

Republic of Maldives: Greater Male' Environmental Improvement and Waste Management Project

Initial Environmental Examination – Transfer Station Improvements
Subproject for Malé and Villingilli

Initial Environmental Examination – Improvement of Waste Handling and
Processing Facilities for Thilafushi Island
(Construction and Demolition Waste Plant, End-of-Life Vehicle
Dismantling Workshop, Waste Vessel Harbor Improvements, and
Administration Building)

Initial Environmental Examination – Island Waste Management Center in
Thulusdoo Island

Environmental Assessment and Review Framework

Resettlement Framework

Land Acquisition and Resettlement Due Diligence Report –Thulusdhoo
Island Waste Management Improvements Subproject

Initial Environmental Examination – Due Diligence for Output 1
Subprojects: Transfer stations in Malé and Villamalé; Construction and
Demolition Waste Processing Plant; End of Life Vehicle Dismantling
Workshop, Waste Vessel Harbor at Thilafushi and Administrative
Buildings for WAMCO

Document Stage: Draft
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March 2018

Prepared by the Ministry of Environment and Energy of the Republic of Maldives for the
Asian Development Bank

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MLD: Greater Malé Environmental Improvement and Waste Management Project –Transfer Station Improvements Subproject for Malé and Villingilli

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CURRENCY EQUIVALENTS

(as of 15 March 2018)

Currency unit	–	Rufiyaa (Rf)
Rf1.00	=	\$0.065
\$1.00	=	Rf15.449

ABBREVIATIONS

ADB	-	Asian Development Bank
BPEO	-	best practicable environmental option
CDTA	-	capacity development technical assistance
CDW	-	construction and demolition waste
CEMP	-	Contractor's Environmental Management Plan
dB L _{eq}	-	continuous noise equivalent level, expressed in decibels
DMS	-	detailed measurement survey
ELV	-	end of life vehicle
EMP	-	Environmental Management Plan
EPA	-	Environmental Protection Agency
EPPA	-	Environmental Protection and Preservation Act of 1993
GOM	-	Government of the Republic of Maldives
GRC	-	grievance redress mechanism
GRM	-	grievance redress mechanism
IEE	-	initial environmental examination
IMO	-	independent monitoring organization
IRC	-	Inter-Ministerial Resettlement Committee
IWMC	-	Island Waste Management Centre
MEE	-	Ministry of Environment and Energy
MPW/100ml	-	most probable number (of bacteria) per 100 milliliters of water
NAPA	-	National Action Programme of Action (for climate change)
O&M	-	operation and maintenance
PMDSC	-	Project Management, Design and Supervision Consultants
PMU	-	project management unit
RWMF	-	regional waste management facility
WAMCO	-	Waste Management Corporation

NOTE

In this report, "\$" refers to US dollars.

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EXECUTIVE SUMMARY

1. The Greater Malé Environmental Improvement and Waste Management Project (the Project) will establish a sustainable solid waste management (SWM) system in the Greater Malé capital region and its inhabited outer islands by (i) establishing a modern waste collection, transfer, and disposal system, (ii) improving community-based outer island waste management systems, (iii) building institutional capacity for sustainable services delivery, and (iv) raising public awareness in reduce, reuse, recycle (3R) behaviors. Physical and non-physical investments are designed to curb climate change and disaster impacts while creating a cleaner environment in Maldives. The executing agency is the Ministry of Finance and Treasury (MOFT). The implementing agency is Ministry of Environment and Energy (MEE) who will establish a project management unit (PMU) comprising officials from MEE and Waste Management Corporation Limited (WAMCO). The PMU will have responsibility for overseeing project management, with support from Project Management, Design and Supervision Consultants (PMDSC).

2. The Project will have three outputs: (i) Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient, (ii) Output 2: Community-based outer island waste management systems targeting poor and women enhanced, and (iii) Output 3: Institutional capacity and public awareness in sustainable waste management strengthened.

3. **Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient.** This will include (i) an efficient waste collection strategy designed and applied in Malé and Hulhumalé in consultation with local communities targeting women; (ii) waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhumalé and Villimalé provided; (iii) transfer stations in Malé and Villimalé constructed and transfer station in Hulhumalé designed; (iv) construction and demolition (C&D) waste processing plant and end of life vehicle (ELV) dismantling workshop constructed; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) 3 vessels for waste transport from outer islands to Thilafushi provided; (vii) heavy equipment (bulldozers, excavators, roll trucks) for controlled dumpsite management at Thilafushi provided; and (viii) construction of 2 administrative buildings for WAMCO at Malé transfer station and Thilafushi waste vessel harbor. All facilities designed will consider climate change and disaster resilient features.

4. **Subproject Scope.** This initial environmental examination (IEE) has been prepared for the subproject on improvements to waste handling and processing facilities including transfer stations in Greater Malé and Villingilli. The planned improvement works comprise the following components: (i) rehabilitation of existing transfer station on Malé; and (ii) upgrading of an existing Island Waste Management Center (IWMC) on the island of Villingilli to a transfer station. These facilities will, collectively, improve the handling and transport of solid waste in Greater Malé, benefiting a population of approximately 183,000 at present, which is projected to rise to 333,000 by 2030 and 528,000 by 2047. Waste collected from homes, institutions and industries is conveyed to transfer stations and then to a waste management facility at Thilafushi, which will be covered under a separate ADB loan in the future.

5. **Malé.** The Malé transfer station will have a vehicle weighbridge and administration building, a ramp system to transfer waste from collection trucks to the containers, an improved perimeter fence and an allowance for green space and a buffer zone. It is to be a focal point for the development of the Waste Management Corporation's (WAMCO's) activities to facilitate organizational and logistical improvement and will include facilities for parking and maintenance for WAMCO's vehicle fleet. The station will be built at an existing site on newly reclaimed land, with an available area of approximately 6,000m². This area is surrounded by Malé's south harbor and various administrative buildings, which are government-owned. The site is serviced by a water supply, electrical power and drainage.

6. **Villingilli.** The IWMC on Villingilli island will be improved and upgraded as a small transfer station, with a secure perimeter wall, asphalt or concrete surface, sheds and equipment. Currently, the existing IWMC has a wall along one side which does not cover the full perimeter, and has no facilities to encourage separation of different fractions of waste. This is underutilized, and consequent haphazard dumping occur in the residential area.

7. This IEE has been prepared based on preliminary designs of the subproject and will be finalized based on the final detailed design. This IEE shall be attached in the bid and contract documents. The civil works package of the transfer station subproject will be awarded to selected Contractor who shall update this IEE based on the final detailed design, and submit the final IEE to the executing agency through the project management unit (PMU). Subsequently, the PMU shall submit the final IEE to ADB for final review and disclosure.

8. **Categorization.** ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB Safeguard Policy Statement (SPS), 2009. Using ADB Rapid Environmental Assessment Checklist, the subproject is classified as Environmental Category B as per the ADB SPS, 2009 as no significant impacts are envisaged. Accordingly, this IEE has been undertaken, which assesses in more detail the likely environmental impacts of the subproject and provides an environmental management plan (EMP) specifying the required mitigation and monitoring measures to ensure that these impacts are managed to acceptable levels. This IEE also emphasizes the need to incorporate pollution prevention and control technologies during the design, construction, and operation of the subproject and adhere to internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines.

9. **Environmental Management.** The potential impacts and mitigation measures have been identified through review of the feasibility study prepared for the project, discussion with the designers, and stakeholder consultation. An environmental management plan (EMP) is included as part of this IEE, which discusses the following:

- (i) mitigation measures for environmental impacts during implementation and operation; and
- (ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting.

10. The transfer stations exist in their current form to address existing impacts of solid waste generation and accumulation, by enabling bulk handling of waste such that it can be efficiently removed from residential and industrial areas and construction sites, sorted and loaded onto vessels for transport to the landfill on Thilafushi island. The project is to improve these facilities, and enable them to handle growing future waste flows, and will be situated at sites currently in use for waste management. Project includes a community outreach component to promote the 3Rs and mitigate both the volume of solid waste that will increase with growing population and the level of separation, to facilitate efficient handling of the different fractions. Each facility is located close to, or on the shoreline and some waste is lost to the sea during the process of loading of onto transfer vessels and this is likely to increase with population growth and consequent increases in quantities of solid waste generated. The project envisages introducing a containerized system and upgraded equipment for handling and transportation as well as more efficient separation of waste fractions. The resulting improvements in efficiency of waste handling are expected to result in long term, positive and significant impacts covering both the immediate area around the islands and the wider marine environment in Zone 3 and beyond.

11. No impact on vegetation is envisaged at any of the locations. Land surrounding the facilities is mainly reclaimed land in the case of Malé, and residential in the case of Villingilli. Improvements in efficiency of operation are expected to reduce current noise and exhaust and dust emissions at each of the three sites. Similarly, improved efficiency is likely to lessen traffic impacts on Malé, though there will be no significant impact in Villingilli as traffic levels are low on the island as a result of restrictions on numbers and types of vehicle allowed on the island.

12. No private property will be affected and no land acquisition will be required for any of the sites. The methods to be used for site preparation, fabrication, construction and commissioning, as well as associated arrangements to ensure sound environmental management and safety at all times, are to be defined by the Contractor in a Contractor's Environmental Management Plan (CEMP) submitted to the project management, design, and supervision consultants (PMDSC) for approval. These will cover the following areas of impact which are potentially significant but can be mitigated by the adoption of good practice: (i) impedance of traffic, (ii) noise pollution and vibration, (iii) waste generation (iv) release of silt from excavations, (v) water pollution, (vi) air and dust pollution, (vii) community health and safety risks, and (viii) occupational health and safety.

13. The proposed improvements are designed specifically to address existing and future operational constraints related to safe and efficient handling of waste, collection of recyclables and shipment to Thilafushi. Existing impacts that are addressed including excessive loss of waste to the sea during loading of transfer vessels, site security, inability to accurately weigh incoming waste, constraints on maintenance and safe storage of vehicles and plant, and site drainage. The use of containers will provide a more efficient system of handling and loading waste, reducing potential losses into the sea. Risks of breakages or mishandling will be mitigated by operation and maintenance training for the containers and handling plant. Improvements will reduce exposure of waste to pests and reduce their occurrence. While each station will handle a growing quantity of waste, and therefore increased vehicle movements, this will occur without the project and will be mitigated by support to WAMCO in developing improved systems of waste collection rosters on each island.

14. **Analysis of Alternatives.** Options analysis for the best practicable environmental option (BPEO) has been undertaken by the consultant team engaged by MEE. For Malé, the layout of the proposed infrastructure improvements has been dimensioned in such a way that future strategies in terms of sorting, recycling and waste flow handling have been taken in account, and projected quantities of each fraction of solid waste have been projected for the design.. The option of direct transport of waste to Malé via a bridge is mentioned for the Villingilli facility, however the construction of such a bridge is likely to be well into the future.

15. Regarding alternatives to project scope, the design of the transfer stations envisages the use of containers, to receive waste from delivery trucks and transfer it to vessels. An alternative to this is an "open" system where trucks are offloaded mechanically, or they tip the waste to a central area or directly onto awaiting vessels, which is not considered acceptable due to likelihood of excessive losses of waste to the sea.

16. Under the "no project" scenario, there will be no means of increasing the handling capacity of the existing waste handling facilities to meet the requirements imposed by the growing volumes of waste, which would vastly exacerbate existing problems.

17. During feasibility study preparation and the identification of the BPEO for the transfer stations and other aspects of the integrated solid waste management system for Zone III, the team worked with key stakeholders such as MEE and WAMCO, and stakeholders are identified

in a stakeholder analysis. Consultations have consistently shown a strong desire for the existing solid waste management system to be improved.

18. **Grievance Redress Mechanism.** A Grievance Redress Mechanism (GRM) will be established at two levels, one at the project site level and another at the level of the PMU, to receive, evaluate and facilitate the resolution of concerns, complaints and grievances of all affected persons. The Grievance Redress Committee will aim to provide a time bound, transparent and thereby trusted way to voice and resolve concerns linked to the project, including environmental concerns, and to be an effective way to address affected the concerns of affected persons without allowing it to escalate and cause delays in project implementation. The GRM will operate on two levels: (i) the first level to be handled on the island where the work is to take place, via a committee; and (ii) the second level to be handled by the PMU.

19. **Implementation Arrangement.** The executing agency is the Ministry of Finance and Treasury. The implementing agency is the Ministry of Environment and Energy (MEE), which will establish a PMU comprising officials from MEE and WAMCO. The PMU will be strengthened with external experts in the areas of finance, procurement, technical areas, and contract management. The PMU will have responsibility for overseeing project management, with support from PMDSC. These functions will include overseeing EMP implementation.

20. For civil works, the Contractor will be required to (i) obtain all statutory clearances prior to commencement of civil works; (ii) establish an operational system for managing environmental impacts (iii) prepare a CEMP based on the EMP of this IEE, and submit to PMDSC for approval; (iv) carry out all of the monitoring and mitigation measures set forth in the approved CEMP; and (v) implement any corrective or preventative actions set out in safeguards monitoring reports that the executing agency or implementing agency will prepare from time to time to monitor implementation of this IEE, EMP, and CEMP. The Contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

21. **Monitoring and Reporting.** An environmental monitoring system has been designed, based on an analysis of the key environmental performance issues associated with each stage of the project. Two areas of environmental monitoring are identified, namely: compliance monitoring and community feedback, which are in addition to monitoring measures in the Design and Monitoring Framework for the project. These provide a means of gauging whether the stations operate more efficiently and with less loss of waste into the sea.

22. EMP compliance monitoring will be undertaken by the PMU, with support of the PMDSC. Effects will be monitored by means of community feedback and laboratory testing. Consistent with reporting requirements set out in the Project Administration Manual, PMU will prepare and submit reports to ADB on a semi-annual basis. To facilitate monitoring and enable responses to emerging issues, monthly reports will be prepared by the PMU and submitted to the MEE.

23. The overall finding of this IEE is that the subproject will result in significant environmental benefits, because it is conceived and designed to address major environmental issues associated with existing difficulties in waste handling and transfer and the rapidly growing volumes of waste that are projected in coming decades. The subproject will not have significant adverse environmental impacts and the potential adverse impacts identified are associated with the construction phase, which can be managed through effective implementation of the EMP. No further environmental assessment is therefore required and the classification of Category B is confirmed. However, this IEE will be finalized based on the final detailed design and this classification shall be reassessed or reconfirmed.

I. INTRODUCTION

1. The Greater Malé Environmental Improvement and Waste Management Project (the Project) will establish a sustainable regional solid waste management (SWM) system in Greater Male by (i) improving collection, transfer, disposal, treatment, recycling, and dumpsite rehabilitation; (ii) strengthening institutional capacities for solid waste services delivery and environmental monitoring; and (iii) improving public awareness and behaviors in reduce-reuse-recycle (3R).¹ The Project will be designed to reduce disaster risk and improve climate change resilience while creating a cleaner environment and reducing greenhouse gas emissions.

2. The Project will establish a sustainable SWM system in the Greater Malé capital region and its inhabited outer islands by (i) establishing a modern waste collection, transfer, and disposal system, (ii) improving community-based outer island waste management systems, (iii) building institutional capacity for sustainable services delivery, and (iv) raising public awareness in 3R behaviors.² Physical and non-physical investments are designed to curb climate change and disaster impacts while creating a cleaner environment in Maldives, one of the world's lowest-lying nations.³

3. The Greater Malé capital region (classified as Zone 3 in the National Solid Waste Management Policy and the most populated in the country),⁴ suffers from severe environmental pollution and deteriorating livability due to inadequate collection and haphazard disposal of solid waste. Open dumping and burning of garbage at the 30-year-old 10-hectare dumpsite on Thilafushi Island (6 km from Malé) creates a significant environmental and public health hazard. Plumes of smoke visible from the capital city Malé, the international airport, and surrounding resorts compromise air quality and pose a daily nuisance to residents and tourists, while toxic leachate contaminates soil and groundwater. Greater Malé and its 32 inhabited outer islands lack an organized and sustainable waste management system for the 774 tons of mixed solid waste generated per day (tpd).⁵ With rapid urbanization and tourism development in the region, waste generation is expected to grow to 924 tpd by 2022. This increasing pressure on an already stressed waste management system poses a significant threat to tourism and fisheries, both of which rely heavily on the country's pristine environment and are cornerstones to the Maldives economy.⁶ Poor communities in outer islands suffer from accumulated garbage with limited awareness and capacity to effectively manage solid waste.

4. **Existing waste collection, transfer, and disposal system.** High population density and narrow streets present unique challenges for waste collection in Malé. Waste collection is operated by the Waste Management Corporation Limited (WAMCO), a state-owned operator created in 2015 to collect and transport waste and manage the regional waste management facilities throughout the

¹ ADB. 2016. *Country Operations Business Plan: Maldives, 2017–2019*. Manila. The project is confirmed via letter dated 17 July 2016.

² The project area encompasses the inhabited islands of the Malé Atoll, North Ari Atoll, South Ari Atoll, and Vaavu Atoll with a total population of 216,000 inhabitants (51% of Maldives). It comprises the capital city of Malé, and 35 inhabited islands. There are 76 resorts in the project area. The Greater Malé capital region within the project area consists of seven islands (Thilafushi, Gulhifalhu, Villimalé, Malé, Funadhoo, Hulhulé and Hulhumalé) and is the most populated.

³ ADB. 2017. *Technical Assistance to Maldives for Preparing the Greater Malé Environmental Improvement and Waste Management Project*. Manila.

⁴ The National Solid Waste Management Policy (2015) divided the country into 7 regional waste management zones (map) each with a regional waste management facility and system for safe transfer to those facilities.

⁵ Breakdown of solid waste by type: household = 149 tpd (19%), commercial = 27 tpd (3%), resort = 48 tpd (6%), C&D = 530 tpd (68%), market = 2.5 tpd (0.3%), airport = 9.3 tpd (0.3%), hazardous = 1.5 (0.2%), end of life vehicles = 0.65 tpd (0.1%), industrial = 6 tpd (0.8%). Waste composition: organic (53%), paper and cardboard (12%), plastic (11%), hazardous (medical) waste (8%), metal (3%), glass (3%), and others (11%). *Source: Project Feasibility Study final report (2017)*.

⁶ Tourism and fisheries account for a quarter of total employment in the country (2014 Census). Tourism being the most rapidly expanding industry and being the highest contributing sector to the Maldivian gross domestic product.

country.⁷ WAMCO has limited professional experience in modern and efficient waste collection systems. The lack of technical and managerial skills is a key issue affecting sector performance.⁸ While WAMCO is trying various initiatives to improve collection, the company received nearly 150 complaints per day (as of September 2017) on its hotline mostly related to non-collection. Collection equipment includes a fleet of aging vehicles unable to access narrow streets. There are no uniform refuse bins or formal transfer stations. Waste is transported to Thilafushi Island in open non-containerized vessels resulting in significant spillage into the ocean.⁹ Since 2008, fires have been deliberately set at the dumpsite to reduce growing mounds. On-site equipment and poor site logistics are severely inadequate to efficiently manage incoming waste and maximize use of limited space. There is no separate collection and processing of construction and demolition waste (CDW) and end-of-life vehicles (ELV).¹⁰ Household surveys in the project area show a high demand for 3R awareness and education programs.¹¹

5. **Impact and Outcome.** The Project is aligned with the following impact: a healthy living environment created in the Greater Malé capital region and its outer islands. The Project will have the following outcome: climate and disaster resilient SWM services improved.¹²

6. **Outputs.** The Project will have three outputs.

7. **Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient.** This will include (i) an efficient waste collection strategy designed and applied in Malé and Hulhumalé in consultation with local communities targeting women; (ii) waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhumalé and Villimalé provided; (iii) transfer stations in Malé and Villimalé constructed and transfer station in Hulhumalé designed; (iv) construction and demolition (C&D) waste processing plant and end of life vehicle (ELV) dismantling workshop constructed; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) 3 vessels for waste transport from outer islands to Thilafushi provided; (vii) heavy equipment (bulldozers, excavators, roll trucks) for controlled dumpsite management at Thilafushi provided; and (viii) construction of 2 administrative buildings for WAMCO at Malé transfer station and Thilafushi waste vessel harbor. All facilities designed will consider climate change and disaster resilient features.

