each community.

A main factor to consider is the feasibility of the projects we propose, which depends mainly on the ownership of the site or the building to develop. Financial feasibility can be a big obstacle to realising these centres; taking in to consideration that buying private land or property would be most expensive for the government, and would take longest. We therefore propose 4 different scenarios within the sites that offer a range of feasibility options as well as a timeline of when they can be achieved.

1. **Vikokotoni: Reuse of Public Building**

   In the North West area of Vikokotoni, we propose the renovation & refurbishment of the former church building, which once also functioned as a place of performance.

2. **Kisimamajongoo: Reuse of Private Building**

   In the South West quarter, we propose the re-purposing of a new storage building into a community centre, which would better serve the lively square around it.

3. **Kundemba: Redevelopment of Private Buildings**

   In Muembe Ladu, in the North East, to enhance the site we propose an urban rearrangement, which would remove some buildings to create instead a community centre with a public square.

4. **Alabama: Use of Public Land**

   In Muembeshauri, in the South East, an area also known as Alabama, we propose the community centre on the empty piece of land facing the currently big and open public space.

---

### Site Plan at 1:500

- **Vikokotoni:** Reuse of Public Building
  - Renovating the building to accommodate for multi-use event space, a restaurant cafe & meeting space.

- **Kisimamajongoo:** Reuse of Private Building
  - 6 years: Reuse of Private Building

- **Kundemba:** Redevelopment of Private Building
  - 10 years: Redevelopment of Private Building

- **Alabama:** Use of Public Land
  - 2 years: Use of Public Land

---

Project by Hannin Alnimri and Anna Niubò Bermejo
Kisimamajongoo
Reuse of Private Building

Re-purposing the storage building to a more inviting program of communal spaces & cafe.

Kundemba
Redevelopment of Private Buildings

Redeveloping the houses in the corner to a more open public space & building program.
Observations & Community Needs

Community Administration
Interviews with the Shehas gave us an insight into the community meetings, which usually take place in private rented halls or in outdoor public space, and also into the community’s interests in dance and music, there being a local tribute band to the famous Bi Kidude.

“Young girls in the community are interested in dancing. They perform in private ceremonies and on the streets sometimes” –Sheha

Social Issues
We noticed the area being vibrant and busy, there was, however, the strong presence of groups of drunk men. They mostly gathered between the Madrasa & the motorbike repair shop.

“There is a problem of alcohol and drug abuse in this area. They drink like this at any time of the day” –Local man

Building Program
This issue was critical for our design proposal which aims to maintain the liveliness of the area while making it safer and more inclusive.

Local Women
Our design tries to respond to the spatial desires of all members of the community.

“We like to play cards together, make sure you design a place for resting” –Local woman

Youth
Providing the youth with a safe environment to play and interact is essential. As well as training them so their energy can grow to become more valuable to the community.

“Yes, I like Taraab music. My grandmother used to be part of a Taraab band ”

–Local youth

Site Analyses

Pedestrian & Vehicle Flows

Urban Approach

1. Division of urban public space creating problematic corners
2. Removal of corner buildings for redevelopment
3. Proposal of Community Centre facing public space
The Other Side

Site Plan at 1:500

First Floor Plan at 1:500
1. Cafe with Terrace
2. Flexible Rooms for classes and meetings

Ground Floor Plan at 1:500
1. Main Hall
2. Informal Meeting Space
3. Food & Shops
4. Water Point

View from pedestrian street

Project by Hannin Alnimri and Anna Niubó Bermejo
Observations and Community Needs

Community Administration
Meeting with the Shehas from this area we realise that Alabama is a very central location for communities from both Shehias. It is used for recreation, and also for community meetings.

Existing Activity
There is a lot of existing activity on the Alabama site including some kiosks, the football field, and a furniture shop. With the redevelopment of the area we plan to relocate the shop in the building, adding to it a workshop that upcycles waste furniture and products.

Local Women
Talking to some local women in different areas of Ng’ambo, we recognise the need for creating opportunities for women through learning new skills, which we hope to achieve in the workshop and by providing flexible kiosks that can be rented out monthly.

Types of Space
Through observation we recognised some trends in the general lifestyle, and tried to understand what parts of the physical environment are taken advantage of and what could be further enhanced. Analysing the areas, we were able to understand some common characteristics of favorable space, for example the necessary need for shading, open areas, and spaces that range in their level of privacy.

Youth
As in the other community centres, empowering the youth is equally important in this area. The Sheha recommended spaces for computer studies, tailoring, music and other training.

“`In my free time I like to chill, would be nice to have a cafe, a garden, some halls and maybe computers”
–Local youth

Building Program

Football Field 1500 m²
Shop 30 m²
Food Kiosks 45 m²
Main Hall 180 m²
Meeting Space 70 m²
Internet cafe 45 m²
Workshop 80 m²
Meeting Room 45 m²
Classes 45 m²
Cafe/ Restaurant 140 m²
Site Analysis

Building Uses
- Sheha's Home
- Furniture Kiosk
- Shops
- Residential

Pedestrian & Vehicular Flows

Building Design

Site

Green

Space Division

Massing

Right Page

Site Plan at 1:500
The Other Side

Project by Hannin Alnimri and Anna Niubó Bermejo

Ground Floor Plan at 1:500
1. Main Hall
2. Informal Meeting Space
3. Kiosks
4. Shop
5. Internet cafe
6. Workshop
7. Urban Farming Plot

First Floor Plan at 1:500
1. Cafe/Restaurant
2. Terrace
3. Flexible Rooms for classes and meetings

Long Section at 1:200

Project by Hannin Alnimri and Anna Niubó Bermejo
The Other Side

Main Entrance

Courtyard View

Short Section 1 at 1:200

Short Section 2 at 1:200

Project by Hannin Alnimri and Anna Nubiò Bermejo
Zanzibar Culture Center
Project by Kristaps Kleinbergs

Enhancing cultural tradition and contemporary self expression in Zanzibar City.

Cultural sustainability
Tanzania and Zanzibar has a rich cultural tradition and also large interest in cultural expression, but there are almost no place in the city that would be dedicated for it, therefore a question arises, will this culture exist in the future? Will both traditional and contemporary Zanzibari culture survive in the future context and will the new generations be able to maintain it?

Currently in Zanzibar city cultural expression takes place in private spaces, on the streets and in temporary events, but there is no permanent publicly accessible, safe space for this matter.

A public building is proposed to maintain and enhance Zanzibari cultural tradition, cultural diversity and self expression since cultural sustainability relates not only to cultural beliefs and practices but also to place attachment. In this regard, built environment and physical artefact is as important as immaterial values and tangible artefacts can help to keep traditions alive and even create contemporary movements.

Above: Future site of the Culture center as seen from Mapenduzi Tower, February, 2018. Source: Personal archive

Left: Center of Ng’ambo. Source: Personal archive
Ng’ambo

This area in Zanzibar City has been studied extensively by many professionals and our main source of information is Local area plan. In the document there are proposed sites for community centers, and after visiting all of them four were selected. However, the scale of the possible community centers would provide access for very small number of people, therefore a site for one larger civic center was selected. In the process of looking for larger community center several aspects were considered, for instance, accessibility, existing programs in youth center and other spaces, as well as symbolic value. The site chosen is in the heart of Ng’ambo, the neighbourhood that has ambition to become the new city center in nearest future, and the site is also the highest point in the area, rendering it symbolically significant.

Centers of gravity

The historical african neighbourhood is extremely dense, but in the wake of revolutionary republic massive urban developments took place, that left significant scars in urban fabric. However, it also made exciting urban plan that has two corridors and currently at the end of each axis there are planned clustered districts of various kind. In the west there is historical Stone Town, that is current economical center for many residents of Zanzibar City, in the East there is planned bus terminal as well as CBD, in the south there is public library and planned office building zone and the northern part of the Michenzani corridor is becoming a “High street” with office buildings along it and leading towards the planned Convention center and mix use development area. However, what is going on in the very center?
Experience

Expectation and reality
As said before, the Michenzani corridor has distinctive character and clear urban layout. With gravitational points around it, the very center of it has been left out of focus. Personal experience suggested, that it has to host very special function of some kind. Walking along these brutal socialist housing blocks creates a feeling of a journey that has to culminate in its centerpoint, that cathartic experience should follow. Going there proved that there is just a large open space with no shadow and nothing to do there. As for now, The Mapinduzi Tower unfortunately is a building with no use, it is difficult to enter the building because of its strange visitors policy and the museum in the basement that should have celebrated country’s 50th anniversary of independence is more a storage than prominent space of exhibits. Nonetheless, a monument is important for a new state and it should be there, but concerns lies within its use and how it benefits the general public and Zanzibari culture.

Michenzani line
Historically the aim of the Michenzani line was to create an axis of public and institutional buildings that would go from Stone Town to newly planned bus terminal. Today only CCM political party headquarters, Mapinduzi Tower and Raha Leo (Zanzibar Radio station) are located on the axis and none of them are entirely publicly accessible. However, the Michenzani block morphology suggest that the central part of Ng’ambo has to be treated in a special manner, because the setbacks have provided large open space in the very center of densely built area and it is not yet fully taken over by other developments. Not yet!
Urban conditions

Regarding the ongoing Green Corridor plan, in this proposal its urban implications are taken into account and with minor changes the traffic is organized accordingly. The proposal suggests changing the street layout in a way that would enlarge public domain and open up space for a public building. Building heights and layout is chosen in respect of Local Area plan and Green corridor plan as well as paying reverence the strong character of Michenzani line.

The site and the building

The concept proposes to elevate culture on top of building’s hierarchy and support it with commercial activities. Artefacts created within the workshops can be sold in rentable facilities on the groundfloor, giving the opportunity for locals to generate income as well as additional motivation for cultural expression.

The building is located adjacent to Mapinduzi Tower and is covering east part of the existing square. The program of the building concentrates on arts and crafts as well as on strong dance tradition and musical expression. The volume derives from a courtyard typology where two functionally separate volumes are organised around the public space.

