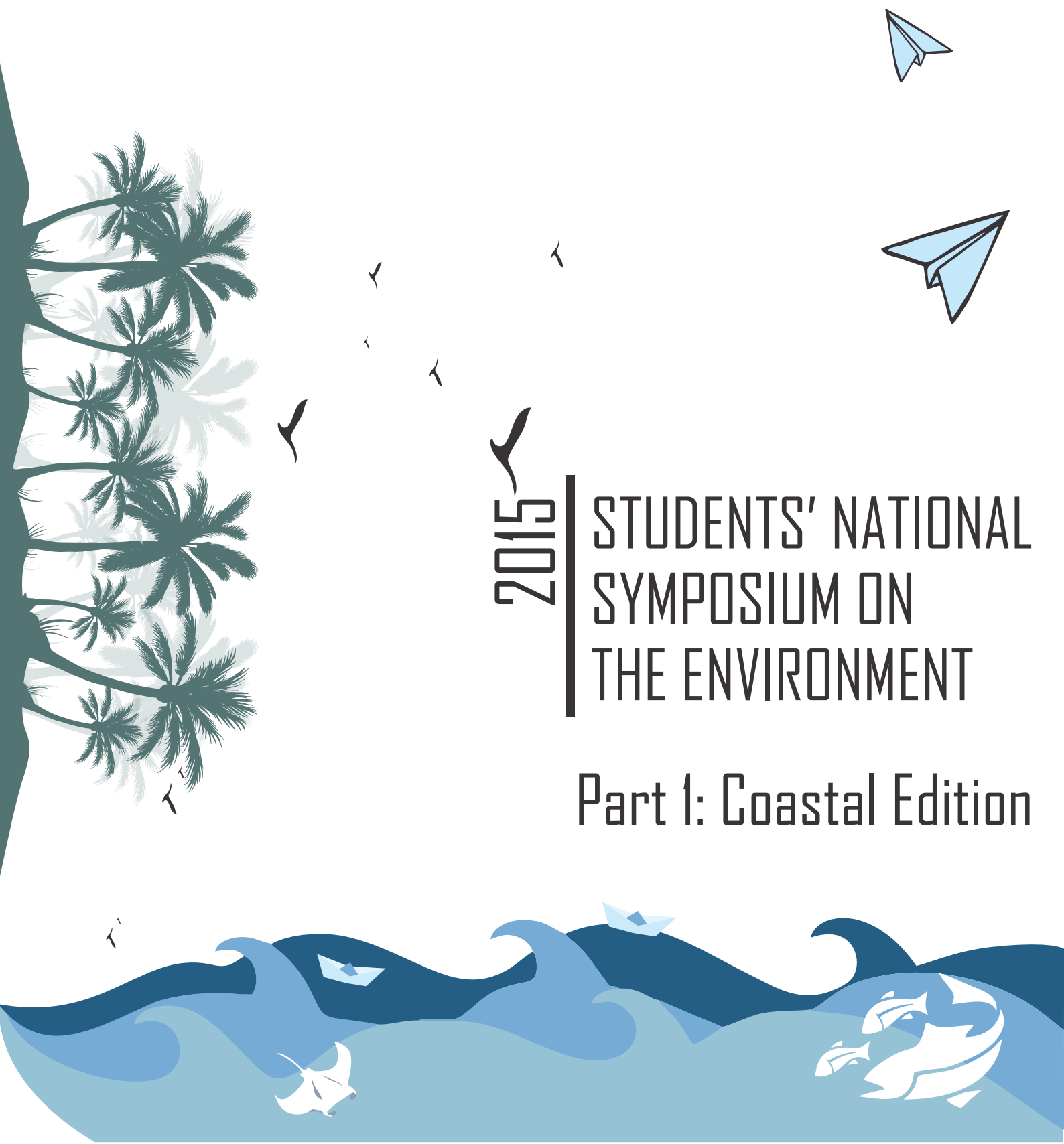


PEMPHIS

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Environmental Newsletter
Ministry of Environment and Energy



2015

STUDENTS' NATIONAL SYMPOSIUM ON THE ENVIRONMENT

Part 1: Coastal Edition

Minister's Note

The issue of coastal protection remains as prominent as ever, with much work to be done in order to protect our vulnerable coastlines from anthropogenic and natural impacts. The work and mindset of the younger generation towards this issue is admirable, and it is comforting to know that the future is in good hands. School Students' First National Environment Symposium saw some very interesting and innovative ideas, which will prove to be of paramount importance in the future with regards to the protection of the environment. These ideas could be the cornerstone for school children in guiding them to the right path in their endeavours in safeguarding our country's environment.

