

Th. Madifushi

Site Analysis



Site Analysis by Students of
Bachelor of Architectural Design
Semester 5
Faculty of Engineering Technology
Maldives National University

This book is a compilation of data collected through research and fieldwork for Design Project 5 Module of Bachelor of Arts in Architectural Design. The analysis was based on studying the devastating effects of the 2004 Tsunami on the island and its impact on the community of Th. Madifushi.

One week was spent on the island for the fieldwork and the information compiled is to be used in the development of a plan for a future land use and to design a semi-permanent disaster relief-housing unit for the island.

Students Involved

The following students were actively involved in the collection and analysis of data for this project.

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How to read this Document

The **INTRODUCTION** gives a general introduction about the study and analysis and includes the importance of the need for effective strategies to deal with disaster relief projects. This section also gives an introduction about the selected site and its relation with the neighboring communities.

The **ANALYSIS** is divided into 4 main chapters, History, Physical Attributes, Biological Attributes and Cultural Attributes. These categories are further subcategorized to include all relevant information based on the conditions after the Tsunami.

The **RECOMMENDATIONS** gives our ideas for improving the quality of life through recommended changes. These options for consider the current population and takes into consideration the population growth and future developments. The assumption is that the site will be developed as per a land use plans after the devastating effects of the tsunami and these recommendations will be taken into consideration.

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INTRODUCTION

Background of the study

The project involves designing a disaster relief housing for an island, which has suffered from the destructive effects of a disaster such as a Tsunami. The Selected Island should have suffered such an incident and design should be able to form clusters of the unit, which should function as a community. The designed unit must also fit into context of a future land use plan which also need to be generated based on the findings of the site analysis.

Keeping these factors in Consideration, the proposed island is Th. Madifushi located in Medhu Dhekunu Province. The island is amongst those that sustained the greatest damage in the 2004 Tsunami. Almost 90% of the built environment sustained damage and one life was lost.

The study assumes that the island has just undergone this disaster and is in ruins and many are homeless. The aim is to develop a future land use plan and design temporary shelters for those who lost their homes.

The objectives of the project are

- To design an economical, predominantly prefabricated disaster relief housing system, suitable for diverse atoll contexts across Maldives.
- To address community concerns about the problematic image of prefabricated lightweight housing types
- To demonstrate proficiency in design integration across sociocultural, spatial and technical dimensions of the project.
- To demonstrate independence and resourcefulness in the design process, in making design decisions, and in making appropriate structural, constructional and material selection.
- To demonstrate proficiency in communicating design ideas and resolution, using either manual or electronic media

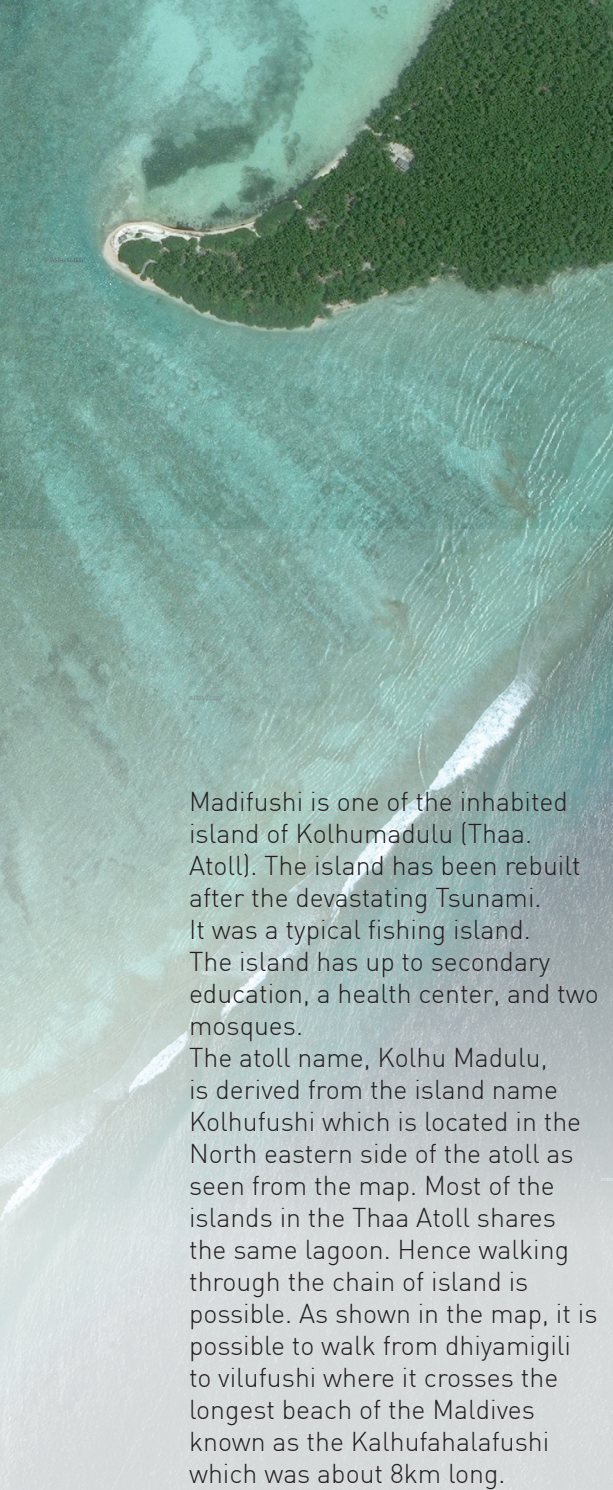
Disaster relief projects

Effective strategies for dealing with natural and man-made disasters needs to be implemented to efficiently provide help and assistance during times of such tragedies. Basic needs such as water, food and shelter essential during emergencies. In addition, educational, administrative and infrastructure facilities are also essential for affected areas. Architectural design addressing the specific needs of disasters is necessary for such projects. These solutions need to be designed in such a way that they can be rapidly manufactured, deployed, transported, erected demounted and reused.

Location

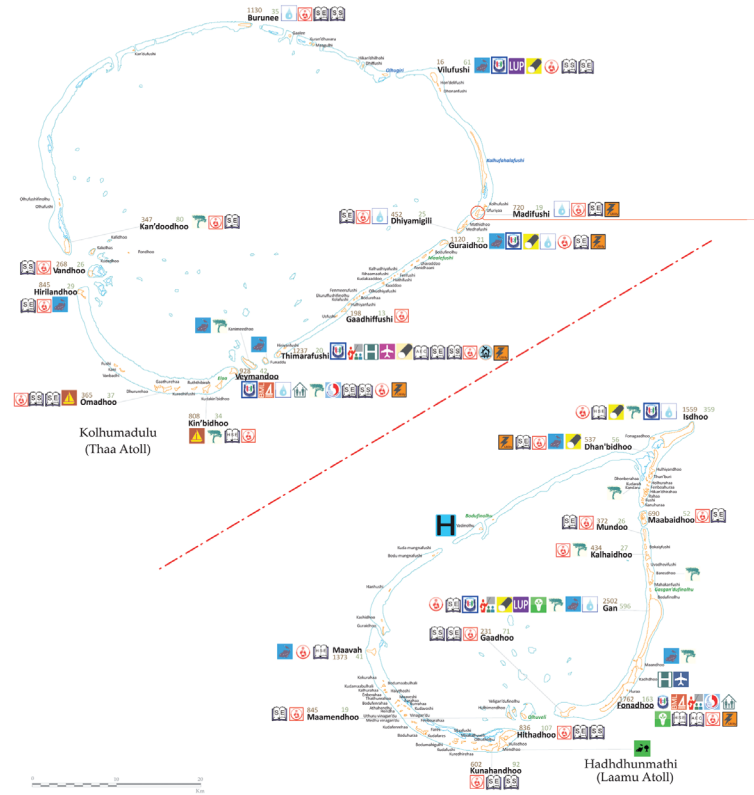


Figure 1:
Location Map



Madifushi is one of the inhabited island of Kolhumadulu (Thaa Atoll). The island has been rebuilt after the devastating Tsunami. It was a typical fishing island. The island has up to secondary education, a health center, and two mosques. The atoll name, Kolhu Madulu, is derived from the island name Kolhufushi which is located in the North eastern side of the atoll as seen from the map. Most of the islands in the Thaa Atoll shares the same lagoon. Hence walking through the chain of island is possible. As shown in the map, it is possible to walk from dhiyamigili to vilufushi where it crosses the longest beach of the Maldives known as the Kalhufahalafushi which was about 8km long.