More linear building are placed near the green corridor as a continuation of streetscape of Michenzani line. It hosts various workshops, for instance, wood engraving workshop, embroidery workshop, painting class, auditoriums for...
lectures as well as small shops and restaurant on the ground floor. The rooftop is partially dedicated to educate about urban farming and permaculture concepts.

The other volume that is more compact and vertical serves for dance and music facilities. There is a recording studio and several dance and music classes. Being closer to 6 floor apartment building it also relates to it in height, raising above it for three meters.

Outdoor spaces has a direct connection with their surroundings. The east side of the building sits in front of the planned square that would celebrate world famous Zanzibari singer Siti Bindi Saad. Therefore access to the upper plaza is organized on the corner of the building in front of the square. Next to the multiple barazas on the corner, there is also the main entrance for the cinema, that has two large cinema rooms.

The other public space, the courtyard, consists of multiple stepping barazas, that is a very common element in Zanzibar’s architecture. Besides seating area and shaded spaces, the main function of the courtyard is the outdoor stage that can be used for performances or outdoor cinema. The stage is oriented in an angle that opens up the courtyard towards the tower and can host more spectators. On the right side of the stage a green wall is placed for acoustic and scenicographic reasons.

The angle of the stage is also used for main entrances in two buildings creating formal cuts in the volume that makes spatial connection with both sides of the building and both squares.

Overall character of the cultural center is achieved with simple post and beam structure and facade is covered with wooden lamella panels that provides shading and creates ambiguous transparency depending on the viewpoint.
History of “Baraza”

Through our fieldwork, I was intrigued to discover Zanzibari social object that well-known as baraza. This social feature is mostly built in front of private house, a store, a mosque and also in some areas in public places. Before going deeper to the baraza as I called “micro-utopian” place, there are some vast array of meanings of baraza as a term and the relation with the social setting of the baraza in Zanzibar.

The term baraza (baraza/mabaraza pl.) as such has many different meanings, yet, the term has so far not really been discussed in the academic literature. There are Marc J. Swartz (1991) and Mohamed Ahmad Saleh (2004) have provided the definitions of the baraza by defining it as “a place of public audience or reception, a veranda, a stone seat in the entrance hall, a bench against the wall outside a house or a raised platform with stone seats and sometimes roofed over in front of the house, for receiving visitors, holding an audience, transacting business, for gossiping, where men gather on a fairly regular basis, usually between maghrib and isha prayers. It is a male place of socialization with contrast to the courtyard, where female members of the society get together for their talks and their domestic activities” (Larsen 2009:178; Swartz 1991:317; Saleh 2004:16).

The oldest Kiswahili dictionary of Krapf (1882) defines the baraza as “a stone seat or bench table, either outside of the house or in the hall, where the master sits in public and receives his friends; hence the public audience held by the Sultan and the council then held; meeting of a council” (quoted in Haugerud/Njogu 1991:8). In more abstract terms, the baraza could be characterized as “inscribed places”, spaces which have been defined in meaningful terms by the people of a specific place, and the way people have transformed undefined space into defined place (Low/Lawrence-Zuniga 2003:13).
Sitting Behaviour

Through my daily observation while visiting the areas of Zanzibar especially Ngambo area as a city center, I witnessed the diverse human activities that are so dynamic but still there are some slow pace activity in between. The thing that caught my attention was how they occupied a space by sitting, squatting, leaning, or standing while they waited, rested or in relaxed discussion along with a very creative relation affect the body movements which are very adapt and respond to the surrounding environment. This unique relation towards body and space furthermore than processed the area surround become a new social space. This phenomenon is really different in Western society where the sitting place is always defined by the structure of rigid shape of furniture or in the terminology of chair, sofa, bench or any other term for sitting object. In Zanzibar, people are casually used construction blocks, coconut trunks, or wooden racks of fruit baskets to sit, lean, even sleep. Although this applies to women, men and children, gender segregation occurs naturally through groups, interest, and informal boundaries. It is also motivated by their culture and religion. However, beyond that there is so much possibility of sitting position that occurs in everyday life in Zanzibar society. The phenomenon that occurs reminds me of a psychological theory that is Affordance Theory. Affordance theory states that the world is perceived not only in terms of objects, shapes and spatial relationships but also in terms of object possibilities for action (affordances) – perception drives action. (J. J. Gibson (1988).

Baraza in front of the Swahili House

Collection photos of Zanzibari people with their sitting gesture behaviour in their daily life

Sketches of sitting behaviour in Zanzibar, from single to groups behaviour
The Location of Furniture

From the Local Area Plan of Ngambo (DoURP, 2015), there are reasonable amount of open spaces in Zanzibar. However, the quality of these open spaces is low as there is lack of maintenance and most importantly, the trees are disappearing from their horizon. This project would focus on re-imaging urban life in Zanzibar through a piece of furniture. Street furniture is designed as a cultural object to create informal, mini utopian space for locals to spend their time outside. The location of the cultural furniture mainly focuses on Green Corridor and Green Network; Karume main road and also on several site-specific location. It is expected not only to be a mere of object but also a cultural symbol that represents and respects the local identity and sense of belonging.
The Ergonomy & Affordance

Ergonomy is the practice of designing products which take proper account of the interaction between the object and the user. Human factors and ergonomics are concerned with the “fit” between the user, equipment, and environment. (Wikipedia, 2018). It accounts for the user’s capabilities and limitations in seeking to ensure that tasks, functions, information, and the environment suit that user. Affordance places an emphasis on the transactional relationship between an individual body and its environment. The study is curious to found multiple affordances of ‘object to sit’ for various sensory-related actions, action possibilities in the environment in relation to the action capabilities of an actor and is independent of the actor’s experience, knowledge, culture, or ability to perceive.

Site Specific Furniture

Some of the furniture has been designed to collaborate with the other projects in Green Network chapter and House on Stilt. This collaboration is a respond to the specific surrounding such as Alabama and flooding housing area. In Alabama, there is a famous football field where every Saturday at 5 pm people gather to watch local teams to play a football match. I thought it would be nice if they have a sitting object to support their activity. Site specific furniture is designed in one of the flooding housing areas, where there is a need to fill a space that is reserved primarily for children’s activities in play. During the field trip, I saw lack of open areas for children’s play. Most of children play in front of their homes or in narrow spaces between buildings and potentially hazy lawns.

Deconstruction of Baraza

A deconstructive approach to criticism involves discovering, recognizing and understanding the underlying and unspoken and implicit assumptions, ideas and frameworks of cultural forms such as works of art, design, and architecture. In the term of repurposing, deconstruction allow designer to re-imagine and re-arrange the initial shape of the object. Therefore, in this project, I tried to re-imagine the cultural seating object that is inspired by the initial shape of baraza. In its form, baraza has two main basic shapes which are triangle with one side curved and rectangular as a seat.
The Other Side

Collection photos of public furniture in various area of Ngambo

The typology of baraza in various area of Ngambo
The various function of sitting objects in daily life

The future sitting object would represent Zanzibari people through the similar identity. Its shape is inspired from the baraza’s form combined with the new functionality which certainly supports the user activity. To support sustainability in Zanzibar, the materials used are also local materials and as much as possible recycled and reused. Then, the need for shade is overcome by the cooperation with the latest’s plan of green network, especially in terms of greening activity with tree planting. Furthermore, in addition to that, in the design development there is also integration of local tent’s forms which are part of the design elements. The abstract program of this sitting object would include; Cultural Dimension; Identity which is the understanding of multiple degrees of differences and similarities among group members and to generate sense of belonging in daily life. Social Dimension; Interaction, Participation, and Connection to Green Network which the furniture as a provocative dialogue create a connection between people and enhance social relation between neighbors. Natural Dimension; Embodied of the climate. The need of shade supports the interaction between people towards micro build environment.

Initial Idea: Socially Engaging Design

Street or public furniture is a collective term for objects and pieces of equipment installed along streets, roads, parks and open spaces for various purposes. The deconstruction of baraza is the first step to cultivate the new sitting object in harmony with the existing culture. The term baraza essentially points thus to three different dimensions: In organizational terms, a baraza may represent different degrees of formality or informality, institutionalization and abstractness. A baraza might be a simple and informal meeting of people, but also a council, or, in historical times, the audience of the Sultan of Zanzibar, which was described as a bar-za (Rute 1998:125). In spatial terms, the baraza represents a spectrum of places where people meet, such as the verandah in front of a house or, in particular a place near the local mosque. In temporal or time-linked terms, a baraza is connected with the specific times of the day when its members meet, such as the baraza za wazee, the “old men’s baraza”, at Jaws’ Corner which is frequented daily between isha and maghrib prayers (Larsen 2009). In addition, each baraza is linked with the stories of that specific place and its people, and, thus, with local history.

The various function of sitting objects in daily life

Sketches of the initial idea and shape towards the programs
The Modularity

Modularity is the degree to which a system’s components may be separated and recombined. Modularity creates a possibility to decompose a furniture into a number of components that may be mixed and matched in a variety of configurations. Modular design is an attempt to combine the advantages of standardization with those of customization and flexibility in design. (Schilling 2000; Baldwin 2000). In this project the sitting object is designed with modularity system. Modular furniture would be able to follow the needs of each place in accordance with most frequent activities, the size of the area, as well as in terms of budget and resources. Modular design allows an object to grow and expand according to future needs and is also easy to replace, move, and reorganize in the future.