Thoriq Ibrahim

Editor's Note

This edition of Pemphis marks the first of a four edition series, in which we would be featuring the concerns raised by the students of Maldives regarding the coastal topography and vegetation of the nation. The articles below have all been summarized and consolidated from the indepth presentations and papers submitted at the School Students' First National Environment Symposium. The thorough research and the enthusiastic delivery by the students at this Symposium were commendable and contributed in making this Symposium a resounding success.

Feedbacks, comments, articles, photos, etc. are welcome at

environment@environment.gov.mv

Artificial Coastal Protection

Aminiya School

“ Artificial coastal protection can be simply defined as any man-made or human-manipulated method of preventing harm to the coastal communities. While it is true that global warming and sea level rise contribute to erosion, it accounts to only a small percentage.

The major causes of erosion are coastal modifications such as land reclamation, deepening lagoons and construction of harbors strike done without proper consideration to the geomorphology of the island and its lagoon. Therefore, proper coastal protection is called for to prevent the erosion of islands and thus the inhabitable area in an island.

This project aims to raise awareness among the public on the importance of coastal protection and to implement innovative solutions for the problems faced. Through research, we have mainly obtained information on the various methods of artificial coastal protection, and the impacts each individual element has.

In conclusion, we recommend the use of methods which are most feasible, and those which are also socioeconomically calculable and environmentally least impactful to the country.

Aim:

To enlighten the public on ways to protect their coast and homes.

Objectives:

- Conduct research on coastal protection methods, as well as their feasibility
- Obtaining public and professional view

Importance of the coast:

- Supports industries such as fisheries and tourism
- Supports a large amount of endangered and migratory life

Recommendations:

- Focus on maintaining the existing artificial protection methods
- Give proper consideration to environmental factors such as climate change, erosion, longshore drifts and their implications before executing new protective measures as well as other developmental projects.

”

Soil Erosion due to Natural Processes

Centre for Higher Secondary Education



As soil is a precious resource, the loss of it through natural processes and anthropogenic activities is one of the major environmental problems faced today.

Soil erosion is the removal of soil faster than natural soil forming processes can replace it. Although it occurs slowly and is mostly disregarded when occurring through natural means, half of the world's top soil has been displaced during the last 150 years, which is an alarming fact.

The small islands of Maldives are no exception. In fact 97% of the islands have reported problems of beach erosion. Dr. Greg Guannel highlights that while erosion and accretion of beaches are naturally occurring process, the timeline of the processes is unpredictable. Consequently, this presents a great concern for the Maldivian economy due to its inordinate dependence on its natural resources.

Moreover the geology, isolation, flora and fauna of the islands in Maldives make the marine and terrestrial environment very unique and different from the rest of the world, which makes the beaches more fragile and vulnerable to erosion. Thus, the information amassed intends to increase awareness on how the unique features of Maldives and other natural processes could cause soil erosion, particularly coastal erosion.