8. **Output 2: Community-based outer island waste management systems targeting poor and women enhanced.**¹³ This output will provide comprehensive support to strengthen sustainable solid waste management in poor outer island communities. It includes (i) a minimum of 22 island waste management centers (IWMCs) with processing equipment (balers, glass crushers, metal presses) developed or upgraded in consultation with community targeting women and incorporating climate and disaster risk measures;¹⁴ (ii) collection equipment for outer islands (bins, refuse collection vehicles, dump trucks) provided; (iii) capacity building of eligible island councils targeting women in waste collection, segregation, composting, recycling, and O&M; and (iv) community awareness and behavior change campaigns in 3R targeting women in outer islands delivered. As subprojects under Output 2 will be prepared after Board approval, each island is required to meet minimum eligibility and selection

⁷ WAMCO does not operate collection within the outer islands. This is the responsibility of island councils.

⁸ Current collection coverage is estimated to be 89% in Malé, 89% in ViliMalé, and 84% Hulhumalé though highly inefficient resulting in waste piles.

⁹ Government of Maldives, Ministry of Environment and Energy. 2016. *State of the Environment*. Malé.

¹⁰ The project will extend the life of the existing dumpsite in the medium term (8-11 years).

¹¹ Around half of TRTA household survey respondents highlighted increasing awareness and education is important. ADB. 2017. *TA-9327. Socioeconomic survey for Preparing the Greater Malé Environmental Improvement and Waste Management Project*. Manila

¹² The design and monitoring framework is in Appendix 1.

¹³ There are 32 outer islands in the project area eligible for support under Output 2.

¹⁴ Out of 32 outer islands, some have existing facilities but are not operational due to inadequate design and insufficient equipment which would be upgraded under the project.

criteria, including safeguards, to receive support from the Project.¹⁵ The criteria is intended to ensure sustainability and is outlined in the Project Administration Manual (PAM).¹⁶ Output 2 will be partially funded by a Trust Fund grant focusing on poverty reduction, which will support islands in the following areas:¹⁷ (i) IWMCs constructed in a minimum of 11 eligible islands, (ii) skills and capacity building in eligible islands targeting women provided, and (iii) awareness campaigns in 3R delivered in all outer islands.¹⁸

9. Output 3: Institutional capacity and public awareness in sustainable waste management strengthened. This will include (i) capacity building support to eligible WAMCO staff (including all eligible women staff) in waste collection, controlled dumpsite management, strategic and financial planning (tariffs, diversified revenue stream), and disaster risk management provided;¹⁹ (ii) a recycling market study conducted;²⁰ (iii) public awareness and behavior change campaigns in 3R targeting the poor and women in Greater Malé delivered;²¹ and (iv) project management, design, and supervision consultant support provided.

10. This initial environmental examination (IEE) has been prepared for the subproject on improvements to transfer stations in Malé and Villingilli under the Project. The planned improvement works comprise the following: (i) a rehabilitated transfer station on Malé; and (ii) upgrading of an existing Island Waste Management Center (IWMC) on the island of Villingilli to a transfer station. These facilities will, collectively, improve the handling and transport of solid waste in Greater Malé, benefiting a population of approximately 183,000 at present, which is projected to rise to 333,000 by 2030 and 528,000 by 2047. Waste collected from homes, institutions and industries is conveyed to transfer stations and then to the RWMF at Thilafushi, which will be covered under a different loan in the future. For existing transfer stations and IWMCs that will require rehabilitation, environmental audit will be conducted in accordance with ADB SPS. to determine the existence of any areas where the Project may cause or is causing environmental risks or impacts. If the Project does not foresee any new major expansion, the audit constitutes the environmental assessment for the project. A typical environmental audit report includes the following major elements: (i) executive summary; (ii) facilities description, including both past and current activities; (iii) summary of national, local, and any other applicable environmental laws, regulations, and standards; (iv) audit and site investigation procedure; (v) findings and areas of concern; and (vi) corrective action plan that provides the appropriate corrective actions for each area of concern, including costs and schedule.

11. This IEE has prepared based on preliminary designs of the subproject and will be finalized based on the final detailed design. This IEE shall be attached in the bid and contract documents.

¹⁵ All 32 outer islands will be screened through the selection criteria outlined in the PAM and EARF. Appraisal and safeguard reports will be approved by ADB prior to start of any project-related physical activities. Subprojects having resettlement impacts will not be included. IWMCs consist of concrete platforms, small covered sheds, segregated waste processing and storage areas, small office, fencing.

¹⁶ Project Administration Manual (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

¹⁷ Additional selection criteria for Trust Fund supported islands includes climate change vulnerability, and women participation in island councils, and is outlined in the Project Administration Manual (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

¹⁸ Upon confirmation from the government and the approval of Trust Fund.

¹⁹ Disaster risk management capacity building will include preparation of a SWM disaster action plan outlining prevention, preparedness, response and recovery tasks. DRM risk awareness activities will include first responders (police, fire fighters) on Thilafushi.

²⁰ The recycling market study will cover plastics, construction and demolition waste, and other primary recyclables.

²¹ Public awareness and behavior change activities under Outputs 2 and 3 will be implemented through a Public Awareness and Community Capacity Building consultant recruited by the PMU.

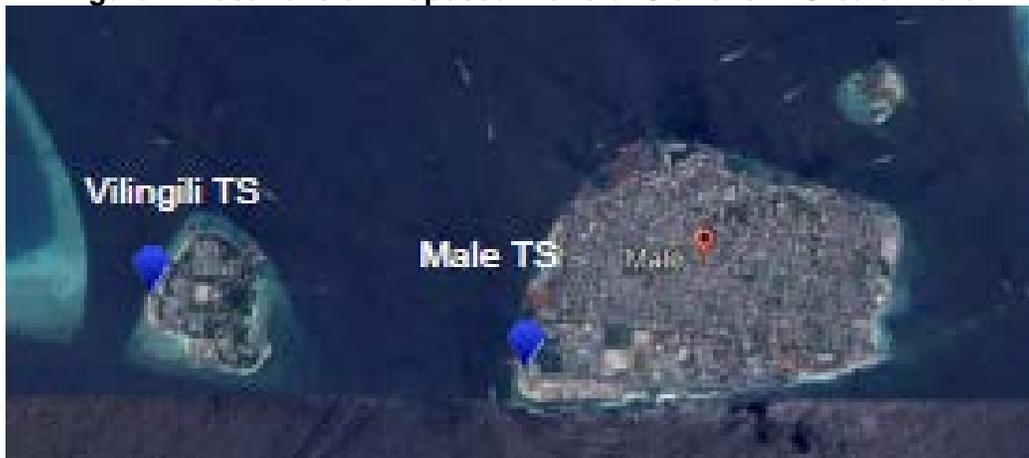
The civil works package of the transfer station subproject will be awarded under a design-build (DB) contract. As such, the DB Contractor shall update this IEE based on the final detailed design, and submit the final IEE to the executing agency through the project management unit (PMU). Subsequently, the PMU shall submit the final IEE to ADB for final review and disclosure.

II. DESCRIPTION OF THE PROJECT

12. The proposed infrastructure improvements are to form part of an improved integrated system of waste management in Zone 3, one of seven zones into which the country is divided for waste management purposes and consisting of the atolls of Alifu Alifu, Alifu Dhaalu, Kaafu, and Vaavu). This description is based on a concept design, prepared by Water Solutions in association with Kocks Ingenieure, which uses a 30 year planning horizon, from 2017 to 2047.

13. The planned works comprise (i) rehabilitation of existing transfer station on Malé and (ii) upgrading of an existing Island Waste Management Center (IWMC) on the island of Villingili to a transfer station. These facilities will improve the handling and transport of solid waste from a catchment area comprising Malé City and Vilingilli. Greater Malé has a population of approximately 183,000 people at present, projected to rise to 333,000 by 2030 and 528,000 by 2047. Over this period the total tonnage of solid waste produced daily is projected to rise from 148.5 tons/day at present to 434.5 in 2030 and 957,000 in 2047, reflecting population growth, increasing per capita waste generation and greater numbers of passengers at the airport.

Figure 1: Locations of Proposed Transfer Stations in Greater Malé



14. Waste is collected from homes, institutions and industries and conveyed to the transfer station. The transfer station at Malé will receive waste from Villingilli and from a future facility on Hulhumale. Following further separation will be transported to the Regional Waste Management Facility (RWMF) at Thilafushi. The main waste streams will comprise household waste and mixed waste from homes, commercial entities including markets and Velana International Airport, construction and demolition waste (CDW) and paper and cardboard waste collected primarily from schools and administrative establishments.

15. Based on a survey of existing CDW generation and composition, and likely levels of construction in the future, carried out by Water Solutions / Kocks in October/November 2017, generation of CDW is likely to rise from a present level of 530 tons/day to 634 tons/day in 2020 and 731 in 2040. CDW is composed mainly of inert material such as aggregates and dust, making

up 91.8% of the total by weight, while most of the rest is wood, making up 7.1%, paper and plastic film material make up a further 1% and the final 0.2% is metal waste.

16. Design of the transfer stations envisages the use of steel containers for conveying waste to the vessels.

17. **Malé Transfer Station.** The feasibility study estimates that around 305,000 tonnes of waste from the Malé, Hulhumalé and Velana airport will be received at the station in the year 2022, the start of operation. This comprises 58% C&D waste, 29.7% household waste, 0.4% market waste, 1.7% commercial waste and 0.2% clinical waste from hospitals. Surveys of waste composition carried out for the feasibility study found that C&D waste comprises mainly 92% aggregates and related (concrete fragments, rock fragments, sand, soil and gravel), 7% wood and the remainder metals and plastics. The composition of household waste is broken down into organic waste (kitchen, garden and other) 60%, paper and cardboard 10%, plastics 10%, glass 3%, hazardous waste (including clinical) 3% and 10% others.

18. At present, the facility receives typically 10 truckloads of waste per day. The feasibility study forecasts this rising to approximately 20 daily truckloads over the life of the Project. Two to three daily transfer vessel sailings to the RWMF are projected, with a turnaround time of approximately 5 hours including loading at the transfer station, the time taken for the crossing (45 mins each way) and waiting and unloading time at the RWMF.

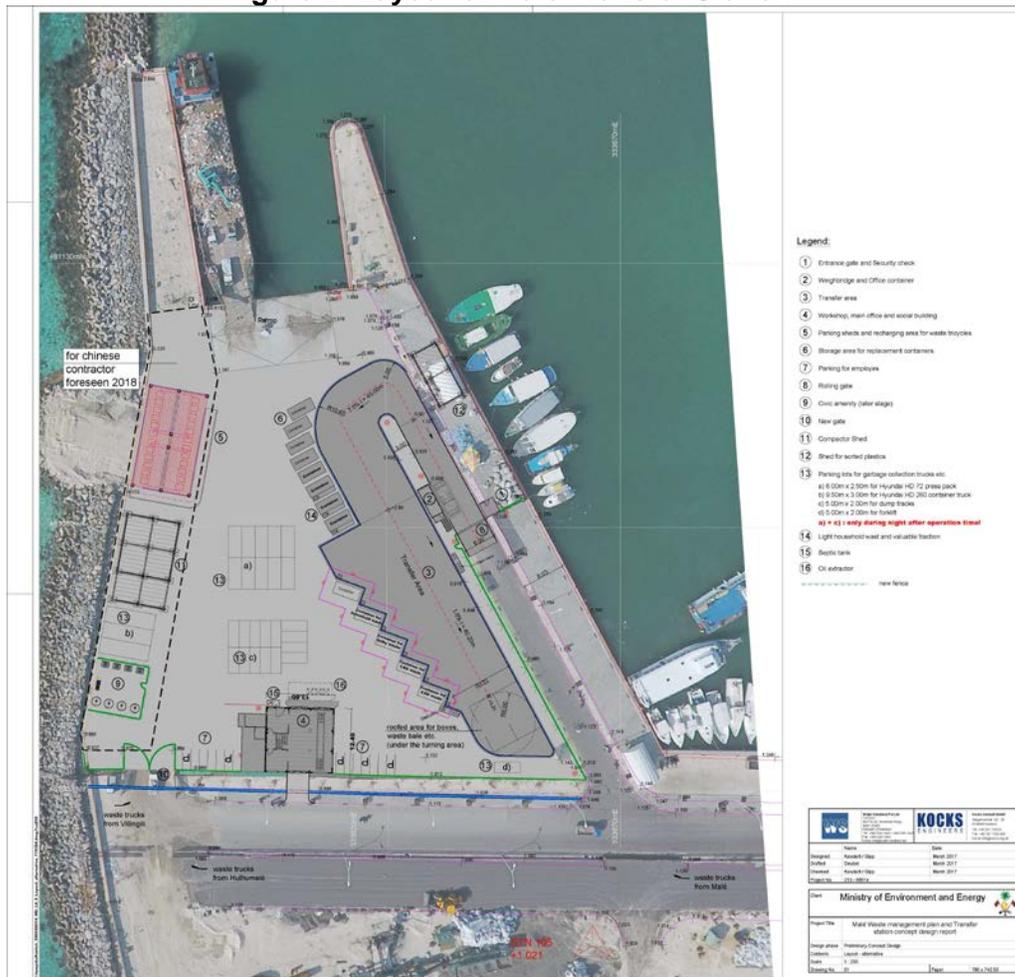
19. Based on requirements for waste handling operations (including sorting, recycling and waste flow handling), vehicle movement and parking, a vehicle weighbridge and administration building, with an allowance for green space and a buffer zone, the improved transfer station at Malé has been designed. Part of the concept is that the Transfer Station will be a focal point for the development of the Waste Management Corporation's (WAMCO's) activities to facilitate organizational and logistical improvement and will include facilities for parking and maintenance for WAMCO's vehicle fleet. It will comprise:

- (i) A steel fenced area with an entrance gate;
- (ii) A waste acceptance office (2 store office container) with a weighbridge;
- (iii) A raised transfer deck with 5 bays and access ramp, for the transfer of waste from trucks (which drive up the ramp and reverse into the bays to tip the waste into containers placed below at ground level);
- (iv) A further raised deck, connected by a curved ramp, to provide parking space for the WAMCO vehicle fleet;
- (v) Space for an administration building;
- (vi) A parking shed for heavy vehicles;
- (vii) Vehicle workshops;
- (viii) Roads; and
- (ix) Miscellaneous site infrastructure (lighting, water supply, rainwater drainage, landscaping etc.).

20. The station will be built at the existing site on newly reclaimed land, with an available area of approximately 6,000m². Surroundings include Malé's south harbor and various administrative buildings, and is under public ownership. The site is serviced by a water supply, electrical power and drainage. A due diligence will be undertaken on the suitability of the reclaimed land where the station will be located.

21. The improved Malé transfer station employs a ramp system for unloading trucks into containers for transfer to the vessel serving the route between the transfer station and the RWMF at Thilafushi. From the design concept report prepared by Water Solutions / Kocks Consulting, Figure 2 and Figure 3 depict the site layout, including an administration building (Which, it is assumed, is being constructed under separate arrangements and is not part of the Project. Environmental audit on the building will be conducted in accordance with ADB SPS.). Incoming vehicles pass over a weighbridge, drive up the access ramp and reverse into unloading bays where containers are placed. Separate containers are to be used for MSW, bulk waste and CDW. The use of standard stackable 6m shipping containers is envisaged, which will be transferred by a reach loader to the Thilafushi bound vessel. Sheltered space is provided for boxes, waste bales and garaging of heavy equipment.

Figure 2: Layout of Malé Transfer Station²²



²² Consultancy Services for Feasibility Study for an Integrated Solid Waste Management System for Zone III (including Greater Malé) and Preparation of Engineering Design of the Regional Waste Management Facility at Thilafushi. Feasibility Report. Ministry of Environment and Energy, Republic of Maldives. December 2017.

Figure 3: 3D Representation of Proposed Layout of the Malé Transfer Station



22. **Villingilli Transfer Station.** The island of Villingilli has an existing Island Solid Waste Management Centre (ISEMCIWMC) which has a wall along one side which does not cover the full perimeter. There are no facilities to encourage separation of different fractions of waste, or to assist loading the waste into containers. Dumping on the beach and within the island is commonplace, showing lack of acceptance and underutilization by islanders. Figure 4 shows an aerial view of the existing IWMC from the air. The IWMC was assessed by Water Solutions / Kocks Ingenieure and found to be managed more or less properly, though in need of some improvement. Deficiencies found include (i) that the area is only partly fenced, (ii) C&D waste is dumped in an uncontrolled manner and (iii) probably undersized for purpose, as much illegally dumped waste can be seen on the beach and around the island, indicating a need for greater capacity.

23. Figure 5 shows the existing poor condition of the site. The concept is for the site to be rehabilitated and provided with a security gate, entrance building, small administration building, a store for recyclables, and a transfer area paved with asphalt or concrete. It retains the existing boundary wall but requires an improved perimeter fence.

Figure 4: Aerial view of the existing IWMC at Villingilli²³



Figure 5: Existing condition of the IWMC



²³ Water Solutions / Kocks Ingenieure (2017) Consultancy Services to Develop and Conceptualize an Efficient and Proper Waste Management System for K Vilingili and K Hulumalé.

Figure 6: Concept layout design of the transfer station²⁴



III. POLICY LEGAL AND ADMINISTRATIVE FRAMEWORK

A. Applicable National Laws, Rules and Regulations

24. The law governing the protection of the environment is the Environmental Protection and Preservation Act (EPPA) of 1993 (Act No 4/93). The law is brief, and sets out the principles for sustaining and extending the benefits of the environment of the Maldives for the people and coming generations. The EPPA confers powers on the MEE to issue regulations and formulate policies for environmental protection and preservation. Such regulations include:

- (i) EIA regulations of 2007, updated in 2012 (Regulation No. 2012/R-27);
- (ii) By-law on Uprooting, Cutting and Transportation of Plants and Trees (2006);
- (iii) Regulation on Stone, Coral and Sand Mining (undated);
- (iv) Regulation for the Protection and Conservation of the Natural Life and character of Old Plants and Trees in the Maldives;
- (v) Dewatering Regulation (213/R-R1697);
- (vi) Environmental Damage Liabilities Regulation (2011/R-9); and
- (vii) Waste Management Regulation (2013-R58).

1. National Solid Waste Management Policy of 2008 and 2015

25. The National Solid Waste Management Policy was developed in 2008, by the Ministry of Environment, through consultations with the community and evaluation of existing waste management

²⁴ Consultancy Services for Feasibility Study for an Integrated Solid Waste Management System for Zone III (including Greater Malé) and Preparation of Engineering Design of the Regional Waste Management Facility at Thilafushi. Feasibility Report. Ministry of Environment and Energy, Republic of Maldives. December 2017.

practices and scope for improved efficiency. The policy was then revised and adapted, and a new policy formulated and adopted in 2015.

26. The policy is in line with government commitment to provide the resources required for waste management in all inhabited islands of the Maldives and is founded on the following 10 principles:

- (i) Each person should be responsible for waste generated at the individual level and should comply with rules and regulations established locally;
- (ii) All household waste should be managed in accordance with the requirements of the local council;
- (iii) Each inhabited island should prepare and submit an island waste management plan for the island;
- (iv) Waste collection should be undertaken on a fee based system for all waste producers, including households and industries;
- (v) Agreements with government agencies in different inhabited islands to ensure management of waste in the islands;
- (vi) Establishment of a waste management system in each inhabited island that is appropriate for the needs of the population and quantity and type of waste generated;
- (vii) Establishment of regional waste management facilities (RWMF) in each waste management zone;
- (viii) Establishment of arrangements to transport all residual waste to a RWMF
- (ix) Promote adoption of waste management practices that generate revenue and to apply revenue to waste management at the island level; and
- (x) Undertake waste management training and awareness campaigns at the national level.