Island scale comparison



MAP LEGEND

Economic Activities and Infrastructures

- Agricultural Activity Islands¹ (76)
- Fishing Activity Islands² (56)
- Existing Airports (4)
- Future Airports (11)
- Seaplane Services - Trans Maldivian Airways (27)
- Seaplane Services - Maldivian Air Taxi (46)
- Planned Transit/Airport Hotels (9)
- Planned City Hotels (9)
- Bank of Maldives PLC Branches (19)
- Fisheries & Agricultural Training Center (2)
- Picnic Islands (12)
- Future Resort - to be opened 2010 (34)
- Future Resort - Contract signed (17)
- Existing Resort (96)
- Existing Yacht Marina (2)

Social Infrastructures

- Tertiary Health Care (Atoll & Regional Hospitals) (32)
- Health Centre (159)
- Higher Secondary (A-level) (32)
- Atoll Education Centre (20)
- Secondary Education (141)
- Single Session Schools (46)
- Police Stations (42)
- Regional Police Headquarters (7)
- Teacher Resource Centers (21)
- Maldives Post Limited - Branches³ (24)
- Family and Children Service Centers⁴ (19)
- Maldives College of Higher Education - Campuses (2)
- Hostels & Regional Vocational Training Centres (2)
- Maldives National Defence Force Head Quarters (2)
- Zone Stadiums (5)
- Youth Centres (13)

Utilities

- Desalination plant in operation (where the plant is in good condition) (43)
- Sanitation Projects - completed (15)
- Sanitation Projects - Ongoing and construction nearly complete (9)
- Electricity provided by STELCO (6)
- Islands where renewable energy is used (8)
- Electricity provided by Utility Companies (25)

Others

- Island outline
- Lagoon outline
- No harbours (25)
- Land Use Plans completed and Approved (15)
- 1999 Population (Population and Housing Census 2006)
- Area (Hectares)
- Dhaadhoo Atoll Capital
- Naivaadhoo Inhabited Islands
- Uninhabited Islands

Figure 2:
Infrastructure map of the region



ANALYSIS



History

The Story of Madifushi

The exact date and first settlers of Maldives are still unknown. Previously several researches had been conducted to find out the information about early settlers of Maldives and some unified theories and beliefs have been made according to the findings. It is believed that it had been more than 2500 years after the first settlers of Maldives. While the exact settlement of Madifushi is unknown, it is believed to have been occupied for hundreds of years.



Figure 3:
Illustrated map of Madifushi
in early 1900's

Vegetation

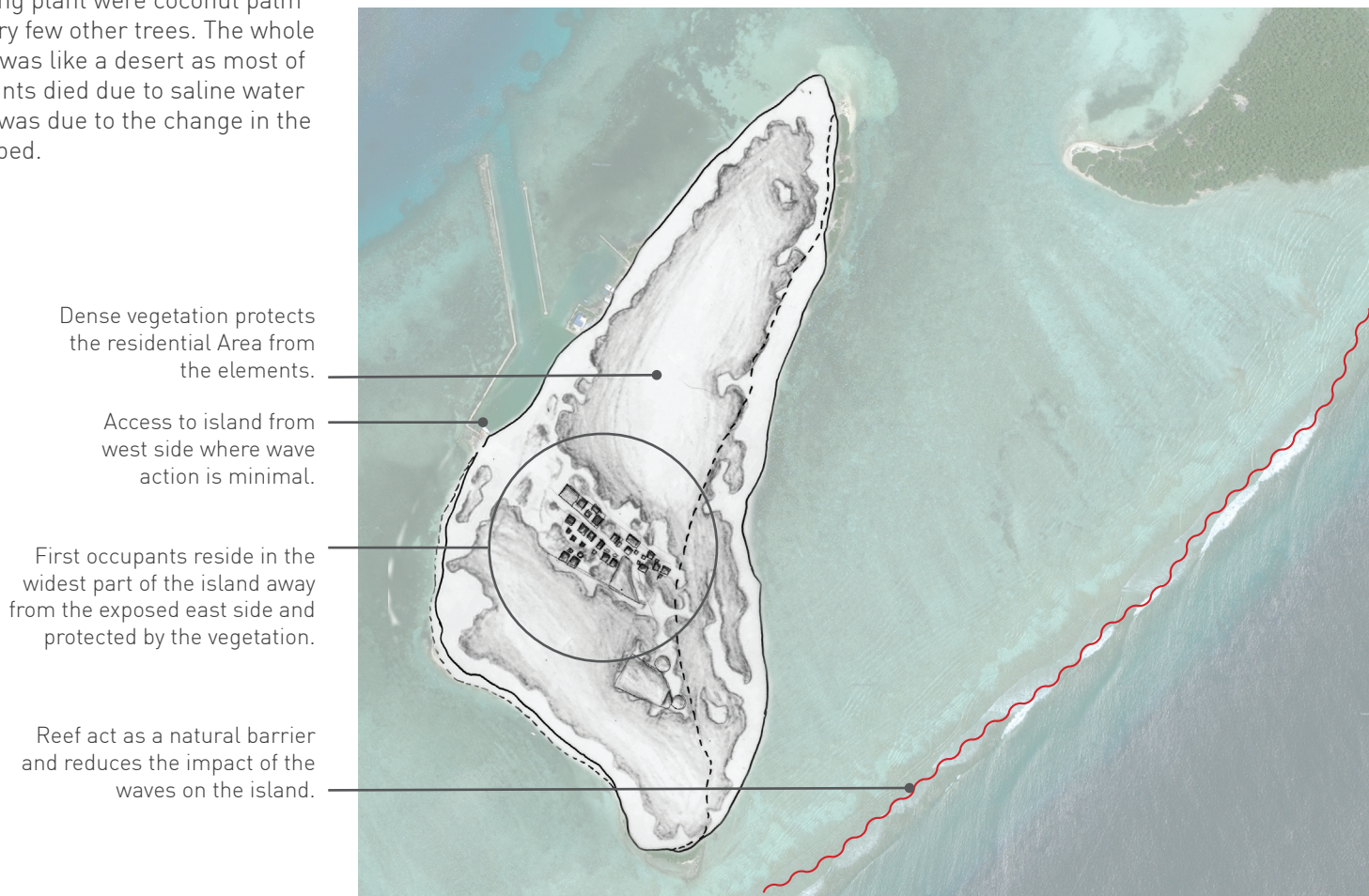
The island was highly vegetated at first as seen from the other coral reef islands. As per the old map of Thaa Madifushi at 1930's almost 75% is the green area but rapid urbanization followed by the allocation of houses in the scarce land led to deforestation throughout the years. After the deadliest Tsunami of 2004 the island was almost washed away. Only the surviving plant were coconut palm and very few other trees. The whole island was like a desert as most of the plants died due to saline water which was due to the change in the water bed.

Environment and Climate Responses

The east side of Madifushi was most eroding side. During Hulhangu moosun people get effected due to storm surge. In the past almost the 30% of the island was vanished due to erosion.

The reclamation has been done to build the harbor at West side.

*Figure 4:
First settlement zone*



Dense vegetation protects the residential Area from the elements.

Access to island from west side where wave action is minimal.

First occupants reside in the widest part of the island away from the exposed east side and protected by the vegetation.

Reef act as a natural barrier and reduces the impact of the waves on the island.

Occupations

The island is a fishing island however they practiced fangevinun, boat building, roanu veshun and bolihilun. 'Venbolhu negun' is an island specialty, according to island people it was used to make garudhiya and even used after drying.

As typical Maldives island the main occupation was fishing. It was cooked and dried and was exported to Male'. According to island people the area is a good zone for fishing. Fish was exported to other countries such as India and Sri Lanka by these merchants. Soon they monopolized virtually all external trade in and out of Malé. They were expelled in the early 1960.