Green Corridor Furniture

In this first project, the sitting object was created as a fulfillment of public furniture in the green corridor area. Based on the reference from Local Area Plan of Ngambo, Karume main road and its intersection will become the central area of the city center. In the design, there is also the integration within the elements such as trash, planter box, and bicycle parking area. The materials used are as much as possible recycled. White coral stone is normally used only for a basic foundation of a house could be used in the furniture. The use of coral stone in different ways such as mould it into a slate and combining with recycled metal from around the site will become a new material representing sustainability.
Site Specific Furniture

In collaboration with The Green Network project (p. 89) the sitting object will respond to Alabama as part of Mwerembushauri. In the middle of the site in Alabama (p. 108) there is a well-known football field. Today, the area is huge but empty, dusty, windy, and also really hot without any shelter for people. Therefore, this second part of the project is a combination of the sitting object for football’s audience and the public benches for the residents. The third part of the project will be integrated with one of the flood resilient housing project as a sitting and playing object for kids who live in the apartments. Lack of play grounds often force kids to play in the busy street or any other empty space. Therefore, the third project is a combination of seating object for the residents and also for kids to play.

The location of site specific furniture

Detail of the Green Corridor furniture: The module, possibility of shape, perspective, and sections

Expanded detail of Housing on Stilts (p. 229) apartment furniture & material selection

Expanded details of Alabama’s (p. 108) furniture & material selection
Details of the Site Specific (Alabama, p. 108) furniture: the module, possibility of shape, and sections

Perspective image of Alabama (p. 108) football field and the site specific furniture

Details of the Site Specific (Housing on Stilts, p. 229) furniture: the module, possibility of shape, and sections

Perspective image of Housing on Stilts project’s (p. 229) backyard and the site specific furniture for kids to play
“If you ask me, a house should have a living room, kitchen and two bathrooms. And no less than three bedrooms! That’s the most important thing. One for the men, one for the women and one for the mother and father. Men close to the entrance to protect the house, and women and parents in the back to get more privacy.”

—Local man from Ng’ambo contemplating on the features of an ideal house
In the discussion of whether or not Ng’amo needs guidelines and regulation, the answer is definitely yes. If taking a deeper look into the area, we can discover many good reasons for why guidelines and regulations should be applied. First of all, as to this date, Ng’amo has no clear regulations or systems that control the development. Existing local documents, such as the Ng’amo Local Area Plan and the Zanzibar Master Plan 2015, present bits and pieces of proposed building regulations and limitations, but do not work as a comprehensive document, only focusing on regulation and the process that comes with it. In an area like Ng’amo, that lacks basic regulations needed to control its fast development, many pressing issues occur. An example is the issue of fire safety up for discussion when seeing the urban sprawl that is happening in the area today. Houses are built extremely close to each other, and without a hierarchy of streets, it gives fire-fighters no possibility to access quickly, and there are great chances for the fire to spread. The fast development happening in Ng’amo makes the city more and more dense, which for the fire safety is bad news. Apart from risk of fires, the city needs to deal with basic infrastructure. By highlighting some issues, we can see that Ng’amo has problems with providing clean water to all its citizens, and many people does not even have running water or water connection in their homes because of a badly maintained water pipe system. This makes it necessary for people to go to water stations each day, to provide enough water for their families. And in a densifying city, where more and more multi-storey building are built, it means people have to carry several liters of water up to multiple floors every day. The problem with a dysfunctional water system also affect sanitation, which is another major issue that the people of Ng’amo needs to struggle with every single day.

The city does not only struggle with fire safety and infrastructural issues, but also livability. Streets are getting more narrow as a result of privatization of public space, trees are cut down...
which affects and reduces the public life, and no limitations for heights results in developers constructing tall buildings which reduce light and air in the city. This list of thing that reduce livability is long, and will continue to grow unless things are start to happen soon.

The need for guidelines is absolutely present, but a set of guidelines alone will not solve all problems. The guidelines depend on the local government and it's ability to develop guidelines further and put them into action in Ng'ambo.

**Approach**

As already written in background, Ng'ambo lacks a document which solely focuses on regulating the development of the city. Also a process for these guidelines to operate within is missing. One of the goals of this project is to create a shared document for building regulations and guidelines which could be used as a basic tool for controlled housing development in Ng'ambo. It aims to be a shared document for all building guidelines and restrictions, which focuses on being a base for housing development in Ng'ambo. The document will be open for changes, additions and subtractions, and can be modified by the changing needs of the city in the future.

When starting with such a task of creating a set of guidelines for Na'mabo, it is important to cover all scales. It is important to get a comprehensive set of guidelines that can operate in large, urban scale as well as are able to tackle issues on smaller, building scale. A number of guidelines should be kept low for the document to be simple and understandable enough. It has been important to see what is needed and what is excessive information, this to make the document as simple and understandable as possible so everyone can understand. Furthermore, it is important to remember that the guidelines presented in this document are not a general set of guidelines, but specialized for Ng'ambo and its needs. They are based on analysis, research and documentation from the area and facilitate for a better Ng'ambo in the future.

There are certain discussions that the guidelines avoid. This can be of various reasons, but a prominent cause is the lack of well covering research and background materials. One example is building materials and structure, because the current resources and affordable techniques are limited. The local government is highly recommended to continue the discussion of these topics in the future.

Apart from guidelines, an important discussion in this document is to establish a framework for the guidelines to operate within. The framework should be simple enough to be understood by all parties. Therefore a simple role chart and process are introduced.

It is important that the primary user of the building guidelines, the local government is part of developing the guidelines as well as the system for them to operate within. Because of the time limit of this project it was not possible to develop the framework for the guidelines in cooperation with the local government. This project offers an example how the process of granting building permits to regulate the development of Ng'ambo could look like.

**Guideline categorization**

The guidelines have a need for categorization to make it easier for a user to orientate through the guidelines and find a comprehensive explanation of how the guidelines will affect and surrounds. The four steps categorization system will in other words give more depth to the guidelines. A categorization system for Ng'ambo is based on a system developed by Alex Lehnerer for his book Grand Urban Rules (Lehnerer, 2009). The categorization system has been further developed to adapt to the guidelines of Ng'ambo and will consist of four components:

- **Motivation**
- **Area regulation**
- **Domain**
- **Building or surroundings**

**Motivation**

Motivation is the key component of the categorization system and divide the guideline into three categories: Size regulation, Contextual and Livability.

Size regulation guidelines have their main motivation in issues concerning dimensional matters, either widths, heights, area dimensions or percentages. They secure that densification of the city happens with right dimensions and sizes. Contextual guidelines are motivated by keeping the city unified and have therefore an extra eye for the context. They are mostly focusing on building elements and makes sure that they are crafted in a certain way. This secures qualities in the city and makes sure that the context of buildings not is forgotten. Livability guidelines focuses on matters that mainly are done to secure a better life for the inhabitants of Ng'ambo. They can for example be measures to preserve culture, or to cope with the climate.

**Area regulation**

The second component in the categorization is Area regulation. It tells if a guideline either affects the whole area without any exceptions, or if they are relative: dependent on the exact situation. If a guideline applies to all areas, it is absolute. This basically means that the guideline is so important for developing the city, that the guideline never can be ignored or considered invalid. On the other hand, when the guideline is relative, it can be considered invalid for certain areas. This must be discussed and finally decided by the local government.

**Domain**

Domains tells the reader what he or she can expect the guideline to affect in the city. There is a total number of five domains, and a guideline can in theory affect everything from one to all five domains.

**Building or surrounding**

Building or surrounding is the final component in the categorization system. This component decides whether a guideline is building or surrounding related. A guideline can either be one of them, or a combination of the two.
1. Motivation - why the rule is applied

<table>
<thead>
<tr>
<th>S</th>
<th>Contextual</th>
<th>L</th>
<th>Livability</th>
</tr>
</thead>
</table>

2. Area regulation - what area(s) it affects

| A | Absolute: all areas | R | Relative: dependent on situation |

3. Domain - which building domain(s) is affected

| D | Density and distribution |
| P | Programmatic regulator |
| F | Form regulator |
| H | Height |
| S | Style |

4. Building or surroundings - Either one of them or both

| B | Building affecting |
| O | Surroundings affecting |

Guideline title

A description of the guideline
The Other Side Part V Private Environment

Density and distribution

- Absolute Form regulator
- Size regulation
- Building affecting
- Outdoor space affecting
- Access streets

Street hierarchy

The street hierarchy in Ng’amo will consist of four categories, from the largest connections to the fine tissue that create Ng’amo. The hierarchy will be based on the old road network, but will make the area more accessible and better structured.

Ng’amo needs a clear hierarchy of streets for the future so the city will be easier to plan and densify.

- Major roads
- Minor roads
- Access streets
- The web

The major roads will handle the large connections through and around the area. They will connect Ng’amo to Stone Town in the west and the suburban areas in the east, and bring people into Ng’amo via Karume and Mandege Road which form the large, characteristic crossroad together. The major roads must be large enough for cars, cyclists and pedestrians, and have designated areas for each on of them.

The minor roads are based on the map for pedestrian and cyclist connections found in the Ng’amo Local Area Plan (DoURP, 2016, p. 69) and will be the main circulation within the four quarters. They shall prioritize pedestrians and cyclists, but must be wide enough for cars. Car traffic should however be regulated by local authorities. Access streets aim to make Ng’amo more accessible and easier to orientate. Before developing the access streets, a grouping of the area is done. The grouping is based on existing houses and should be formed by extensive analyses. For the purpose of showing how Ng’amo can benefit from this subdivision, a proposed grouping, based on current streets, connections and groupings, is done in the south-west quarter. The access streets should encircle each group and tie them together. Together, they will create a web of wider streets through Ng’amo.

The access streets will have a minimum width of five meters, which will be developed in two steps. The first developer of the area is responsible to secure a minimum three meter boundary to surrounding groups. With surrounding groups already developed, it is required to add another two meters to the access streets, which will make it five meters in total. This makes the access streets wide enough for a car to pass through.

The web are the streets within each group. They should remain narrow, as this is something that characterize Ng’amo and promote walking and cycling instead of using motorized transportation.
Ng’ambo will be divided into four different height categories based on the street hierarchy. The Michenzani buildings will remain as the tallest housing buildings, while the rest will belong to the other categories.