2. Waste Management Regulation (No. 2013/R-58)

27. The Waste Management Regulation of the Maldives was enacted under Article 3 of the EPPA in 2013 and is implemented by the Environmental Protection Agency. The regulation focuses on the following five areas:

- (i) Waste management standards: Defines standards for waste collection, transfer, treatment, storage, waste site management, landfills and managing hazardous waste;
- (ii) Waste management Permits: Defines approval procedures for waste management sites;
- (iii) Waste transfer: Defines standards and permits required for waste transport on land and sea, including trans-boundary movements;
- (iv) Reporting: Defines reporting and monitoring requirements and procedures; and
- (v) Enforcement: Defines procedures to implement the regulations and penalties for non-compliance.

3. Other relevant legislation

28. **Cultural Heritage.** Items of cultural heritage significance are protected under the Law of Historical and Cultural Properties of the Republic of Maldives of 1979 (Law number 27/29) and its implementation is currently under the Ministry of Education. UNESCO state that there is a lack of rules and regulations, constraining the implementation of the law and that there is also no national inventory of heritage properties (no site has yet been inscribed under the World Heritage List). A new law is under preparation and awaiting completion as of June 2017 .

29. **Health and Safety.** Legislation covering occupational health and safety is currently included in the Employment Act (2008), Chapter 8 “Work Place Safety and Employer Health”. This requires employers to implement measures for the safety and protection of employees at the work place, including safe work place, procedures, safe equipment and materials, provision of protective equipment, safety training to employees, conducting health checks where work involves chemical or biological materials that may cause a hazard, providing medical care as well as first aid for employees injured while at work. The law also sets out employee’s obligations with regard to safety at work.

30. **Land use and acquisition.** The Land Act (2002) covers matters relating to land including land use, land ownership, and permissible uses of land belonging to island councils, which includes environmental protection. The land act and processes relating to the project are described in the Resettlement Framework (RF).

B. Environmental Assessment Requirements

31. Responsibilities and procedures for conducting environmental assessments, together with the requirements for environmental monitoring of projects, are set out in the EIA Regulations of 2012. All projects that may have an impact on the environment are referred to the Minister of Environment and Energy (EPPA 5(a)).

32. The EIA Regulations assign primary responsibility for undertaking environmental assessment of projects to the project proponent and set out procedures, rights and responsibilities for the preparation and approval of EIAs. The Ministry of Environment and Energy (MEE) undertakes review and approval of environmental assessment reports.

33. Project proponents are defined in the EIA regulations as a person, department or agency that is seeking to carry out or proposes to carry out the development proposal and in this case is the MEE, as implementing agency for the Project. EIA work must be carried out by registered consultants, and the procedures and requirements for registration are set out in Part V of the regulations.

34. The EIA regulations include a schedule (Schedule D) of investment project types that require an EIA. These include landfills, waste incinerators and large scale waste storage projects. However, some of these project types may be classified as environment Category A as per ADB SPS, 2009, and therefore, will not be considered under this subproject of GMEIWMP.

35. For schedule D projects and those identified by the IEE as requiring an EIA, a scoping meeting is convened by the MEE to determine the specific Terms of Reference for the EIA. On completion of investigations and reporting, the EIA report is subject to review by MEE, which invites comments from other relevant ministries and the public following which an environmental decision is made. Although the transfer station in Malé is a large scale facility, it is not a storage or separation facility and the subproject comprises improvements to the existing facility. However, confirmation should be provided by MEE that improvements to the transfer station do not qualify as a schedule D project.

36. For project types not included schedule D, a screening form is submitted in a specified format on the basis of which the MEE decides whether an Environmental Management Plan is required or if further information is required, in which case an Initial Environmental Examination (IEE) will be carried out. The IEE is completed according to a specified format. If the IEE finds

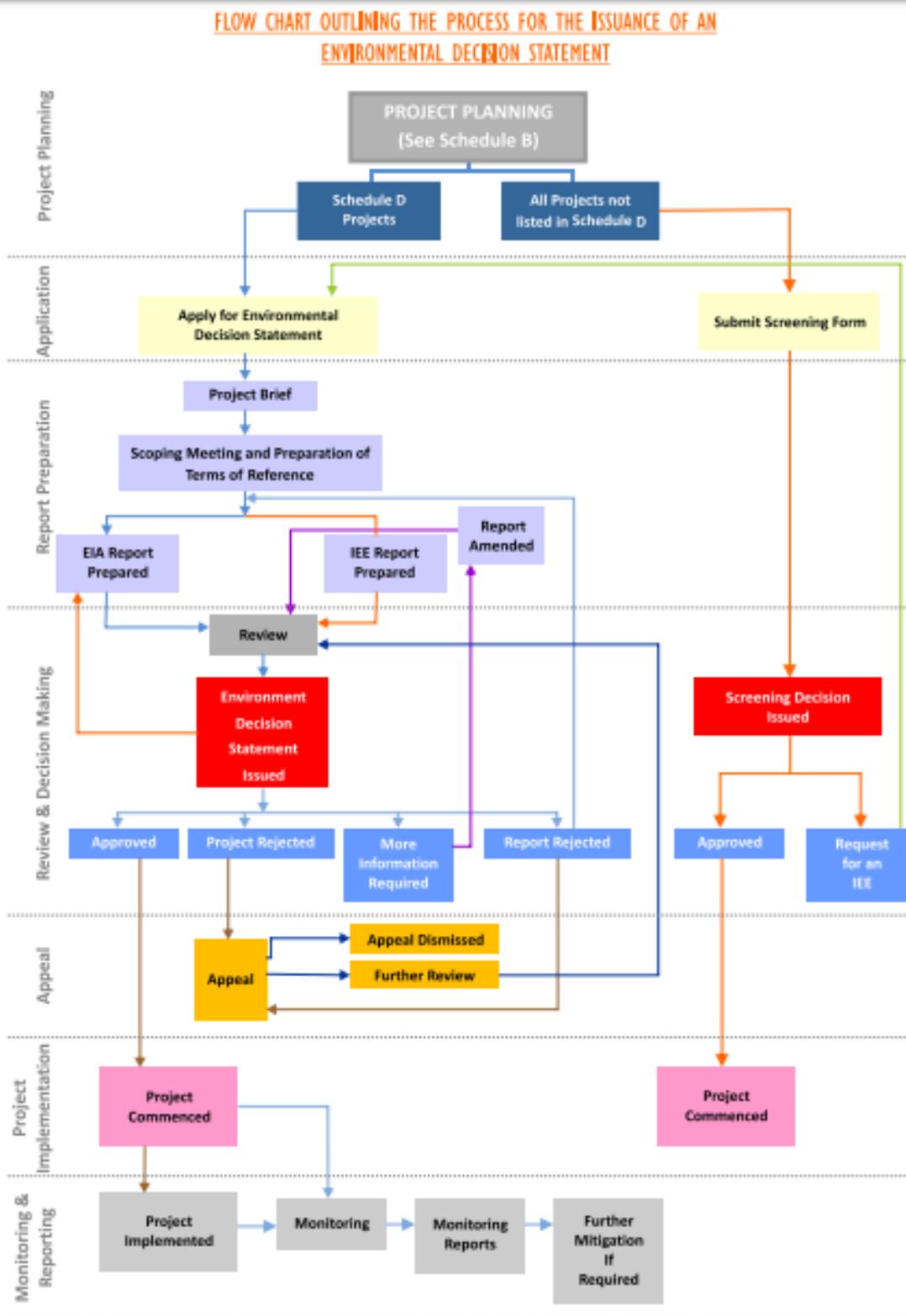
that the project may cause a significant environmental impact, a full EIA is required, prior to preparation of an Environmental Management Plan (EMP). If an EIA is not required, an EMP is then prepared to address the impacts identified in the IEE.

37. The Environmental Management Plan, following either the IEE or the EIA process, is prepared on a specified format and reviewed for compliance by MEE.

38. The MEE issues the decision in the form of a decision note issued to the proponent, which sets out specific binding requirements for the conduct of the project on the basis of review of the EIA report.

39. Summary of application stages and steps is outlined in Figure 7.

Figure 7: Flow chart of Maldives EIA process²⁵



²⁵ Source: Environmental Assessment Regulations (2007), Schedule A

40. The timelines for clearance and approvals are as follows:
- (i) On completion of a screening form for non-schedule D projects – 10 working days for a screening decision from MEE
 - (ii) For review of compliance of an EMP by MEE – 7 working days
 - (iii) For review of a project brief on Schedule D projects – 5 days to confirm the date of a scoping meeting
 - (iv) For consideration of Terms of Reference drafted by the project proponent following the scoping meeting – 10 days to confirm the Terms of Reference.
 - (v) For the review of a completed EIA report for completeness – 2 working days.
 - (vi) For circulation of an EIA report to other ministries and to the public for comment – 10 working days
 - (vii) For issuance of a decision or to request revisions, following circulation of the EIA report and receipt of comments – 28 working days.

C. Applicable International Environmental Agreements

41. In addition to national laws, rules and regulations, the government of Maldives is also a signatory to various applicable international conventions, as follows:
- (i) UN Convention on the Law of the Sea – UNCLOS (1982);
 - (ii) International Convention for the Prevention of Pollution of the Sea by Oil (1982);
 - (iii) Vienna Convention for the Protection of the Ozone Layer (1985);
 - (iv) Montreal Protocol on Substances that Deplete the Ozone Layer (1987);
 - (v) Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (1989);
 - (vi) The London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1990);
 - (vii) Agenda 21 and the Rio Declaration of the United Nations Conference on Environment and Development (1992);
 - (viii) Convention on Biological Diversity (1992);
 - (ix) United Nations Framework Convention on Climate Change (1992);
 - (x) The Copenhagen Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1992);
 - (xi) The Montreal Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1997);
 - (xii) The Beijing Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1999);
 - (xiii) Washington Declaration on Protection of the Marine Environment from Land-Based Activities;
 - (xiv) Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998);
 - (xv) Cartagena Protocol on Biosafety (Maldives acceded on 2 September 2002); and
 - (xvi) United Nation Convention to Combat Desertification (2002).

D. ADB Policy

42. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

43. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type

and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

- (i) **Category A.** A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.
- (ii) **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of Category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.
- (iii) **Category C.** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
- (i) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a financial intermediary (FI).

44. **Environmental management plan.** ADB SPS, 2009 further requires the development of an environmental management plan (EMP) specifying the required mitigation and monitoring and who is responsible for implementation.

45. **Public disclosure.** ADB will post the following safeguard documents on its website so affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:²⁶

- (i) final or updated IEE upon receipt; and
- (ii) environmental monitoring reports submitted by the project management unit (PMU) during project implementation upon receipt.

46. **Pollution Prevention and Control Technologies.** During the design, construction, and operation of the Project the PMU will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of Maldives regulations differ from these levels and measures, the PMU will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

²⁶ As per ADB SPS, 2009, prior to disclosure on ADB website, ADB reviews the "borrower's/client's social and environmental assessment and plans to ensure that safeguard measures are in place to avoid, wherever possible, and minimize, mitigate, and compensate for adverse social and environmental impacts in compliance with ADB's safeguard policy principles and Safeguard Requirements 1-4."

Table 1: Applicable WHO Ambient Air Quality Guidelines²⁷

Table 1.1.1: WHO Ambient Air Quality Guidelines ^{7, 8}		
	Averaging Period	Guideline value in $\mu\text{g}/\text{m}^3$
Sulfur dioxide (SO ₂)	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline)
Nitrogen dioxide (NO ₂)	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM ₁₀	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM _{2.5}	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

⁷ World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile.

⁸ Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

Table 2: World Bank Group's Noise Level Guidelines

Table 1.7.1- Noise Level Guidelines ⁵⁴		
Receptor	One Hour L _{Aeq} (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational ⁵⁵	55	45
Industrial; commercial	70	70

⁵⁴ Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999.

²⁷ World Bank Group's General Environmental, Health, and Safety Guidelines: www.ifc.org/ehsguidelines

47. All statutory clearances will be obtained prior to commencement of civil works. IEEs will be prepared for each package involving civil works and EMP to be attached in the bid and contract documents. IEE will be submitted to ADB for review and approval prior to issuance of bid documents. Monitoring of EMP implementation by the executing agency is reported to ADB.

IV. DESCRIPTION OF THE ENVIRONMENT

48. To establish specific baseline values for indicators of ambient air and water quality and noise levels at the proposed subproject site, measurements will be taken by the Contractor prior to construction.

A. Physical Resources

4. Geology, Topography and Soils

49. The Maldives archipelago comprises 22 atolls which are peaks of a vast submarine mountain range in the Indian Ocean, the Chagos-Maldives-Laccadive Ridge. The atolls collectively contain over 1,192 reef islands that have formed atop former peaks of former submarine mountains of the Ridge, which is slowly subsiding. The reef islands form mainly at the periphery of each atoll, with the inner area, the eroded former mountain peak, occupied by a lagoon. Formation takes place by the deposition of shallow-water carbonates and successive coral deposits at the tidal level which gradually rise as a rock base forms from the calcium carbonate deposits of dead coral. Underlying rock is variable in consistency, reflecting the growth patterns of the coral, which forms dense colonies (coral heads) and large voids between the heads. The coral heads form hard rock, while the voids fill with coral derived fragments that form a softer rock. Unconsolidated sand and gravel on top of the rock layer is subject to seasonal conditions, particularly monsoons as well as wave action, and the beaches are dynamic subject to continual erosion and accretion – phenomena that are known and understood by island communities who have adapted to these patterns in the past, though increasing population density and development of infrastructure involve an outward spread toward the shorelines, making infrastructure in such locations vulnerable to erosion.

50. The islands have soils derived exclusively from coral deposits which are predominantly sandy in texture, with a significant silt component formed from abrasion within the sand deposits. In inner parts of the islands, deposition and breakdown of organic matter has led to the formation of a thin layer of topsoil. The soils are free draining when uncompacted, have poor nutrient status and are generally alkaline. Surface relief is extremely low, generally below 2m above sea level.

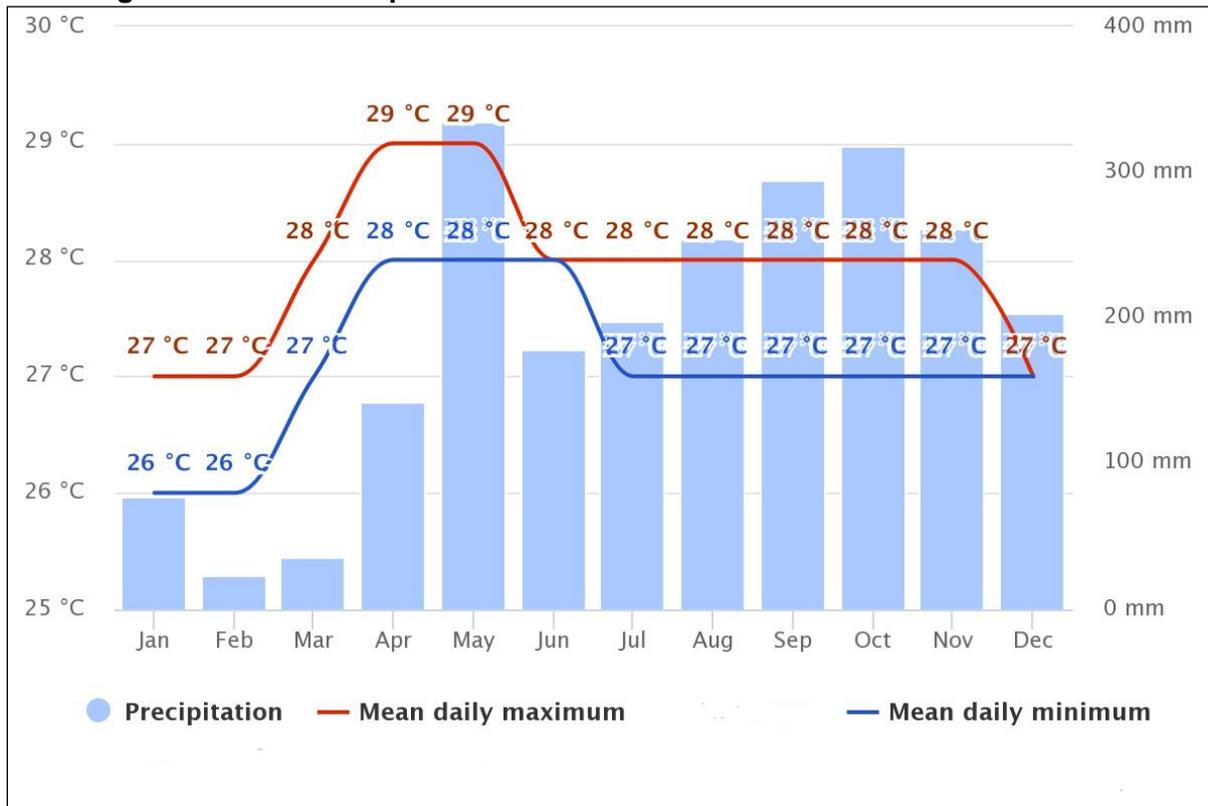
5. Climate

51. The Maldives have a maritime tropical climate featuring two monsoon seasons, originating over the Indian Ocean to the southwest between May and September (Halhangu), and the Bay of Bengal to the drier northeast between December and February (Iruvai). The southwest monsoon is the stronger and monthly rainfall typically exceeds 200mm towards the end of the southwest monsoon period, and is lowest in February after the cessation of the northeast monsoon rains. Cyclones are a regular occurrence in the Indian Ocean, occurring mainly between April and December, although those that have affected the Maldives occur between October and January. These are more common either side of India, further north of the Maldives, though damage from “edge effects” of the larger cyclones is not uncommon. Cyclone Ockhi occurred in late November / early December 2017 and caused capsizing of vessels and damage to homes,

including on Kaafu Atoll. The United Nations (2007)²⁸ estimate that there is a 10% probability of a level one storm on the Saffir-Simpson scale occurring over Kaafu Atoll in a 10 year period. Storms in the level one category are described as being “very dangerous” with wind speeds likely in the range of 119 – 153 kph, and pressures below 100hPa, but not lower than 980 hPa.

52. Temperatures are relatively constant and range between 25°C and 30°C, with the hottest period occurring in March/April and the coolest, December/January. Monthly rainfall fluctuates between around 20mm in February to over 300mm in May, and is over 200mm for most of the year, the annual average in the Greater Malé area is 2,200mm. Figure 8 below shows the annual temperature and rainfall pattern in the Greater Malé area.

Figure 8: Annual Temperature and Rainfall Pattern in the Greater Malé area

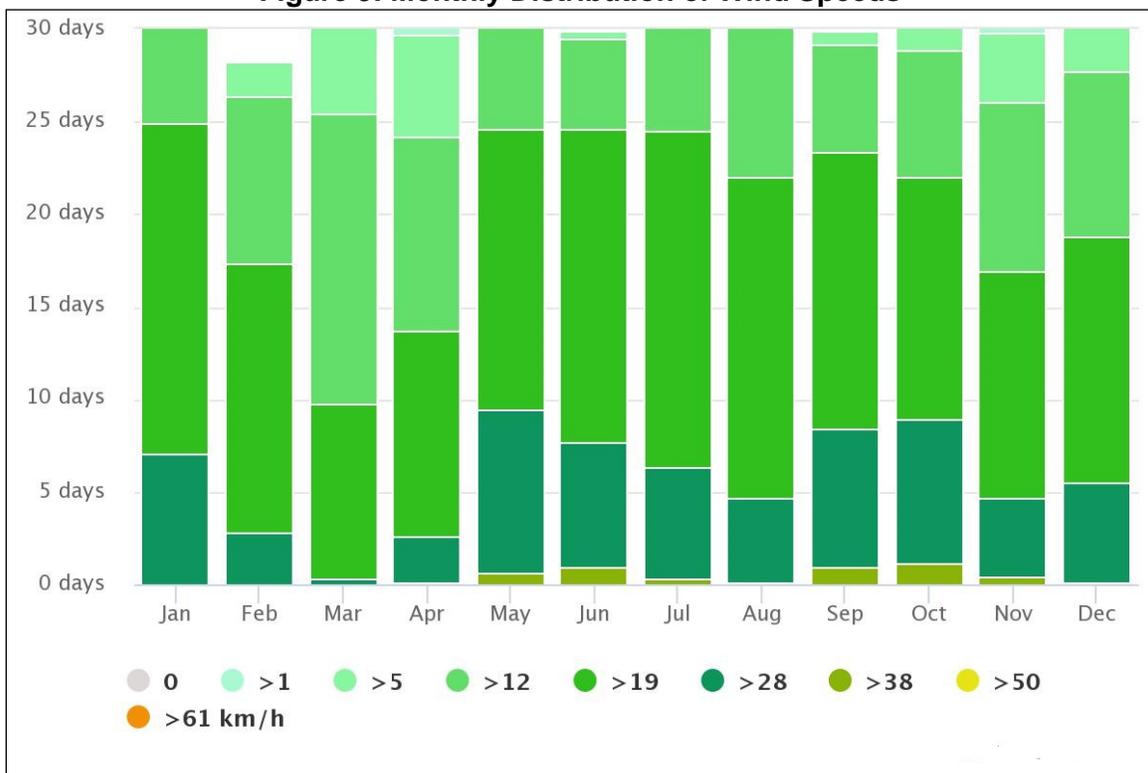


Source: meteoblue.com

53. The prevailing winds are predominantly westerly for much of the year, with easterly winds rare and south-easterly winds almost non-existent. Winds are influenced by the monsoon patterns. Figure 9 below shows the monthly distribution of wind speeds, and Figure 10 is a rose diagram, showing the prevailing direction of winds over an annual period.