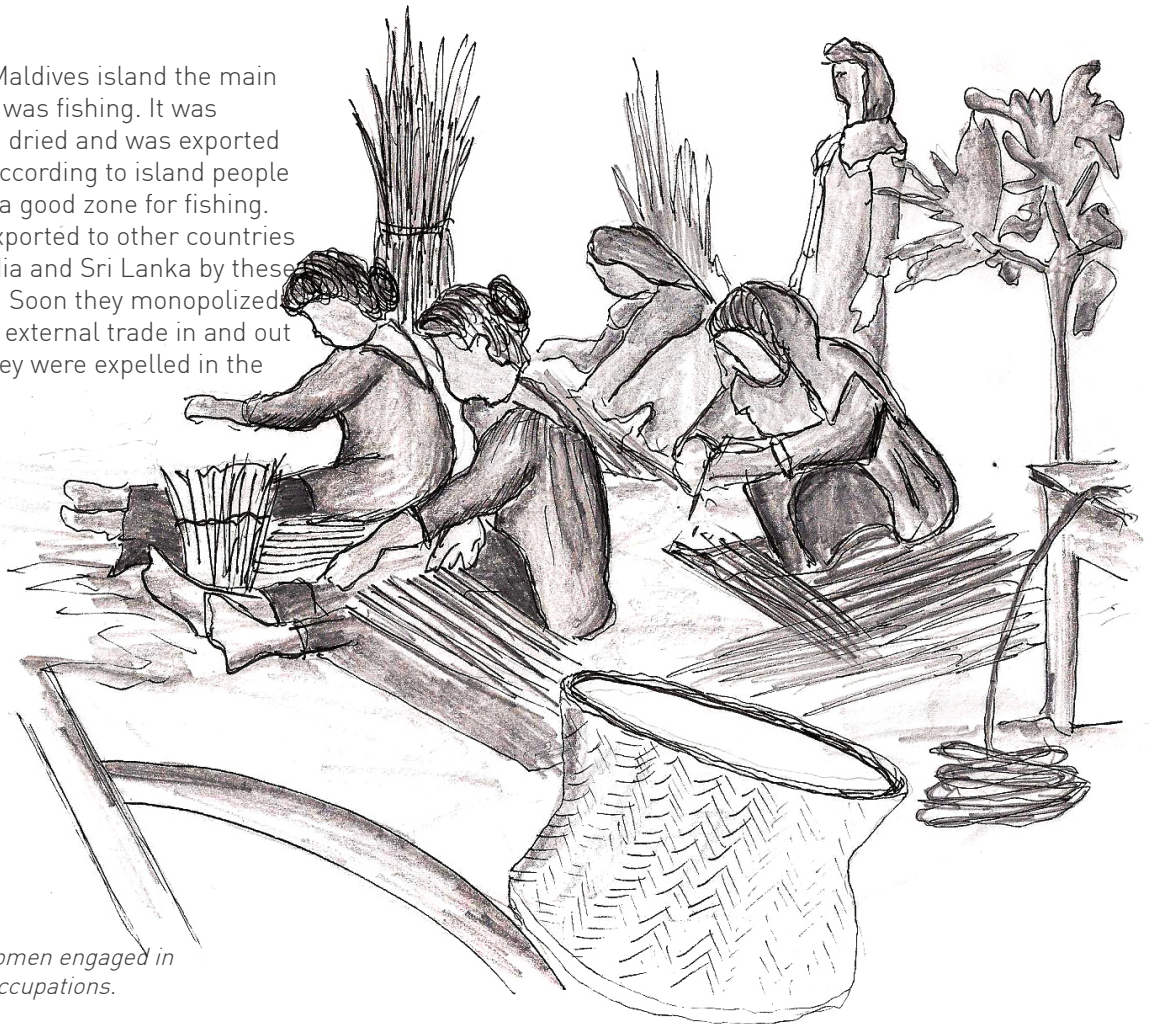


Figure 5:
Sketch of Women engaged in
traditional occupations.



Figure 6:
Sketch of beach area in a
typical morning

Food and Water

In early days the locals of Madifushi used to eat rice and "baipen" like (a soup) was prepared specially for breakfast. The other food they used includes bimbi, ussakuru and aveli. Women used the beach to wash their kitchen utensils until very recent years.

Binbi, kudhibai
Dhonalha, zuvaari
Helikusa (fenalhaigen)
GooduHakuru (Red Color)
Banbukeyo, Kashikeyo
Kahtala, othuala

They used ground and rain water for there cooking and drinking purposes.

Basic Needs

Madifushi is a self sufficient island because they fulfilled their basic needs using the materials and services available from the island and nearby areas of its location. The residents of the other islands of the Maldives have also lived in the same way during the past years where modern technology and knowledge is very far from their view. Therefore they continued their living style depending on naturally accessible materials.

Dhivehi-beysverikan (Traditional medicine) was used when people were ill in early years. They faced health problems and successfully overcame many diseases by treating the patients using the medicine in which most of the ingredients are natural and available from the island. For the people who suffers from Juzaam bali is quarantined in a separate area, the patients are isolated form the community and kept on one side of the island.




Transport

People used to travel by Sail Boats across the seas of Maldives. They used Ruku Fan to make riyaa and later used Fothi riyaa dhoni. It often takes more than 30 days to travel to Male and the duration depends on the wind direction in early days as they travelled in sail boats. To travel to near island during the high tide they use Bohkuraa.

Sports and Entertainment

In early days citizens of Madifushi were involved in traditional sports activities which were played in the island. They played Gigunifathi dance and hoali lava.

*Figure 7:
Sketch of bodu beru
performance*



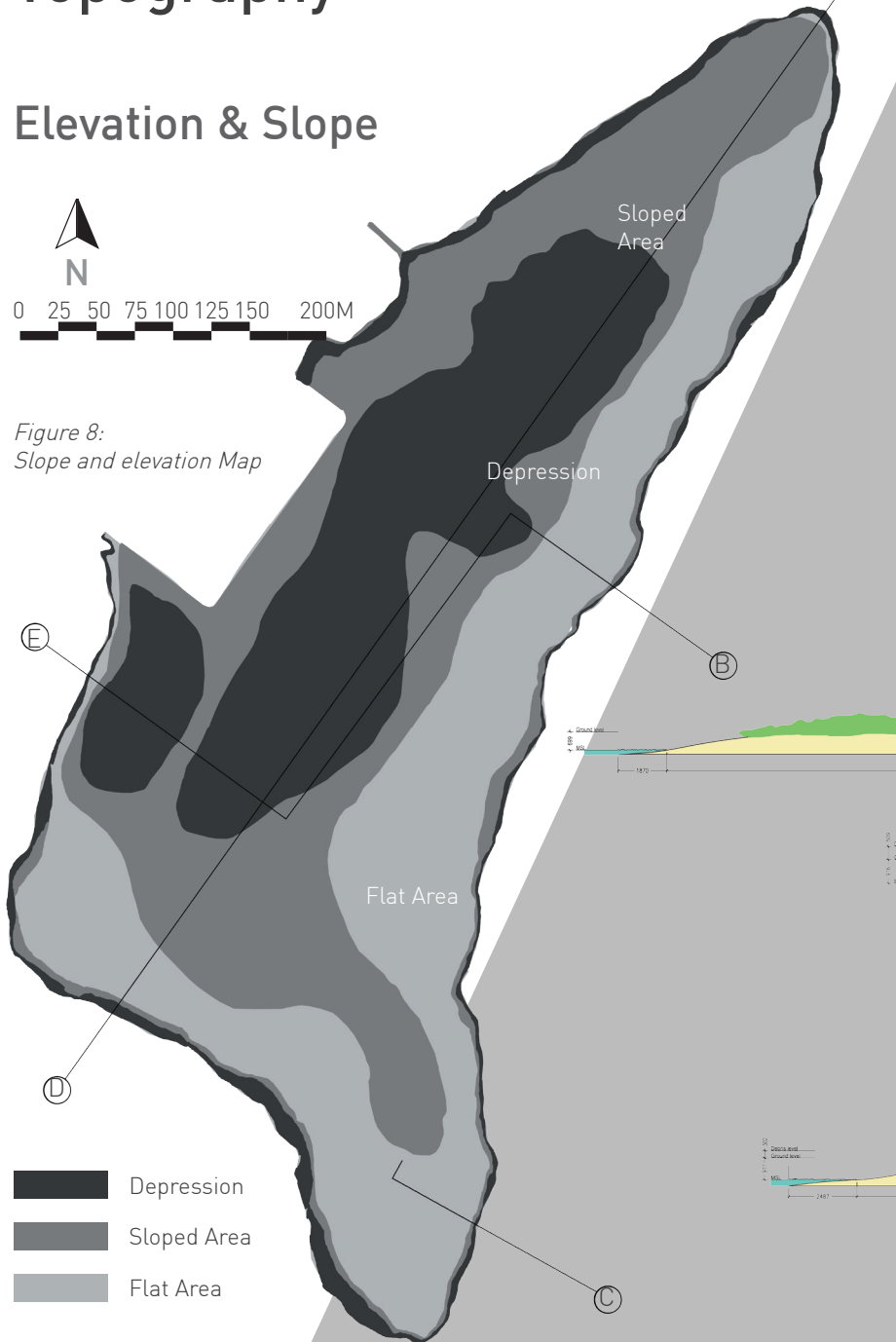
Physical Attributes

Topography

Elevation & Slope



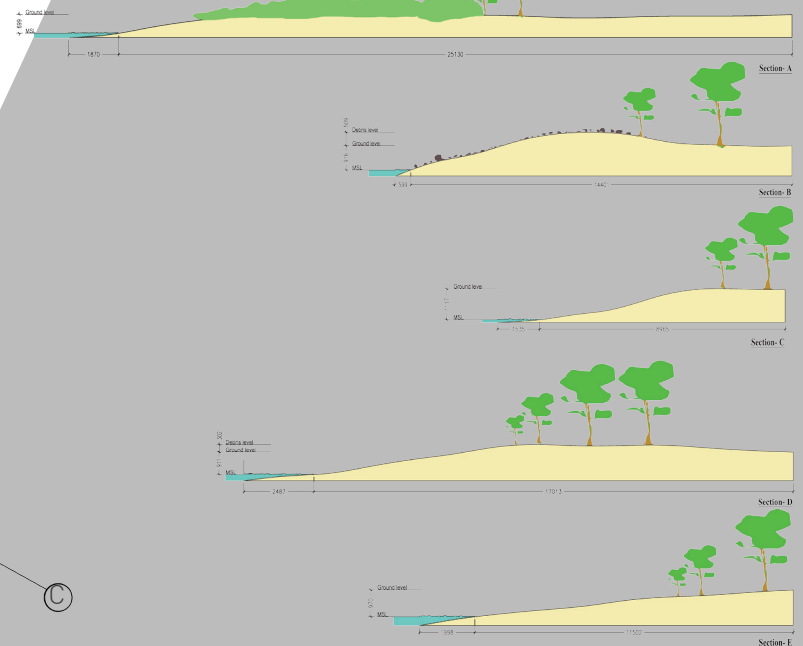
Figure 8:
Slope and elevation Map



The island is generally low lying and flat. The difference in slope is barely significant, there is only less than 1 feet difference in the land profile. The highest points are near the shore line around the island. The range in color shows a difference of about 200mm.

The color range in the map shows the difference in slope. Where the darker tone is for the lowest point and the color fades as the slope steepens near the shore line boundary.

