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Status and Future Plans of Severe Weather and Flash Flood Hazard Early Warning Mechanism in Maldives

IBRAHIM MIFLAL FAYAZ

COASTAL PROTECTION AND DISASTER RISK REDUCTION

MINISTRY OF ENVIRONMENT

General Information

1,190 islands

198 Inhabited Islands

14 Airports (4 International)

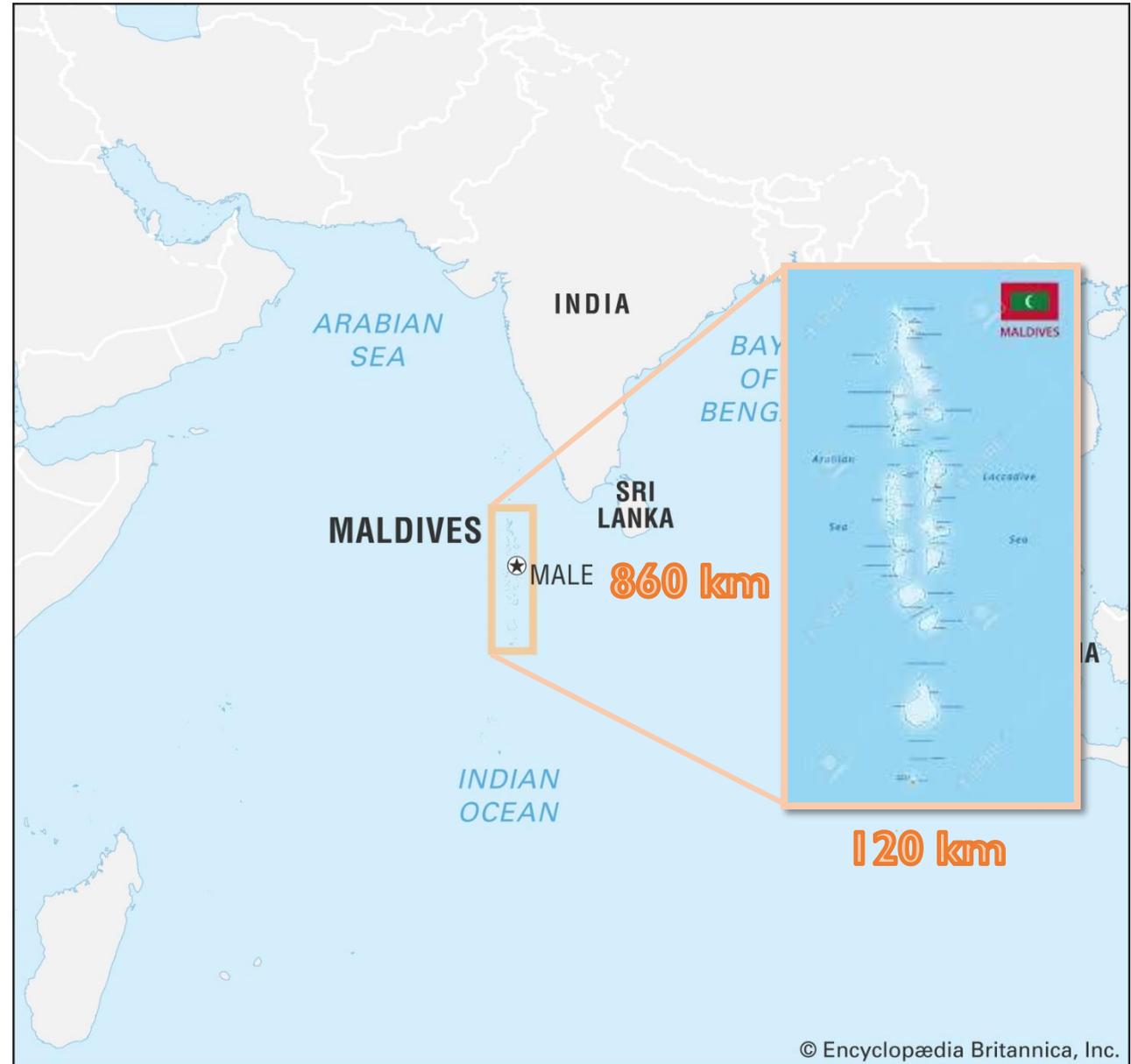
More than 120 Resorts