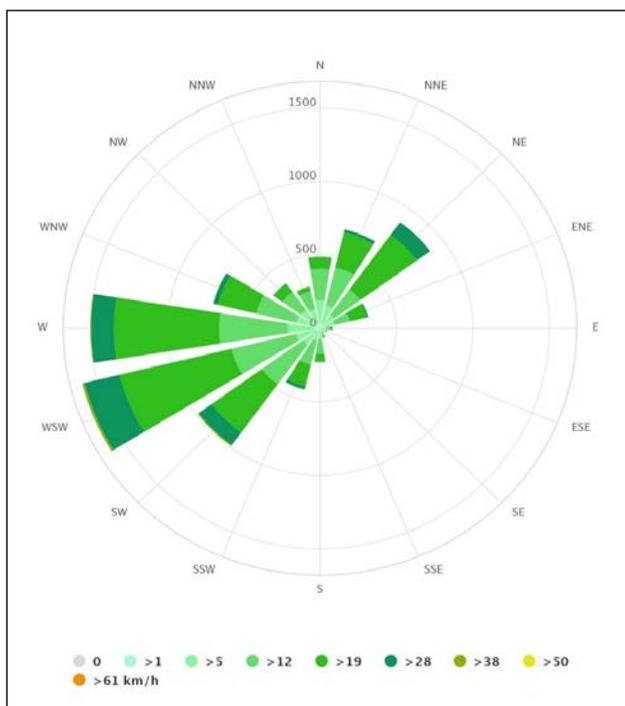
²⁸ United Nations Office for the Coordination of Humanitarian Affairs - Regional Office for Asia and the Pacific (OCHA ROAP) (2007) Maldives: Composite Hazard Map.

Figure 9: Monthly Distribution of Wind Speeds



Source: meteoblue.com

Figure 10: Rose Diagram of Prevailing Wind Direction over an Annual Period



Source: meteoblue.com

54. The tidal regime is semi-diurnal – two high and two low tides a day. The range for spring tides is approximately 1m and for neap tides, 0.3m while the extreme range between highest high water and lowest low water is 1.32m at the tidal gauge for the Malé area, on Hulhulé Island. Table 3 below gives the average tide levels at Hulhulé,

Table 3: Average tide levels at Hulhulé²⁹

Tidal level	Water level from mean sea level (m)
Highest High Water (HHW)	0.62
Mean Highest High Water (MHHW)	0.34
Mean High Water (MHW)	0.33
Mean Low Water (MLW)	-0.36
Mean Lowest Low Water (MLLW)	-0.37
Lowest Low Water (LLW)	-0.72

55. Wave heights are also influenced by variations in atmospheric pressure and strong winds. Atmospheric pressure at sea level at Malé typically varies between 1011 and 1017 hPa, and an increase in air pressure of 1 hPa typically lowers the water level by 1cm. Lower pressures can occur in storm events, and may drop below 1000 hPa, entailing an increase of around 10cm or more, adding to effective storm wave heights.

56. Surface currents reflect tides and wind, and generally follow the monsoon pattern, with westward currents dominant from January to March, and the reverse between April and December. Current direction and velocity at any one time depends on the interaction between the wind induced prevailing currents and tidal currents. Measurements taken around Thilafushi during June 2017³⁰ found current velocities around the island to range between 0.2 m/s and 0.4 m/s – though this gives only a “snapshot” indication.

6. Freshwater Resources

57. Natural freshwater sources for the Maldives islands are rainwater collected from roofs and groundwater that accumulates through infiltration of rainwater into a freshwater lens that forms in underlying strata. In the Greater Malé area however, these sources do not suffice for the large domestic and commercial demand and the islands of Male, and Villingilli are heavily dependent on salt water reverse osmosis plants for the supply of freshwater. Freshwater reserves are subject to degradation as a result of high salinity and/or polluted water.

7. Marine Resources

58. Marine waters around the islands are used extensively for fishing and recreational diving. The marine environment in the immediate vicinity of the transfer station at Malé is affected by loss of solid waste, including organic, plastic and inorganic fractions, due to inefficiencies in handling at the transfer station, as well as effects of intense ship and boat traffic around Malé island and urban development on the island. Floating waste accumulates in and around the docking area.

²⁹ Source: University of Hawaii Sea Level Center Database, quoted in the Second National Communication of the Maldives to the United Nations Framework Convention on Climate Change. Ministry of Environment and Energy, 2016.

³⁰ Water Solutions Pvt Ltd (2017) Environment Impact Assessment: Reclamation of 15 hectares of land at Thilafushi for development of the Regional Waste Management Facility for Zone 3. Submitted to the Ministry of Environment and Energy.

59. The quality of water both in and around the islands is influenced by sewerage discharge, illegal dumping of solid waste and industrial activity. While no data could be provided for water quality around the transfer station, marine water quality testing carried out by Water Solutions for the Reclamation of 15 hectares at Thilafushi (2017), 6km away provided the following results:

Table 4: Marine Water Quality Test Results

Test	Unit	Average result from six sites	Comparable international standards ³¹
Salinity	(‰)	32.6	-
Electrical Conductivity at 25°C	mS/cm	49.75	-
pH at 25°C		8.09	6.5 – 8.5
Total Dissolved Solids	mg/l	36,529.83	-
COD	mg/l	420.5	-
Iron (Fe)	mg/l	0.15	0.3
Boron (as B)	mg/l	2.67	1
Arsenic (as As)	mg/l	0.0016	0.05

60. The report states that biological oxygen demand (BOD) values and values for phosphate exceed the levels given in Maldivian Water Quality standards, but that temperature and turbidity are within the limits. For heavy metals, Chromium, Mercury, Lead, Cadmium and Zinc were not detected, and nor were phenolic compounds. No values for these are given however. In comparison to international standards, None of the above values exceed trigger values above which damage to the marine ecosystem is expected. Turbidity, Total Suspended Solids, Phenolic Compounds, Zinc, Cadmium, Lead, Mercury and Chromium, but not detected. The level of Boron found significantly exceeds international standards.

8. Marine Sediment

61. Pollutants from industrial activity and waste, particularly hazardous waste, can accumulate in the sediment on the lagoon or sea floor. These can include heavy metals, organometallic compounds and aromatic benzene compounds. Samples of sediment taken by Water Solutions in 2017 and tested for a set of contaminants by a recognized international laboratory in Sri Lanka found some traces of copper and lead, but did not detect other contaminants. A comparison of the levels of copper and lead, which reached 31.3 and 2.7 mg/kg respectively, against international standards³² were below trigger values of 65 and 50 mg/kg respectively. An earlier set of tests carried out in 2011 by CDE Consultants for a greater range of contaminants on six sites detected ten heavy metals in the samples, but levels were below trigger values given in international standards.

³¹ The figures used for this comparison are those of recreational water quality standards of the Australian and New Zealand Environment and Conservation Council. Recreational water standards which apply to situations where users have body contact with water. Other standards for marine water quality relate to primary production are more stringent and would not apply to this situation.

³² Australian and New Zealand Environment and Conservation Council (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

9. Air Quality

62. Air pollution sources include vehicle emissions, emissions of other plant and machinery including diesel power generators, and construction activity, and industrial activity (mainly on Thilafushi). While Malé in particular sees heavy traffic for much of the day, concentrated on a small area, air is rapidly dispersed by wind action from the surrounding ocean.

63. Equipment for continuous monitoring of air quality in the area is not currently in operation. Air quality monitoring equipment and data logging had been set up for Malé, but was discontinued due to a lack of suitably qualified technical staff.

64. Ambient air quality was studied by AECOM in 2010 on Malé, Hulhulé and Hulhumale and compared with World Health Organization (WHO) standards for ambient air. Focusing on the main pollutants of potential concern, namely particulate matter of between 2.5 and 10 µg in size, particulate matter of less than 2.5 µg, Sulphur Dioxide (SO₂), Oxides of Nitrogen (NO_x) and Carbon Monoxide (CO), none were found to exceed WHO guideline levels in terms of the average 24hr mean. Levels of particulate matter were relatively constant for each island, though CO, NO_x and SO₂ levels were markedly higher in Malé than in the other islands.

10. Noise

65. Sources of noise pollution are similar to those for air quality, particularly the operation of vehicles and machinery of various kinds. Wind and waves can contribute significantly to ambient noise levels. Noise measurements over a 24 hour period to determine the continuous noise equivalent level (dB L_{eq}) of ambient noise for daytime (10am to 6pm) and night time (7pm to 5am) were taken at a variety of locations on Malé, Hulhumale and Hulhulé, and were found to range between 55 and 71 dB L_{eq} during the day and 50 and 69 dB L_{eq} during the night. These are moderate to high, in comparison to national standards.

B. Ecological Resources

1. Marine Ecosystems

66. Coral ecosystems have significant ecological significance and occur within lagoon waters and on the periphery of the islands. Information on the status of benthic communities in the vicinity of the transfer station at Malé was not available, however surveys undertaken at other locations in Greater Malé area give an indication of the existing state of marine biodiversity in the area. A survey of the status of the corals, using an established coral survey method, established by the international NGO Reef Check³³ to assess the coverage of coral and other substrates on the sea bed. Seven sites around Thilafushi island were surveyed, finding predominantly rock, rubble and sandy cover, with live corals accounting for up to 20% of cover in one location, to the south of the island. Studies on the reef at Hulhulé were carried out in 2007 and 2010 in connection with airport expansion projects and summarized in the EIA report carried out in 2011 for the Male International Airport Concession Project³⁴. A study was carried out at Villingili also in 2007 by Land & Marine Environmental Resource Group, as part of an EIA for the construction of a maritime survival

³³ Hodgson, G., W. Kiene, J. Mihaly, J. Liebeler, C. Shuman, L. Maun and J. Hill (2006). Reef Check Instruction Manual: A Guide to Reef Check Coral Reef Monitoring Published by Reef Check, Institute of the Environment, University of California at Los Angeles.

³⁴ AECOM in association with Water Solutions (2011). Expansion and Modernization of Malé International Airport: Social and Environmental Impact Assessment, prepared for GMR Malé International Airport Private Limited.

training center³⁵. This similarly found the dominant cover to be rock, rubble and sand, with low level coral cover (approximately 6%) and significant algal cover (around 30%).

67. Pelagic fish form an important part of the local economy, both through commercial fishing activities and game fishing. Fishing activity focuses on areas known to be abundant and these occur throughout the Maldives waters, usually distant to the coast. Fish populations in inshore waters around Thilafushi were assessed by Water Solutions in 2017, again using a method developed by Reef Check employing a transect method, undertaken by a diver travelling on a transect and stopping at 5m intervals, to count fish of indicator species. The transect was undertaken at three locations, and identified 20 indicator species belonging to 7 families. None of the observed species are of conservation significance, as rated by the International Union for the Conservation of Nature (IUCN). At Hulhulé / Hulhumale a fish census was taken at two sites by AECOM in 2010 for the Malé International Airport expansion project EIA, also finding indicator species from 7 families. Fish populations were also surveyed around Villingilli by Land & Marine Environmental Resource Group in 2007, who listed 35 species in 11 families.

2. Avifauna

68. The Maldives has a diverse range of birds, including a significant seasonal population of migratory birds. The islands are important wintering grounds for a large number of migratory species that follow the Central Asian Flyway, a flyway covering a large continental area of Eurasia between the Arctic Ocean and the Indian Ocean, and comprising several important migration routes, extending from the northernmost breeding grounds in Siberia to the southernmost non-breeding wintering grounds in West and South Asia and the Indian Ocean Territory including the Maldives. Within Greater Malé, bird populations are influenced by urbanization, and birds (largely non migratory) common to urban areas in South Asia, such as crows and sparrows, are commonplace. The landfill at Thilafushi and other areas where waste accumulates, such as markets and the transfer stations attract significant numbers of birds. Uncollected waste, particularly floating waste, is a known hazard to birdlife in Greater Malé and elsewhere in the islands, particularly when toxic waste is ingested or when articles such as plastic bags and string can cause birds to be debilitated or where they cause damage to the digestive system, or when it damages a natural habitat. The habitat of the white-breasted waterhen (*Amaurornis phoenicurus*) is known to be threatened by floating, uncollected solid waste.³⁶

3. Terrestrial Ecosystems

69. The present day vegetation cover on the islands is substantially influenced by human habitation and has little biodiversity conservation significance. Vegetation is dominated by pan-tropical species such as coconut (*Cocos nucifera*), Goats foot creeper (*Ipomea pes-caprae*), hibiscus (*Hibiscus tiliaceus*) and beach colophyllum (*Calophyllum inophyllum*).

4. Protected Areas

70. There are 42 protected areas in the Maldives designated under the EPPA and covering around 24,500ha, or 0.2% of national territory totalling more than 24,494 hectares (0.2% of the national territory) designated under the Environment Protection and Preservation Act 4/93 (EPPA 4/93) to prevent over exploitation, and improve conservation and preservation, including banning

³⁵ Land & Marine Environmental Resource Group (2007). Environmental Impact Assessment for Construction of Maritime Survival Training Centre at K. Villingili. Prepared for Maldives College of Higher Education.

³⁶ Common Birds of the Maldives. Live & Learn Environmental Education. www.livelearn.org

of export of important baitfish as aquarium fish, protection of threatened marine species such as sharks, sea turtles, giant clams and black coral and also to enhance and sustain dive tourism.

71. The Baa Atoll, in the central western part of the Maldives, is a UNESCO Biosphere Reserve, designated in 2011. An initiative commenced in 2012 to make the entire Maldives a UNESCO Biosphere Reserve and following consultations in late 2012 an implementation plan was formulated in 2013 to set out the vision and strategies to make the Maldives a biosphere reserve. The implementation plan recognizes inadequate solid waste management as a threat to the environment and envisages that a "effective waste management system" will be in place³⁷.

72. Four protected areas occur in the vicinity of Greater Malé, all designated by the Government on 1 October 1995 and listed by the IUCN as dive sites. The IUCN has not set a category for any of the sites.

Table 5: Protected areas in the vicinity of Greater Malé

Name	Type	Area	Notes	Location relative to Greater Malé project area
Dhekunu Thilafalhuge Miayaruvani (Lions Head)	Reef	142	Situated on a reef face, favoured as a dive site for shark viewing. Overhanging reef features.	Immediate Southwest of Thilafushi Island
Gulhee Falhu Kollavaani (Hans Hass Place)	Reef	102	Deep lagoon area	East of Gulhifalhu Island, itself 0.4km to the East of Thilafushi Island
Giraavaru Kuda Haa	Reef	200	Isolated reef approx. 30m above lagoon floor	4km North of Thilafushi island

C. Socio-Economic Factors

1. Population Levels

73. The population of the atolls making up Zone 3 is 182,102 of which the majority, 127,079 are on Malé and a significant but rapidly growing population, 15,769 at the time of the census, are on Hulhumale. Population growth predictions by Water Solutions and Kocks Engineers the feasibility study of an integrated Solid Waste Management System for Zone 3³⁸, based on an extrapolation of growth rates between the 2006 and 2014 census and varying scenarios. This predicts a rise in the total population of Zone 3 to 253,000 by 2020 and 405,000 by 2035.

2. Economy

74. Tourism and fishing dominate the national economy, with the contribution to GDP of 17% and 15% respectively, and the tourism sector growing rapidly in recent years, with a sharp increase of visitor arrivals. The nation's economy has seen a rapid rise over the past 30 years,

³⁷ Ministry of Environment and Energy. 2012. Maldives as a Biosphere Reserve, Implementation Plan 2013 – 2017. <http://www.environment.gov.mv/v2/wp-content/files/publications/20130507-pub-maldives-as-a-biosphere-reserve-implementation-plan-2013-2017.pdf>

³⁸ Water Solutions in association with Kocks Ingenieure (2017) Consultancy Services for Feasibility Study for an Integrated Solid Waste Management System for Zone III (including Greater Malé) and Preparation of Engineering Design of the Regional Waste Management Facility at Thilafushi: Feasibility Report.

from ranking by the United Nations among the world's least developed countries in the early 1990s, to being among those showing "high human development" in 2016³⁹. The Maldives has, according to 2014 figures, a gross national per capita income of \$6,950, close to that of China and well ahead of neighbouring countries (\$3,800 in Sri Lanka and \$1,590 in India)⁴⁰, effectively achieving the shift within a generation and attributable mainly to the growth in tourism.

75. Outside tourism and fishing, agriculture is significantly constrained by the poor soils characteristic of coral reef islands and scarce arable land though these suffice for some trade in crops such as coconut, banana, breadfruit, papayas, mangoes, taro, betel, chillies, sweet potatoes, and onions. There is heavy reliance on imported foods, including staples such as rice. Agriculture provides about 1.0% of GDP.

76. The manufacturing sector provides less than 4% of GDP, the larger areas of activity being boat building and handicrafts, while modern industry is limited to a few tuna canneries, bottling plants, and limited manufacturing industries (PVC pipe, soap, furniture, and some food products).

77. While the economic outlook is generally positive, the economic base, reliant on tourism and fishing, is narrow and diversification is a challenge. The country has a shortage of labor and relies on workers from Bangladesh, Sri Lanka and elsewhere for manual labour, work on construction and service on the resorts. At the same time, increasing employment for the educated workforce is a significant challenge.

78. Access to education in the national as a whole is good, with enrolment in primary education close to 100% and literacy rates at about 98%.

3. Public Health

79. In the health sector, indicators also show improvements over recent decades. The Infant and maternal mortality rate has declined rapidly. With international assistance, authorities have succeeded in eradicating or heavily reducing the incidence of a number of infectious diseases including leprosy, measles and lymphatic filariasis, though tuberculosis, hepatitis, HIV/AIDS cases continue and dengue and the zika virus are emergent threats. Non communicable diseases including addictions and nutrition related conditions are also a current focus of health authorities.

D. Site-specific Baseline Environmental Conditions

1. Malé

80. The site is situated to the south of the island, where land use is dominated by commercial facilities, and land to the south of the site is newly reclaimed. The edge of the residential part of the island is around 300m distant from the site. Figure 11 shows the island, with the location of the site indicated.

³⁹ <http://hdr.undp.org/en/composite/HDI>

⁴⁰ ADB (2017) Basic 2017 Statistics

Figure 11: Malé island, showing the location of the transfer station in the mainly commercial area. Figure 2 gives a detailed view of the transfer station.



2. Villingilli

81. The IWMC is situated next to a road, outside residential core of the island, and close to the beach. The area is identified on an aerial photograph of Villingilli shown in Figure 12.

Figure 12: Villingilli island showing the location of the existing IWMC / future transfer station



V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Method of Assessment

82. The potential impacts and mitigation measures have been identified through review of the Feasibility Study prepared for the Project, discussion with the designers and stakeholder consultation. The feasibility study presents the preliminary design. Initial screening and categorization was done using ADB Rapid Environmental Assessment Checklist and the assessment shows that the subproject is unlikely to cause significant adverse impacts. See Appendix 1. As such, the subproject is classified as environment category B as per ADB SPS, 2009. This IEE is based on this rapid environmental assessment, and on the preliminary design. Therefore, this EE will

be updated based on the final detailed design, due for completion by quarter 3, 2020, and the classification will be reassessed or reconfirmed accordingly.