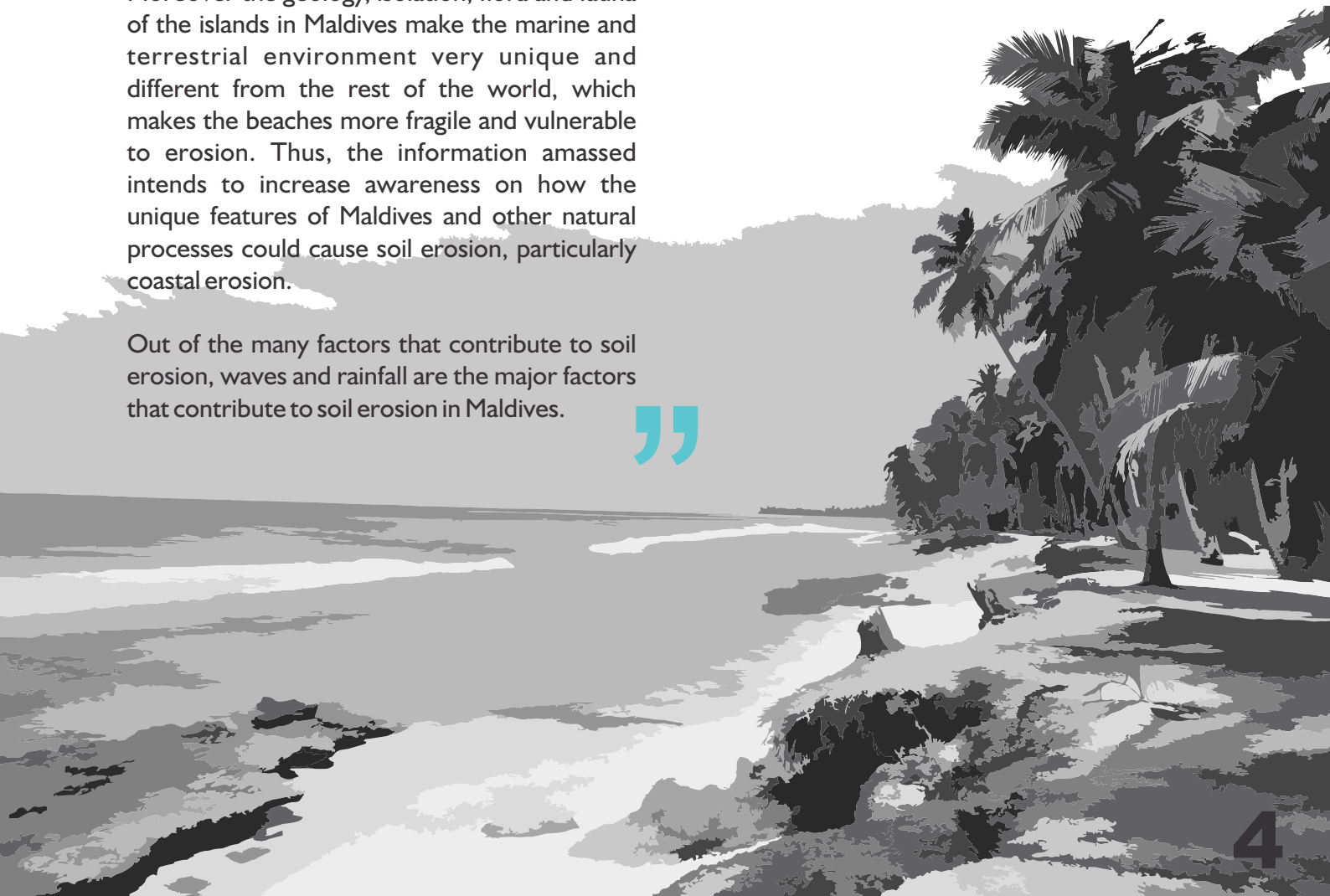
Out of the many factors that contribute to soil erosion, waves and rainfall are the major factors that contribute to soil erosion in Maldives.



- Soil Erosion is the removal of soil faster than natural soil forming processes can replace it.
 - Half of the topsoil on Earth has been eroded away within the past 150 years.
 - The damage being done is almost irreversible
- “44% of human settlement and more than 80% of critical infrastructure in Maldives is within 100m of coast”

Recommendations

- Protect the reef
- Improving indigenous coastal vegetation.



Human Impacts on Soil

Fuvahmulak School

“ Human impacts on soil erosion are generally reflected in land-use changes. Thus, identifying the characteristics of land-use changes associated with their driving forces has great potential for evaluating regional soil-erosion variations and the impacts of human activities, especially for regions where soil-erosion data are scarce.

This project highlights human impact on soil erosion. A survey was carried out among randomly selected citizens, council members and police regarding the issue. After analyzing the data, the result was generalized that the major impact on soil erosion in Fuvahmulah is caused by mining of sand from the beach, coral mining and construction of the harbor. Due to this, the wave action which meets together has the possibility to collide strongly. So, when the waves break on the sea shore, it loses the soil near the beach as it is washed away with the current. However, studies have found that the geographical formation of the island also affects it, as where it is located.

Aim

To critically assess the human impact on soil erosion in order to protect Fuvahmulah from the danger of being lost.

- Beach erosion is the washing away of land and the removal of beach or dune sediments by wave action, tidal currents, wave currents, drainage or high winds.
- It is a natural process however it is worsened by human activities.
- This presentation is based on human impacts on soil erosion in Fuvahmulah, known as one unique island and atoll in Maldives for its natural beauty, culture, history and dialect.

Suggestions

- Since there are few trees near Bondofannu beach it is recommended to plant more trees near this beach.
- Sand mining was found as the major issue on beach erosion therefore it is suggested to take more strict legal action against sand mining from south east of the harbor and Thundi beach.
- Reduce the prices of gravel, so that sand will be replaced by gravel.