Total land area : 300 km²

Islands range b/w 0.2 – 5 km²

Population : Approx. 400,000

Economy: Tourism and Fishing





Maldivian Atolls



Tourist Resort



Local Island



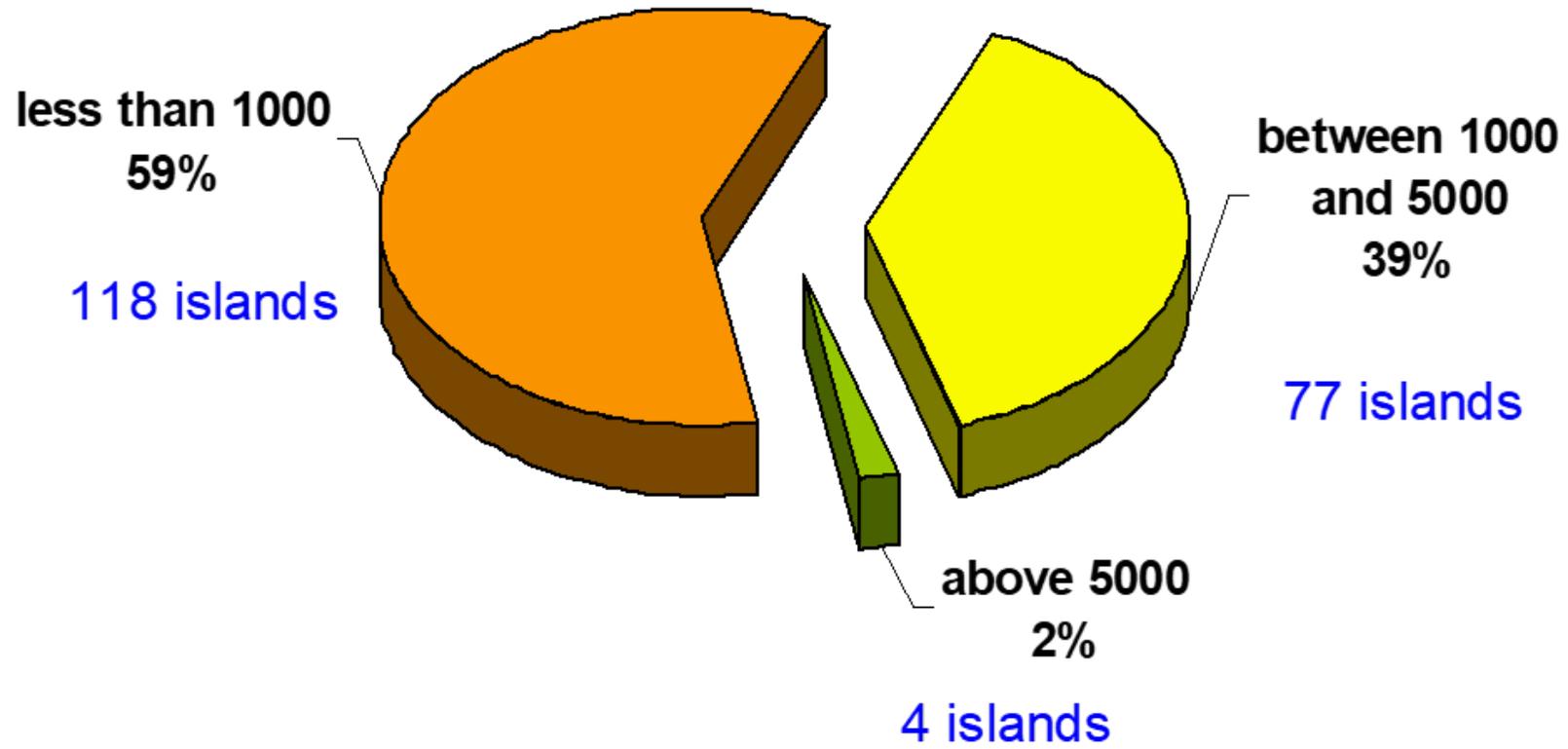
Uninhabited Island

Capital City – Male' City

- About 1/3 of the population live in Male' City
- Approximately 120,000 People



Population Distribution (excluding Male')



