Water Pollution Control and Enforcement
Status and Challenges in Maldives

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Strategies and Practices for Water Pollution Enforcement Workshop
November 8-10, 2016 Taipei, R.O.C (Taiwan)
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Mr. Ali Mishal is an Engineer at Environmental Protection Agency and has been working with Ministry of Environment for almost 11 years. He was awarded a Government Scholarship on September 2007 to do his Bachelor’s degree in Civil Engineering in Malaysia. His specialization was on Water and Wastewater. After his studies, he joined Environmental Protection Agency (EPA) as an Engineer on 25th January 2012. Currently, he is heading the Water and Sewerage Department of EPA. Over the years he has been involved in lot of Environmental Surveys and ground water quality surveys.
• Cluster of about 1190 tropical palm covered coral islands
• Stretching 870 Km (500Nm) north to south
• 26 Geographical Atolls
• Total population estimate: 400,000
Highest elevation ~ 2.4m ASL
Land area ~ 300 km²
>1,100 islands
~ 200 inhabited
~ 200 + resorts
~ 600 ‘agricultural’
Principal industries:
Tourism
Tuna Fishing
Dispersed population
2/3 rural
Regulations and Guidelines of water sector in Maldives

- Dewatering Regulation
- Borehole Drilling Guidelines
- Desalination Plant Regulation
- Drinking Water Guidelines
- National Waste Water Guidelines
- Rain Water Harvesting Guidelines
- Septic Tank Guidelines
- Technical Specification for Water Supply System
- Technical Specification for Sewerage System
Challenges

- Lack of institutional and financial capacity for establishment, operation and management of water and sewerage services
- Lack of trained personnel in the sector
- Lack of regulatory framework, guidelines and standards
- Lack of capacity to respond in an emergency and in mitigating the impacts of climate change (water shortages during dry periods)
WATER RESOURCES IN MALDIVES

• Rainwater

• Ground water

• Surface water on few islands (natural ponds & wetlands where groundwater becomes visible)

• Recycled water

• Seawater
What Pollutes Groundwater?
Sources of Groundwater pollution...

- landfills
- leaky underground storage tanks
- pesticides and fertilizers
- septic tanks
- hazardous waste - deep well injection
- any pollutant in runoff that percolates
Pollution in Maldives

Pollution sources can be land-based or sea/marine based. In the Maldives, the distance from land to sea is very short and therefore effects from both these sources of pollution are felt significantly by the marine environment.
Pollution in the Maldives is predominantly from point sources and therefore will provide more control over monitoring and management of these pollution sources. The most significant sources of coastal pollution in the Maldives include:

Land-based pollution sources:
- contamination from solid waste
- untreated sewage and wastewater disposal
- agriculture/mariculture

Sea/Marine-based pollution sources:
- oil pollution
- ballast water
Solid Waste Disposal

* Solid wastes include **domestic** and **industrial** wastes of organic and inorganic origin and variable size, ranging from small tins to whole cars.

* A comprehensive survey of solid wastes in Malé was carried out in 1989, and a per capita generation rate of 0.32 kg/day and an average waste density of 280 kg/m$^3$ was found. Waste quantities in Malé and in the Maldives will generally increase as the population increases, but will also increase on a per capita basis as the standard of living improves. Higher percentages of paper, plastic, glass and metal can be anticipated.
Solid Waste Disposal

Waste collection and transfer in Male’ is carried out by Male’ municipality and other private Waste is not segregated in the households and therefore, sorting at the domestic collection yard is a difficult and time consuming activity. **Waste from Male’ is transferred to the municipal landfill site, Thilafushi.**
The waste management situation is far worse in the islands than in Male’ as there is very little provision of waste management services to these islands. Thus householders carry their own waste and dispose of it on their own through informal dumping, burning and even burying.
Under the sea in Sea
Waste machine and lubricating oils associated with small-scale machine shops present a problem in Malé; current disposal seems to be simply into the ground around the workshop concerned, resulting in contamination of groundwater supplies.

Under the **International Convention for the Prevention of Pollution of the Sea by Oil**, reception facilities for waste oil and oil separated from bilge water has to be provided. Such facilities do not currently exist and neither do facilities for oil disposal. Recently, bins have been placed in Thilafushi for dumping waste oil.
EPA to seek legal advice over fining STELCO

The Environment Protection Agency (EPA) will seek legal advice from the Attorney General over fining the State Electricity Company (STELCO) for environmental damages.

On March 30 an STELCO oil pipe buried under Male’s ring road Boduthakuruufaanumagu burst, leaking large quantities of oil into the track swimming area, frequented by school children and the public.

Following the accident with the oil pipe, the EPA discovered 4.4ml of oil in the swimming area in its thrice-weekly inspections.