Effects of land reclamations on the coastal topography of the island – Thinadhoo

G.DH. Atoll Education Centre



The aim of the project is to find out the effect of land reclamation on the coastal topography of Thinadhoo. G.Dh. Thinadhoo has undergone topographical modifications due to land reclamation and coastal infrastructure for dwelling need of growing population. The land reclamation activities have resulted in the modification of the entire coastline, while the vegetation is sparse and almost extinct in the newly reclaimed areas. Land reclamation activities leads to drainage issues and flooding during heavy rainfall. The newly reclaimed areas do not have a coastal vegetation belt, increasing the risk of erosion and increased impacts from ocean induced flooding events. Environmental issues associated with land reclamation are being experienced by its inhabitants including ground water contamination, degradation of coastal areas, depletion of vegetation and coastal erosion. Our survey involves random sampling method to confirm the knowledge of people about the land reclamation and its effects to the coastal areas of the island. Qualitative and quantitative analysis and sampling techniques were also carried in different areas, mostly outskirts of the island. From our findings it was proved that there are several effects on costal topography of the island due to land reclamation.



Aim:

To find out the effect of land reclamation on the coastal topography of Thinadhoo.

Objectives

- Changes in topography of Thinadhoo due to land reclamation.
- Effects of land reclamation on beach side, marine environment and coastal vegetation of the island.

Land Reclamation: Thinadhoo

- Land reclamation started in 1990's
- Approximately 71 hectares or 61% of present island is reclaimed
- Maahutta also has been joined to form the present Thinadhoo

Recommendations

- Establishing proper drainage system
- Constructing revetment structure
- Construction of a vegetated ridge
- Environment Impact Assessment (EIA) should be done before each land reclamation project.
- Conducting awareness programs for students and community



Erosion

Hafiz Ahmed School



Beach erosion is a very serious issue for the Maldivian islands. The islands depend on tourism as the main source of development and what attracts tourists to Maldives are the clear white sandy beaches, blue lagoons and it's under water coral gardens. Maldives need to protect its vulnerable and dynamic beaches for its own very existence.

Moreover, beaches have always played a vital role in the everyday lives of the locals in the islands. Beaches are associated with moments and memories for local residents. It is therefore a responsibility of each island community to play its part in the protection of these dynamic beaches.

The project highlights the plight of the people of Fuvahmulah who face an uncertain future due to the severity of beach erosion and the speed of land loss over the recent past years. The objective is to show how concerned the future guardians of the island are and to share the strong sentiments of the people drawing urgent attention to the dire consequences, that could follow if nothing is done to protect the island. For the students, some of whom live just few feet away from the shore, beach erosion is a daily reality. To put this project together, the students surveyed the coastal topography of the worst affected areas of the island.



Aim:

Instill a love for environment in students, sensitize them towards the fact that erosion can have devastating consequences and encourage them to give voice to the plight of a safe environment.

Objectives

- To gain students' attention towards erosion, land loss and other environmental issues.
- To give students an opportunity to voice out their concerns and get involved in conserving our environment.

Conclusion

- Beach erosion is a very serious issue for Maldivian islands.
- We need to protect these vulnerable and dynamic beaches for its own very existence.
- Beaches are associated with the moments and memories for local residents like us.
- It is therefore, a responsibility of each and every island community to play its part in the protection of these dynamic beaches.



Coastal Congestion

Isdhookalaidhoo school



The main aim of the project is to create awareness among the people, especially students, in the coastal areas towards coastal congestion. As a result of which we can find a solution to this problem.

In Maldives, the capital city Male' is the island which has this problem the most. This is due to the intense competition for land and residency in Male'. In this presentation we have discussed about this problem in Male' and in Israel and presented some suggestions for the governments to minimize these problems.

We recommend the government to have strict laws against encroachments, discourage migration to coastal areas, do meticulous planning and bring economic development to other areas so that the people don't have to migrate to Male' and coastal lines



The problems faced in Male City because of coastal congestion

- Sea pollution
- Sound pollution
- Traffic issues

Recommendations

- Strict laws against encroachments
- Discourage migration to coastal areas
- Meticulous planning
- Economic development of other areas and generating of employment opportunities.



“Save our Beaches – please.”

Muhiddin School

“ Ten minutes east of main land Male', lies a little island considered to be a fifth ward of Male' – Villimale'.

The coastal areas and its beaches surrounding Villimale' provides recreation and enjoyment not only to its inhabitants but to other visitors who frequent this place regularly. Unfortunately, the flora, fauna and eco system of these beaches and adjoining reefs are being affected by the thoughtless and selfish acts of inhabitants and visitors alike.

The environment club of Muhyiddin School would like to address this matter while acknowledging and appreciating the untiring effort of some NGOs who work at creating awareness about this serious issue of beach pollution in Villimale'.

The project will highlight the status quo in the hopes of bringing this issue to the forefront. In addition, suggestions on responsible behavior and practices will be put forward.

It is hoped that we would be able to reach out to the masses and a lasting impression with desirable changes could be brought about through this presentation.

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Major activities responsible for coastal and marine pollution.