Major Environmental Problems

- Waste Management
- Coastal Erosion
- Pluvial and Coastal Flooding
- Lack of Water Security and Sanitation
- High dependency on fuel
- Impacts of Climate Change
 - Changing Weather Patterns
 - Coral Bleaching
 - Sea Level Rise



Vulnerability Indicators

- 1 Meter above Sea Level (80% of the land)
- Majority of the inhabited island face issues of coastal erosion
- Wide dispersal of population across very small islands
- Lack of access to remote islands
- High economic dependence on tourism and imports
- Lack of Food Security
- Many islands face issues of Pluvial and Coastal Flooding
- Highly Susceptible to Climate Change and Global Warming



Highest Elevation is
1.5m above sea level

- Most islands are only one Meter above Sea Level (80% of the land)



Coastal Erosion

- Most of the inhabited islands in the Maldives are facing issues of severe Coastal Erosion.
- Due to human activities
 - Development of harbors and other coastal structures.
 - Loss of coastal vegetation
 - Land reclamation



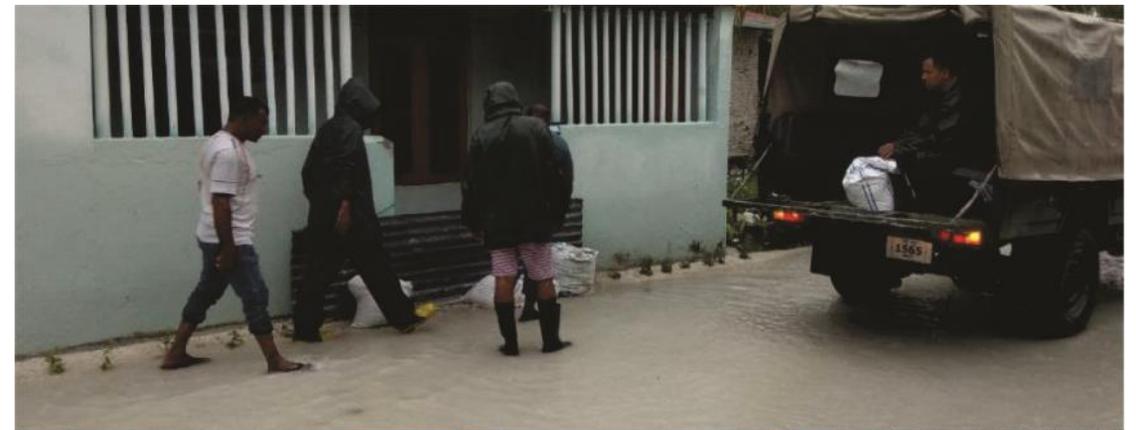
Geographical Challenges

- Wide dispersal of population across very small islands
- Lack of access to remote islands



Status of Severe Weather and Flash Flooding

- Maldives is exposed to several climate hazards such as heavy rainfall, wave swells, storm surge caused by cyclones in the South Indian Ocean, floods, droughts, and strong winds
- More than 51 islands have been identified to be facing risk of pluvial flooding due to severe weather.
- More than 56 islands have been identified to be facing the risk of coastal flooding due to severe weather.