B. Environmental Impacts Related to Location

83. The transfer stations exist in their current form to address existing impacts of solid waste generation and accumulation, by enabling bulk handling of waste such that it can be efficiently removed from residential and industrial areas and construction sites, sorted and loaded onto vessels for transport to the landfill on Thilafushi island. The Project is to improve these facilities, and enable them to handle growing future waste flows, and will be situated at sites currently in use for waste management. Project includes a community outreach component to promote the “3 Rs” and mitigate both the volume of solid waste that will increase with growing population and the level of separation, to facilitate efficient handling of the different fractions.

84. **Effects on the surrounding seawater and marine ecosystems.** Each facility is located close to, or on the shoreline. Some waste is lost to the sea during the process of loading of onto transfer vessels, including food waste, household waste, construction and demolition waste and likely, hazardous waste. With population growth and consequent increases in quantities of solid waste, the risk of this loss will increase. The use of a containerized system and upgraded equipment, to be provided by the Project, will reduce the loss of waste to the sea. More efficient separation of waste fractions including hazardous waste as a result of the improved collection system and capacity building support to WAMCO, also to be included in Project, will further reduce levels of contamination. If the efficiencies of site operation made easier by the use of the containerized system are achieved, the potential impact is long term, positive, significant and will cover both the immediate area around the islands and the wider marine environment in Zone 3 and beyond.

85. **Effects on vegetation.** Infrastructure improvements will be within the footprint of existing solid waste management facilities at Malé and Villingilli and will not entail removal of vegetation. Given space constraints, site improvements are not likely to improve significant landscaping or planting. No damage or improvement to vegetation is expected. No impact on vegetation is envisaged at any of the locations.

86. **Surrounding land use.** The area immediately adjoining the facility in Malé is reclaimed land, currently under development and likely to be used for commercial and industrial purposes. The existing transfer station cause noise generation from machinery, exhaust emissions and odors. The levels of these are expected to increase as population and the waste stream grow, however the Project itself will mitigate this growth through greater efficiency in waste handling and transfer to Thilafushi-bound vessels. The ambient noise levels from wind and sea waves masks noise of operation of the facility. The potential impact is positive, mainly as a result of ensuring efficient truck movements, preventing congestion and traffic queues that cause noise and increased emissions, long term and confined to the area immediately surrounding the transfer station.

87. The existing site in Villingilli is close to a residential area. Again, improvements in efficiency and protected storage areas will mitigate the effects of increased waste and by community outreach to be included with Project, providing advice and assistance related to reduced, re-used waste and recycling to reduce the volume that needs to be handled at the facility. The potential impact is positive, significant, long term and will cover the immediate area around the transfer station and also the residential area on the island.

88. **Impedance of traffic.** In Malé, the layout of the improved facility is designed to enable more efficient transfer of waste to containers, and therefore more rapid throughput of trucks bringing waste from around the island. This measure, in combination with careful scheduling of waste collection (including maximizing truck trips during night hours and minimizing or prohibiting trips during peak traffic hours) will reduce the risks of queuing of vehicles containing waste and impeding traffic in the area. The potential impact is positive, significant and long term.

89. On Villingilli, restrictions apply to types of vehicle allowed on the island, and private vans and motorized scooters or motorcycles are banned. The operation of collection vehicles is therefore unlikely to impede local traffic. The potential impact is not significant.

90. **Loss of land and effects on property.** In each case, improvements will take place within the boundaries of existing waste management facilities. No private property will be affected and land acquisition will be required and there is therefore no impact.

91. Table 6 summarizes the impacts related to location. Based on the assessment, the location of the two transfer stations will have potential impacts that are general positive, consistent with the Project's objectives.

Table 6: Summary of impacts related to location

Potential Impact	Malé	Villingilli
Surrounding seawater and marine ecosystems	Long term, positive, significant	Long term, positive, significant
Vegetation	Nil	Nil
Birdlife	Long term, positive, not significant	Long term, positive, not significant
Surrounding land use	Long term, positive, confined to immediate surrounds	Long term, positive, confined to immediate surrounds
Impedance of traffic	Long term, positive, significant	
Loss of land and effects on property	Nil	Nil

C. Environmental Impacts Related to Construction

92. **Construction method.** The methods to be used for site preparation, fabrication, construction and commissioning, as well as associated arrangements to ensure sound environmental management and safety at all times, are to be defined by the Contractor in a Contractor's Environmental Management Plan (CEMP) submitted to the PMDSC for approval. The CEMP must adhere to EHS general guidelines 1 to 4 (environmental, occupational health and safety, community health and safety and for construction and decommissioning).

93. **Impedance of traffic.** Construction vehicle movements will add to traffic levels in the vicinity of each construction site, particularly in Malé where traffic levels are already high. The impact is temporary and will be mitigated by requiring the contractor to provide notices to the public advising of timing and duration of construction work and the effects on traffic routes during construction and to the extent practicable, schedule work that blocks roadways to periods of low traffic.

94. **Noise pollution and vibration.** Construction operations, particularly excavations and compaction will cause noise and vibration, which will be particularly apparent at Villingilli where ambient noise levels are lower. The nearest residential area to the Malé transfer station is approximately 300m away. In Villingilli there are homes approximately 50m from the existing waste management site, while the school on Villingilli is approximately 250m away. To mitigate the impacts the contractors will be required to (i) provide information on scheduled work to affected persons through direct liaison and via the local media about the timing and duration of the works (ii) limit construction activities to normal daylight working hours (iii) adhere to the planned work schedule and (iv) ensure that all construction equipment and vehicles are kept in good working order with working exhaust mufflers.

95. **Waste Generation.** Construction waste will include packaging of equipment, fuels, lubricants, materials, equipment and food and some rubble where existing structures need to be demolished. Some specialist lubricants and paint for marking may be hazardous. Contractors will be responsible for removing waste to Thilafushi. Approval from the PMDSC must be obtained prior to importing materials rated as hazardous under the Globally Harmonized System of Classification and Labelling of Chemicals.

96. **Handling of Waste during the Construction Period.** Waste produced and collected from households, markets and construction sites during construction needs to be transported to the RWMF at Thilafushi. To ensure that this takes place the design-build contractor will include in the Contractors Environmental Management Plan details of how waste will be loaded onto transfer vessels during construction. Measures may include designated times for waste transfer to the vessels to take place, machinery to be used to ensure efficient handling, and alternative docking sites while work takes place on the existing docking site.

97. **Release of silt.** Excavations to form foundations for structures will involve making temporary stockpiles of material that will either be removed or re-used. To prevent the release of silt into drains or the sea contractors will be required to ensure that (i) excavated areas are rapidly refilled on completion of works, (ii) to place silt fences around temporary piles of excavated material and (iii) avoid excavation in wet weather to the extent practicable.

98. **Water pollution.** The use of vehicles and plant can cause risks of water pollution, in the event of leaks and spills of fuel, lubricants, hydraulic fluid or other fluids used for vehicle operation. To reduce risks and limit impacts the contractor will be required to ensure that vehicles and plant are maintained in sound operable condition, free of leaks and that the condition of vehicles and equipment is regularly checked. The contractor will prepare and submit a plan for spill management, including provision of spill kits, training/briefing of workers on procedures on handling spills and allocation of responsibility within the contractor's team for ensuring that spill kits are available and that workers know how to use them.

99. **Air and dust pollution.** Potential sources of air pollution are exhaust fumes from vehicles and plant, dust from transport of construction and waste materials and areas around work sites where soil and debris is deposited. The effect will be limited in Malé where there are high ambient levels of vehicle exhaust fumes from traffic, but significant in Villingilli where the site is close to homes. The mitigation measures are to require vehicles and equipment to be well maintained and tuned and fitted with exhaust baffles. Water will be applied to suppress dust around work sites where needed.

100. **Community health and safety risks.** The use of plant and machinery, use of compressed air lines and cables and excavations are potentially hazardous but most work sites are within the

transfer station areas where public access is restricted. The contractor will ensure that restrictions to access are enforced and for work on gates and boundary fences adjoining public roads and footpaths, will provide notices to the public identifying hazards and erect safety barriers/covers for areas of open excavation.

101. Contractors shall establish their community health and safety plans following international best practices and the World Bank EHS guidelines on construction and decommissioning activities⁴¹. As a minimum and whichever is applicable, the community health and safety plan shall ensure the following:

- (i) Implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning;
- (ii) Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community;
- (iii) Removing hazardous conditions on construction sites that cannot be controlled affectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials; and
- (iv) Implement measure to prevent proliferation of vectors of diseases at work sites.

102. **Occupational Health and Safety.** To reduce day to day risks associated with working with heavy equipment in trafficked areas, contractors will be required to appoint health and safety officers for each site and to ensure regular briefing of the construction workforce on health and safety issues. Contractors shall establish their occupational health and safety plan to be adopted at each site following international best practices and the World Bank EHS guidelines on construction and decommissioning activities. As minimum and whichever are applicable, the occupational health and safety plan shall ensure the following:

- (i) Communication and Training
 - (a) Training of all workers on occupational health and safety prior to construction works;
 - (b) Conduct of orientation to visitors on health and safety procedures at work sites;
 - (c) Signages strategically installed to identify all areas at work sites, including hazard or danger areas;
 - (d) Proper labeling of equipment and containers at construction and storage sites; and
 - (e) Suitable arrangements to cater for emergencies, including: first aid equipment; personnel trained to administer first aid; communication with, and transport to, the nearest hospital with an accident / emergency department; monitoring equipment; rescue equipment; fire fighting equipment; and communication with nearest fire brigade station.
- (ii) Physical Hazards

⁴¹ <http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES>

- (a) Use of personal protective equipment (PPE) by all workers such as earplugs, safety shoes, hard hats, masks, goggles, etc. as applicable, and ensure these are used properly;
 - (b) Avoidance of slips and falls through good house-keeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from foot paths, cleaning up excessive waste debris and liquid spills regularly, locating electrical cords and ropes in common areas and marked corridors, and use of slip retardant footwear;
 - (c) Use of bracing or trench shoring on deep excavation works;
 - (d) Adequate lighting in dark working areas and areas with night works;
 - (e) Rotating and moving equipment inspected and tested prior to use during construction works. These shall be parked at designated areas and operated by qualified and trained operators only;
 - (f) Specific site traffic rules and routes in place and known to all personnel, workers, drivers, and equipment operators; and
 - (g) Use of air pollution source equipment and vehicles that are well maintained and with valid permits.
- (iii) General Facility Design and Operation
- (a) Regular checking of integrity of workplace structures to avoid collapse or failure;
 - (b) Ensuring workplace can withstand severe weather conditions;
 - (c) Enough work spaces available for workers, including exit routes during emergencies;
 - (d) Fire precautions and fire fighting equipment installed;
 - (e) First aid stations and kits are available. Trained personnel should be available at all times who can provide first aid measures to victims of accidents;
 - (f) Secured storage areas for chemicals and other hazardous and flammable substances are installed and ensure access is limited to authorized personnel only;
 - (g) Good working environment temperature maintained;
 - (h) Worker camps and work sites provided with housekeeping facilities, such as separate toilets for male and female workers, drinking water supply, wash and bathing water, rest areas, and other lavatory and worker welfare facilities; and
 - (i) Maintain records and make reports concerning health, safety and welfare of persons, and damage to property. Take remedial action to prevent a recurrence of any accidents that may occur.

103. Table 7 summarizes the impacts related to construction. As all can be mitigated by consistent application of the mitigation measures described, none are significant.

Table 7: Summary of impacts related to construction

Potential Impact	Malé	Villingilli
Impedance of traffic	Negative, temporary, not significant	Negative, temporary, not significant
Noise pollution and vibration	Negative, temporary, not significant	Negative, temporary, significant
Waste generation	Negative, temporary, not significant	Negative, temporary, not significant

Potential Impact	Malé	Villingilli
Release of silt	Negative, temporary, not significant	Negative, temporary, not significant
Water pollution	Negative, temporary, not significant	Negative, temporary, not significant
Air and dust pollution	Negative, temporary, not significant	Negative, temporary, not significant
Community health and safety risks	Negative, temporary, not significant	Negative, temporary, not significant
Occupational health and safety	Negative, temporary, not significant	Negative, temporary, not significant

D. Environmental Impacts Related to Operation

104. **General.** The proposed improvements are designed specifically to address existing and future operational constraints related to safe and efficient handling of waste, collection of recyclables and shipment to Thilafushi. Existing impacts that are addressed including excessive loss of waste to the sea during loading of transfer vessels, site security, inability to accurately weigh incoming waste, constraints on maintenance and safe storage of vehicles and plant, and site drainage. The impacts for each location are summarised in Table 8.

105. **Use of containers.** While containers provide a more efficient system of handling and loading waste, reducing potential losses into the sea, any breakages or mishandling of containers will result in significant discharge of waste into the sea. Operation and maintenance training must provide for instruction on maintenance of containers, loaders, cranes and vessels and sound operation including licensing of vehicle and plant operators and restrictions on operation during stormy weather.

106. **Retention of waste awaiting transfer to the RWMF.** In practice, vessels may not, on some occasions, be stacked with a full payload of filled containers. However, deferring of sailings will entail retention of waste with a putrescible content which under usual conditions will result in rapid decomposition and emissions of odors, creating unacceptable working conditions. Adherence to a daily sailing schedule needs be observed to avoid excessive in-situ decomposition of waste.

107. **Pests.** Although improvements will reduce access to them, the transfer stations will still be subject to pests such as birds and rodents. Numbers of these can be kept down by improved operation regimes, including site hygiene and regular cleaning of surfaces, minimizing time that putrescible waste is stored, and provision for enclosed storage of such waste.

108. **Effects on traffic.** Each station will handle a growing quantity of waste, and therefore increased vehicle movements. This can add to or cause traffic congestion in the vicinity of the stations. The impact is mitigated by careful planning by WAMCO of waste collection rosters on each island.

109. **Occupational health and safety.** Improved site cleanliness at the transfer stations will reduce exposure to toxins and disease and improve the existing level of occupational health and safety for workers. The operators of these transfer stations shall implement measures following

international best practices and the World Bank EHS industry sector guidelines for infrastructure: waste management facilities.⁴²

Table 8: Summary of impacts related to operation of the improved facilities

Potential Impact	Malé	Villingilli
General	Positive, significant, long term	Positive, significant, long term
Losses of waste during handling	Positive, significant, long term	Positive, significant, long term
Pests	Positive, significant, long term	Positive, significant, long term
Effects on traffic	Positive, significant, long term	Not significant
Air and dust pollution	Positive, significant, long term	Positive, significant, long term
Community health and safety risks	Positive, significant, long term	Positive, significant, long term
Occupational health and safety	Positive, significant, long term	Positive, significant, long term

E. Global, Transboundary and Cumulative Impacts

110. The proposed improvements will occur within the Greater Malé area, on the individual islands of Malé, and Villingilli. However, the improvements in collection, treatment and disposal of waste, which will be facilitated by the transfer station improvements, will reduce the discharge of waste from these islands into the surrounding ocean waters.

111. Capacity building for the EPA will assist in the build-up of capabilities required to further improve and manage waste management facilities throughout the Maldives.

VI. ANALYSIS OF ALTERNATIVES

112. The Feasibility Study prepared by Water Solutions and Kocks Ingenieure discusses the best practicable environmental option (BPEO) for the transfer stations.

A. Alternatives to the Transfer Station Improvements

113. For Malé, the Feasibility Study report states that the layout of the proposed infrastructure improvements has been dimensioned in such a way that future strategies in terms of sorting, recycling and waste flow handling have been taken in account, and projected quantities of each fraction of solid waste have been projected for the design.

114. Consideration was given to the use of purpose built, steel 25 m³ containers to receive waste from the collection trucks for transfer to the Thilafushi-bound vessels, and emptied on Thilafushi. The movement of these containers would involve mobile cranes, using a hook-lift system. However, in view of the advantages of a stackable container system to enable greater flexibility in scheduled sailings of the waste transfer vessels, standard 6m containers are favored. These are readily transported with reach-stacker vehicles, in favor of mobile cranes.

⁴² World Bank EHS Industry Sector Guidelines: Infrastructure; Waste Management Facilities

B. Alternatives within the Project Scope

115. The design of the transfer stations envisages the use of containers, to receive waste from delivery trucks and transfer it to vessels. An alternative to this is an “open” system where trucks are offloaded mechanically, or they tip the waste to a central area or directly onto awaiting vessels. The use of containers however provides a much higher level of control, and greatly limits the risk of waste being lost to the sea during the offloading and loading processes.

116. The concept design envisages separate selection of wet waste (primarily organic waste from eating or retail establishments) and dry waste (primarily wood and other fibre based products, metals and glass). This enables dry waste to be pre-sorted and pressed into bales for temporary storage on site or direct shipping to a user. The system relies on separated streams for collection, and enables a greater level of recycling and reuse of waste.

C. The no project alternative

117. Under the “no project” scenario, there will be no means of increasing the handling capacity of the existing waste handling facilities to meet the requirements imposed by the growing volumes of waste, projected to rise at current rapid levels. This may lead to excessive on site storage, in conditions that allow increased loss of waste to the sea. Figure 13 below provides a view of the existing situation at Malé. Waste is piled high on a barge about to depart to Thilafushi. Some of the uncompacted, uncontained waste falls into the sea either at the transfer station or Thilafushi harbor or during the crossing. Limited space for maintenance of vehicles and plant will not be upgraded by provision of the workshop area, and separation of recyclable factions will remain haphazard.

Figure 13: Existing Situation. The transfer of waste from delivery trucks to barges is time consuming and inefficient, and significant volumes of waste are lost to the sea.



VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Consultations and information during design

118. During feasibility study preparation and the identification of the BPEO for the transfer stations and other aspects of the integrated solid waste management system for Zone III, the team worked with key stakeholders such as MEE and WAMCO, and stakeholders are identified in a stakeholder analysis. Consultations have consistently shown a strong desire for the existing solid waste management system to be improved.

119. Public consultations were held on 13th February 2018 in Malé and Villingilli in relation to the proposed transfer station improvements, through individual interviews. Respondents were given an introduction to the project, covering project background and likely construction and operation phase impacts. The table below summarizes the views and concerns of respondents and how they are addressed in project design and the EMP.

Table 9: Summary of outcomes of public consultation on Malé

Views and concerns expressed	Responses / Appropriate Action
The transfer station is distant from residential homes, no direct impact on homes and	-

Views and concerns expressed	Responses / Appropriate Action
businesses due to smell, dust or noise are expected to reach the area.	
Workers in the southwestern part of Malé notice odors during existing conditions when the wind comes over the transfer station	Improved handling, use of containers and site hygiene to reduce odor emissions
Concern over traffic impacts of other planned activities in the industrial area where the transfer is situated, namely moving of fuel sheds, warehouses and industries.	The Contractor is to (i) provide notices to the public, scheduling work that blocks roadways to periods of low traffic and (ii) co-ordinate with any other major construction projects taking place in the vicinity of the transfer station on Malé to agree measures such as scheduling of construction traffic to avoid peak vehicle movements occurring at the same time.
Improvements in waste handling by WAMCO observed, also creation of job opportunities, particularly for women	-
Respondents mentioned that two dumpsites elsewhere in Malé had been closed in favour of a single location at the transfer station, which had reduced public nuisance	-
No burning at the transfer station should be permitted	The improvements provide for more efficient handling and transport and the use of containers, no burning is envisaged or to be permitted.

Table 10: Summary of outcomes of public consultation on Villingilli

Views and concerns expressed	Responses / Appropriate Action
Bad smells occur, particularly as waste accumulates prior to being taken to Thilafushi, however some participants said that the situation has improved due to more regular collections.	Improvements are to include improved processing and storage as well as more efficient collection.
Participants that improvements to the waste transfer area are needed and are in favour of the project	-
Concern over noise and dust during construction.	Noise: the EMP requires Contractors to (i) provide information, (ii) confine construction activities to daylight hours and (adhere to the construction schedule). The EMP also requires contractors to maintain plants and vehicles in good condition with noise suppression. Dust: Addressed by (i) maintenance of vehicles and plant in good condition and (ii) Apply water to suppress dust where needed and sweeping of work sites.

