

Fourth Regional 3R Forum in Asia

“3Rs in the Context of Rio+20 Outcomes – The Future We Want”

Ha Noi, Viet Nam, 18-20 March 2013

Country Analysis Paper

(Draft)

<Maldives>

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1. Introduction

A waste management system is efficient when it accurately correlated to population density, industrial and commercial activities with the respect to geospatial characteristics. The environment is being placed under pressure from a growing population, changing lifestyle and improvements in living standards. Waste are being generating in ever growing volumes. Without adequate treatment and disposal provision for wastes, the risk of polluting the environment is becoming ever greater. It has been recognized that the one of the main causal factor to the devastation of land in the Maldives is the inadequate management of wastes.

Maldives being a small islands country, which islands are separated each other by either a lagoon or sea, waste disposal practices in Maldives vary among islands depending on access to disposal facilities, local custom and government/municipal interventions. Dig a hole and bury it, collect and dump in deep sea or collect and burn it have been practiced as the most cost effect methods of waste disposal. As a result, land degradation, coastal erosion and marine pollution are some major impacts occurred. Challenges to human health and safety are equally important. In this respect, new approaches for waste management are now a priority to the country and hence been/being discussed in various platforms across the country, from the top level ministerial discussions to most common individual discussion.

2. Country Profile

Index	Description	Reference
Geography	800 Km from North to South across the equator at coordinates 7 6 35 N and 0 42 24 S	Google earth
	A double chain of 1,192	DNP, 2009
	Common elevations of islands are less than 2.5 meters above mean sea-level	Mahmood Riyaz et al, 2010
	194 inhabited island and 101 tourist resorts	DNP 2012
Climate	Warm and humid, two distinct monsoon of North East monsoon and South West monsoon	
	Average maximum temperature 31 C Average annual rain fall approx.. 2000 mm	DNP 2012
Population	298,968 with an annual growth rate of 1.69 (exponential)	DNP 2012
Economy	Expanded at an average of 7% per year for the last 25	Martin Medina

	years	
Poverty	Reduced by more than 50%	Martin Medina
Development Status	Graduated from LDC to Middle Income Group with a per capita GDP of US\$2,800	Martin Medina
Main economic activities	Tourism (with a contribution to GDP estimated at 33%), fisheries, construction, transport and related services.	Martin Medina

3. Waste management current situation

Currently the country hosts three landfill facilities per se, these landfills have been developed on three distinct parts of the country as north at Kulhudhufushi, central at Thilafushi and south at Hithadhoo. But, the north facility is dysfunctional as it has been developed on an inhabited island. The inhabitants of the island do not agree to receive wastes from any other islands to their island as “your garbage is not in my backyard”. The construction of both the north and south landfills was financed by the Asian Development Bank (ADB).

3.1 Thifushi Landfill

A mixed solid waste, transportation and disposal service is operated by the Male City Council for Male` (The capital). All waste collected from these islands is transported to Thilafushi where it is disposed of as part of the island land reclamation project. Three barges operate daily between Male and Thilafushi Landfill. Each barge makes two crossings per day carrying five (15 tonne) tipping trucks. All waste is transported and disposed of free of charge to the consumer. However, collection is undertaken voluntarily by the waste producers from the point of waste generation to the transfer station.

Thilafushi landfill is a non-engineered low-lying landfill operated by Male City Council. The landfill operated in this way has an 80-year life expectancy (minimum). Waste stockpile at the site is frequently burned sending massive plumes of dark smoke into the atmosphere.

3.2 Waste Management Facility in the South

The facility located at Hithadhoo of Addu City is privately operated and offers a voluntary fee for service domestic household collection at 50 MVR/month. A collection service is also available to some local industries and a gate fee is charged for waste brought to the facility by other local industries and the tourist resort. Some separation of wastes occurs at household level and rudimentary separation occurs to remove PET, recyclable metals and glass from the general waste stream at the disposal site. Although scrap metal recyclers periodically visit the facility to “cherry pick” high value scrap items, no collection of separated recyclable material has ever taken place. Mixed not recyclable wastes are stockpiled and periodically burned to reduce volume.

The viability of business at Hithadhoo waste management facility is at best marginal. The absence of a sustainable mechanism and local regulation within the waste sector has meant that a significant portion of the potential waste collection business is poached by “competitors” who allegedly dump the waste on the beach foreshore to be washed out to sea by the tide. There is almost no adequate means of redress against less scrupulous operators. Similarly, the collection services operated are voluntary and there is little in the way of effective sanctions against individuals who, instead of utilizing the collection service, dispose of their waste on the foreshore themselves. The business, which operates a small fleet of tipper trucks to collect the waste, is also very sensitive to increases in variable costs such as the cost of fuel. Although, price hikes affect all small businesses to some degree, the problem for the Hithadhoo waste management facility operator is compounded by a wider lack of revenue generation capacity. The operator is unable to increase prices for fear of driving customers to cheaper “competitors” and has not been able to secure other compatible public service contracts that complement the existing business but offset its dependence on fuel.