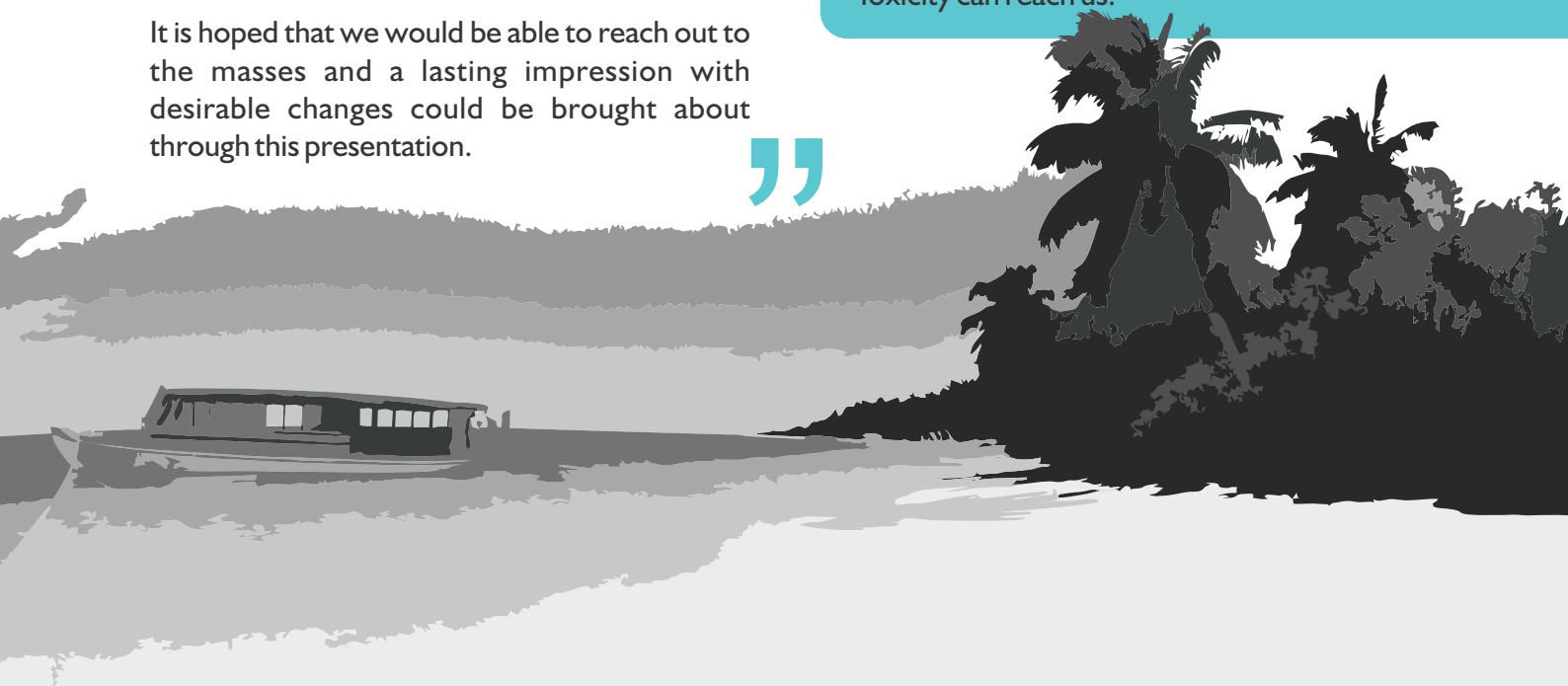
- Infrastructural development
- Leisure and recreation activities
- Inappropriate garbage disposal
- Drift

Major pollutants

- Domestic waste
- PET bottles
- Plastic containers and wrappings
- Building materials and rubble
- Metallic items
- Industrial effluents

Impact of pollution on coastal ecology

- Generally marine pollution affects ecosystem health, public health, recreational water quality and economic viability.
- Eutrophication of coral reefs
- Mutagenic and carcinogenic effects occur in marine organisms.
- Occur in marine organisms
- Toxicity can reach us.



Beach Monitoring

Rehendhi School

“ The aim of this presentation is to overview the existing condition and the methods we can implement to monitor the changes occurring due to natural causes and the action of man on Maldivian beaches with reference to Hulhumalé. In the presentation we have included the opinions of locals and tourists regarding the current condition of Hulhumalé beach. We have also included procedures followed by Hulhumalé Development Cooperation (HDC) to monitor the beach. Furthermore, we will be discussing some of the activities which can be conducted by the environment clubs all over the country to save and protect the beaches of Maldives.

”

Benefits of beach monitoring

- Improving the conditions of the beach.
- Understanding beach evolution.
- Identify the current situations and problems ,in order to take necessary measures to improve the conditions of the beach.