EPA Director Ibrahim Naeem told MNBC One that the agency has decided to fine STELCO as the company was responsible for the damage. However he did not reveal the amount of fines to be levied.
Oil contamination in Male’ City
Currently there are no proper disposal facilities to manage the used engine oil or black industrial oil in Male’. The only disposal facilities available are bins in Thilafushi for dumping waste. Another source of pollution is used engine oil in plastic containers dumped daily into Male’ lagoon from vessels.
Sewage Disposal

* Sewage poses a series of potential problems depending on the mode of disposal; discharge of raw, untreated sewage into the marine environment causes nutrient enrichment, algal blooms, deoxygenation and human health problems depending on the siting of the outfall. Such conditions adversely affect coral growth. Sewage-related problems are of concern around the densely populated islands and some tourist resorts.
According to the State of the Environment Report 2002, sewage effluent, potentially harmful substances and different chemicals are disposed untreated into coastal water of Male’ from nine pump stations by means of six sewer outfalls around Male’. “The pollution load from these sewer outfalls probably exceeds the dilution capacity of the receiving waters,”
Twenty five percent of the global crude oil and nearly 82% of the oil from Middle East to East Asia passes through the Maldives and Sri Lanka. This makes the region a very critical risk area for oil pollution and accidental oil spills.
Sewage Disposal

Sewage Treatment in the Capital City

Domestic sewage, industrial wastewater and clinical and lab waste water from photo and X-ray labs are discharged untreated from these six sewer outfalls into the sea and reefs around Malé.

This area was converted into an Artificial Beach recently.
The recently opened ‘Rasfannu’ artificial beach in Malé’s west coast has been closed to swimmers after an underwater sewage pipe in the area burst open.

Fazeel Rasheed, an official from Malé Water and Sewerage Company, said one of the sewage pipes extending into the ocean from the northwestern side of the capital was found to be leaking, prompting the housing ministry to close the beach for swimming.

The ministry has put up boards advising swimmers to stay away from the affected beach.
Sewage Disposal

Sewage Treatment in the Capital City

* The results of the discharge of untreated sewage effluent, sediment stress from harbor dredging and reclamation has affected coral reef around Malé and seriously degraded the reef compared to other islands. Except few resorts, sewage treatment is an alien business in the Maldives: most of the islands sewage effluent is disposed into ground by mean of septic tanks or untreated into sea.

* There is potential impact of the untreated wastewater on the health of people and the environment, and the fear of these chemicals getting into the food chain.
Sewage Disposal

Sewage Treatment in Maldives

One of the effects of the disposal of untreated sewage and wastewater to the marine environment is **eutrophication**. Disposal of untreated sewage and food waste are believed to be major contributors to the nutrient influx to the marine environment. This is evident from the growth of seagrass beds in the vicinity of islands following inhabitation or increased population in the islands. There are neither existing guidelines nor a framework for monitoring and assessment of nutrient levels in the marine environment.

Increase in the extent of seagrass with inhabitation and increase in population in B.Goidhoo (left) and K.Maafushi (right).
Agriculture

In the Maldives, the impact on the marine environment from agriculture is believed to be locally insignificant. Leaching of pesticides and fertilizers into the freshwater aquifer is expected to have a more significant impact than on the marine environment. In-depth studies have not been undertaken in the Maldives to assess the level of impact from agriculture in the Maldives.
Agriculture

The cumulative effects of pesticide use may be considerable in the region since the Bay of Bengal area is bordered by countries that carry out significant agricultural activities. At present, **internationally banned persistent organic pollutants (PoPs) are banned from import into the country.** With the adoption of the pesticide bill, the remaining few PoPs that are imported are expected to be banned as well.

A GEF funded project on groundwater protection through sustainable extraction of freshwater has been approved by National Planning council. The project will also undertake a study into the effects of chemical seepage into the groundwater aquifer and the surrounding marine environment.
Coastal Development

- Sedimentation from Dredging and Reclamation activities.
- Effluent Discharge from industrial activities eg: canaries and processing factories.
- Leaching and runoff from agricultural islands
- Leaching and runoff from landfills eg: thilafushi
Ballast Water

Marine pollution of oil or the problem of invasive species from ballast water from ships may not be a major issue in the Maldives as the ships that arrive in the Maldives carry cargo with them and therefore do not need considerable amounts of ballast in their hulls. However, all container ships carry about 200 tonnes of ballast water and ships entering the Maldives are required to change their ballast water at least 50 miles from the nearest land and in water at least 200 meters depth under IMO regulations (IMO, 2002). While it is expected that ships follow this regulation, there is no mechanism to monitor and enforce the legislation at present in the Maldives.
Government Initiatives
Ministry of Environment and Energy
Malé

Regulation number: 2013/R-58

WASTE MANAGEMENT REGULATION

Part One - Introduction

Introduction 1. Given that Article 22 of the Constitution of the Republic of the Maldives states that the State shall undertake and promote desirable economic and social goals through ecologically balanced sustainable development and shall take measures necessary to foster conservation, prevent pollution, the extinction of any species and ecological degradation from any such goals, this regulation is constituted for the purpose of pursuing this undertaking. In this regard this regulation determines an action plan of waste management in the Maldives pursuant to article 3 of Act No:4/93 (Environment Protection and Preservation Act of Maldives) with reference to article 7 and 8 of and said Act.