3.3 Other inhabited Islands

Current arrangements for solid waste management on the inhabited islands are inadequate. Most wastes are dumped onto the island foreshore and burnt at low combustion temperatures. Leachates and unconsolidated wastes are entering the lagoon systems and airborne contaminants are being released into the atmosphere to be inhaled by the island inhabitants.

Until recently, there was little in the way of infrastructure investment in the waste sector on inhabited islands. Waste management infrastructure development on these islands was started following the Indian Ocean Tsunami in 2004 when the tsunami debris and other mixed wastes were accumulated on the impacted islands. The Government started a clean-up programme and realized that there was an urgent need of providing the infrastructure to those islands. Hence construction of island waste management centres were first started on tsunami impacted islands. The constructions of these centres were with the financial aid from international organizations as Association of Australian Red Cross and Canadian Red Cross, UNDP and the EU/World Bank.

3.4 Tourist Resorts

The Maldives currently hosts 101 tourist resorts. Waste management activities on tourist resorts falls under the jurisdiction of the Ministry of Tourism, Arts and Culture. The tourism regulation “*Regulation on Disposal of Garbage*” requires all tourist resorts to burn their combustible wastes (including plastic bags) in on-site incinerators, and to crush cans and bottles. Food wastes may be ground up and disposed of in deep water. In theory resort islands may only remove processed recyclable wastes and other non-combustible/ non-putrescible residual wastes for disposal elsewhere. In practice, however, mixed solid wastes from resorts are often backloaded on resort service dhonis traveling between Male and the resort and disposed of at Thilafushi. An unloading fee is charged based on the length of the dhoni per hour it is berthed at the landfill unloading platform (m/h).

4. Development in the waste management sector in the Maldives

As identified in the public perception of environment survey carried out in 2007, waste management has been one of the key environmental issues in the Maldives. Following are the key developments in the period between 2007 and 2010.

4.1 Waste Management Policy

It is widely recognised that without a national policy framework and implementation strategy for waste management the potential for improving environmental outcomes in this sector will be limited.

Progress at island level, through direct INGO intervention has, however, outstripped the capacity of the Ministry of Environment, Energy and Water to develop and implement National Policy initiatives to meet the National Development Programme objectives.

The National Solid Waste Management Policy for the Republic of the Maldives was formulated in 2007 with the assistance of UNDP. The focus of the policy include the following principal objectives: (1) establishing and activating waste management governance; (2) creating waste producers' duties; establishment of waste management infrastructure; (3) activating the waste management system; and (4) influencing consumer choices and waste management practices promoting 3R

4.2 Development of a Waste Management Regulation

With assistance from UNDP a Waste Management Legislation has been drafted. Public consultation has been undertaken, and it is expected to enact the regulation in the second quarter of the year 2013. With the legislation it is expected that waste management will become more effective with equity and better management.

4.3 Construction of Island Waste Management Centers

Following the Tsunami the Government has constructed of 74 Island Waste Management Centers (IWMC) on tsunami impacted islands with the assistance from Governments of Canada and Australia through the association of Australian Red Cross and Canadian Red Cross (ARC/CRC). The Government of Maldives and UNDP also developed projects under which waste management centres were built on a number of islands. Later the development this basic infrastructure for waste management has been extended to other inhabited islands and hence 121 IWMCs have been constructed to date. Another 10 IWMCs are under construction. The design of these centers is based on the premise that 70% of the household waste fraction produced on the islands is organic and can be adequately treated, reused or disposed of on the island through composting, that 1% hazardous waste and 3% of household waste fraction that is recyclable can

be stored on the island and removed periodically, and that only the remaining residual fraction, 26% of the household waste generated will require routine collection and transportation for disposal elsewhere.

4.4 Procurement of Equipment in the Waste Management

Under EU funded South Ari Project, solid waste management equipments were procured and handed over to utility companies that were formed in the 7 provinces and the equipments have been placed in selected islands to be developed as model islands in waste management in the respective regions. The equipments include trucks, excavators, and small fuel assisted incinerators, can crushers, plastic shredders, chippers, generators, 240 L bins and 660L bins.