Currently Ng’ambo has various building types, which can be divided into three broad categories:

- Traditional Swahili houses
- Modern multi-storey buildings
- Michenzani Blocks

The traditional Swahili houses dominate Ng’ambo. They vary in size, colors and details, but have the large metal roof and traditional doors in common. Usually these houses only consist of ground floor, and some more that ground floor + one storey.

The modern multi-storey buildings becomes more prominent in the cityscape of Ng’ambo. Shape and size vary, but are from ground floor + two to five storeys.

Michenzani blocks have a large influence on the area. They divide Ng’ambo into its four quarters and are of a massive scale compared to the rest of the city. In height they vary from ground floor + five to seven storeys.

Today, Ng’ambo has no clear height restrictions. The Local Area Plan suggest to keep new building mass below the Michenzani building and have a general maximum height of ground floor + three storeys in Ng’ambo. In some areas it is also proposed ground floor + four storeys. Also, it emphasize that higher buildings will need to have more strict fire regulations (DoURP, 2016, p. 98).

When a new height hierarchy will be developed, it will be based on the street hierarchy, current building heights and local documents that dwell around the topic, and divided into four groups:

- G+7 - Crossroad centre
- G+4 - Along major and minor roads
- G+3 - Along access streets
- G+2 - Inside groups

The Crossroad centre is mainly affecting the Michenzani buildings, while Along major and minor roads affect all houses laying along one of these roads. Along access streets will affect all houses within a group that face an access street. Inside groups will affect, as the name suggest, all houses inside a group that does not face any access street.

The illustration to the right shows how Along access streets and Inside group will work together. Each floor has a restricted maximum height to prevent developers from violating the guideline. Ground floor is limited to 4.5 meter, while upper floors are limited to 3.5. This number measures from ceiling to ceiling. If floors violate the heights, they will count as two storeys.
Plot handling

Plot handling will be divided into five steps that allow developers to handle their groups correctly.

1. A whole group or subdividing
2. Give space to access route around the group
3. From private inside to public outside
4. At least 25% of the group must be open space
5. Give specific borders for each building.

Ensure privacy and public exposure: Groups will have a public-to-private structure, where public life occurs along the group border and private life happens in the centre of a group.

Open space: In current groups an average of 25 percent is open space, but it is consumed by narrow streets. In new groups, larger open spaces shall be provided inside the group, pushing most building mass to the borders. This leaves narrow spaces between buildings and opens up towards the centre. Based on old groups and the proposals for groups presented in this book, at 25 percent of each group should be open space.

Space between buildings: Open space encircling the groups and larger open spaces within the groups, make less use for space between buildings. However, each building plot within the group must have clear borders to ensure that the space between does not get privatized.

Crossing boundaries

All objects belonging to one plot, have to be kept within the boundaries of the plot. This refers to balconies, extensions, and all other objects which is under the ownership of each individual plot inside a group.

A common problem in Ng’ambo is privatization of public space. Specially the narrow streets between houses suffer from this, since these spaces usually are the easiest to privatize. This problem has more than one factors one of the being lack of clear boundaries. Today, the building footprint works as the plot boundary. This leaves little room for development and ends in privatization of public space. For the group development, each building within a group should have clear borders to follow, as mentioned in the chapter discussing the Plot handling.

Another issue is the common acceptance of crossing boundaries. People think it is fair to cross them since everyone does, when in fact only eaves are allowed to cross the border lines of the plot.
The grouping development should have a focused two-directional approach, meaning that opening mainly should turn towards access streets and inner open spaces to promote both public and private life. Although residents spend much time in the streets socializing, the house is a private space. It is therefore important to provide both private and public places when designing new housing in Ng’ambo. Houses within the new groups will therefore have two main directions for openings: Towards access streets and towards the inner open space of the group. This will provide a communication with the surroundings, but also give privacy by facing towards the core.

The narrow spaces between buildings should have smaller openings and mainly be used for ventilation. This is to prevent unwanted privatization of public spaces, which is a current problem in Ng’ambo.

Culture lays deep in doors of Swahili architecture. Zanzibar has been influenced by different cultures through time. This has made doors an important cultural element and can tell a lot about the people living behind them. Regardless of their importance, it cannot be demanded that these doors are incorporated in the future, especially if Ng’ambo is aiming for an affordable development. That is why this traditional identifier will not be a part of the guidelines, but should rather be taken into consideration by developers.

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Cross ventilation

All houses and buildings should be provided with cross ventilation. If possible, a north-south direction is preferable because of local wind conditions. Because of the hot weather, cool and well ventilated places are needed in Zanzibar. Cross ventilation is a way to solve this problem. It helps maintaining a good indoor climate with low cost. All rooms should have good ventilation, but kitchen and bathroom should be prioritized and provided with cross ventilation if the developer sees no chance for cross ventilation in all rooms.

For the cross ventilation to be most efficient, openings should point in a north-south direction. This is because of the local climate, which has this as its major wind direction. However, it is important to remember that cross ventilation in any direction is much better than not providing it at all. Cross ventilation can be provided in various ways. Room arrangements, ventilation holes and ducts as well as perforated walls could be used to allow the air to run through the building.

Meeting places

When developing, groups should contain at least the same amount or equal area of Barazas as the houses it replaced. This, along with additional street furniture and vegetation in Ng’ambo will make the city more livable and preserve the culture.

One thing that especially characterises Ng’ambo and Zanzibar, is the public life culture. People in Zanzibar spent a lot of time outside in public spaces. It is an important part of the local culture, who the people are and what they share together. When designing a city for the future, this is one aspect we definitely do not want to change. It is an important part of who they are, and what they share as a people.

In Ng’ambo along with the rest of the Swahili culture, their use of Barazas is important and widespread. They come in different shapes, colors and comfort, but they bring people together and into the streets. When developing Ng’ambo, it is important to remember the Barazas and the meaning for the locals, so that the development is for the better.

Today, almost every house in Ng’ambo has a Baraza. That should continue in the future. In the future, equal number of Barazas should be built into the new houses as there was in the replaced ones. It is also a possibility to apply Barazas in storeys above the ground floor, but these should never replace the Barazas on street level. Barazas is part of the local culture which should be kept and encouraged when building new houses.
The system: roles in the building process

To establish a system that the guidelines can operate within, the system needs a clear role distribution. It will be good for all actors if the system were kept as simple as possible. If necessary, the number of roles in a simplified system can be boiled down to three to five roles.

- Local government
- Primary developer
- Responsible contractor
- Responsible applicant
- Responsible designer

Out of these five roles, the three first ones are probably most needed, but it is likely that the two additional roles will make the process even clearer for everyone involved.

The local government has an important role when it comes to the follow up of the guidelines. They make sure that a new project and the developer of the project operate within the guidelines, and will be the one who approves all applications and gives permissions. How the local government structure this role and how many people that should be involved, has to be decided by the local government.

The primary developer is the one owning and paying for the project. It does not necessarily have to be one single person, but can also be several people, a cooperation or others. The primary developer has the primary responsibility to make sure that his project follows the guidelines and building restrictions, but can, if wanted, pass this to someone else more suitable for the task. This additional person will be the responsible applicant.

The responsible contractor has the responsibility of the physical construction work and planning of the project. They are responsible for the building to be built securely, and that the building follows the governmental approved applications and drawings when being built. If the responsible contractor does not wish to be responsible for the planning of the projects, or if the primary developer wants other people being responsible for the design, this task can be given to someone else more suitable for the task.

The responsible applicant is only necessary if the primary developer does not want to do all tasks himself. The responsible applicant will work as representative for the primary developer when communicating with the local government. He or she should know the guidelines and other building restrictions well, to make the process as efficient and easy for all actors. The responsible applicant will therefore deal with the administrate part of the building process, and give everyone the information needed for a smooth process.

The responsible designer is only needed if the primary developer see the need for or want someone else than the responsible contractor to take care of the design. The responsible designer will have the task to plan the project and develop sketches, drawings and construction drawings for the building and contractor. They should be aware of the guidelines, so the design process does not get any major set-backs or has the need for major design changes because the designer not is aware of the current guidelines. Nevertheless, it is important that the responsible applicant (or primary developer if it is the same person), makes sure that the responsible designer and contractor have understood the guidelines.

The system: building permit process

The new building development process will be divided into three clear phases: Prepare, Design and Completion. These phases will again be divided into four steps each. This three phase process aims to ensure that guidelines are taken seriously and are followed by all building projects in Ng’ambo.

The first phase starts of with an idea from the primary developer. This idea is developed as an outline proposal either by the primary developer, or together with a responsible designer. After the outline proposal is done, a notification is sent to the local government, to make them aware of the coming project. The notification is sent to the local government by the responsible applicant unless the primary developer has decided to represent himself. Local government does not have to respond to the notification. It is just for the local government to be aware.

In the second phase, the responsible designer develops the final project together with the primary developer. When they are happy with the design, they get the green light from responsible contractor which ensures that everything is doable and legally done.

It is time to send an application to the local government. The responsible applicant now applies for project start-up permission. If everything is within the local guidelines, the project will be granted building permission.

In the final phase, the construction is executed by the responsible contractor. Throughout the building period the building should be inspected by the local government at least one time to see that the guidelines are being followed.

The building is now completed and the responsible contractor sends the second application to the local government. This time the aim is to receive a certificate of completion. If the finished building corresponds to the guidelines, the certificate is granted.

An important thing to remember is that some developers might not apply for the certificate because they have violated the guidelines in the completion phase. Therefore, the government needs to ensure that this does not happen.

A punishment system must be established to make sure that every developer follows the guidelines and the system. One possibility would be to give economic sanctions for the developers who choose to avoid the guidelines or if they do not engage a conversation with the local government and follow the three-phase process. The worst possible outcome for developers sneaking away from their responsibility of following guidelines and process, should be a demolition of their illegally built projects.

Local government needs to be involved in making a system for the guidelines as they will be the primary user of them. This will ensure that the system is adapted to their already everyday working process. Because such an involvement of local authorities not has taken place, it is important to remember that the system presented here only is an example of how simple and efficient a system can be.