Conclusion

Coastal managers must make three key changes with respect to sandy beach ecology

- There must be widespread recognition of the beach as a natural ecosystem
- Managers need to better incorporate existing science into beach management
- Research in beach ecology must advance.



Damages done to water due to land reclamation on the coastal topography of the island.

Thulhaadhoo School



Aim

To assess the damages done to water due to land reclamation on the coastal topography of the island.

Thulhaadhoo's land has been reclaimed by the government twice. Also some of the land is reclaimed by the people of Thulhaadhoo (baadi jehun).

Findings

The reclaimed area of Thulhaadhoo have more salt and chloride content than the natural area. Also the reclaimed area have a pungent smell and a reddish colour. Due to these problems some of the people in the island stopped using that water.

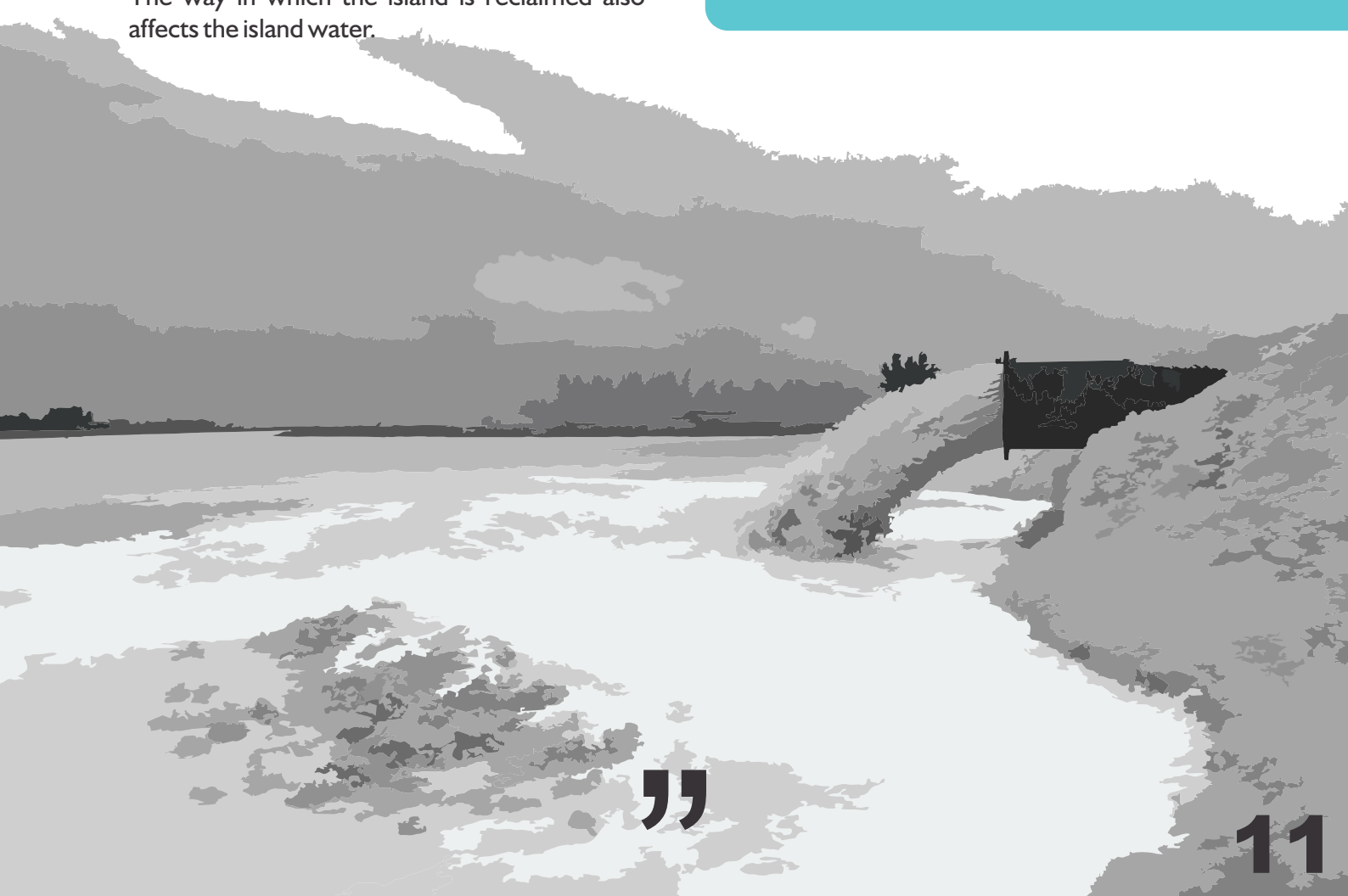
The way of disposing waste and the design of the sewage system in the island also affects the island water.