Figure 9:
Land profiles



Hydrology

Surface Drainage

As since there is a slop difference in the land from center to the edge(about 200mm). Flooding usually happens mostly in the center of the island. The main lane of the island (the Gaazeemagu) gets flooded to the edge of the side wall. The usual drainage is slow hence if it rains heavily it takes only about 2-3 minutes for it to start flooding.

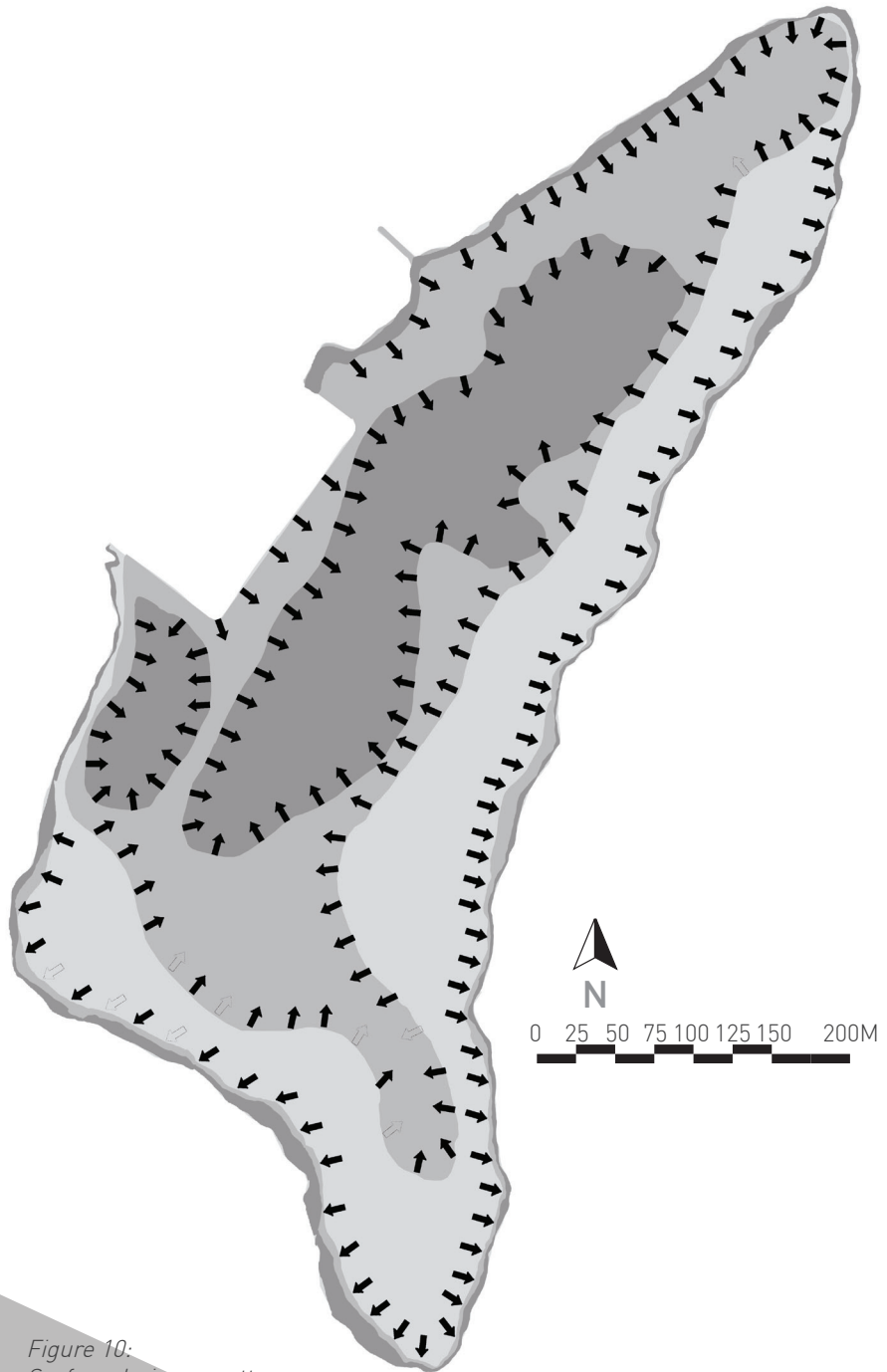


Figure 10:
Surface drainage patterns

Soil

Erodibility

A large part of the island from the eastern side has eroded since 1930's. (Island council. 2013). In addition, part of the eastern shore eroded during the 2004 Tsunami. The island is still prone to erosion especially on the east and the south side.

Fertility

The tsunami destroyed a major part of the vegetation of the island. The soil condition deteriorated and over time most of the large trees died. Almost all the coconut palms survived and became the only vegetation of the island. The salinity decreased the fertility of the soil however the palm tree belt around the island ensured fertility of that area.

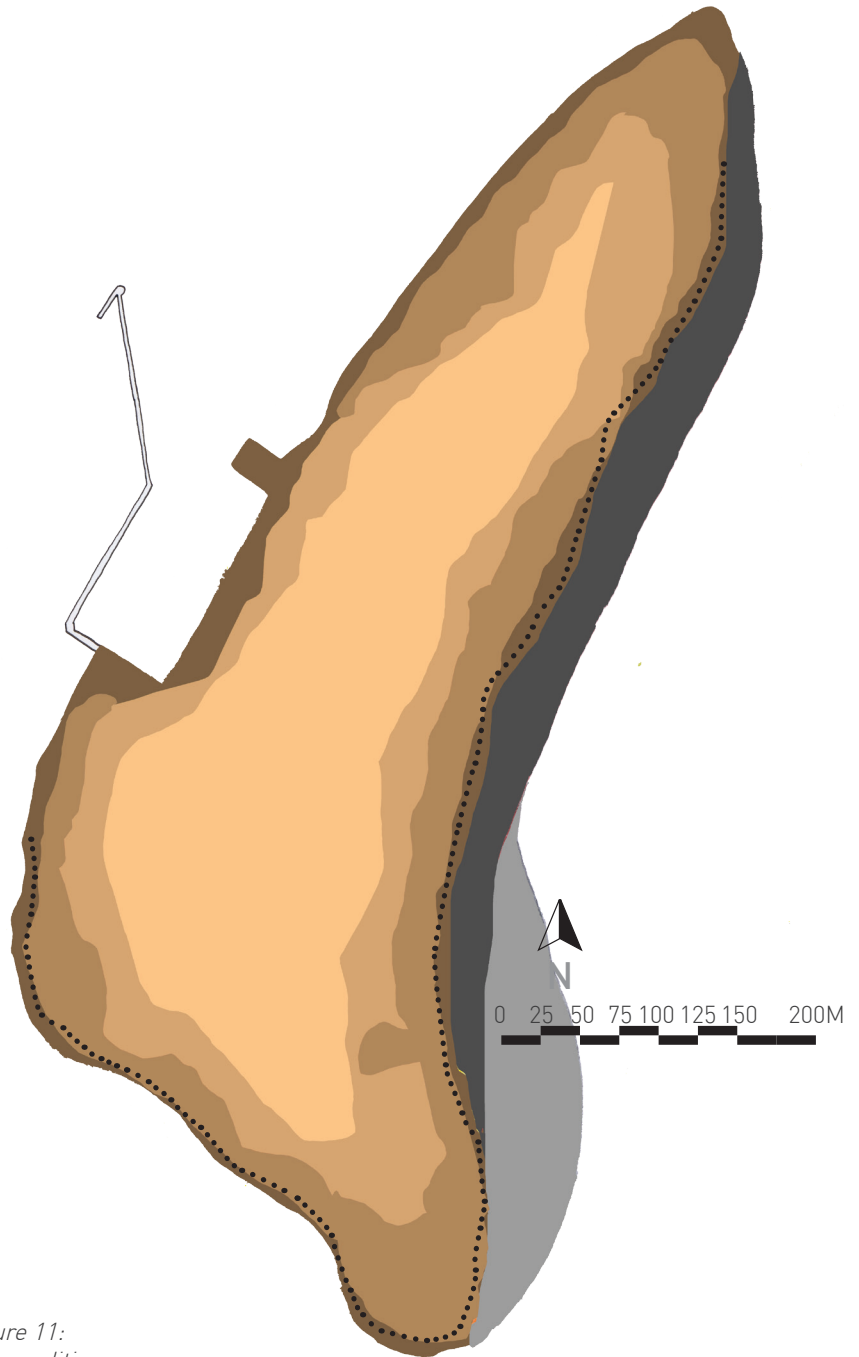
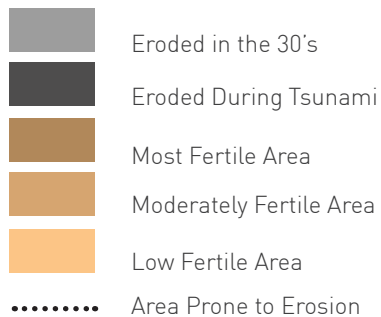