Views and concerns expressed	Responses / Appropriate Action
Consensus that the project is needed and happy about the current location of the site	-

B. Further Information Disclosure and Public Consultation

120. This IEE, once updated on the basis of detailed design and a Dhivehi translation of the executive summary will be provided to commune officials for public disclosure. Similarly, the updated IEE based on detailed design will be shared with stakeholders, as will results of monitoring. Stakeholders will be kept informed of construction activities that are likely to cause noise and dust nuisance (particularly on Villingilli), or disruption to roads and pathways and will be made aware of the grievance redress mechanism and consultations will take place regularly to gain feedback and ensure that impacts are being adequately managed.

121. **Information, Education and Communication (IEC).** The IEC component will address perceptions on solid waste management, communication channels within the island communities, the role of women and scope for public involvement in improved solid waste management activity, in line with the “3 Rs”. This will potentially include adopting practices at the household level that reduce waste generation (including in particular reduced use of disposable plastics) and the separation of compostable and recyclable waste, and eliciting participation in community level activity.

122. The IEC will also support island councils in the management of solid waste, particularly through partnerships with resorts, NGOs or other islands to support initiatives to manage solid waste safely and sustainably. Resorts could provide technical training to islands, help in repair of SWM equipment, joint transport of waste to treatment centers, and carry out joint awareness programs on SWM. Strategies may include:

- (i) Involvement of environmental clubs that have been formed in schools;
- (ii) Use of social media, particularly those in common use already such as “facebook” and “viber”;
- (iii) Setting up a dynamic knowledge portal;
- (iv) Sharing information on the project, its activities and roll out schedule of the project components;
- (v) Partnerships between resorts and neighbouring islands on sustainable waste management;
- (vi) Promoting 3R practices, including reduction of plastic water bottles through use of reusable glass bottles and/or large, reusable bottles for drinking water; and
- (vii) Encouraging use of locally produced compost.

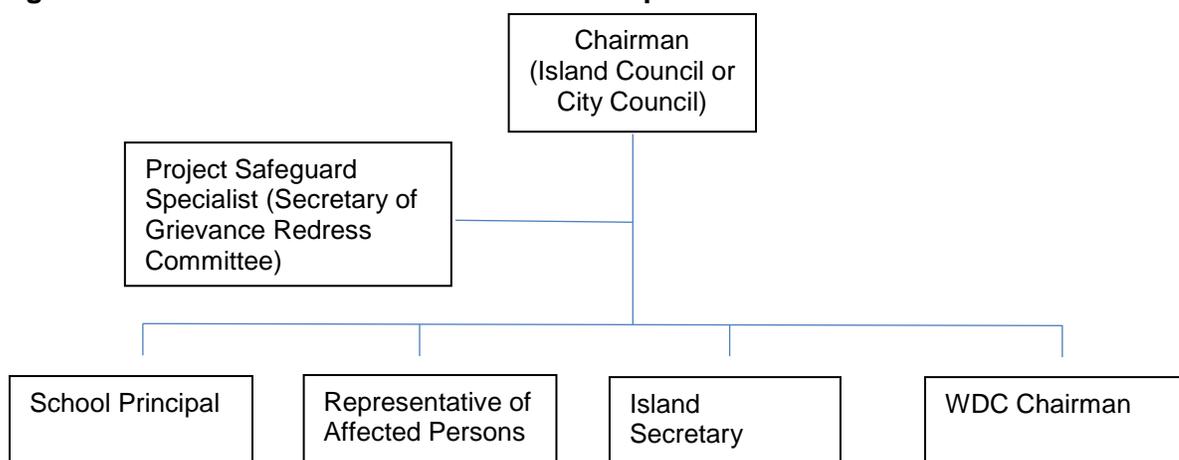
VIII. GRIEVANCE REDRESS MECHANISM

123. A grievance redress mechanism (GRM) will be established to receive and facilitate the resolution of affected persons (APs) concerns, complaints, and grievances on negotiated/voluntary land donation or involuntary land acquisition, relocation, income restoration, environmental management and other construction and operation related issues. The GRM is accessible to all APs to address their concerns, grievances and issues effectively and swiftly, in accordance with ADP SPS, 2009.

124. **First Tier:** City Council/Island Council – grievances will be registered informally by contacting the city/island councils. If the grievance cannot be resolved informally then the APs can register a formal complaint. The council must screen the grievance to determine whether the

concerns raised in the grievance are within the scope of the project. The council will determine solutions to the issues either by (i) discussing internally, or (ii) joint problem solving with aggrieved parties, or (iii) a combination of both options. If the complaint is resolved within a week, the council must communicate the decision to the aggrieved party formally or informally. Should matter be unresolved and/or the affected person be unhappy with the result, the complaint will be referred to the next tier. The grievance redress committee (GRC) includes the island's representatives as well as project officers related to each island, as shown in the figure below.

Figure 14: Grievance Redress Committee Composition for First Tier



125. **Second Tier:** The AP can elevate the grievance to the second tier, and submit a complaint on a letter addressed to MEE. The MEE will forward the letter to the PMU. The PMU will be responsible to resolve the complaint within 15 days and communicate the decision to the aggrieved party. The PMU screens the grievance and determines if it is related to the project. If unrelated, the AP is notified in writing. If it is relevant to the project, the PMU will hold discussions with the MEE on the matter and if necessary, (i) arranges visit the site and hold on-site discussions and/or (ii) refers the matter to the project steering committee. The PMU then decides on the action that will be taken by the project to address the grievance, and the decision will be conveyed to the AP in writing.

126. The affected persons can also direct contact (in writing) the ADB Project Officer at ADB headquarters. The complaint can be submitted in any of the official languages of ADB's Developing Member Countries. This may be done at any time by sending the written complaint to the following address:

Project Officer – Greater Malé Environmental Improvement and Waste Management Project
South Asia Urban Development and Water Division
South Asia Regional Department
Asian Development Bank
6 ADB Avenue, Mandaluyong City 1550
Metro Manila, Philippines

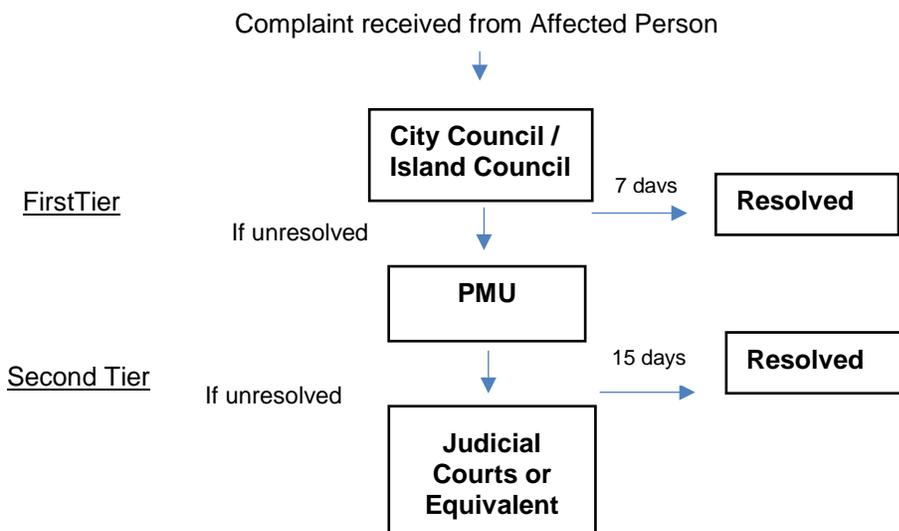
127. The affected persons can also use the ADB Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB. The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the Project Information Document to be distributed to the affected communities, as part of the project GRM.

128. The legal system is accessible to all the APs. APs can seek legal redress through Maldives judicial or appropriate administrative system at any stage of the matter or issue concerned. The affected persons can also use the ADB Accountability Mechanism through directly contacting (in writing) the CRO at ADB. The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the PID to be distributed to the affected communities, as part of the project GRM.

129. The GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage through the Maldives judicial or appropriate administrative system. This can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

130. The flow diagram of resolving complaints under the GRC is shown in Figure below.

Figure 15: GRM Diagram for Complaints Resolution



131. The GRM will include group meetings and discussions with APs to address general and common grievances. These meetings and discussions will be announced in advance, conducted at the time of day agreed on with APs (based on their availability), and facilitated by the PMU and PMDSC at least are assisted to understand the grievance redress process, to register complaints and with follow-up actions at different stages in the process. Records will be kept by the PMU to keep track of all grievances received, both informal and formal, including contact details of complainant, date when the complaint was received, nature of grievance, agreed corrective actions and the date when these were effected, and final outcome. A Sample Grievance Registration Form is attached in Appendix 2.

132. All costs involved in resolving the complaints (meetings, consultations, communication and reporting, and information dissemination) will be borne by the PMU.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Objectives

133. This EMP sets out the needs for environmental management of transfer station improvements within the GMEIWMP in terms of institutional responsibilities to ensure mitigation and monitoring takes place during the pre-construction, construction and operation phases, meeting the requirements of the Government of the Maldives and the ADB's SPS.

134. A copy of the EMP must be kept on work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

135. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

B. Institutional Arrangement

136. **Implementation arrangements.** The executing agency is the Ministry of Finance and Treasury (MOFT). The implementing agency is the Ministry of Environment and Energy (MEE) who will establish a project management unit (PMU) comprising officials from MEE and WAMCO. The PMU will be strengthened with external experts in the areas of finance, procurement, technical areas, and contract management. The project steering committee chaired by Minister, MEE will provide overall guidance and strategic directions to the project. Consultant firms will be recruited under the project to support engineering designs, supervision, project management, institutional capacity strengthening, and community awareness.

137. **Project Management Unit.** The Director General of the Solid Waste Department of MEE proposed that a dedicated full-time PMU for the ADB Zone 3 waste management project will be established (pending approval by MOFT) with eight staff as follows: (i) Project Director (part-time, Director General of Department), (ii) Project Manager (full time), (iii) Procurement Specialist, (iv) Finance Specialist, (v) Safeguard Specialist, (vi) Civil Engineer, (vii) IEC Specialist, and (viii) administrative assistant. The Project Director is a government official empowered to take official decisions, while remaining PMU staff are contracted staff recruited from the market. The PMU will be supported by consultants for project management, capacity building, monitoring, and technical design and supervision support. The proposed PMU contract staff are to be recruited competitively without further delay in phases.

138. **Terms of Reference for PMU Environment Officer.** Key tasks and responsibilities of the PMU environment officer are as follows:

- (i) confirm existing IEEs/EMPs are updated based on detailed designs, and that new IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
- (ii) confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;

- (iii) provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by island councils and contractors
- (iv) establish a system to monitor environmental safeguards of the project, including monitoring the indicators set out in the monitoring plan of the EMP;
- (v) facilitate and confirm overall compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant; e. supervise and provide guidance to the island councils to properly carry out the environmental monitoring as per the EARF;
- (vi) review, monitor, and evaluate the effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken as necessary;
- (vii) consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;
- (viii) ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public;
- (ix) address any grievances brought about through the grievance redress mechanism in a timely manner;
- (x) With assistance from the PMDSC, provide orientation to PCU and PIU staff in environmental management arrangements for the project;
- (xi) Provide inputs to progress reports and the project completion report;
- (xii) Visit worksites during construction and provide guidance relating to supervision and compliance monitoring; and
- (xiii) Visit completed works and assist with establishing environmental monitoring procedures for the operation phase of the improved infrastructure.

139. Terms of Reference for PMDSC Safeguard Consultants. The Social, Environmental and Occupational Health and Safety Expert in PMDSC will:

- (i) Ensure compliance with ADB safeguard requirements;
- (ii) Screen and categorize IWMCs for inclusion in the project;
- (iii) Ensure no Category A subproject per ADB SPS definition;
- (iv) Provide guidance on safeguards and issue instructions to the Contractors;
- (v) Assist in obtaining all necessary permissions and complying with statutory requirements;
- (vi) Prepare necessary IEE and EMP for each IWMC that will be considered in the project.
- (vii) Submit IEE and EMP to PMU for submission to ADB;
- (viii) Ensure IEE and EMP is included in the bid and contract document and) and such items are included in BOQ;
- (ix) Review the Contractor's Environmental Management Plan (CEMP) for adequacy in terms of compliance with the requirements of the EMP and instruct amendments and additions as necessary;
- (x) Monitor and ensure compliance with ADB SPS and contractors' implementation of the EMPs;
- (xi) As part of the EMP, prepare a project focused Occupational Health and Safety Plan (OHS) to be adopted by the Client and the Contractor;
- (xii) Ensure that relevant provisions in contracts on OHS are abided by the contractors during the construction works;
- (xiii) Facilitate meaningful consultations and carry out disclosure of safeguard documents;
- (xiv) Prepare environmental and social mentoring reports;

- (xv) Prepare corrective action plan/s as required to ensure compliance with ADB SPS, 2009 and national laws and regulations;
- (xvi) Assist in GRM implementation;
- (xvii) Conduct Safeguards Orientation to contractors prior to mobilization; and
- (xviii) Develop and conduct regular safeguards trainings (see indicative institutional capacity development program) to ensure PMU, island councils and other stakeholders have common understanding of ADB SPS requirements during all phases of project implementation.

Figure 16: Project organization structure

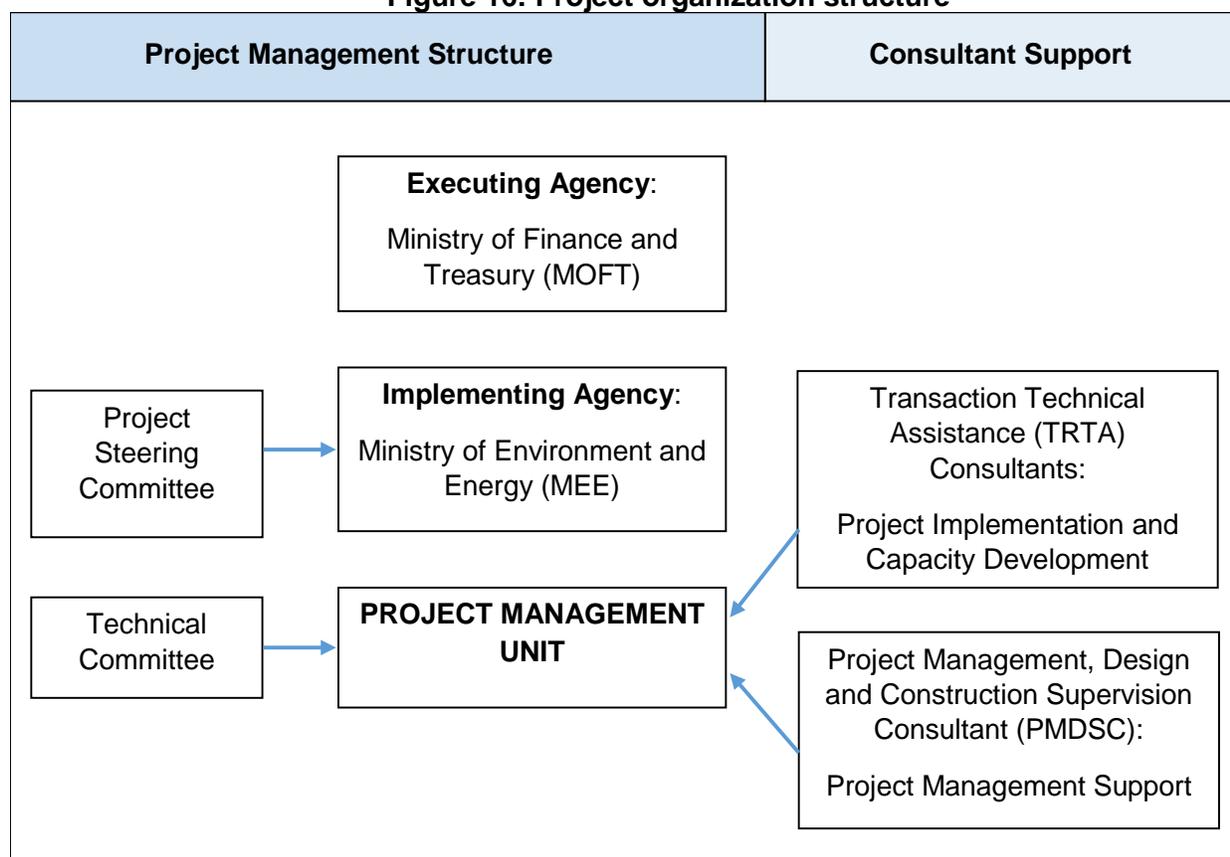


Table 11: Roles and Responsibilities of Project Implementation Organizations

Project Implementation Organizations	Management Roles and Responsibilities
<p>Executing agency Ministry of Finance and Treasury (MOFT)</p>	<p>Guide and monitor overall project execution. Financial oversight. Ensure flow of funds to the implementing agency and timely availability of counterpart funding; ensure adequate budget for successful implementation of the project. Monitors compliance with project legal Agreements Procurement oversight. Responsible for approving procurement. Review and coordinate evaluation of bids for works, goods, and consultant services. Maintaining project accounts and project financial records; Review and sign withdrawal applications before submitting to Asian Development Bank (ADB). Approve project management unit (PMU).</p>

Project Implementation Organizations	Management Roles and Responsibilities
Project steering committee [Chair: Minister, Ministry of	Provide policy direction to facilitate project implementation. High-level troubleshooting.
Environment and Energy (MEE)]	Meets quarterly (or as needed) to review project performance and resolve issues.
Implementing agency 1 (MEE)	Overall day-to-day project management, monitoring, and evaluation.
PMU in MEE	<p>Responsible for overall project management, implementation and monitoring;</p> <p>Reviews the reports submitted by (project management, design and construction supervision consultant) PMDSC with respect to detailed design, costs, safeguards, financial, economic, and social viability</p> <p>Prepare, with the support of PMDSC, bidding documents, request for proposals, and bid evaluation reports;</p> <p>Serves as point of contact with ADB, maintains project documents, and submits timely reports (quarterly progress reports and project completion report) to ADB by consolidating relevant inputs from PMDSCs and island council;</p> <p>Consolidates expenditures and prepare withdrawal applications for direct payment, reimbursements and use of imprest advance;</p> <p>Opens and manages imprest account for ADB Grant;</p> <p>Organize project orientation for participating island councils by elaborating scope of the project and sharing about their obligation and including maintaining separate accounts for their respective contributions;</p> <p>Establishment and maintaining of project website by disclosing progress reports, safeguard monitoring reports and design reports; and</p> <p>Collect supporting documents and submit withdrawal applications to ADB via MOFT.</p> <p>Monitors and ensures the compliance of covenants, particularly timely submission of audited project accounts and compliance with safeguard requirements;</p>
Technical committee	Advise and facilitate to resolve technical issues.
WAMCO	Operator for collection, transport, and disposal of waste services in project area Manage regional waste management facilities
Island Councils	Operators of solid waste services on outer islands Responsible for management and O&M of Island Waste Management Centers
ADB	<p>Conducts project review missions, midterm review mission and project completion review mission to assess project implementation progress of all outputs, compliance of grant covenants including actions required in terms of safeguards (environmental impacts and social mitigation measures applicable); timeliness of budgetary allocations and counterpart funding; project expenditures; progress with procurement and disbursement;</p> <p>Post on ADB website the updated project information documents and safeguards documents as per disclosure provision of the ADB safeguards policy statement.</p> <p>Reviews executing agency and implementing agency's submissions for procurement of goods, equipment, works and services and provides comments and no objection on the submissions</p>

Project Implementation Organizations	Management Roles and Responsibilities
	Checks Statement of Expenditure on sampling basis

140. **The Contractor.** The contractor will have the following roles and responsibilities:
- (i) obtain all statutory clearances prior to commencement of civil works;
 - (ii) complies with all applicable legislation, is conversant with the requirements of the EMP, and briefs staff about the requirements of same;
 - (iii) prepare a Contractor's EMP based on the EMP of this IEE, and submit to PMDSC for approval;
 - (iv) carry out all of the monitoring and mitigation measures set forth in the approved CEMP;
 - (v) ensures any sub-contractors/ suppliers, who are utilized within the context of the contract, comply with the environmental requirements of the CEMP/EMP. The Contractor will be held responsible for non-compliance on their behalf;
 - (vi) implement any corrective or preventative actions set out in safeguards monitoring reports that the executing agency or implementing agency will prepare from time to time to monitor implementation of this IEE, EMP, and CEMP;
 - (vii) provides environmental awareness training to staff;
 - (viii) bears the costs of any damages/ compensation resulting from non-adherence to the EMP or written site instructions;
 - (ix) conducts all activities in a manner that minimizes disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment;
 - (x) ensures that its staff or engineers are informed in a timely manner of any foreseeable activities that will require input from the environment and safety officers (or equivalent);
 - (xi) appoints one full time environment and safety officer (or equivalent) for implementation of EMP, community liaising, reporting and grievance redressal on day to day basis; and
 - (xii) receives complaints/grievances from the public, immediately implements the remedial measures and reports to the PMU and PMDSC.