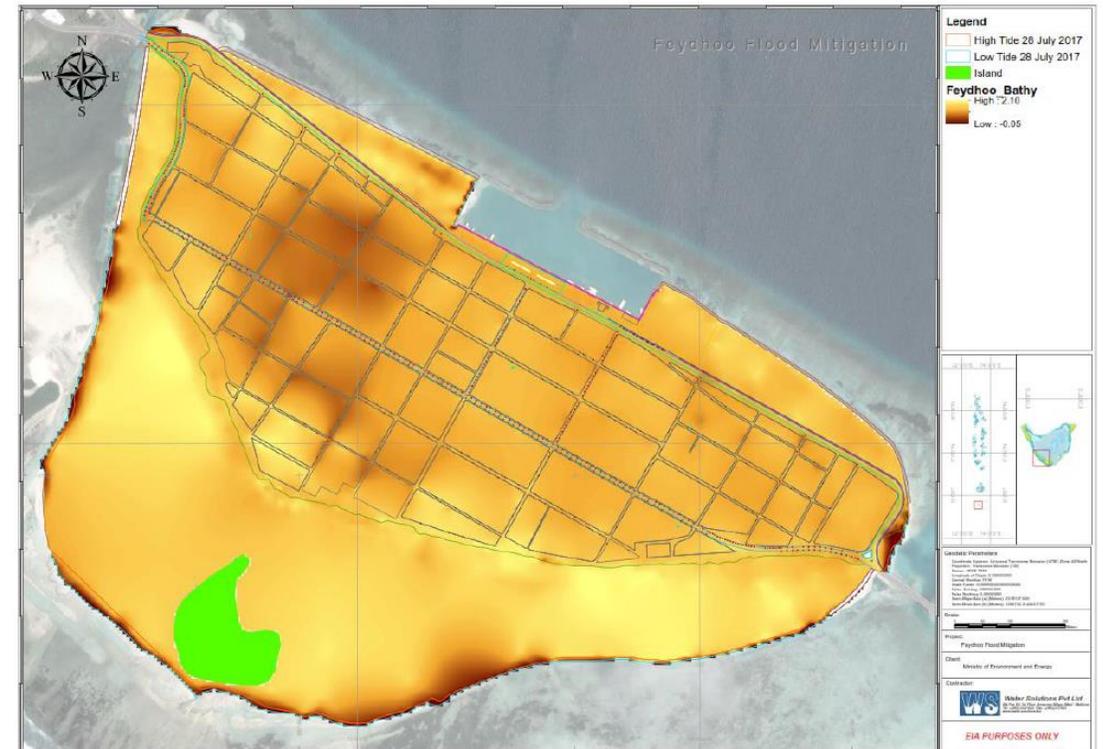
Reasons for Pluvial Flooding

1. Climate change and changing weather patterns (Severe Weather)
2. Infrastructure development leading to disruption of natural drainage.
3. Reduced infiltration due to increased built area.



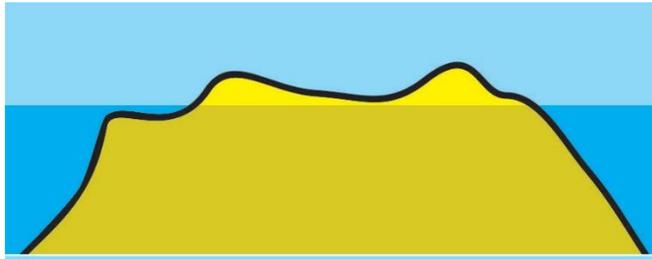
Infrastructure Development

- Harbours
 - Generally built higher than the existing land and includes a bit of reclamation.
- Land Reclamation
 - Considering the possibility of sea level rise and effects of climate change, new land reclamation is carried out to a height in-between 1.5 to 2.0 meters above mean sea level. This tends to be higher than the existing land in most islands.