4.5 Decentralization of Waste Management

In 2010 a new governance structure for the Maldives has been established under a law (decentralization Act). Therefore, by the law the local councils have been mandated to waste management. This was a major shift from central planning to respective region. With the name change of Environment Research Centre to Environmental Protection Agency, EPA in 2008, now has a role of facilitating and encouraging good practices and enforcing national policies and strategies and implanting national regulatory framework in waste management and other environmental concerns.

4.6 Development of Other Regional Waste Management Facilities

As part of South Ari EU Grant project under the Tsunami aid, feasibility was done on the establishment of an engineered waste management facility in the north central region of Maldives. Due to funding limitation and the high cost that was estimated, the facility was not developed as part of the project, but the funds were used for the procurement of waste management equipments and consultancy projects such as understanding the waste management in tourist resorts.

A feasibility study was also done on the establishment of an engineered site in the Upper North region of the country as part of the ongoing World Bank funded Maldives Environmental Management Project. After all the necessary studies have been undertaken, the construction works of the facility have been contracted to a company, which was selected through international procurement. It is expected that the work on ground will begin in early third quarter of 2013 to establish the site, after which collection of waste from different islands in the region will commence. To facilitate this, the procurement of vessels for collection and movement of waste has also been tendered. Complementary studies have also been undertaken by EPA, such as the guideline on the transport of waste on sea and land with assistance from UNDP.

4.7 Recycling

Wastes transported to Thilafushi are manually sorted by foreign guest workers to remove recyclable wastes. Although periodically a wider range of recyclable wastes have been collected, PET and recyclable metals are predominantly the wastes streams stockpiled at Thilafushi. Scavenging rights over all waste received on the island have been issued to a private company who periodically crush and export the stockpiled recyclable wastes. Data from Maldives Custom Service indicates that there has been an increasing trend in the tonnage of recyclable metals exported over the last five years. Although the overall trend is positive there is, however, significant annual variation in the figures.

Recycling in the Maldives has not gain a significant attention. However, a study conducted on the feasibility of recycling in the Maldives in the year 2009 indicates that some materials are currently being recovered from the waste stream for recycling. Some of them are processed locally but most of them are exported. The following are the materials currently salvaged from waste:

- 1) Between 300-400 tons of metals / month are recovered and exported to India
- 2) Approximately 30 tons of PET / month are recovered and exported to India

Furthermore, the study claims that current recycling rate is about 15 % of the municipal solid wastes (MSW) generated in Male. At the national level the recycling rate would be 4.9 %.

Since the recovery of recyclables occurs from mixed wastes, it requires more effort, time, and the quality of the materials is lower compared to securing materials segregated at the source.

The following table and chart show the composition of waste according to the JICA sponsored study:

Waste Composition in Male

Composition	Percentage
Food waste	22.22 %
Yard waste	50.85 %
Wood	1.74 %
Other organic waste	4.64 %
Total compostable waste	79.45 %

Paper	1.87 %
Cardboard	1.55 %
Plastic film	1.84 %
PET	0.14 %
Other plastics	0.66 %
Rubber & leather	0.77 %
Textiles	1.75 %
Glass	1.37 %
Steel cans	2.35 %
Aluminum cans	0.15 %
Other metals	0.34 %
Dirt, ash, stone, sand	7.60 %
Hazardous waste (batteries)	0.17 %

As it can be seen, organic matter comprise most of the wastes generated in Male. Highly organic wastes present problems in tropical countries, since it decomposes quickly. Organic wastes can be breeding grounds for various animals that can transmit diseases. But organic wastes can also become opportunities and turn into a resource by composting them. Inorganic materials present in the waste can also be recovered, but in smaller quantities.

5. Challenges and Barriers

Population dispersed with insignificant numbers on small islands separated each other by a lagoon or sea, hinders providing a practical solution for the waste management. It was further identified the following as the major barriers to delivering efficient waste management services within the Maldives:

1. The pressing need for greater levels of government investment in waste management infrastructure and equipment within the inhabited atolls and islands. This is not a problem in the resort islands, but there are concerns about the design and age of some of the equipment, such as the incinerators, and some of the prevailing practices such as dumping food waste into the marine environment;
2. This lack of investment within the waste infrastructure within inhabited islands is exacerbated by, as well as a function of the lack of appropriate cost recovery mechanisms throughout the sector;

3. Inadequate institutional capacity and financial resources within key government agencies resulting in an inability to fully execute mandated responsibilities;
4. The absence of a national waste management policy resulting in a lack of clear roles and responsibilities, leadership and co-ordination;
5. Inadequate level of education and awareness, resulting in low levels of compliance from the public, coupled with uncertainty about available options and best practices;
6. Weak legislative and regulatory framework that hinders effective monitoring and enforcement;
and
7. The limited involvement of the private sector in service delivery resulting in opportunities to improve efficiency and reduce costs not being fully realized.