The illustration on the next page shows how the process is intended to work.
Conclusion

It is clear that Ng’amo needs regulation. The area has many challenges to solve in a time when development is happening fast and without any regulation to follow. To get a hold of these challenges, a set of guidelines are presented in this document. The eight guidelines and a system for them to operate within, attempt to put Ng’amo back on the right path and make it a more safe and livable area.

The guidelines have been developed through several perspectives, from an urban level to small scale planning. Each guideline has also been categorized by a categorization system that divides the guidelines into three:

- **Size regulation**
- **Contextual**
- **Livability**

**Size regulation** contains three guidelines, which are Street hierarchy, How high can you go and Plot handling. With the establishment of a street hierarchy, development through groupings instead of single house development becomes more natural. *How high can you go* bases its height hierarchy on a street hierarchy, while *Plot handling* presents five steps on how to develop a them.

The three guidelines under Contextual, which are Crossing boundaries, Roofing and Openings, focus on how the each building relate to its context and the local culture. *Crossing boundaries* ensures that buildings respect their borders and that public space does not get privatized. *Roofing* focuses on providing an affordable solution to all new development, and ensures a unification of the houses in Ng’amo. Finally, *Openings* aim to provide both public and private spaces within Ng’amo, by suggesting openings toward the periphery of the group, but also to its inner core.

**Livability** contains two guidelines that focus on keeping Ng’amo a livable place in the future. *Cross ventilation* secures fresh air inside the houses, while *Meeting places* make sure that the culture of street life and Barazas continue.

The building permit process will be simple to follow and the new grouping of houses will attract developers. Together the eight guidelines and the system how the guidelines will operate have been developed to ensure safety and predictability of the densification in Ng’amo.
Flood-resilient Housing

Both Zanzibar and N’gambo area have experienced great difficulty with flooding especially in urban context. The next two project are exploring a new typology that is both resilient to flood and offers new possibilities to the specific urban structure of N’gambo.

Context

The research focuses mainly on problems related to flooding and infrastructure in The greater region of Zanzibar City as well as the specific context of Ng’ambo. The data was extracted from existing documents, interviews with government officials and locals as well as independent field work.

Rainfall patterns in Zanzibar

Zanzibar lies in the tropical belt and the rainfall depends heavily on the season and is related to the change of monsoon. The season of heavy rains (40% of the total annual rainfall) lasts from March until May. The relatively cool and dry season (Kas) covers the period from June to September. A lesser rainy season (20% of the total annual rainfall) occurs during October to December. The north-eastern monsoon (Kaskazi) lasts from January until March. Zanzibar town receives an annual rainfall of about 1500 to 2000 mm.

Summarized rainfall data

The rainfall data was obtained from the Tanzanian Meteorological agency at Zanzibar Airport; Kisauni and the Victoria gardens; Stone Town. It was acquired on a daily basis and includes data until 2009 (see Table 1 for summary).

The inference from Table 1 is as follows:

• although the data recorded at Victoria gardens tends to be lower than that of Kisauni Airport, it will be used for the purpose of the design based on its proximity to the chosen site.
• the highest total rainfall recorded in the last 5 years was 1,999 mm in 2006
• the lowest total rainfall recorded in the last 5 years was 121 mm in 2008
Potentials for rainwater collection

Making a rough approximation of annual rainwater yield, taken from before mentioned studies, with a 10% rain water loss factor.

\[
\frac{85 \text{m}^2 \times 1500 \text{mm}^2}{\text{annually}} \times 0.9 = 114,750 \text{ l/annually} = 315 \text{ l/day}
\]

The current water demands per household are a meager 50l per day, so considering the units would consist of a maximum of 4 flats, it would be feasible to assume excess water could be used for irrigation of urban crops as well as being a main source for installations, such as toilets.

Extreme events

Based on a projection and environmental assessment plan made by Global Climate Adaptation Partnership (GCAP) in reference to the document ‘The Economics of climate Change in Zanzibar’, there has been a significant increase in extreme events on the island in the last 20 year period.

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The highest ever recorded precipitation event on the island was recorded in 2005, with a flood that seriously damaged at least 1,000 homes and displaced 10,000 people. Heavy rainfall events in 2011 also led to major impacts, including the damage of road infrastructure on Pemba.

Low and erratic rainfall in 2006 and 2007 on the islands led to a major crop failure. The crop failures in 2007 also led to a large-scale hunger crisis in 2008, which affected over 20% of the population (300,000 people).

General difficulties in flooding areas

The infrastructure concerning stormwater drainage is almost nonexistent and there subsequently exists a major problem concerning flooding in urban areas of the island.

A number of ponds or depressions are present on the natural channels draining these areas where water collects. Dense housing has encroached into the depressions and into many of the natural drainage lines. There can be extensive flooding and sedimentation of the houses that are constructed in the depressions which inevitably leads to damage of property and possessions, and presents significant health risks. Ponds accumulating in low-lying areas foster diseases, such as Cholera, and mosquito breeding exasperating the spread of Malaria. These bodies of water are also at high risk of contamination due to informal sewage systems e.g. pit latrines and improper emptying of septic tanks. Saturated ground conditions lead to flooding of pit latrines which causes biological pollution.

Agriculture is carried out in some of the depression areas, which also helps with the water retention problem in the area.

<table>
<thead>
<tr>
<th>Month</th>
<th>Kisauni Rainfall (mm)/Year</th>
<th>Victoria Gardens Rainfall (mm)/Year</th>
</tr>
</thead>
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<tr>
<td>Jan</td>
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<td>191</td>
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<tr>
<td>Feb</td>
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<tr>
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<tr>
<td>Average</td>
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</tr>
</tbody>
</table>

Table 1: Summarized rainfall data 2004-2009

There is a grid of unpaved roads/walkways which are used for access into the housing areas. These roads serve as drainage channels for stormwater runoff from the housing areas.

Flooding in Ng’ambo

Storm water discharge and flooding are matters of serious concern in Ng’ambo. There are large surfaces of low laying land, particularly at the former Creek along Mkapa Road, which are prone to flooding. Due to climate change and increase in hard-surfacing within the area, the flood risk will increase over the years to come.

All should be done to reduce the risk of flooding. The first goal should be to increase soft surfaces as much as possible; more open green space and the use of permeable rather than sealed pavement. This is hard to achieve in the heart of a city, due to the high density of built up space and...
intensity in traffic. The need for the retention of excessive storm water run-off in the future cannot be stressed enough. The recent floods have once more proved the need for retention basins free from tidal influences is of great importance. The existing retention capacity of Funguni Basin, Mnazi Mmoja and the depression at Kilimani needs to be protected or compensated.

Storm water, if not drained by absorption of soft surfaces, needs to collected and discharged through drainage channels. These drainage channels will discharge into the sea, or via retention basins. Drainage channels should be underground in high density residential areas.

Impact on locals

During the course of the social studies, interviews and questionnaires were undertaken to gauge living conditions and impacts of flooding on life in the greater Zanzibar City area. Householders were asked about the frequency of flooding that had taken place between January and June 2010 to get an indication of the extent of hardship they have to deal with every year.

“Forty-seven percent of respondents had experienced a single flooding during the period, 33% had experienced flooding twice and 20% more than three times.”

Forty-seven percent of respondents had experienced a single flooding during the period, 33% had experienced flooding twice and 20% more than three times. In addition, 34% of respondents indicated that it took less than a day for the water to recede, 30% said it took between one and two days and 10% indicated they waited up to three days for the water to recede. The remainder indicated longer periods for the water to recede to normal levels, but these could also be confused with their time of absence. Many respondents indicated that they vacated their homes for longer periods when they thought that the rain was going to persist (with intervals) for several days or weeks.

Flooding occurs in different ways. Certain streets and pathways become water ways for runoff rainwater. Excessive rain (in some areas even the slightest down pour) transforms narrow paths into torrents that carry along sand and debris which gradually erodes the ground surface as well as the buildings along its path.

In some parts, notably Mwatenga, where houses have been built on very steep gradients, residents experience severe runoff during rainfall which occasionally causes flooding for the duration of the downpour. Several householders mentioned the loss of possessions due to the rapid speed with which water rushes down these slopes, through the compound and downstream. The sheer force of water has caused several house walls and stand-alone structures such as latrines to collapse. Structural damage to dwellings and latrines is the most common loss that households suffer as a result of the flooding. It cost the 57 respondents who were able to provide the cost of repairs and replacement of broken furniture and fittings an average of Tsh 411,825 ($305) to repair the structural damage or to replace lost property and damaged furniture. Many mentioned that they had not repaired the damage due to lack of financial means.

Although the situation was not as severe in N’gambo, there was nonetheless obvious substantial damage to houses observed after
conducting a general field investigation. Since there were no general risk areas mapped, apart from the Mnazi Mmoja flooding fields in the South of N’gambo, we conducted a field study of water build up after a period of rain lasting for several hours to see what might be potential problem areas in a more urban setting (see Figure 2 for reference). Where we found the water to pool is also where the houses sustained the most damage and where the typology of building a small retention wall in front of doors to keep the water out was most prevalent. The existing storm drains were overflowing already after only some hours of rainfall, so it was easy to assume that the area would be problematic during rainy season. After speaking with locals it became evident that there indeed was a problem, with water entering houses and staying for up to a day. The site was chosen.

Figure 2: map of areas affected by flood in Kikwajuni Bondeni

Water accumulation after rain in Kikwajuni Bondeni

Overflowing storm drain Kikwajuni Bondeni
Creating a public urban landscape in the wake of new spatial possibilities brought forth by a new typology; the flood resilient house. Flooding is a major issue not only in N’gambo, but Zanzibar City in general, the project thus explores ways of dealing with flood prone areas in respect to alternative land use combined with public programme.