Figure 11:
Soil condition

Climate

Monthly Average Rainfall & Sunshine

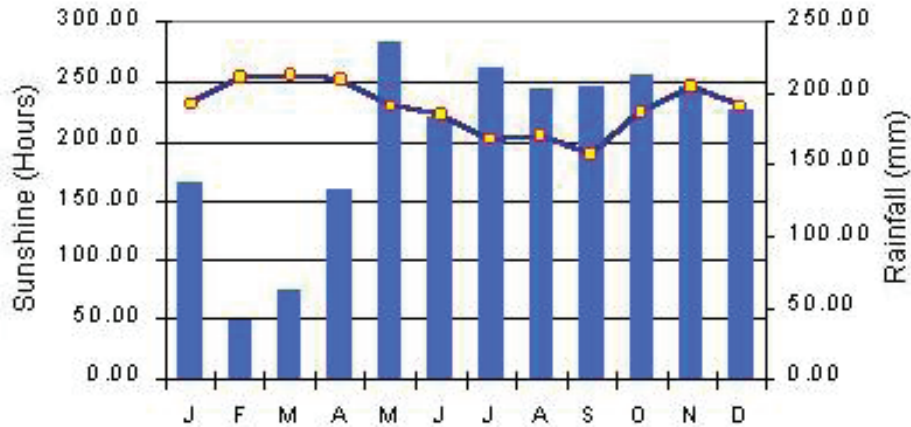


Figure 12:
Average Rainfall and
sunshine



Monthly Average Temperature

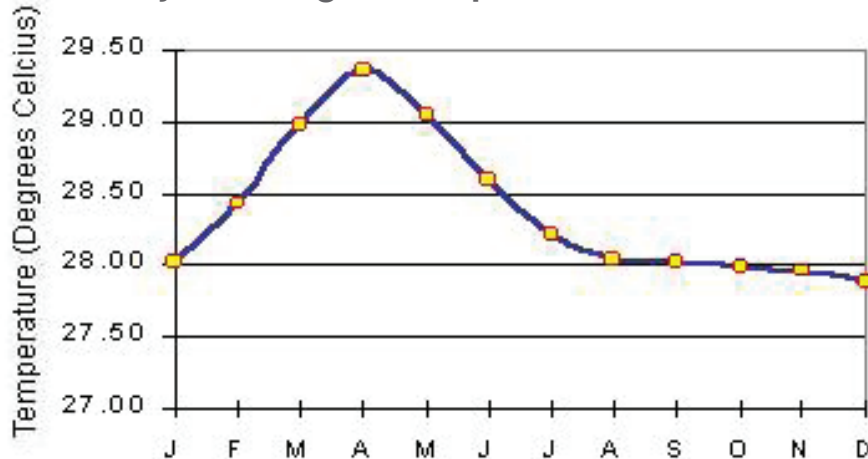
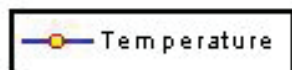


Figure 13:
Average temperature



Since all islands of the Maldives share same climate, the monsoon, Rainfall, humidity, wind direction, temperature are typical. Every year, Maldives has two monsoons which is Iruvai moosun (North East monsoon), and Hulhan'gu moosun (South east monsoon). Iruvai starts From November and finishes at April, while Hulhan'gu starts From May and ends at September. Maximum temperature reached every year is 30 degree Celsius, while minimum temperature is 26 degree Celsius. With a mean humidity of 77%, mean rainfall is 187.5mm per year.

Sun Path & Wind

The direction of sun changes monthly. Sun is angled mostly during June and January where maximum shadows are gained. Since the greenery is on the outer belt of the island, the island is very hot. At Iruvai wind blows from North East side, while at Hulhuan'gu, wind blows from South west side.

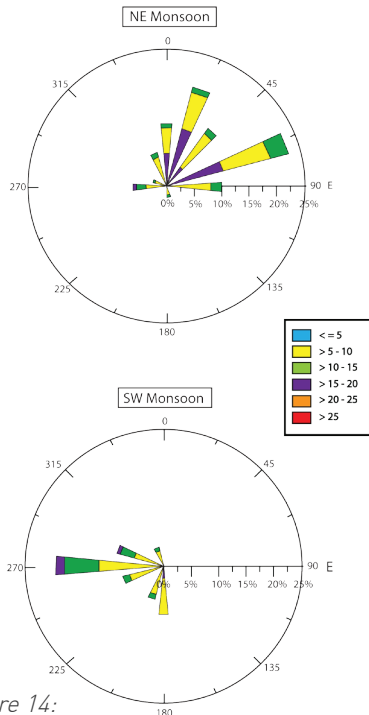


Figure 14:
Wind direction data

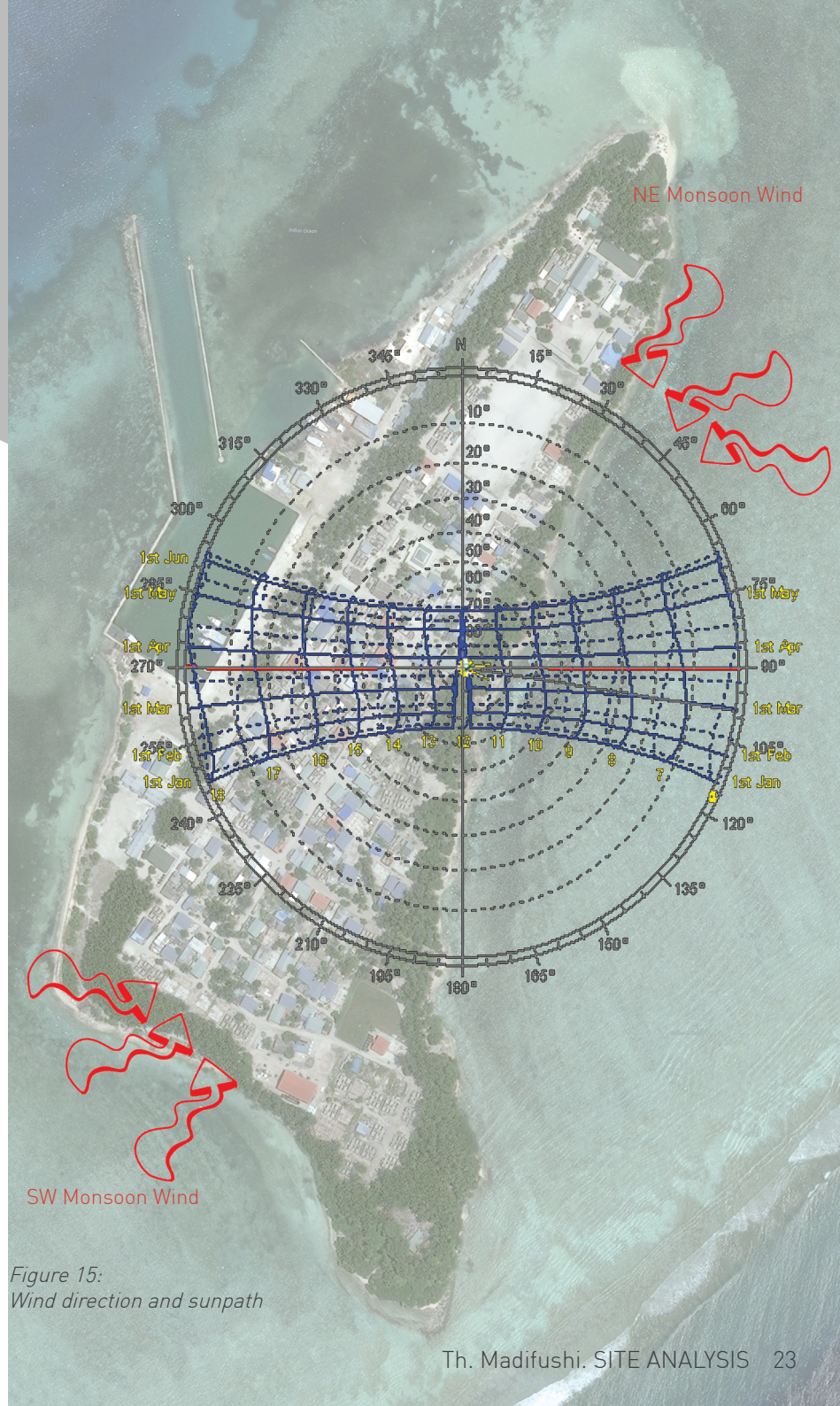


Figure 15:
Wind direction and sunpath

Natural Hazards

The east side of the island is prone to storm surges especially during the southwest monsoon. In extreme cases the floods from these surges reach inwards towards the center of the island up to the main road of. The island is prone to erosion, mainly at the east side where the island is exposed to high wave action. The northeast tip and the South east part of the island have also eroded over time.

Tsunamis are another potential hazard facing the island. It is estimated that a large-scale tsunami will be generated from the east of Maldives, at the Ring of fire near Sumatra, Indonesia, every 200 years.

The center of the island is the area which gets flooded with the rain. The drainage rate is comparatively slow and hence water level stays up to 6-8 inches in normal limit of rain.

Flooding



Storm surge

Tidal waves hits the island every year but after the devastating Tsunami of 2004, it has increased. Possibly due to the impact on the reef. During the Storm surges the waves reach up to the main lane of the island (Gazee magu)



Tsunami

The arrows shows the direction of the Tsunami of 2004. There is a greater percentage of chance of reaching the tsunami from the same direction of December 2004.

Tsunami penetrated through the island to west and south west direction. The water at a level of about 6-8 feet stayed for about 4 – 5 minutes in the island.

During the Tsunami about 10 to 12 feet's waves stroked the island causing destruction to the island infrastructure and community. It approached from south side and dragged which came into contact from the north side.