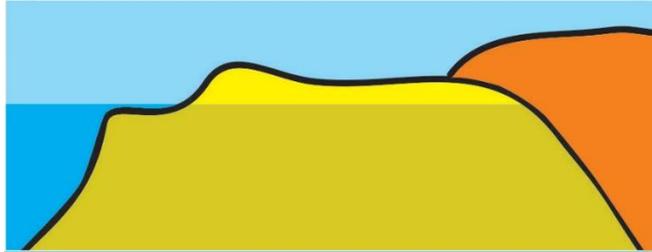


Change in Topography

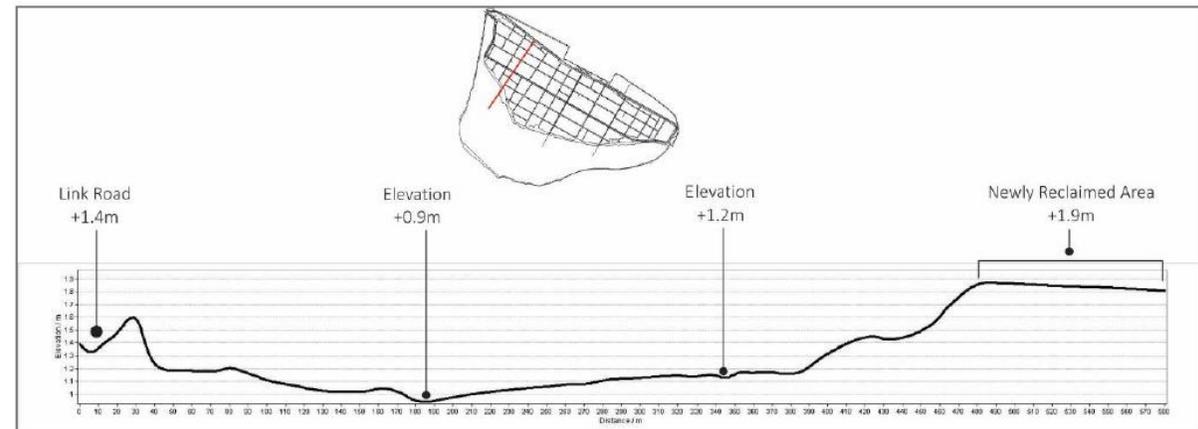