A new typology?
The flooding crisis in Zanzibar City is a growing problem that has yet to be addressed properly by the higher authorities. The lack of basic infrastructure and sufficient drainage as well as no legislation that would ensure enough water retention spots during flooding season, has left the government treating more symptoms than trying to get to the root of the problem. Urban encroachment into flood-prone areas due to the rapid speed of urbanisation and population growth that the city is undergoing, has left an open question as to if it is viable to build on flood-prone land and if yes, how?

With a simple augmentation of raising the house up on stilts, a whole world of possibilities arises as to what to do with the new space provided. Therefore the project is titled “The Footprint” as it mainly deals with urban issues and opportunities brought forth by the opening up of the streetscape below. Open space is indeed a true commodity in the city, so it was important to structure it in a way to make it a ‘place’ instead of mere dead shaded ground.

“No man is an island”
One of the main issues was also determining the scale of the project. Because of issues with developers having to deal with too many stakeholders if the scope of the development is too large (as a single plot of land could have up to 10 owners), it was decided to work in small clusters of 4 to 6 houses and develop them as individual units or ‘islands’ that could function in their own right in relation to the existing urban tissue and be independent even if development would cease.

As urbanisation continues the individual islands would start forming chains, soon becoming an archipelago of functioning units that communicate on a street level with one another. Each cluster as it is developed responds to local context of surrounding buildings while still maintaining the local area plan in mind as to what will follow in the development to come.
Scale; why work in clusters?
If we look at the existing structure in N’gambo we notice no prevalent logic as to how the buildings are arranged in a grander scheme of things, they react to each other in specific situations and somehow naturally start to visually group into clusters. The typology is the very typical swahilli house, with more or less set dimensions of 8x12m. Each housing approximately a family of six. If an investor would approach a project of developing 20 or more houses, the number of constituents would be overwhelming in terms of land ownership. On the other hand, if every plot would undergo development individually, the urbanisation would be too chaotic and capital driven. Therefore the clusters for development, need to be relatively small, but still large enough to start to implement an order into the system. 4 to 6 houses proves for a good sample, to make a composition that could function as a closed system.

The benefits of going higher
The easy fix would be just to raise the typology by only a fraction so as to avoid flooding of interior spaces, but if we increase that amount to 3 or 4 metres, what is left underneath becomes usable space, that can be structured in a way to benefit the public interest, as open space in this kind of urban context is scarce to say the least. Another thing that arises is inherent safety that comes with raising things off the ground. One of the main reasons for building in heavy materials such as cinder blocks is the safety they provide, because of frequent robberies. Going up means decreasing access points to the flats to a single staircase and that opens up possibilities to using lighter, cheaper construction materials and concrete only as a skeletal frame.
Geometry/typology

- generic courtyard typology
- subdivision
- differentiation
- contextual deformation
- layering/stacking
- vertical and horizontal communication
- complementing open and closed programme
- spatial division with levels

Spacial hierarchies and communications

Pattern of growth

- existing undeferentiated structure
- clustering
- subdivision of cluster
- first stage of development
- second stage of development
- final stage of development

From public to private

- entrances
- hierarchy of spaces
- main axes

Project by Tina Čerpnjak
Programmatic structuring of the Footprint

**water retention**

Open space reserved for greenery that retains water after rainfall and contributes to maintaining or improving the decreasing groundwater amounts.

**infrastructure**

Access point to water and other amenities, like public toilets, to surrounding houses as existing infrastructure is poor or insufficient.

**communal**

Mostly includes open air programme for play and sports, such as playgrounds and gyms, as well as communal based programme like daycare, workshops and community centres.

**commerce**

A combination of open air and enclosed commercial spaces, that are available either for rent or are in the ownership of the apartment owners.

The excess water from rainfall is funneled into the green barazas that work as storm drains in times of flood, siphoning the water away and providing a bed for trees and plants to grow, creating a microclimate in each building courtyard. The plants grow on built soil, meaning that the system is applicable anywhere in N’gambo, even where the land is not fertile enough to sustain plant growth. Moreover it acts as a natural filter, cleaning the water as it enters the ground.

The clusters have also an integrated system of rainwater collection. The sloped roofs collect water and funnel it to the infrastructure knots that contain both kitchens and sanitary services. The water is stored in tanks on the top floor and provides water for flushing and irrigation throughout the building.

There are septic tanks located underneath the infrastructure knots and are always accessible from the street level. They are to be emptied out periodically by trucks.
The Other Side

**Project by Tina Čerpnjak**

**Legend:**
1. open air market
2. restaurant
3. playground
4. outdoor gym
5. shops
6. green baraza
7. water access point
8. workshop
9. apartments
10. apartments

Left page. Ground floor programatic scheme

Right page. Ground floor
Street-scape scenarios

Commercial restaurant and cafe

Communal outdoor recreation space

Commercial shop front with workshop
Zanzibar still suffers from issues caused by seasonal flooding and unfortunately, there are families living in those areas. The main point of this project is to present a solution that deals with the issue of flooding by lifting a house on stilts and, through that present a proposal for new a urban image.

Background of the project

While we were walking through Ng’ambo area, it was possible to understand some of the main issues. One that stood out was the flooding. Unfortunately, it is something that is still present in the population’s life of this town. That’s why I decided to develop a project that is made on stilts. A proposal that can be built in the areas that are affected with this problem. The solution? Develop housing on stilts.

There are already some solutions around Ng’ambo that have followed the same principles. However, the spaces under the houses were not developed, and due to that, people started using them as garage, for example.

This project was developed in order to help and serve the communities living in Ng’ambo. To answer to a demand for solutions to flooding issues, an elevated space with different characteristics is located under each building. The freed space could be used as a café, market or store. Each one could serve the community in their own way.

The main point was to create a project that could solve different issues related to flooding. Densifying the habitat, but at the same time, releasing space for the community and solving flooding problems inside the houses. Collecting rain water to water the exterior spaces and waste collection points is also part of the core idea of this housing proposal.

Zanzibar is a place with high temperatures around the year. In order to create better access points, some of the exterior walls have been covered with vegetation forming a structure named as “The Green Facade”. By using greenery on the surfaces of buildings, the access spaces can become cooler while keeping the idea of sustainability in mind.

While developing this project, my aim was to try and answer to the demands presented to me. As this is a relatively “new” idea, this solution is presented in a small scale concept that is ready to be developed further in the future.
Typology
To develop the typology, I followed the footprint of the Swahili houses that exist in the area, however I needed to change the position of the buildings to be possible create a cluster. The measurements of most of them is 8x12m. As a solution, three different typologies are presented. One apartment that occupies the entire area, two smaller inside the same area and a typology with two floors. The main reason that made me to present these three different apartments is the fact that the size of the families in this area varies. One of the main ideas is to eliminate the distinction between social classes. Probably this can help with that. With this three different typologies, it is possible to rise the number of families living on the same plot from four to nineteen.
The Other Side Part V Private environment

Project by Francisco Correia Mascarenhas Soares
The Other Side Part V

Private environment

Project by Francisco Correia Mascarenhas Soares
The Other Side
Water collection, ventilation and waste management

The water collection system is composed of tubes that collect the rainwater from the rooftop to the pipes (blue color). They are located inside the towers that are connecting the buildings, just like the waste collectors (red color).

As a way of improving the ventilation inside, the inner walls are not touching the ceiling. That way the air can circulate better inside of the apartment. To protect that gap, a wood structure has been added for better support. The wooden structure is similar to the one that is used to support the green facade.

Building materials

We were trying to find more sustainable materials. However, I chose concrete for the structure because, despite of not being so sustainable, it is affordable and especially resistant. Concrete does not require as much maintenance and it needed to be taken into account that the part of the structure will sooner or later be exposed to large quantities of water during the rain season.

For the exterior walls, I opted to use coral stone. Is one of the most abundant natural resources in the island and has good thermal characteristics. Coral stone is a material that is used in most of the buildings around Stone Town. Coral stone is also a way of supporting the continuation of vernacular architecture.
The Other Side

Part V Private environment

Project by Francisco Correia Mascarenhas Soares
Green Community Housing

Project by Keiti Lige

The housing idea is to develop community-based living system with the organic urban farming operation and make most value of common space for community resource and economic development opportunities.

Starting point

The affordable housing project is located in Zanzibar city, in Ng’amo village. The neighborhood needs more density according to population growth in urban areas. Ng’amo’s current situation is that most of the buildings are one story high in an organic pattern – the spaces between the buildings form a nice atmosphere in human scale. In the future, the area is going to be a three to five stories high area. New plots for development are defined by existing building groups which also define street hierarchy and accordingly building heights.

Concept

I’m working with a group of 9 houses and the idea is to develop a community-based living system with an organic urban farming operation which provides food and opportunity to sell crops. Additionally, urban gardening would improve the city’s ecosystem and health and also supports a life in harmony with the environment. During the field trip to Zanzibar we had the opportunity to discover the local people’s living habits and take it into account in our design process. For example, according to the climate – most of the activities take place outside. Basically, the project’s design is focused on three different spaces - public, semi-public and private space. The aim is to extend home boundaries to outdoor - the people’s daily household activities continue also outside of the physical wall. My intention is to create a smooth transition between those three different spaces. Public space includes street activities like commercial, cafes, restaurants and entrances to apartments. Courtyard urban gardening, cooking, community spaces are located in semi-public spaces. And the private spaces are living spaces for inhabitants.
Site analyse

The houses in Ng’amo area have been developed in an organic way without any strict structure – it gives characteristics to the neighbourhood. To keep the area characteristics, the project design follows the old building’s footprint in more organized way with 3m x 3m structure. I’m using pillars system which gives flexibility to change the volume in time and in needs.

Structure

The houses in Ng’amo area have been developed in an organic way without any strict structure – it gives characteristics to the neighbourhood. To keep the area characteristics, the project design follows the old building’s footprint in more organized way with 3m x 3m structure. I’m using pillars system which gives flexibility to change the volume in time and in needs.