Mainly whole island's water table was affected by the Tsunami

Figure 16:
Natural Hazard Map

Man Made Structures

PROTECTION WALL

Built using cement bags to prevent erosion.

FUEL SHED

Provide fuel for vehicles and vessels.

STAGE

Concrete base with GI pipe truss roof structure.

HARBOR

Reinforced concrete seawall.

WATER PLANT

Single story Concrete and masonry structure housing desalination plant.

TV HUT

Masonry and steel structure hut.

WATANIYA ANTENNA

Steel truss communication antenna on concrete base foundation.

RESIDENTIAL PLOTS

FOOTBALL GROUND

Safety nets behind goal side on GI pipe frame.

SLIP WAY

Slip way and boat building hangar.

TV HUT

Masonry and steel structure hut.

LAND FILLS

Crushed coral stone walls and Used concrete pile acting as a breakwater.

Dhiraagu Antenna

Steel truss communication antenna on concrete base foundation.

WASTE MANAGEMENT

Open ground with masonry perimeter wall. Partially covered with roofing sheets.

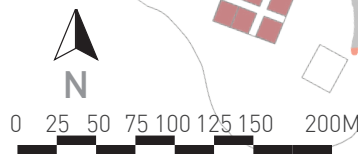


Figure 17:
Existing Man made structures

Biological Attributes

Ecological Communities

Vegetation & Wild Life



Figure 18:
Vegetation and wildlife map

Dhigga, Hirundhu,
Kaani, Banyan tree,
Bread Fruit tree.

Coconut Palms

Mangroves, Kuredhi and
other small plants



Cultural Attributes

Land use and Tenure

Th. Madifushi has evolved without a Master or Land-use plan and resulted in a peaceful small community with access to only the basic of necessities. The island being less than 20 ha in size and services and amenities scattered throughout, gives the residents easy and quick access to these facilities. The south side is the most densely populated because of the large number of residential plots occupying the side. This side is also the site of the earliest settlements of the island, which has created narrow and irregular roads and pathways. The North side caters for a small density and has a football ground and Island School. The Main mosque is also located in the central part towards the north side.

A main road run across the island from south to north connecting the residential zone to the school, mosque and the football ground. Various land areas are located for institutional and utilitarian purposes throughout the island. Powerhouse and garbage disposal site are located in the south east corner of the island away from the main residential zones. Private plots are given to residents free of charge, however the island has reached its capacity and faces land limitation problems. The residents own these plots and build and develop their own houses in these plots. Industrial and commercial spaces are available on a lease basis and the income goes to the council budget.

Land-use Plan

- 1 Institutional & Community Zones
 - 1.1 Island Office
 - 1.2 Island Court
 - 1.3 Pre School
 - 1.4 School
 - 1.5 Friday Mosque
 - 1.6 Women's Mosque
 - 1.7 Club Jamiyya

- 2 Recreation
 - 2.1 Football Ground
 - 2.2 Open Playground

- 3 Utility & Municipal
 - 3.1 Cemetery
 - 3.2 Power House
 - 3.3 Waste Management
 - 3.4 Fuel Tank
 - 3.5 Dhiraagu Tower

- 4 Industrial Zone
 - 4.1 Boat Building
 - 4.2 Fish Processing

- 5 Commercial
 - 5.1 Shops
 - 5.2 Cafe'

- Residential

-



Figure 19:
Existing Landuse plan

Public Infrastructure

The island has only the most basic of infrastructures facilities. A power House generates enough electricity for the whole island and residents store their own rain water at houses.

A water plant is available but the island does not have a water pipe network.

Dhiraagu and Wataniya towers are located on the island and the island has mobile, telephone and internet facilities.

Roads are cleared but unpaved and sometimes trees and plants appear in the middle of the roads. However this is not a concern for circulation as the number of vehicles in the island are extremely low and most residents prefer to walk.

The island does not have a sewerage system, instead residents have individual soak pits in the ground for handling sanitary sewer.



Figure 20:
Infrastructure map

Street Function - Circulation

Thought there are 30 feet and 20 feet main roads from North to South, most pedestrians prefer to travel from beach side which continues around the island. It happens because heat level inside the island is higher than outside since most of the trees inside the island were destroyed during or after the Tsunami. Also, they feel comfortable to walk while enjoying the beautiful nature surrounding the island. Therefore people prefer inside roads during early morning and evening. Since most happening area is the harbor, more pedestrians uses roads near the harbor.

Most of the people are seen during starting, and finishing time of schools which is around 8am and 2pm, and in prayer times. Also, when atoll ferry or other boat lands on harbor, people seems active near harbor.

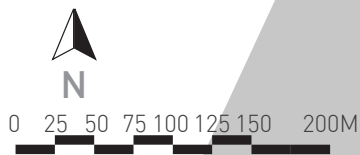


Figure 21:
Circulation, Pedestrian and
Vehicular

Noise

In general Madifushi is a calm and soothing island. There were no distracting noises usually. The sound of motorized vehicles is limited as there were very few. Most people prefer working as the island was a small island (Approx 1.5 Km). The noise from occasional arrival and departure of dhoni and boats are at harbor. Unlike that, the noise of the wildlife (Crows) can be heard from every inch of the island.

The evenings are considered to be happening time for the island as a greater percentage of the community gathers in the preschool area and harbor side for playing.

- A - Noise from occasional arrival/ Departure of Dhoni and boats
- B- Noise of Crow and other Domestic animals



Figure 22:
Noise Map

Historic Resources

Archaeological sites

The only historical site in the island is a public bath used in the island in the early 30s, when the island population was around 40 men. They also use this place to wash sail and cotton nets.

Once in a week all the men gathers to clean and drain this bath. The remains are only one of many such bath which could accommodate up to 50 people at once.

The place was destroyed during Ahmend Kamil Didi's order, which was the Majilis member of the island at that time. The limestone used to make the structure was later used in island mosques "Harimma". Now only the ruins are visible and the place has been left without proper maintenance.

*Figure 22:
Location of Vevu*



*Figure 23:
Ruins of*



Landmarks

The island is surrounded by a natural bay. Unlike other islands of the Maldives, Madifushi has 4 uninhabited islands and 2 inhabited islands sharing a large lagoon.

All these islands can be accessed by walking on the lagoon, without using any vessel. The lagoon is full with natural beauty which pleases anyone who walks on it. Different type of sea cucumber, corals, fishes etc grant richness to the lagoon. It takes 15 minutes to reach the uninhabited island Uhuriya on foot, from North Madifushi. The island Kolhufushi adjacent to North of Uhuriya is just 20 meters away from it. The hues in between the islands during dusk and dawn are unique and picturesque. The lagoon of Uhuriya is so shallow that you can run in the water during low tide. A 1.5-kilometer walk from Kolhufushi, is Kalhufahalafushi, which is home to the longest beach in the country. Walking on this beach is an experience of a lifetime, while enjoying true beauty and nature of Maldives.

Similar islands and experiences are on the south side with 2 uninhabited islands and Dhiyamigili beyond that. All these islands are connected by the same shallow lagoon and reef creating a unique and beautiful landmark in the area.



Figure 24:
Madifushi Lagoon

Sensory Perception

Views Into Site



A. The gazing rays of the sunlight which penetrates through the palm trees in dawn and dusk might be reason for being a hot spot of island.



2. As the dhonis approach the island in a steady motion, it reveals the perfection of nature.



3. From the harbor as the dhoni enters, the real essence of island life is seen.



Figure 25:
Views into the site



4. Nature's perfection and its balance with the harmony of sea, greenery and sky



5. The effect of garbage disposal which has altered the feel for natural beauty.



6. The greenery of island which it self gives protection and comfort to the livelihood.



Views From Site



1. The island in reach (Mathidhoo) which shares the same astounding lagoon, a perfect natural balance of colors in between the grey and white



2. The ever relaxing blue sky with the soft clouds that pass by becomes perfect with the view of a living environment



3. The sun that vanishes to the horizon to be back in another day, with the rays of sun showing the tones of orange and red to turn black at last



Figure 26:
Views From the site



4. The perfection of nature , the green pearls on the crystal blue sea makes the picture complete



5. With the blossom colors the dawn breaks, for a new day to a new beginning.



6. The hidden beauty of nature that reveals on specific times.



Views Through Site



1. The interaction and mingling of people is best seen when they are on work



2. The real value of trees and its shades is realized in hot sunny days where every one want to be



3. A typical day begins with the people the fight for education,



Figure 27:
Views through site



4. The peeping through the coconut palms shows the structures of the island, meanwhile the a perfect spot for relaxing



5. Walking through the coconut palms, the iconic of Maldivian to harbor



6. A spot in the entrance to island which is the heart of Madifushi (Madiushi Anhenunge Café)



Building & Neighborhood Character

The island still has a traditional Maldivian feel to it. People get together mostly at the breezy and vegetated areas closest to their dwellings. These places form, small nodes of communal activities. The island is not divided into administrative districts and the residents are a close knot community.

A shallow lagoon and reef allows people to travel the uninhabited islands for picnics and to gather coconuts and palm leaves. As a result, a pathway is created in between the islands.

Most of the houses were destroyed during the tsunami, new houses were built for them by aid organizations. As a result, 3 designs of housings are visualized in almost all parts of the island. The standard design of these prototype houses has resulted in the loss of any individual architectural feature of the island.