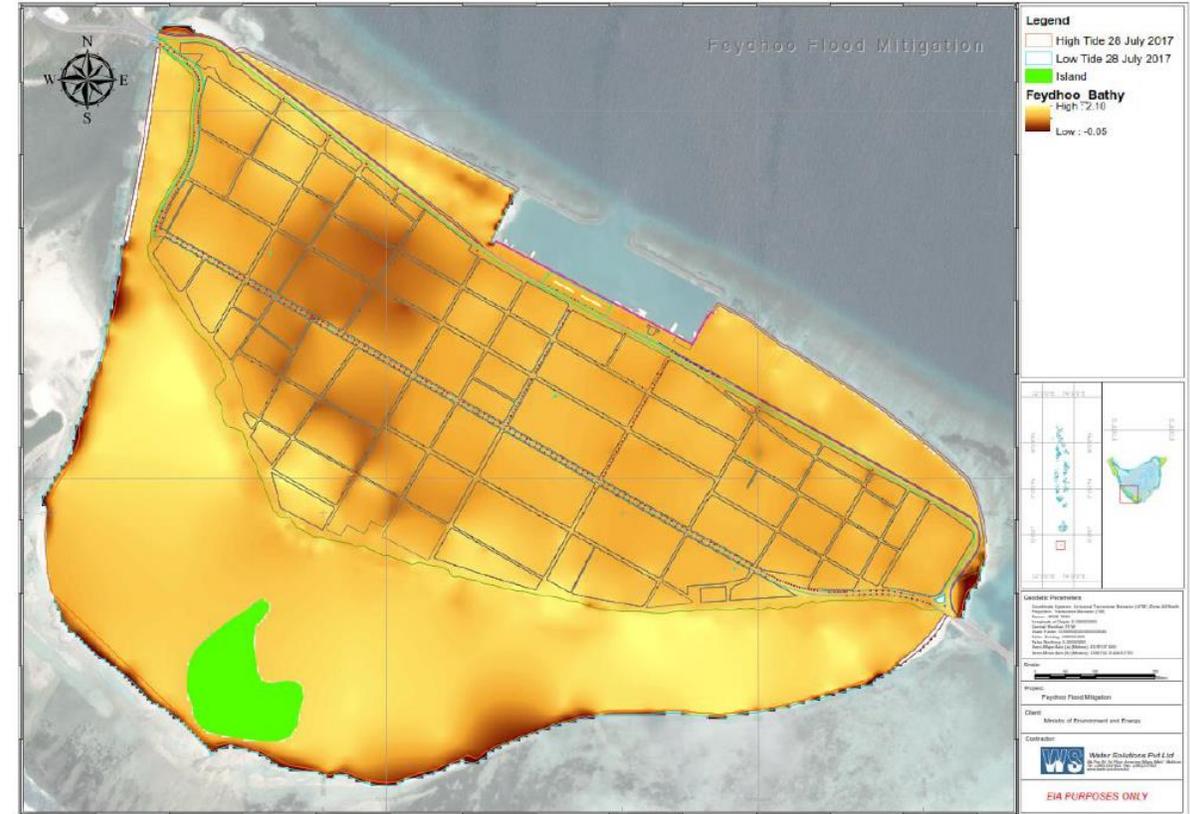
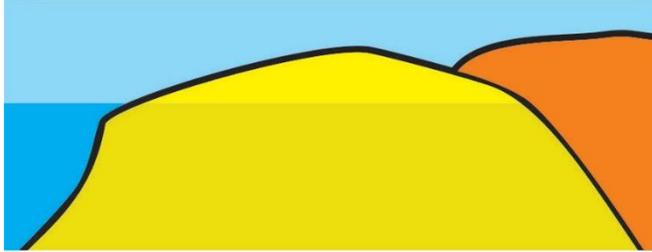
- Type A