Materials

In this climate it is important to have an opening for ventilation and use materials which help to keep the building cool. The structure of the building is concrete, the space between the pillars are filled with compressed earth bricks that are finished with lime plaster. Wood is used for entrance walls, windows, railing, doors, roof structure and stairs. The roof is made of metal sheets, that can be produced of recycled metal.
Space analyse

- public space
- semi-private space
- private space

Scheme of different spaces

- traditional swahili house
- modern house

Living room
- natural ventilation/light
- biggest
- welcome guest
- family gathering place

Bedroom
- flexible
- more private
- separation between gender

Kitchen
- can be storage place
- more private/closed
- usually women area

Gardening
- fruit trees
- trees for shading
- composting, waste
- vegetables, herbs

Baraza
- public space
- socializing
- meeting place
- resting/playing
- selling coffee

Commercial units
- for services
- for rent
- for shops

Community units
- common rooms
- common washing room
- playground
Part V Private environment

site plan S 1:1000

Project by Keiti Lige
section A-A  S 1:200
Gongoni Cluster
Project by Fernando Navarrete Suárez

A mixed used community with the aim of preserving and recovering elements from Swahili culture working also as an economy activator for a developing residential area. Small habitat that can be taken as a pilot project for solving the need for densification and lack of green spaces.

New city center
The capital of Zanzibar is a city under the influence of many different cultures, and Ng’ambo, is also affected by them. In this project, this variety is understood as the main value and strength and is trying to deal with the heritage of the Swahili culture at the same time that proposing solutions for the current problems of the city.

Ng’ambo is looking forward to be the city center of Zanzibar but the current situation has some problems that should be solved for that.

The chosen location for the project is west-south quadrant of Ng’ambo because it contains most of these problems. An area with a variety of building conditions and typology, flooding vulnerable and with a big need for densification as most of the buildings are one story tall. Uncontrolled development is already taken place, so a quick response is also critical for achieving a good image of the city.

Cultural Heritage
This proposal aims to preserve all kind of elements in Swahili culture, like the way of using space in the single-family houses, spending time at the veranda or “baraza” by the street as well as the tradition of occupying urban space and taking advantage of the refreshing shadow of a sheltering tree.
Urban network grouping

Ng’ambo area was not planned in detail, but has been growing vernacularly with time. What we can find nowadays, is a chaotic street network with lack of hierarchy and with problems of accessibility in several areas. Green areas and open spaces has been occupied by houses and Ng’ambo has lost a big amount of vegetation and nature in the city.

In the field trip, by studying and identifying the main facades and most busy streets, a grouping solution was proposed. This brings the possibility of preserving the already existent plots at the same time it organize and clarify a hierarchy of streets. It also creates the element of the cluster, open and green spaces that will be shared by small communities as a semi-public backyard. By identifying the main facades gives the possibility of implementing this main streets with commerce and impulse the economy in the area.

Densification

Ng’ambo is planned to be a high density area in Zanzibar, so its built area needs to rise from the 63 persons per Ha to 160. This means that the population has to be multiplied by three and likewise the amount of buildings. Due to lack of space this has to happen vertically.

Following the idea of streets hierarchy, in the main streets building height can be Ground Floor +3 and the others should be Ground Floor +2 as proposed in the project Rules as Tools (p. 179). To maintain the culture and its traditions its important to identify also the areas in which the typical Swahili house can be preserved.

One of the problems of the current situation is that some of the plots has already been developed and there are some that doesn’t respect their neighbors and surroundings or extend higher than the proposed 4 floors. The grouping solution also helps to solve this problem, if groups of 2,3 or 4 houses are developed at the same time and in the same project, they only need to respect some rules with their neighbor groups but they have more flexibility individually.
Current Situation

Nowadays buildings don’t have enough space between them so the circulation is sometimes difficult and even impossible to access. This also create dead spaces that doesn’t have any use and accumulate waste and get in bad condition.

We can find some open spaces were a lot of life and activities take place, were people meet and spend time. These spaces should be maintained to prevail the sense of ownership and continue to strengthen the community.

New plot configuration

As this community is facing a main street, the main facades of those buildings should appear unified and face clearly the street. The buildings are set back to widen the street and allow for better circulation. The common backyard is large and allows to give more light and ventilation for the new buildings. Most of the plots preserve their original dimensions and are only tilted or adjusted. In some of the cases the original plan could be maintained and there is the possibility to preserve their variety in colours and parts of the façades.

Grouping of buildings

By making groups inside the community we connect them in the upper floors to keep the community feeling. In the ground level open spaces are maintained to create clear circulations and access.

Groups are small so we can continue with organic development and organization at the same time they work together.

If buildings are developed by couples or groups of 3 is much more easy for the neighbor to work together or for an investor to be interested. This way communities can be constructed in several phases but they will always respect their neighbors.

Housing unit

An orthogonal grid that can be adapted to the plots and be used by all of them allows to unify the typology and makes cheaper the construction for affordable housing to be possible.

The dimensions of the modules are 3’2x3’2 so it allows flexibility in the floor plan and they continue being easy to adapt to the plots.

The structure created by this modules is very simple and it gives the possibility to have different uses in different levels because of the free façade and lighter so ventilation and big openings can be created. It also allows to have an open ground floor for cases of flooding or for use them as commerce.
Housing Typologies

The proposal still maintain the size of the actual plots, around 80-90 m². But increasing the heights, the new community increases also the number of dwellings from 13 to 38. 5 of them have commercial spaces.

In typical Swahili residences living in the ground floor has always been a very big advantage because of their way of living with the backyard and very connected living room to the outside.

In this proposal of multistory buildings, those elements has been kept with the living rooms extended by the balconies and the kitchen at the end very open to the outside.

Cross ventilation has been solved with the corridor that connects all of the rooms giving privacy at the same time.
Community Life

The cluster creates a semi-public space in which the community can meet and develop different activities and kids can play safely. A place in which the Swahili heritage is again enhanced by having elements like “barazas” and full of green and nature that the community can take advantage of. The courtyard of the cluster should be used for recovering the original green city that Ng’ambo was in the past by connecting it with the green corridor and creating a secondary network through these new communities.

What do you do in your spare-time?

“I hang out in the streets. Shade and barazas are important.”

Is the area safe?

“We feel very safe here, it is good for the children.”

“We have no bigger spaces, so people gather in the streets”

“There is good community and people spirit in the area”

– Local people and Shehas
The Other Side Part V
Private environment

Project by Fernando Navarrete Suárez

Section BB'  Scale: 1:125
Axonometric schemes of the different stories

Scale: 1:200

Axonometric View

Scale: 1:300
Investment model

The development of Ng’ambo is already taking place very quickly but it is important to maintain an equilibrium. Looking for mixed uses and balance between affordable, middle income and high-end housing is central for the projects to be successful and for the city to grow in a correct way.

Gongoni Cluster is mainly an affordable housing project because it is located in a residential area but for attracting investors to the development of the project it also needs to be balanced. As it is facing a very important street, its main facade ground floor is commercial for activating the area and giving income to the community. The middle floors apartments are for relocating the owners and for renting or mortgage so the Government can also participate and take advantage of the project. Finally, the top floor takes advantage of the sloped roof and higher ceilings to give a high end housing quality for the investors to sell the apartments.
The Other Side Part V
Private environment

Project by Fernando Navarrete Suárez

Gongoni Community Cluster View
Part VI Way Forward

“When the time is right, nothing can stop you.”

—New friend on the street of Ng’amo
Way Forward

How often do you get 16 adults from completely different backgrounds and lives, suddenly living under the same roof thousands of kilometers away from home and working on one single project for three weeks with undivided attention and focus? Point taken – quite rarely. That was only one of the countless reasons the three weeks we spent on the location conducting research and collecting data, was special to say the least.

This is where we’ve come

As this publication is inching its way closer and closer to the printer, the inevitable question comes to mind; what happens next? From the seemingly endless flow of stimulus, information and ideas, we have managed to squeeze out ten independent, yet deeply intertwined proposals for developing Ng’ambo as the future modern city center of Zanzibar City.

Before travelling to Zanzibar, most of us had vague expectations of what awaited us, but only after feeling and breathing the place for three weeks, those expectations and ideas slowly got replaced by experiences from real life and we began to understand Zanzibar in a slightly better and more concrete way. After meeting one person more enthusiastic than the other about developing Zanzibar, it almost seemed like everyone wanted to be a part of making the island the greatest place on earth. We met people with inspiring ideas devoted to their missions in life, driven by endless enthusiasm of making the island a better home to the people living there. That enthusiasm was not only inspiring, but also highly contagious.

There is no limit to the amount of experiences, major and subtle, Zanzibar had to offer us during those three weeks of fieldwork – and even afterwards. If someone asked for your most vivid memory from Zanzibar, you couldn’t boil it down to one specific thing without missing important details that make the place what it is. Walking around the city, you live and breathe the everyday life that feels strangely familiar and cozy but at the same time keeps on surprising with its unforeseen discoveries and unexpected encounters with no language barrier high enough to keep the conversations form going. Ng’ambo wouldn’t be Ng’ambo, if you didn’t mention the narrow, zigzagging streets that so deeply characterize the city and always keep you waiting for the next view opening around the corner. Filled with smiling by-passers, sounds of the hassle at Darajani market and the foreign smell of spices, the colorful way of life not only seen, but also heard, smelled and felt, is something that gets vividly imprinted in your mind.

Reading, observing and physically experiencing Zanzibar, has helped us paint a picture of what the island has been in the past, what it currently is and what it possibly could be in the future, yet there is still so much left to discover, and so many questions left to ask. The shared experiences meeting people, having conversations and simply spending time among the local life, has been an inevitably important part of the foundational understanding of the place we built on Zanzibar together as a team. After these five months of digesting everything we’ve learned, the bits and pieces of the gained information seem to have found their places within the projects presented in this publication.
Future prospects
In the end, all of this research has given us insight to the great potential that exists on the island, but also to the challenges Zanzibar is facing in terms of flood control, diminishing green environment and the rapidly growing city. Lack of resources and regulation combined with insufficient infrastructure sets challenges for sustainable development of the city as well as the entire island.