*Figure 28:
Prototype homes built
after tsunami*



Node
Activity

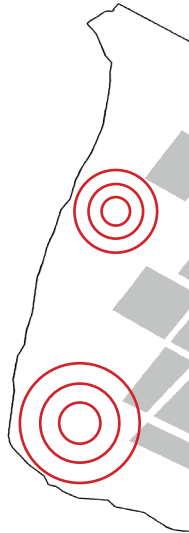




Figure 29:
Communal areas

CONCLUSION

An island rich in history and character, destroyed by a natural disaster, is losing its story, identity and sense of place. While moving towards progress and future its cultural, architectural and traditional elements are ignored. Madifushi is a small community of unity and friendship with potential for development into a lifestyle of wellbeing.

The island's location exposes it to high waves and potential tsunami in the future, however with a proper plan and safety measure, the island can be developed into a habitable and developed community.



RECOMMENDATION

Site Carrying Capacity

Th. Madifushi is currently at its full capacity in terms of land. However with a proper and well executed land use plan the available land of the island can be used to improve the quality of life for the people of the island.

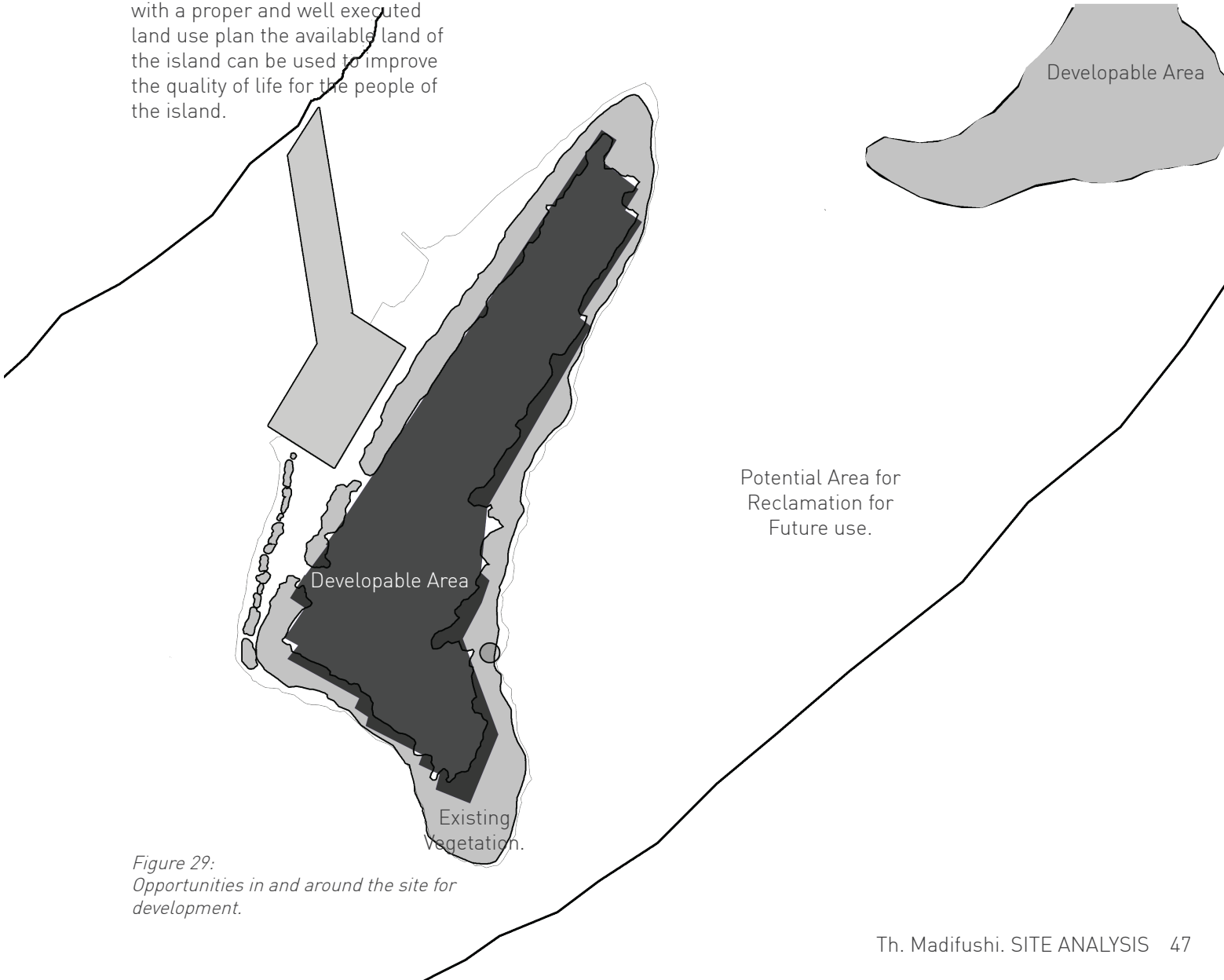


Figure 29:
Opportunities in and around the site for development.

Recommendations

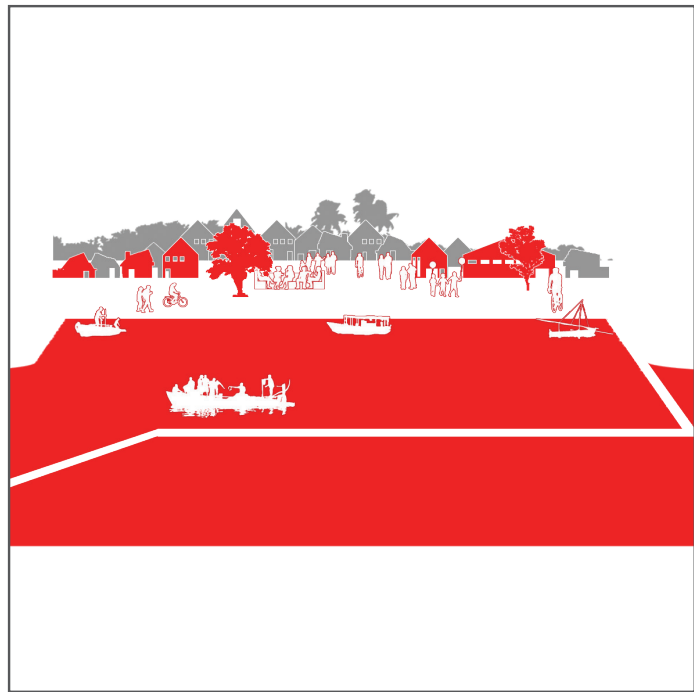
*Figure 30:
Harbour front.*

CHALLENGE

Harbour area, gateway into the island is neglected and unused.

RECOMMENDATION

Turn the Harbour area into an attractive gateway into the community by incorporating communal and interesting varying activities into the area

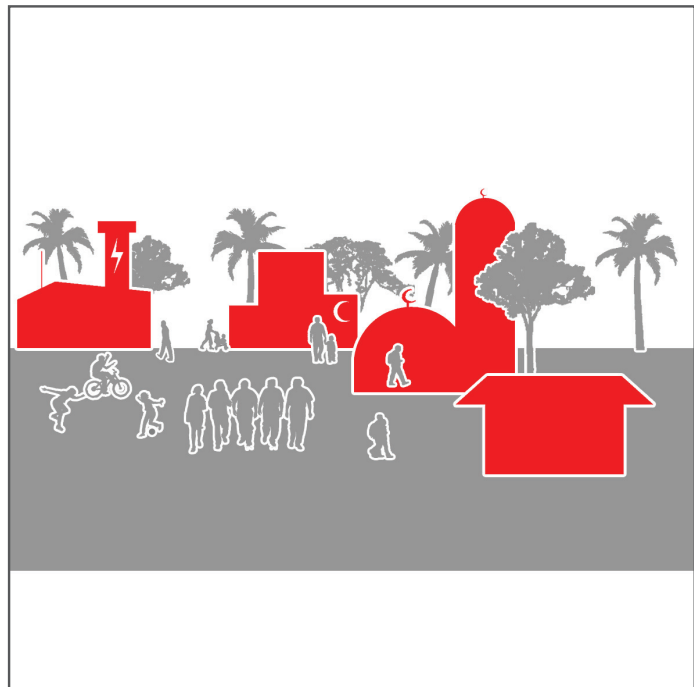


CHALLENGE

Institutes and amenities scattered around the island making access difficult and inconvenient.

RECOMMENDATION

Central location for institutes and essential amenities within walking distance and easy access.