- Type B



- Type C



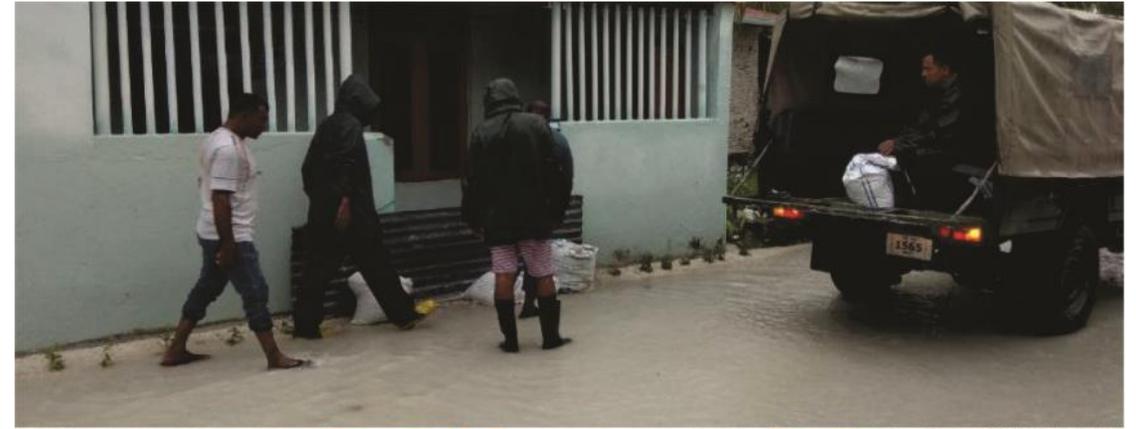
Reasons for Coastal Flooding

1. Climate change and changing weather patterns (Severe Weather)
2. Removal of coastal vegetation
3. Sand Mining

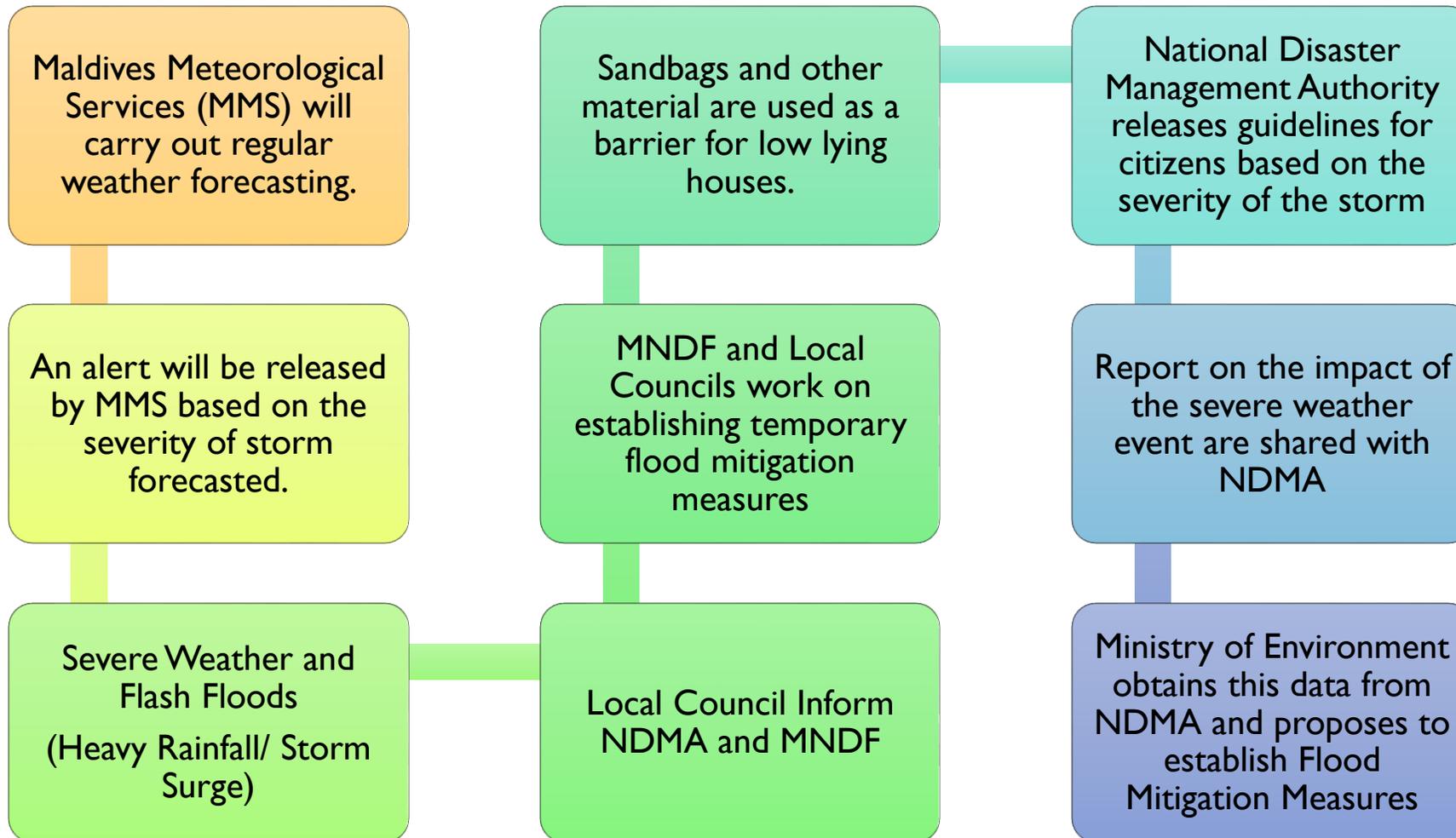


Concerned Agencies

- Maldives Meteorological Services
- National Disaster Management Authority
- Maldives National Defence Force
- Ministry of Environment
- Ministry of Planning and Infrastructure
- Local Government Authority
- Local Councils