C. Institutional Capacity Development Program

141. The PMU, to be established by the MEE, will be responsible for the implementation of safeguards and ensuring that they comply with ADB requirements as well as the EPPA. The body responsible for approving environmental impact assessments and issuing of permits is the Environmental Protection Agency (EPA), which is under the Ministry of Environment and Energy.⁴³ Capacities were assessed by the PPTA consultants during interviews that took place in July and September 2017. The EPA has few trained technical staff and at the time of capacity assessment work undertaken by the PPTA consultants, all senior members of the EPA's waste department were away from the office for study, which is indicative of a low staffing resource level. The agency relies on external consultants for functions such as environmental monitoring for projects, however this is usually confined to the construction phase. The EPA does have one team of field staff a laboratory and a boat for fieldwork, but laboratory operations and travel is constrained by budget constraints. The situation is reflected in other departments of the MEE.

⁴³ Note that EPA, while it comes under MEE, has a governing board which is a statutory body.

142. The PMDSC will provide assistance during the project for the implementation of safeguards in compliance with ADB SPS 2009 requirements and with the requirements of the EPPA. This provision responds to lessons learned for project design to include support to PMU staff in project implementation particularly in procurement, contract management, and safeguards . The PMDSC will provide assistance to the PMU for overseeing EMP implementation.

143. Besides the IEC component which includes some capacity building measures for ICs (e.g. increasing outreach of IEC, closing feedback loop), the Transaction Technical Assistance (TRTA) for Strengthening Capacity for Sustainable Solid Waste Management in the Greater Malé Region will provide both implementation and safeguard guidance and assistance towards the PMU. Since recycling is of a major concern, a market sounding will be carried out during the TRTA to increase the knowledge in this regard and to inform the institutional stakeholders (mainly MEE, WAMCO and ICs) about the potential for recycling of certain waste components.

144. Capacity development support will be provided via the TRTA including support for the improvements of the Malé and Villingilli transfer stations. It will also include implementation guidance specifically to the new PMU to be formed for the project. The TRTA team includes a national safeguards and gender expert.

D. Impacts and Mitigation

145. Table 10 summarizes the potential impacts and mitigation measures in relation to location, construction and operation identified in the IEE.

Table 12: Environmental Management Plan

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsible for Implementation	Responsible for Supervision
Pre-Construction Stage						
Efficiency of operation of the transfer stations	Malé, and Villingilli	Inclusion in detailed design of provisions needed for efficient and high standard of operation of the transfer stations, including drainage design, handling of clinical waste, washing of sites, vehicles and containers and treatment of drain runoff water and water used for washing, effluent management, fire prevention and fire fighting measures and site security	Compliant with PMDSC company quality control standards	Design cost	DB Contractor; PMDSC	MEE
Sanitation and welfare provisions for the administration building	Malé	Inclusion of provisions for canteen, meeting room and toilet facilities, including provisions for treatment/discharge of wastewater in design of the administration building	Approval by PMDSC	Design cost	DB Contractor; PMDSC	MEE
Pests: Birds and Rodents	Malé, and Villingilli	Provision in the design of enclosed areas for storage of putrescible waste and of cleaning equipment such as hoses.	Compliant with PMDSC company quality control standards	Project funds	PMDSC	MEE
Effects on traffic	Malé – primarily Villingilli – limited	Consideration of traffic flows in final layout design	Compliant with PMDSC company quality control standards	Project funds	PMDSC	MEE
Construction Impacts	Malé; Villingilli	Preparation of Contractor's Environmental Management Plan providing specific detail in relation to chosen construction methods	Approval by PMDSC	Construction Cost	Contractor	PMDSC
General impacts on local residents		Provision of information to the public on Grievance Redress Mechanism	Completion of disclosure measures as prescribed in the GRM	Project Management Cost	PMU	-

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsible for Implementation	Responsible for Supervision
Climate risk and vulnerability mitigation		Incorporation of recommendations from CRVA into detailed design	Compliant with PMDSC company quality control standards	Design cost	PMDSC	MEE
Construction stage impacts						
Impeding access to property or facilities, or traffic disruption	Malé – primarily Villingilli – limited	<p>Notices to the public, scheduling work that blocks roadways to periods of low traffic.</p> <p>Co-ordination with any other major construction projects taking place in the vicinity of the transfer station on Malé to agree measures such as scheduling of construction traffic to avoid peak vehicle movements occurring at the same time.</p>	No complaints registered via the GRM in respect of traffic impacts, or any such complaints addressed	Construction Cost	DB Contractor	PMDSC
Noise pollution and vibration	Villingilli – primarily Malé - limited	<p>Providing information to the affected persons through direct liaison and via the local media about the timing and duration of the works.</p> <p>Construction activities will be limited to normal daylight working hours. A work schedule will be followed.</p> <p>All construction equipment and vehicles will be in good working order with working mufflers and noise suppression.</p>	<p>No complaints registered via the GRM in respect of noise and vibration, or any such complaints addressed</p> <p>Noise level not to exceed 70L_{Aeq 1hr} dBA at construction site.</p>	Construction Cost	DB Contractor	PMDSC

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsible for Implementation	Responsible for Supervision
Waste generation from construction activities	Malé; Villingilli	All solid waste must be disposed of at a landfill or approved disposal site. Importation of any materials rated as hazardous under the Globally Harmonized System of Classification and Labelling of Chemicals to be subject to approval by PMDSC, which will be conditional on stating adequate arrangements for disposal.	Site free of construction waste on commissioning. Written PMDSC approval available for any hazardous chemical in use	Construction Cost	DB Contractor	PMDSC
Handling of day to day waste during construction	Malé; Villingilli	Inclusion in CEMP of measures to ensure regular transfer of waste from households, markets and construction sites	Continued collection of waste during the construction period; no impedece of works or traffic from piled waste	Construction Cost	DB Contractor	PMDSC
Release of silt	Malé; Villingilli	Excavated areas to be rapidly refilled on completion of works. Use of silt fences around temporary piles of excavated material. Avoid excavation in wet weather to the extent practicable.	No instances when silt release is uncontrolled	Construction Cost	DB Contractor	PMDSC

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsible for Implementation	Responsible for Supervision
Water pollution	Malé; Villingilli	<p>Vehicles and plant are to be maintained in sound operable condition, free of leaks. The condition of vehicles and equipment will be periodically checked.</p> <p>Contractor to prepare and submit a plan for spill management, including provision of spill kits, training/briefing of workers on procedures on handling spills and allocation of responsibility within the DB Contractor's team for ensuring that spill kits are available and that workers know how to use them.</p>	<p>Vehicles and construction plant to have at all times at a minimum: (i) intact and securely fitted exhaust pipes and mufflers (ii) operable brakes (iii) no fuel or lubricant leaks.</p> <p>Spill kits on site at all times</p>	Construction Cost	DB Contractor	PMDSC
Air and dust pollution	Villingilli – primarily Malé – limited	<p>Require vehicles and equipment to be well maintained and tuned and fitted with exhaust baffles. Apply water to suppress dust where needed and sweep to remove and clear spoil on surfaces.</p>	<p>Vehicles and construction plant to have at all times at a minimum: (i) intact and securely fitted exhaust pipes and mufflers (ii) operable brakes (iii) no fuel or lubricant leaks</p>	Construction Cost	DB Contractor	PMDSC

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsible for Implementation	Responsible for Supervision
Community health and safety hazards	Malé; Villingilli	<p>Restriction of access to the transfer stations. For work at the periphery of the sites, provide notices to the public identifying hazards and erect safety barriers / covers for areas of open excavation</p> <p>Contractors to adopt the WB EHS Guidelines on Community Health and Safety, particularly those that relate to construction works.</p>	Barriers and notices to be in place at all times, entrance to sites actively controlled	Construction Cost	DB Contractor	PMDSC
Occupational health and safety hazards	Malé; Villingilli	<p>Contractors to appoint health and safety officers for each site and to ensure regular briefing of construction workforce on health and safety issues. Adequate personal protective equipment to be provided to the workforce.</p> <p>Contractors to adopt the WB EHS Guidelines on OHS, particularly those that relate to construction works.</p>	<p>Member of the Contractor's staff nominated as health and safety officer to be present on site.</p> <p>Appropriate protective equipment to each construction operation to be worn at all times (including steel toe capped boots at all times, hard hats when working near machinery or roofing work, eye protection for welding)</p>	Construction Cost	DB Contractor	PMDSC
Impacts During Operation						

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsible for Implementation	Responsible for Supervision
Risks of loss of containers and contents	Malé;; Villingilli	O&M training to include instruction on maintenance of containers, loaders, cranes and vessels and sound operation including licensing of vehicle and plant operators and restrictions on operation during stormy weather	O&M training completed Operators to have undergone training and have licences to drive/operate vehicles and machinery.	Training budget	Implementation consultants / DB Contractor	MEE
Pests: Rodents and birds and odors	Malé; Villingilli	Maintenance of site cleanliness, minimizing storage time for putrescible waste, provision of enclosures for putrescible waste.	Sites to be clean and all putrescible waste enclosed at the close of operations each day	Operation Cost	WAMCO	MEE
Retention of waste awaiting transfer to the RWMF	Malé	Adherence to a daily sailing schedule needs be observed to avoid excessive in-situ decomposition of waste.	No cancellations of vessel transfers to RWMF except in the case of storms or unavoidable mechanical outage	Operation Cost	WAMCO	MEE
Operator occupational health and safety	Malé; Villingilli	Operators trained to recognize risks and hazards. Personal safety equipment issued and worn. Health and safety recognized as primary employer responsibility. Operator to adopt the WB EHS Guidelines on OHS for SWM projects.	Allocation of responsibility for safety standards to a full time member of staff. Appropriate protective equipment to each construction operation to be worn at all times (including steel toe capped boots and hard hats at all times)	Operation Cost	Implementation consultants / DB Contractor WAMCO	MEE
Community Health and Safety Hazards	Malé; Villingilli	Operate a security system to restrict access to the public. Operator to adopt the WB EHS Guidelines on Community Health and Safety for SWM projects.	Perimeter fence intact and site secure at all times	Construction and Operation Cost	WAMCO	MEE

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsible for Implementation	Responsible for Supervision
Effects on traffic	Malé; Villingilli	Scheduling of waste collection to night/low traffic hours.	Submission of waste collection schedule to MEE and adherence to it	Operation Cost	WAMCO - Operator	MEE
Damage to the facility and loss of waste during storm events	Malé; Villingilli	Procedures for shut-down and securing of site, vehicles and vessels in the event of severe storm warnings	Availability of written procedures for inspection; awareness of staff of such procedures	Operation Cost	Implementation consultants / DB Contractor WAMCO	MEE

E. Environmental Monitoring

1. Monitoring Plan

146. The design of the environmental monitoring system is based on an analysis of the key environmental performance issues associated with each stage of the project, set out in Table 11 below.

Table 13: Analysis of Environmental Monitoring Needs

Phase	Key Environmental Performance Issues	Environmental Performance Indicator	Means of Monitoring
Design/ Preconstruction	Inclusion of mitigation measures in design/build and/or detailed design documentation and construction activities	Compliance with EMP design measures	Compliance monitoring
	Air and water quality Noise	Water Quality: BOD, TSS, TPH Faecal coliform/enterococci; Metals (Pb, Cu, Cd, Hg, Cr) Air Quality: SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} , O ₃ Noise L _{Aeq} 1hr (dBA)	Measurements prior to construction
Construction	Adherence to provisions in the EMP to mitigate construction impacts	Compliance with EMP	Compliance monitoring
	Direct effects on communities from impacts such as accidental damage, dust generation, noise generation and safety	Views and opinions of communities Contractor's records relating to minor and major pollution and health and safety incidents (with a target of zero incidents)	Community feedback Grievance redress mechanism
	Air and water quality; noise	As above	Measurements at monthly intervals
Operation	Effectiveness of waste transfer system	Reduced occurrence of floating waste in the sea in the Greater Malé area	Site observations Community feedback
	Air and water quality; noise	As above	Regular measurements according to agreed monitoring plan for operation

BOD = biological oxygen demand; TSS = total suspended solids; TPH = Total Petroleum Hydrocarbons, L_{Aeq} = weighted continuous noise equivalent level dBA = decibels

147. Two areas of environmental monitoring are identified: compliance monitoring and community feedback, which are in addition to monitoring measures in the Design and Monitoring Framework for the project. These provide a means of gauging whether the stations operate more efficiently and with less loss of waste into the sea.

148. Compliance monitoring is required during detailed design and construction of the transfer station facilities, to ensure that mitigation specified in the EMP is carried out to an adequate standard. Compliance monitoring is a function of the PMU and its cost of this monitoring is part of the running cost of the PMU.

149. Community feedback provides for the monitoring of environmental indicators gauged by public perception. Appropriate indicators are:

- (i) Reductions in the incidence of waterborne diseases
- (ii) Effectiveness of waste handling (appearance of floating waste in the sea in the vicinity of the transfer stations and between the Malé station and Thilafushi)

150. Costs of environmental assessment and monitoring during construction are project costs. Environmental monitoring during operation is carried out by the WAMCO, and costs will be met from O&M budgets prepared and managed by the WAMCO.

Table 14: Environmental Monitoring Plan

Impact to be Monitored	Means of Monitoring	Construction Phase			Operation Phase		
		Frequency	Responsible Agency	Indicative Annual Cost	Frequency	Responsible Agency	Indicative Annual Cost
General Construction Impacts	Community Feed-back	To be established by PMDSC	PMU	Covered in project participation plan	To be established by PMDSC	WAMCO	Operational Cost
Compliance with EMP	Inspections	As set up by supervising engineers	PMU / PMDSC	Included in project management and consultancy cost	To be established by PMDSC	WAMCO	Operational Cost
Occurrence of floating waste	Community Feed-back	To be established by PMDSC	PIU	To be determined in design of community outreach component of Project	To be established by PMDSC	WAMCO	Operational Cost
Air and water quality	On site measurements and lab analysis	Prior to construction then monthly	Contractor	Construction cost	To be established by PMDSC	WAMCO	Operational Cost

2. Reporting

151. EMP compliance monitoring will be undertaken by the PMU, with support of the PMDSC. Effects will be monitored by means of community feedback and laboratory testing. Consistent with reporting requirements set out in the Project Administration Manual (PAM). PMU will prepare reports to be sent to ADB on a semi-annual basis during and immediately after construction. Semi-annual reports during operation are to be prepared by WAMCO (suggested outline is attached as Appendix 3). To facilitate monitoring and enable responses to emerging issues, monthly reports will be prepared by the PMU and submitted to the MEE.

X. CONCLUSION

152. The overall finding of the IEE is that the Project will result in significant environmental benefits, as it is conceived and designed to address major environmental issues associated with existing difficulties in waste handling and transfer and the rapidly growing volumes of waste that are projected in coming decades. It will not have significant adverse environmental impacts and potential adverse impacts are manageable through the effective implementation of the EMP.

153. The classification of Category B is confirmed. No further environmental assessment is therefore required. However, this IEE will be finalized based on the final detailed design and this classification shall be reassessed or reconfirmed accordingly.

Rapid Environmental Assessment Checklist

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: Transfer Station Improvements in Male and Villingilli

Sector Division: SAUW

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area...			
▪ Densely populated?	✓		Population density of Malé is 23,002/km ² (59,570/sq mi) while Villimalé (also known as Villingilli) is 26,000/km ² (67,000/sq mi).
▪ Heavy with development activities?	✓		Malé is the center of many development activities in the Maldives. Villimalé used to be a resort earlier before it became a residential island and popular holiday destination among the residents of Malé and Hulhumalé, specially during the weekends. There are several hotels and guest houses in Villimalé.
▪ Adjacent to or within any environmentally sensitive areas?		✓	
• Cultural heritage site		✓	
• Protected Area		✓	
• Wetland		✓	
• Mangrove		✓	
• Estuarine		✓	
• Buffer zone of protected area		✓	
• Special area for protecting biodiversity		✓	
• Bay	✓		Malé is geographically located in Kaafu Atoll. Villimalé considered the fifth district of Malé.
B. Potential Environmental Impacts Will the Project cause...			

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ impacts associated with transport of wastes to the disposal site or treatment facility 	✓		<p>The transport of waste from collection points to transfer stations may have potential impact to the environment due to littering along transport routes. Similarly, transport of wastes from transfer stations to the disposal site may also have potential impact as the route will be by the sea through marine vessels.</p> <p>The Project will include the introduction of a containerized system to improve the efficiency of waste handling from collection points to the disposal site and substantially limit the scope for waste losses during transport. These measures are reflected in the in the designs and EMP of the transfer station subproject .</p>
<ul style="list-style-type: none"> ▪ impairment of historical/cultural monuments/areas and loss/damage to these sites? 		✓	There are no historical and cultural monuments at the subproject sites.
<ul style="list-style-type: none"> ▪ degradation of aesthetic and property value loss? 		✓	The subproject will improve land aesthetics because of expected better efficiency of collection and transport of solid wastes currently being dumped.
<ul style="list-style-type: none"> ▪ nuisance to neighboring areas due to foul odor and influx of insects, rodents, etc.? 	✓		Likely. However, the improvements to the transfer stations and their operations will reduce existing odor and pest issues. The designs and the EMP ensure good housekeeping and site management measures to mitigate the impacts within and adjacent to the subproject sites.
<ul style="list-style-type: none"> ▪ dislocation or involuntary resettlement of people? 		✓	Not anticipated. All lands to be used for the subproject are owned by the government. Social safeguards due diligence conducted shows no potential for IR impacts.
<ul style="list-style-type: none"> ▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups? 		✓	The project will benefit all sectors in the subproject areas.
<ul style="list-style-type: none"> ▪ risks and vulnerabilities related occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation? 	✓		Occupational health and safety (OHS) risks are inherent to construction activities. However, these risks can be reduced through implementation of good construction practices and adoption of internationally recognized OHS measures such as the WB EHS guidelines on construction OHS and SWM. These are included in the EMP.
<ul style="list-style-type: none"> ▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, insects, birds and rats? 	✓		<p>Likely. However, the EMP ensures good housekeeping measures are included to mitigate the impacts at all subproject sites.</p> <p>The Project will significantly reduce exposure of waste to pests and vectors of disease.</p> <p>Limited public access; reduced exposure of pests to waste. The operation of the transfer stations will ensure community health hazards are avoided with the adoption of WB EHS guidelines on SWM as indicated in the EMP.</p>
<ul style="list-style-type: none"> ▪ deterioration of water quality as a result of contamination of receiving waters by leachate from land disposal system? 	✓		Transfer stations will be designed with concrete flooring and provided with leachate management (onsite treatment or store and transfer to appropriate treatment facilities will be finalized during detailed design stage).