*Figure 31:
Infrastructure.*

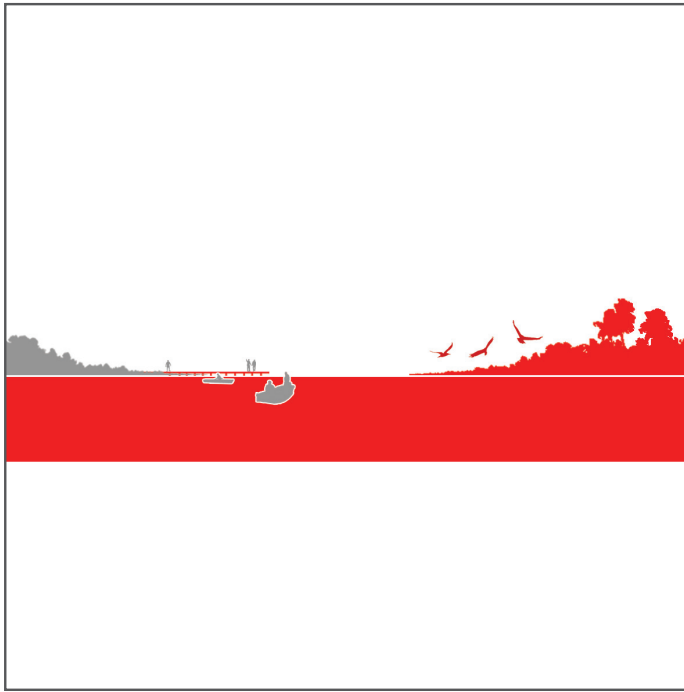


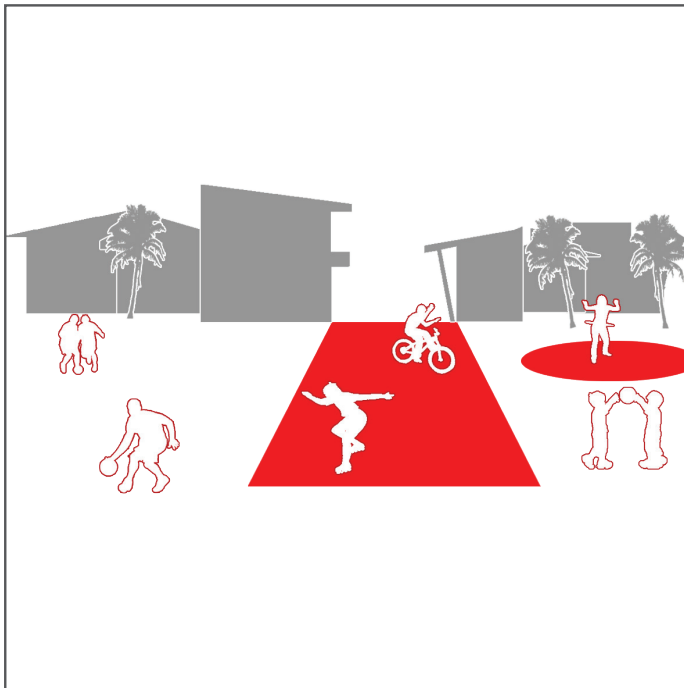
Figure 32:
Natural Beauty.

CHALLENGE

The natural beauty of the setting is ignored and unutilized.

RECOMMENDATION

Build jetties on sea to celebrate unique natural beauty and provide a way for people to move out of the island and enjoy natural beauty surrounding the island.
Establish Cafe's and restaurants incorporating the natural surrounding.



CHALLENGE

Lack of recreational facilities for residents.

RECOMMENDATION

Provide a sports center for youths of both sexes in a friendly environment.
Introduce new sports to the island.

Organize coaching camps for newly and ongoing sports activities

Organise competition in island level, and atoll level

Figure 33:
Recreation.

Figure 34:
Cultural Centre

CHALLENGE

Diminishing cultural and traditional activities.

RECOMMENDATION

Develop a cultural center.
Educate and promote cultural and traditional crafts through the center.



CHALLENGE

Heritage site in ruins.

RECOMMENDATION

Excavate and protect the heritage site.
Educate the residents through the site on the heritage and traditions of the island.
Develop the area into a communal and interesting place.

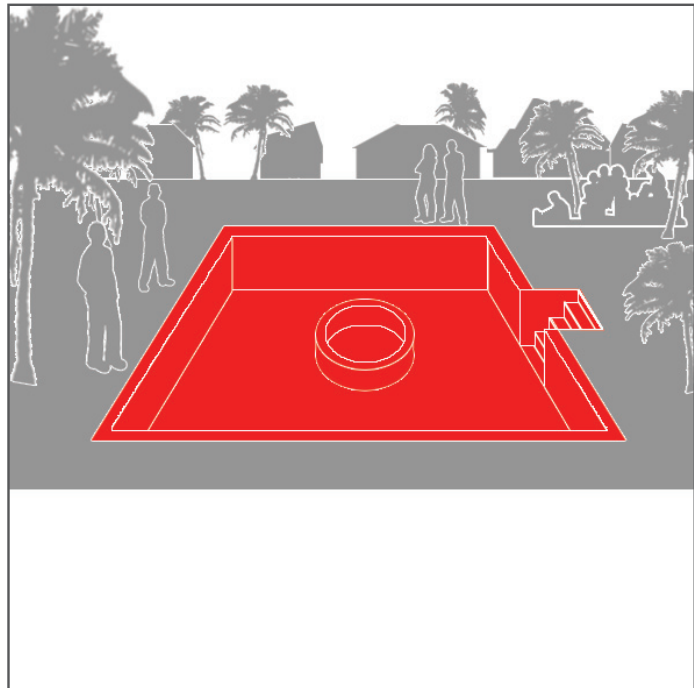


Figure 35:
Heritage site



Figure 36:
Safe point.

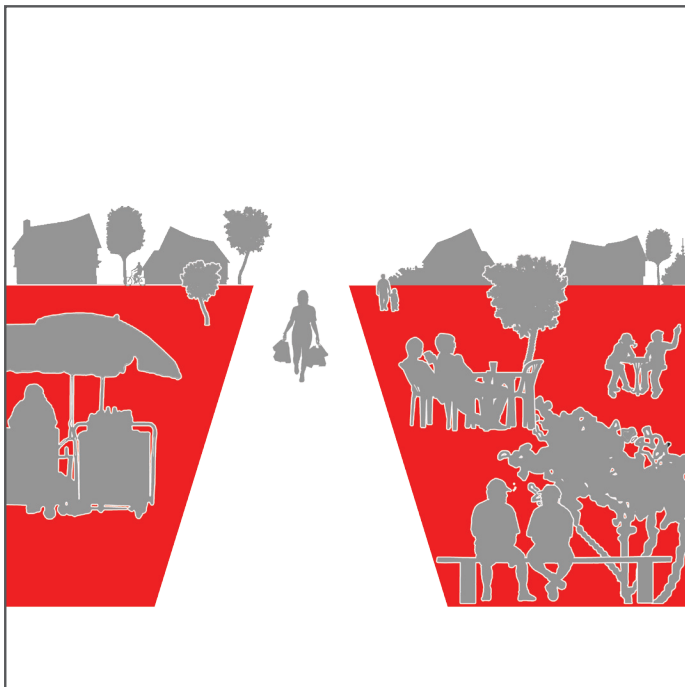
CHALLENGE

No safe point during a disaster.

RECOMMENDATION

Build a safe shelter to be used in disaster situations like a tsunami.

Educate the public on procedures and the use of the shelter in emergency situations.



CHALLENGE

Lack of friendly communal spaces

RECOMMENDATION

Develop friendly and safe communal areas open for public.

Encourage its use by incorporating services such as cafe's, shops and communal activities.

Figure 37:
Communal areas

Figure 38:
Architecture

CHALLENGE

Lack of identity in architecture because of prototype houses.

RECOMMENDATION

Give plots instead of buildings to individuals and encourage their own designs and traditional elements in architecture.
Help of professionals in the design process to reflect individual needs and tastes.



CHALLENGE

Road and pathways are neglected and under utilized.

RECOMMENDATION

Design and build pedestrian and bike friendly roads.
Vegetation buffer separating walkway, bike path and vehicle lanes.

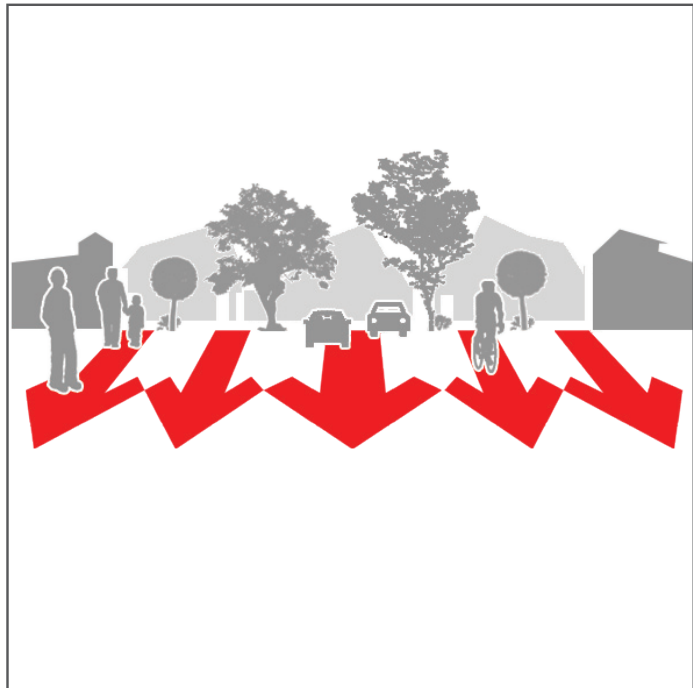


Figure 39:
Roads



Figure 40:
Clean beaches

CHALLENGE

Garbage disposal at beaches.

RECOMMENDATION

Create proper waste disposal methods minimizing the impact on the environment.

Locate bins and waste collection spots within access to communities.

Landuse plan

These recommendations can be used when developing a new and efficient land use plan and to design semipermanent disaster relief houses.

The design must reflect the island and its people and must create a sense of place for the people.