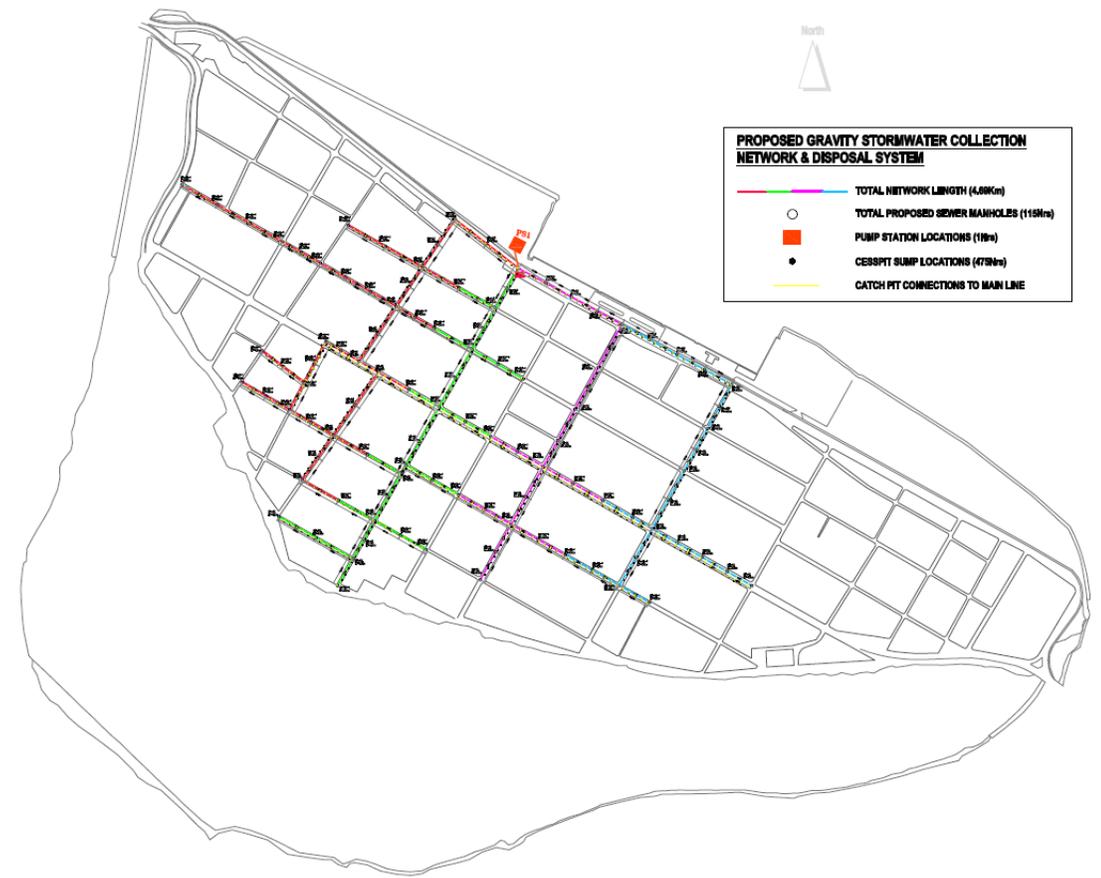


During Severe Weather



Adaptation Measures

- Flood Mitigation Systems are being established in 8 islands from the Governments Budget.
- More islands have been proposed to be included in 2020's budget for establishment of Flood Mitigation Systems.
- The systems are designed to reduce the impacts of severe weather and flash floods.
- Depending on the economic feasibility, measures to recharge the islands freshwater lens are also integrated into the design.



Major Challenges

- Lack of funding to establish adaptation measures in all islands in need.
- Challenges for maintenance due to lack of road infrastructure and sediment seepage into the system
- Increased impact of flash floods due to lower level of houses compared to the existing roads.





Strategic Action Plan

SAP

STRATEGIC ACTION PLAN

2019 - 2023

- **Strategy 1.8:** Develop localized coastal protection and flood mitigation mechanisms, and infrastructure in the islands identified as most vulnerable to disaster and climate risk [PI36, PI37, PI44]
 - Action 1.8a: Enhance and scale-up existing flood mitigation capacities at island level by integrating ecosystem-based approaches
 - Action 1.8b: Mechanism to identify impacts and objective criteria to prioritize implementation of infrastructure for flooding and coastal risks
 - Action 1.8c: Implement locally appropriate flood mitigation measure for high risk/ high priority islands [the island selection should align with spatial planning and islands with road development projects]
 - Action 4.1c: Establish basic level of response equipment for fire and flooding events at local councils that can be used by voluntary emergency response teams.

Thank you!