Title 2. This regulation shall be cited as “Waste Management Regulation”.
Ministry of Housing and Environment

Male'  

Regulation Number: 2012/R-18  

1st Amendment to the Regulation on the Preparation of  
Environmental Impact Assessment Report 2012  

1. Amendment of (a) of Article 13 of the Regulation as follows.  

13. (a) On receipt of the Environmental Impact Assessment Report, the ministry shall check the completeness of the report by verifying the administrative checks listed in Annex (g), and if incomplete, the developer should be informed of the acceptance or non-acceptance of the report within 2 (two) working days from the date of receipt.  

2. Amendment of (a) of Article 20 of the Regulation as follows, followed by declaring the policy on penalizing those who repeat the offenses described in this article; and adding the following annex to the regulation.  

20. (a) A developer who commits any of the offenses described below, shall be fined by an amount not more than 200,000 (two hundred thousand) Rufiyaa. Schedule T of this regulation describes how this fine shall be imposed. Details of the offenders charged under this article shall be made public.
Schedule T

Policy on imposing fines on those who repeat the offences described under (a) of Article 20

For the purposes of this Annex, the phrase ‘repetition of the offense’ is interpreted to mean that the first offense and the second offense are repetitions, and they need not necessarily be the same offenses.

<table>
<thead>
<tr>
<th>Number of time of offense described in (a) of Article 20</th>
<th>Amount to be fined</th>
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<tbody>
<tr>
<td>1. If it is the first offense</td>
<td>20,000 (twenty thousand) Rufiyaa</td>
</tr>
<tr>
<td>2. If it is the second offense</td>
<td>60,000 (sixty thousand) Rufiyaa</td>
</tr>
<tr>
<td>3. If it is the third offense</td>
<td>120,000 (Hundred and twenty thousand) Rufiyaa</td>
</tr>
<tr>
<td>4. Every offense after the third offense</td>
<td>200,000 (Two hundred thousand) Rufiyaa</td>
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3. This amendment to the Regulation on Compilation of Environmental Impact Assessment Report shall come into force on the day this amendment is published in the government’s gazette.
Law No: 4/93

ENVIRONMENT PROTECTION AND PRESERVATION ACT OF MALDIVES

Introduction

1. The natural environment and its resources are a national heritage that needs to be protected and preserved for the benefit of future generations. The protection and preservation of the country's land and water resources, flora and fauna as well as the beaches, reefs, lagoons and all natural habitats are important for the sustainable development of the country.

Environmental Guidance

2. The concerned government authorities shall provide the necessary guidelines and advise on environmental protection in accordance with the prevailing conditions and needs of the country. All concerned parties shall take due considerations of the guidelines provided by the government authorities.

Environmental Protection and Conservation
Regulation number: 2013/R-1697

DEWATERING REGULATION

Introduction

1. (a) This regulation is constituted for the purpose of ensuring that the drainage of water in the islands of Maldives in the process of dewatering and subsequent dumping of discharge water into the soil or to the sea, is conducted with minimal impact to the environment. Given water is the source of life and one of the essential elements forming the environment, the purpose of this regulation is to avoid contamination of the groundwater table, to mitigate the damage caused to the water table; and to protect the habitat, the environment, the public and all living organisms from the impact of dewatering.

(b) This regulation is enacted from the rights vested on the Ministry from article 3 of Act 4/93 (Maldives Environment Protection and Preservation Act).
Vietnamese vessel faces hefty fine after ‘major’ damage to Maldives reef

**TOPICS:** Aground Ship  Environment  Environment Protection  EPA  Fuvahmulah

**POSTED BY:** MOHAMMED VISHAM  SEPTEMBER 26, 2016

"MV NGOC Son" ran aground on the reef to the south of Fuvahmulah while carrying water and sewerage material to the island for Sri Lankan contractor Sierra.

PHOTO/MNDF

The Vietnamese cargo vessel which ran aground in Fuvahmulah in August had caused major damage to the reef, environment protection agency said Monday.

A Vietnamese shipping company may be fined a record MVR 633 million (US$45 million) for damaging a reef in the country, according to a proposal by environmental regulator.

- MV NGOC Son allegedly damaged the island’s south western reef on August 13
- The carrier vessel belonging to Northern Shipping Joint Stock Company was carrying construction material for a water and sanitation project Fuvahmulah
Current Challenges
Thank you for your attention!

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