The way in which the island is reclaimed also affects the island water.

Recommendation

Innovate a way to produce fresh water by using sea water whilst using carbon to remove the pungent smell. Moreover oxygen levels in the water should be increased. Furthermore a sewage system should be designed and implemented along with an alternative to build the houses without further land reclamation.

We believe that the water will get contaminated due to seaweeds. The raw materials used to reclaim the area by the people of the island was, sea weed, corals and rocks from the reefs and the waste from the island. Through the findings we would like to say that it is better to ponder upon the island water before designing the sewage system and road construction. In addition, the people of Thulhaadhoo were not aware of the effects caused to the island water due to the land reclamation using sea weeds. And also the water was adversely affected in both ways of land reclamation.



Erosion

Hiriya School

“ A long, white-sand strand, framed by a rocky shoreline, cooled by coastal breezes, with crashing, pounding waves providing a soundtrack, is our nation of paradise. The beautiful beaches of Maldives is affected by soil erosion.

Soil erosion is one of the most serious environmental problems facing human society, especially for low lying countries like Maldives. Higher rates of erosion and coastal land loss are is being faced by almost all islands of Maldives. Each year, large areas of land is lost due to soil erosion, thus reducing the land available for living and agriculture. Low-lying islands of Maldives are likely to experience increased sea flooding, inundation and salinization as a direct consequence of sea level rise.

There are many things which can be done in order to deal with the problems associated with soil erosion. This includes construction of water breakers and building sea walls with sand sacks and used tires. In addition, planting more trees near the coastal area helps to hold the soil particles together, thus minimizing the damage caused by soil erosion. Preserving mangroves, allowing the growth of sea grass and promoting artificial reefs are some of the permanent ways of preventing our islands from soil erosion.

Awareness programs have to be conducted for students, youth and for the whole community about the dangers of soil erosion. We also believe that media can play a dominant and influential role in delivering the message to the community.

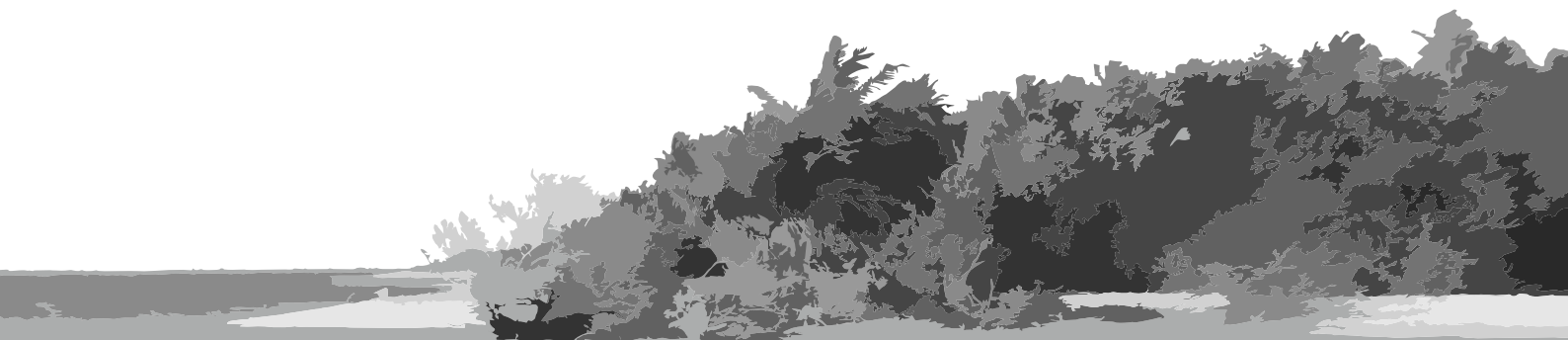
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Artificial solutions

- Construction of water breakers
- Building sea wall
- Building sea wall with sand sacs
- Building sea wall with used tires
- Coir erosion control mats

Natural solutions

- Plant more trees & increase vegetation
- Do not take corals from reefs
- Promote coral planting
- Avoid taking sand from the beach
- Preserve mangroves
- Conduct awareness programs



Reduce Soil Erosion

Hulhudhoo School



Aim

To give a message to the public, on the impacts of taking sand from the beaches and also cutting down trees near the beach. The main impact is these human activities will lead to beach erosion. This project found that in our island, the causes of beach erosion is mainly due to human activities such as cutting down trees near the beach for building houses and burning wood (fuel) as cooking. In addition, taking sand and corals from the beach for building their homes can lead to beach erosion.