Environmental resilience
There are important needs to be filled in developing Zanzibar and Ng‘ambo towards a long-lasting urbanized future. Issues with seasonal flooding are a clear threat to year around stable livability both in and out of the streets. Resilience thinking in future urban planning is necessary in order to build awareness of the environmental capacity for growing amount of inhabitants. Protecting the existing ecosystems such as the mangrove forests along the northern coastline of Zanzibar City, can prevent problems with flooding from getting worse.

Need for trees
As we learned during our visit, Zanzibar has suffered from deforestation over the past decades, and the urban areas are in great need of greener environment to cool the air and provide shade. To avoid the city turning into a boiling hotpot with not enough shade for open spaces to reach their full potential, conservation of existing trees as well as planting new ones is necessary. Characterized by its open life, Ng‘ambo needs high-quality public spaces for communities to keep on gathering and take full advantage of the positive aspects of Zanzibar’s climate. As a rule of thumb, it is possible to argue that where there is shade, there are people, and when there are people, there is life.

Cultural continuity
It is vital to make sure Zanzibar City, just like the rest of the island, will experience steady and healthy development that provides inhabitants with a safe and just living environment and supports not only continuation, but also creation of cultural heritage. Focusing on developing public community areas that also take women and youth into consideration is central in approaching this issue. Ng’ambo could benefit from setting up smaller community centers offering local people the possibility for gathering, learning and building strong connections to the people around them. Public buildings including a chain of four community centers and a main culture center for Ng‘ambo are have been proposed to support the local quality of life in terms of activities, education and community development.

Where there is shade, there are people, and when there are people, there is life.
Safe and just urban environment

Furthermore, there is a great need to focus on well-planned densification, to ensure that safe livability and equal accessibility is acknowledged and maintained while urbanisation accelerates. Providing local people with culturally considerate modernized housing alternatives, grows to be more and more important as the urban population increases. With the help of unified regulation, it is possible to ensure safe and coherent development within Zanzibar City as well as other urbanizing centers around the islands of Zanzibar and Pemba. In addition to the guideline system, private housing from the perspectives of flood-resilience, urban gardening and maintaining traditional Swahili building elements have been proposed in the projects presented.

Tourism as an opportunity

It is also worth mentioning, that even though tourism is currently a major source of income for Zanzibar, there is also a need of creating guidelines around the massive yearly flows of people travelling in and out of the island in order to avoid creating income on the expense of the most important part of all: the local people. Today, Stone Town along with a few other coastal cities on Zanzibar are benefitting from tourism-generated income the most, but there are also significant downsides in allowing foreign businesses to enter Zanzibar at the cost of the local economy and ecosystems. With clear established boundaries, tourism can serve as a useful financial gateway towards prosperity and economic growth, as the city center of Zanzibar City expands towards the comforts of modernity.
Reflection: From footprint to handprint thinking

Even though this course and the current development framework of Zanzibar have a strong focus on sustainability, the environmental impact of transporting 16 people from Northern Europe to the other side of the equator is far from being environmentally friendly. While many individual choices from meals to plastic bottle consumption during the field trip have had an impact to the carbon footprint of this course, it is most likely the long intercontinental flights that cause the largest contribution to global carbon dioxide and other greenhouse gas emissions. The exact numbers of carbon dioxide emissions vary between emission calculators and depend on the aircraft type, the number of passengers and cargo and the number of layovers, but an estimate of 20 tons can be made based on the roundtrip flights of 16 people from Helsinki to Zanzibar (ICAO 2018). Per person, that is around 1,250 additional kilograms of carbon dioxide in the atmosphere – not to mention the other possible greenhouse gases that are emitted during the flights, such as water vapor. Compared to the carbon emissions of Tanzania per capita per year (0.12 tons, 2006; U.S. Energy Information Administration & World Resources Institute 2009), the individual carbon emissions of just one roundtrip flight to Zanzibar are already ten times more.

The evaluation of the negative environmental impacts of the field trip is somewhat easily done, but the actual benefits that can overshadow the footprint are harder to communicate and depend on the time after the course itself. The carbon footprint and its minimization are, of course, crucial to understand and need to be considered more in all our actions, but there is plenty of room for handprint thinking, too, for overall evaluation of the projects and the processes of the course to highlight and show their positive impact.

The exact numbers of carbon dioxide emissions vary between emission calculators and depend on the aircraft type, the number of passengers and cargo and the number of layovers, but an estimate of 20 tons can be made based on the roundtrip flights of 16 people from Helsinki to Zanzibar (ICAO 2018).

While the final handprint evaluation can truly be done only after witnessing the real impact of the projects and their possible execution, it is worth looking at possible positive accomplishments that this kind of a course setting has. Intercultural exchanges can, eventually and at their best, move all people forward in deeper understanding and mutual respect. In today's complex and evolving world, the global challenges we face – such as climate change – are hard to tackle without global cooperation and working relationships between peoples and nations. Even with the current technological achievements, fostering friendship and peace requires its physical context and meetings.

The things we want and decide to learn are the things that shape our tomorrows. Learning through interaction and exchange should parallel the shared goal of triumphing over the challenges facing human development: promoting all sorts of human and cultural knowledge and appreciating other struggles and visions for the future encourages mutual understanding, innovation and wisdom for peace, sustainability and equal welfare.

The ideas of handprint and footprint thinking (as in Briemer et al. 2013 a, b; Behm et al. 2016)
Finally
Based on the talks we had with the local people, there seems to be an emerging change in attitudes and openness towards new kinds of solutions in terms of urbanized housing needed in the future. The possibility live a meaningful and independent life in a safe and enjoyable environment belongs to everyone. All hopes and dreams come enhanced with a different set of details, but the foundational needs for safety, shelter, health and belonging are the things that make us as all the same – human.

There might not be one right order in meeting these challenges, but it is important to start somewhere. No matter how much scarcity a place might be facing in resources, people are the heart of life wherever you go. We see great potential in the natural case of living and the warm community lifestyle on Zanzibar and especially in Ngambo. All in all, we would have to look hard to find a place that would make us feel more open-heartedly welcomed than every single person we met during our visit, made us feel.

We wish all the best for the future development of Zanzibar City as well as the rest of the island. Not only did we gain an unforgettable experience both on personal and professional level, but we also got the honor to be a part of the change that is already taking place on Zanzibar.

With this publication, we want to thank you for the opportunity to learn, to grow and to experience a place so warm and welcoming that it will stay with us forever. We hope that the ideas presented in this publication will offer valuable food for thought and maybe even plant a seed of an idea or two for paving the way for the bright, resilient and sustainable future of The Other Side.

10 projects, 10 ways forward

1. Resilience
Protecting ecosystems such as mangroves, and building resilience against future environmental challenges ensure Zanzibar the opportunity to keep striving for its goals of growth.

2. Importance of trees
The foundations of a sustainable city grow from the roots of trees and other greenery brought close to people within urban areas.

3. Community empowerment
People are the heart of cities, and by providing those people with neutral space for communication and self-expression, strong communities can thrive and initiate positive change and development in the area.

4. Culture centers
Physical space is important for cultural sustainability, and therefore Zanzibar Culture Center as a central public building is proposed to support and enhance the Zanzibari cultural traditions, cultural diversity and self-expression.

5. Regulation
With a coherent guideline and regulation system concerning all construction, it is possible to develop Zanzibar City in a unified and sustainable way towards an increasingly urbanized future.

6. The Baraza
The baraza is a central part of the Zanzibari culture and open life, serving as a place for community gatherings, and therefore should be embraced even within the modernizing future city center.

7. Flood-resilient housing
New housing solutions including elevations and rainwater collection systems necessary for dealing with the issue of seasonal flooding, can be seen as an opportunity to create a new urban landscape.

8. Coral stone
Out of the building materials traditionally used on Zanzibar, coral stone is a viable material for preserving the feel of vernacular architecture while modernising the cityscape with new construction.

9. Urban gardening
Combining gardening with an increasingly urbanising lifestyle could enhance the enjoyability of private living environments by bringing nature closer to the city, and provide communities with additional financial income through selling the plants grown in household gardens.

10. Traditional building elements
By including the traditional community living elements such as barazas, open spaces and cluster-like positioning of private houses in future construction of Zanzibar City, it is possible to preserve the rich cultural heritage while keeping up with inevitable urbanisation.
RGoZ & AAM [Revolutionary Government of Netherlands Enterprise Agency. 2014] Ng’ambo Local Area Plan, Department of Urban and Rural Planning, Revolutionary Government of Zanzibar in collaboration with City of Amsterdam, African Architecture Matters and Netherlands Enterprise Agency.


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I wouldn’t like us all to live in Zanzibar but sometimes I would.

"On the Difficulty of Imagining an Ideal City"
George Perec, *Species of Spaces and Other Places*
Asante sana, Zanzibar!
How does the potential rise of the sea level affect a small island like Zanzibar? How can a city become more resilient against seasonal flooding through architectural solutions? What is the vital power of shade in an equator climate? How to sustainably prepare for future densifying urban areas and accelerating population growth through planning and regulating?

These are some of the questions we hope to offer insight to between these covers. In February 2018, the multidisciplinary architecture design studio Interplay of Cultures took 13 Aalto students to Zanzibar. The main focus of the studio is architectural design in developing countries. The work of this year’s team presented in this publication will guide the reader through ten individual projects covering scales from global to local and public to private. Moving from global environmental future to someone’s home porch – a “baraza” – these ten projects create a deeply intertwined network of urban development proposals for Ng’ambo, the new city center of Zanzibar.

Five months of research, fieldwork and project development has focused on the core themes of environmental resilience, community empowerment through public space and housing for future urbanisation. Research and project development was conducted in collaboration with the Department of Urban and Rural Planning of Zanzibar, Zanzibar City authorities as well as local university students and the residents of Zanzibar.

Welcome aboard, on a journey to The Other Side.