Recommendations:

- Conduct awareness programs in school and community level. (Eg: Distributing leaflets on impacts of soil erosion.)
- Planting trees near the beach by school children.
- Poster drawing in school against cutting down trees and taking sand from the beach.



Challenges

- Not getting enough budget , resources to conduct awareness programs
- Less support from stakeholders
- Limited time for conducting programs
- Less expertise around the island People are getting reserved to their own needs.

Recommendations

- Schools and teachers require additional resources to undertake environmental activities on the islands, including physical resources and additional reference materials on issues.
- Environment clubs need further institutional support to function effectively.
- Plan beach erosion awareness workshops , seminars.
- Give more opportunities to research the current and further changes of beach erosion
- Praising awarding the NGOs and school who are taking part in protecting island from erosion



Soil erosion due to destruction of coastal vegetation

Ghaazee School

“ Soil erosion is defined as the wearing away of topsoil by the action of water or wind, compounded by poor agricultural practices, deforestation, overgrazing, and desertification.

Number of islands in Maldives is suffering from soil erosion. Some of the islands are heavily populated and this has brought negative impact to the people of the island as well as to the whole environment of the island. The beautiful beaches surrounded by the island and the white sand banks are on the verge becoming a history and a bed time story to the youngsters of our country.

The project mainly highlights on soil erosion due to the destruction of coastal vegetation. An intensive research is done to see how severely Villimale', Kaafu Atoll of Maldives have suffered from soil erosion.

A study on soil erosion is done on one of the island in Maldives, Villimalles.

HOW UPROOTING OF TREES AFFECTS SOIL EROSION?

- The roots of the plants bind the soil together and interweave with other roots forming a more solid mass that is vulnerable to both water and wind erosion
- The removal of vegetation increases erosion!
- A study has shown that in areas that which trees were uprooted, it has suffered three times more damage from erosion.

Conclusions

- Since almost all of our country's income come from the tourism industry it is vital to preserve the natural environment.
- We all have to contribute towards saving our islands.
- We all have to fulfill our obligatory duty for our nation.



Month in Review

September

06

Design works for the establishment of Water Supply facilities in 08 islands awarded

Consultancy services for the Design of Water Supply facilities in Ha.Hoarafushi, Hdh.Hanimaadhoo, Sh.Milandhoo, R.Ungoofaaruu, Lh.Naifaru, Dh.Kudahuvadhoo, Th.Guraidhoo and Ga.Villingili were awarded.



Invitation for Pre-qualification for Construction of Water Supply and Sewerage Facilities in Fuvahmulah announced

The project of setting water supply and sewerage facilities in Gn. Fuvahmulah financed by the Government of Republic of Maldives and Kuwait Fund for Arab Economic Development aid was announced.

10

Workshop to endorse Maldives' Intended Nationally Determined Contribution to the new climate agreement

A workshop was held to endorse Maldives' Intended Nationally Determined Contribution (INDC) to the new climate agreement.



15



Workshop on Strengthening Low Carbon Energy Island Strategies Project

A workshop for the project "Strengthening low carbon energy island strategies" was held. The project is funded by Global Environment Fund and implemented by Ministry of Environment and Energy with assistance from UNEP.

World Scout Environment Badge inaugurated

Minister of State for Environment and Energy, Mr. Abdul Matheen Mohamed inaugurated world scout Environment Badge.



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17

Renewable Energy Roadmap workshop held

The final workshop for the Renewable Energy Roadmap for the Republic of Maldives was held at Kurumba Resort, Maldives. The roadmap was developed by International Renewable Energy Agency (IRENA) at the request of the Ministry of Environment and Energy to assist in accelerating deployment of renewable energy in the Maldives.



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AOSIS Ministers call for ambitious and legally binding agreement in Paris



Ministers of the Alliance of Small Island States (AOSIS) met for the first time under the Maldives Chairmanship, at United Nations Headquarters in New York. The meeting was focused on climate change, given that there is few months left for the Twenty First Conference of the Parties of the UN Climate Change Convention to commence in Paris.

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Maldives Submits INDC

Maldives submitted its Intended Nationally Determined Commitment (INDC) for climate change action to the United Nations, ahead of crucial negotiations scheduled for the end of the year in Paris and urged all countries to do the same.



Meet this month's contributors:

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Fathimath Ansam Waheed

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Aishath Hanan Hussain Rasheed
Fathimath Shaheen

Aishath Jeehan Nazim
Aminath Eeva Ahmed
Aminath Eesha Ahmed
Aishath Aish Hussain
Aishath Mahaa Ibrahim

Aishath Luthfee
Aishath Maya
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Hawwa Shafa
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