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ contamination of ground and/or surface water by leachate from land disposal system? 	✓		Transfer stations will be designed with concrete flooring and provided with leachate management (onsite treatment or store and transfer to appropriate treatment facilities will be finalized during detailed design stage).
<ul style="list-style-type: none"> ▪ land use conflicts? 		✓	Not anticipated. All lands to be used for all subprojects are owned by the government.
<ul style="list-style-type: none"> ▪ pollution of surface and ground water from leachate coming from sanitary landfill sites or methane gas produced from decomposition of solid wastes in the absence of air, which could enter the aquifer or escape through soil fissures at places far from the landfill site? 		✓	Not applicable. The subproject will involve construction of transfer stations.
<ul style="list-style-type: none"> ▪ inadequate buffer zone around landfill site to alleviate nuisances? 		✓	Not applicable. The subproject will involve construction of transfer stations. However, preliminary designs of the transfer stations incorporated buffer zones.
<ul style="list-style-type: none"> ▪ road blocking and/or increased traffic during construction of facilities? 	✓		Anticipated during construction activities. However, impacts are temporary and short in duration. The EMP ensures measures are included to mitigate the impacts. Construction contractors will be required to coordinate with the local traffic police and they will prepare Traffic Management Plan. This will be included in the Contractor's EMP.
<ul style="list-style-type: none"> ▪ noise and dust from construction activities? 	✓		Baseline data on noise shows high ambient noise levels. No dust monitoring has been conducted but expected to be low level due to inherent high winds condition in the islands. The impact of increase in noise will be avoided by undertaking activities during day time when background noise is high. There are no works during night time. Noise-suppression gadgets may also be used. Dust emission can be avoided with the implementation of dust control measures such as sprinkling of water on sites and regular hauling of spoils.
<ul style="list-style-type: none"> ▪ temporary silt runoff due to construction? 	✓		Run-off during construction will be more. However, impacts are temporary and short in duration. The EMP ensures measures are included to mitigate the impacts. Construction contractors will be prohibited from stockpiling loose materials along drain channels and will be required to immediately dispose any waste materials. Silt fences and traps to be used.
<ul style="list-style-type: none"> ▪ hazards to public health due to inadequate management of landfill site caused by inadequate institutional and financial capabilities for the management of the landfill operation? 		✓	Not applicable. The Project will not cover the existing landfill in Thillafushi. However the Project will support capacity building support to WAMCO staff (including all eligible female staff) in waste collection, controlled dumpsite management, strategic planning, and disaster risk management (Output 3).
<ul style="list-style-type: none"> ▪ emission of potentially toxic volatile organics from land disposal site? 		✓	Not applicable.

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ surface and ground water pollution from leachate and methane gas migration? 	✓		<p>Waste in the transfer stations to be stored in containers with limited holding time.</p> <p>The transfer stations will be designed in such a way that leachate formed, especially during monsoon season, will not flow to receiving water bodies or seep to the ground.</p> <p>The operation will have a regular schedule of turnover of solid wastes to the landfill site. Hence, no methane gas formation is expected at these stations.</p>
<ul style="list-style-type: none"> ▪ loss of deep-rooted vegetation (e.g. trees) from landfill gas? 		✓	Not applicable.
<ul style="list-style-type: none"> ▪ explosion of toxic response from accumulated landfill gas in buildings? 		✓	Not applicable.
<ul style="list-style-type: none"> ▪ contamination of air quality from incineration? 		✓	Not applicable. The subproject will not cover incineration.
<ul style="list-style-type: none"> ▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, rodents, insects and birds, etc.? 	✓		<p>Likely. However, the EMP ensures good housekeeping measures are included to mitigate the impacts at all subproject sites.</p> <p>The Project will significantly reduce exposure of waste to pests and vectors of disease.</p> <p>Limited public access; reduced exposure of pests to waste. The operation of the transfer stations will ensure community health hazards are avoided with the adoption of WB EHS guidelines on SWM as indicated in the EMP.</p>
<ul style="list-style-type: none"> ▪ health and safety hazards to workers from toxic gases and hazardous materials in the site? 	✓		The EMP ensures OHS measures are included following relevant WB EHS guidelines. Chemicals other than vehicle fuels will not be used during construction and operation activities. Fuels will be stored and handled properly as per EMP.
<ul style="list-style-type: none"> ▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 		✓	<p>Not anticipated. Population influx due to project construction and operation is minimal. Labor requirements will be sourced locally.</p> <p>Priority in employment will be given to local residents. Construction contractors will be required to provide workers camp with water supply and sanitation.</p>
<ul style="list-style-type: none"> ▪ social conflicts if workers from other regions or countries are hired? 		✓	Labor requirements will be sourced locally.
<ul style="list-style-type: none"> ▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation? 	✓		The EMP ensures community health and safety measures are included following relevant WB EHS guidelines on waste management. Chemicals other than vehicle fuels will not be used during construction and operation activities. Fuels will be stored and handled properly following WB EHS guidelines as included in the EMP.

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components (e.g., landfill or incinerator) of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning? 	✓		During construction and operation of the transfer stations, community health and safety risks will be managed by adopting the WB EHS guidelines as indicated in the EMP.

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Greater Malé Environmental Improvement and Waste Management Project

Sector : Waste Management

Subsector: Water and urban infrastructure and services

Division/Department: South Asia Department / Urban Development and Water Division

Screening Questions		Score	Remarks ^a
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	1	All sites are located close to the coastline
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	1	Sea level rise and peak tide levels need to be considered in design
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	1	Design life of structures to take account of heat stress due to predicted temperature increases
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

^a If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): Medium

Other Comments: _____

Prepared by: _____

Grievance Redress Mechanism Complaint Form

(To be available in local language, if any)

The Greater Malé Environmental Improvement and Waste Management Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing ***(CONFIDENTIAL)*** above your name. Thank you.

Date		Place of registration			
Contact Information/Personal Details					
Name		Gender	Male Female	Age	
Home Address					
Village / Town					
District					
Phone no.					
E-mail					
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below:					
If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
If – then mode:	
<input type="checkbox"/>	Note/Letter
<input type="checkbox"/>	E-mail
<input type="checkbox"/>	Verbal/Telephonic
Reviewed by: (Names/Positions of Official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Means of Disclosure:	

GRIVENCES RECORD AND ACTION TAKEN

Sr. No.	Date	Name and Contact No. of Complainer	Type of Complain	Place	Status of Redress	Remarks

Template for Semi-Annual Environmental Monitoring Report

Introduction

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number	Roles
1. PMU				
2. PIUs				
3. Consultants				

- Overall project and sub-project progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/List of Works	Contract Status (specify if under bidding or contract awarded)	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M) ¹	If On-going Construction	
				%Physical Progress	Expected Completion Date

¹ If on-going construction, include %physical progress and expected date of completion

Compliance status with National/State/Local statutory environmental requirements²

Package No.	Subproject Name	Statutory Environmental Requirements ³	Status of Compliance ⁴	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish ⁵

Compliance status with environmental loan covenants

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

Compliance status with the environmental management plan (refer to EMP TABLES in APPROVED IEE/S)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise IEE Documentation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
	Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		

- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.

² All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.

³ Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)

⁴ Specify if obtained, submitted and awaiting approval, application not yet submitted

⁵ Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.

Package-wise Contractor/s' Nodal Persons for Environmental Safeguards

Package Name	Contractor	Nodal Person	Email Address	Contact Number

- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

Summary of Environmental Monitoring Activities (for the Reporting Period)⁶

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

⁶ Attach Laboratory Results and Sampling Map/Locations

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

Approach and methodology for environmental monitoring of the project

- Briefly describe the approach and methodology used for environmental monitoring of each sub-project.

Monitoring of environmental IMPACTS on PROJECT SURROUNDINGS (ambient air, water quality and noise levels)

- Discuss the general condition of surroundings at the project site, with consideration of the following, whichever are applicable:
 - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
 - Identify if muddy water is escaping site boundaries or if muddy tracks are seen on adjacent roads.
 - Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these are intact following heavy rain;
 - Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area in the Appendix.
 - Confirm spill kits on site and site procedure for handling emergencies.
 - Identify any chemical stored on site and provide information on storage condition. Attach photograph.
 - Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
 - Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
 - Provide information on barricades, signages, and on-site boards. Provide photographs in the Appendix.
 - Indicate if there are any activities being under taken out of working hours and how that is being managed.
- Briefly discuss the basis for environmental parameters monitoring.
- Indicate type of environmental parameters to be monitored and identify the location.
- Indicate the method of monitoring and equipment used.
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements.

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Monitoring Results)	
			Day Time	Night Time

Grievance Redress Mechanism

- Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

Complaints Received during the Reporting Period

- Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors
- Others

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name _____
 Contract Number _____

NAME: _____ DATE: _____
 TITLE: _____ DMA: _____
 LOCATION: _____ GROUP: _____

WEATHER CONDITION: _____

INITIAL SITE CONDITION: _____

CONCLUDING SITE CONDITION:
 Satisfactory _____ Unsatisfactory _____ Incident _____ Resolved _____ Unresolved _____

INCIDENT:
 Nature of incident: _____

Intervention Steps: _____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes No

Signature _____

Sign off

Initial Environmental Examination

Document Stage: Draft
Project Number: 51077-002
March 2018

MLD: Greater Malé Environmental Improvement and Waste Management Project
– Improvement of Waste Handling and Processing Facilities for Thilafushi Island
(Construction and Demolition Waste Plant, End-of-Life Vehicle Dismantling Workshop, Waste Vessel Harbor Improvements, and Administration Building)

Prepared by the Ministry of Environment and Energy of the Republic of Maldives for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 15 March 2018)

Currency unit	–	Rufiyaa (Rf)
Rf1.00	=	\$0.065
\$1.00	=	Rf15.449

ABBREVIATIONS

ADB	-	Asian Development Bank
BPEO	-	best practicable environmental option
CDTA	-	capacity development technical assistance
C&D	-	construction and demolition
dB L _{eq}	-	continuous noise equivalent level, expressed in decibels
DMS	-	detailed measurement survey
ELV	-	end of life vehicle
EMP	-	Environmental Management Plan
EPA	-	Environmental Protection Agency
EPPA	-	Environmental Protection and Preservation Act of 1993
GOM	-	Government of the Republic of Maldives
GRC	-	grievance redress mechanism
GRM	-	grievance redress mechanism
IEE	-	initial environmental examination
IMO	-	independent monitoring organization
IRC	-	Inter-Ministerial Resettlement Committee
IWMC	-	Island Waste Management Centre
MEE	-	Ministry of Environment and Energy
MPW/100ml	-	most probable number (of bacteria) per 100 milliliters of water
NAPA	-	National Action Programme of Action (for climate change)
O&M	-	operation and maintenance
PMDSC	-	project management, design and supervision consultants
PMU	-	project management unit
RWMF	-	regional waste management facility
WAMCO	-	Waste Management Corporation

NOTE

In this report, "\$" refers to US dollars.

This initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, management, or staff, and may be preliminary in nature. Your attention is directed to the "terms of use" section of this website.

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EXECUTIVE SUMMARY

1. The Greater Malé Environmental Improvement and Waste Management Project will establish a sustainable solid waste management (SWM) system in the Greater Malé capital region and its inhabited outer islands by (i) establishing a modern waste collection, transfer, and disposal system, (ii) improving community-based outer island waste management systems, (iii) building institutional capacity for sustainable services delivery, and (iv) raising public awareness in reduce, reuse, recycle (3R) behaviors. Physical and non-physical investments are designed to curb climate change and disaster impacts while creating a cleaner environment in Maldives. The executing agency is the Ministry of Finance and Treasury (MOFT). The implementing agency is Ministry of Environment and Energy (MEE) who will establish a project management unit (PMU) comprising officials from MEE and Waste Management Corporation Limited (WAMCO). The PMU will have responsibility for overseeing project management, with support from Project Management, Design and Supervision Consultants (PMDSC).

2. The Project will have three outputs: (i) Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient, (ii) Output 2: Community-based outer island waste management systems targeting poor and women enhanced, and (iii) Output 3: Institutional capacity and public awareness in sustainable waste management strengthened.

3. Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient. This will include (i) an efficient waste collection strategy designed and applied in Malé and Hulhumalé in consultation with local communities targeting women; (ii) waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhumalé and Villimalé provided; (iii) transfer stations in Malé and Villimalé constructed and transfer station in Hulhumalé designed; (iv) construction and demolition (C&D) waste processing plant and end of life vehicle (ELV) dismantling workshop constructed; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) 3 vessels for waste transport from outer islands to Thilafushi provided; (vii) heavy equipment (bulldozers, excavators, roll trucks) for controlled dumpsite management at Thilafushi provided; and (viii) construction of 2 administrative buildings for WAMCO at Malé transfer station and Thilafushi waste vessel harbor. All facilities designed will consider climate change and disaster resilient features.

A. Description of the Subproject

4. The planned works comprise improvements to the waste vessel harbor and waste processing facilities on Thilafushi Island, including a C&D waste processing plant, and end-of-life vehicle (ELV) dismantling workshop. The improvements are to take place on the southern part of Thilafushi Island, allocated to the regional waste management facility (RWMF). The waste vessel harbor and waste handling area will be fenced and storm water drainage will be improved with the fence demarcating the newly rehabilitated area from the surrounding area. The concept design recommends a green belt, to improve working conditions in the waste handling area. Site drainage will be achieved by incorporating an overall 1% gradient sloping toward the sea and surface water ditches. Existing docking facilities, which are in very poor condition, will be substantially improved to enable handling of containers to be used on the transfer vessels. Rehabilitation works will include widening, extending and paving to increase vessel handling capacity, docking for the full fleet of barges, boats, landing craft and Dhonis; a surface that can be regularly swept, sluiced and drained to create a clean working area, sound foundations for buildings, cranes and other sessile plant, roads and parking to ensure good circulation of trucks and mobile equipment and adequate storage area of different types of separated waste.

5. A single storey steel structure administration building with a floor area of approximately 320 m² will also be constructed and will include office rooms, changing rooms, a kitchen, wash facilities, an area for storage of hazardous waste and a sales area to handle marketable reusable waste. Two weighbridges will be included, one for incoming waste from sources on the island, and one for incoming and processed waste from the waste vessel harbor and the C&D waste processing area. A plant will be built to handle a throughput of 600 t/day involving initial sorting, pre-crushing, pre-screening, sorting, further crushing of concrete components, magnetic separation of ferrous metal components and final separation. Wood and plastics will eventually be sent to the treatment plant that will be built under a new project in the future, while stone and concrete fragments and scrap metal will be re-used and/or sold. The plant will be housed in an open shed.

6. The ELV dismantling workshop will comprise a small workshop building fitted with ramps, drains for the collection of waste oil, and equipment for dismantling of the mechanical components as well as a crusher, or press, for the vehicle body once the chassis and other main components have been removed.

B. Policy Legal and Administrative Framework

7. The law governing the protection of the environment in the Republic of the Maldives is the Environmental Protection and Preservation Act (EPPA) of 1993 (Act No 4/93) and responsibilities and procedures for conducting environmental assessments, together with the requirements for environmental monitoring of projects, are set out in the EIA Regulations of 2012. Completion of EIAs is the responsibility of project proponents and all EIA work must be carried out by registered consultants. The EIA regulations require all landfills, waste incinerators and large scale waste storage projects to have full EIAs. The Environmental Management Plan, prepared following either the IEE or the EIA process, is prepared on a specified format and reviewed for compliance by MEE.

8. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments and sets out the requirements for different categories (category A requiring an EIA, category B requiring an IEE, category C requiring a review of environmental implications and category F1 relating to investments through a financial intermediary). The SPS further requires the development of an environmental management plan (EMP) specifying the required mitigation and monitoring and who is responsible for implementation and public disclosure. Emphasis is placed on pollution prevention and control technologies to be incorporated during the design, construction, and operation of the project and adhering to recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines.

9. For the project, all statutory clearances will be obtained prior to commencement of civil works. IEEs will be prepared for each package involving civil works and EMP to be attached in the bid and contract documents. IEE will be submitted to ADB for review and approval prior to issuance of bid documents. Monitoring of EMP implementation by the EA is reported to ADB.

C. Description of the Environment

1. Physical Resources

10. The islands of the Maldives are reef islands formed from calcium carbonate deposits from coral colonies. Underlying rock is variable in consistency, reflecting the growth patterns of the coral, which forms dense colonies (coral heads) and large voids between the heads. Thilafushi Island is “artificial” having been reclaimed between 1992 - 1994 by placing dredged material on the lagoon, piling it to a sufficient height to overtop the water level. Thilafushi Island was made to form a landfill to cope with solid waste generated in the Greater Malé area and also to create land for industrial use.

11. The climate is tropical maritime featuring two monsoon seasons, the southwest monsoon between May and September (Halhangu), and the drier northeast monsoon between December and February (Iruvai). The southwest monsoon is the stronger and monthly rainfall typically exceeds 200mm towards the end of the southwest monsoon period. Cyclones are a regular occurrence in the Indian Ocean, occurring mainly between April and December, although those that have affected the Maldives occur between October and January.

12. Temperatures are relatively constant and range between 25oC and 30oC, with the hottest period occurring in March/April and the coolest, December/January. Monthly rainfall fluctuates between around 20mm in February to over 300mm in May, and is over 200mm for most of the year, the annual average in the Greater Malé area is 2,200mm. Prevailing winds are predominantly westerly for much of the year, influenced by the monsoon patterns.

13. The tidal regime is semi-diurnal – two high and two low tides a day. The range between high and low reaches approximately 1m and for neap tides. Surface currents follow the monsoon pattern, with westward currents dominant from January to March, and the reverse between April and December.

14. Freshwater sources are rainwater collected from roofs and groundwater that accumulates through infiltration of rainwater into a freshwater lens that forms in underlying strata. In the Greater Malé area however, these sources do not suffice for the large domestic and commercial demand and the islands of Malé, Villingilli and Hulhumalé are heavily dependent on salt water reverse osmosis plants for the supply of freshwater.

15. Marine waters around the islands are used extensively for fishing and recreational diving. The quality of water both in and around the islands is influenced by sewerage discharge, illegal dumping of solid waste and industrial activity.

16. Pollutants from industrial activity and waste, particularly hazardous waste, can accumulate in the sediment on the lagoon or sea floor. Thilafushi is the site of both industrial and waste deposit facilities and therefore a potentially significant source of pollution.

17. Air pollution sources include vehicle emissions, emissions of other plant and machinery including diesel power generators, and construction activity, and industrial activity and is readily dispersed by winds. Smoke from burning waste on Thilafushi affects nearby islands and is a concern.

18. Noise pollution occurs from the operation of vehicles and machinery of various kinds, but ambient levels of wind and wave noise are high.

2. Ecological Resources

19. Coral ecosystems are extensive throughout the Maldives and have strong conservation significance. A review of survey work undertaken on benthic communities in the vicinity of proposed infrastructure improvements found predominantly rock, rubble and sandy cover, with live corals accounting for up to 20% and significant algal cover. Pelagic fish form an important part of the local economy, both through commercial fishing activities and game fishing. A review of fish population surveys undertaken around Greater Malé shows that fish life is abundant, with over 35 indicator species representing 11 families, none of which are of conservation significance, the highest diversity being found at Villingilli. The Maldives have a diverse avifauna, including a significant seasonal population of migratory birds as the islands are important wintering grounds for many species that follow the Central Asian Flyway. Within Greater Malé, bird populations are influenced by urbanization, and birds (largely non migratory) common to urban areas in South Asia, such as crows and sparrows, are commonplace. Waste is a common attractant to birds and a risk to birdlife when toxic or otherwise dangerous waste is ingested, and also when it causes habitat damage. Thus reducing uncontrolled dumping of waste or losses during transfers will reduce the risk on bird life. Present day vegetation cover on the islands is substantially influenced by human habitation and has little biodiversity conservation significance

20. There are 42 protected areas in the Maldives to prevent over exploitation, and improve conservation and preservation. Two protected areas occur in the vicinity of Thilafushi, both designated by the Government on 1 October 1995 and listed by the IUCN as dive sites. The IUCN has not set a category for either of the sites.

3. Socio-Economic Factors

21. At the time of the most recent census, in 2014, there were 2,052 people resident on Thilafushi Island, almost exclusively male (99.8%) and consisting mainly of overseas workers (84%). There are no schools or hospitals on the island.

22. Tourism and fishing dominate the national economy, with the contribution to GDP of 17% and 15% respectively, and the tourism sector growing rapidly in recent years, with a sharp increase of visitor arrivals. Outside these areas, agriculture provides about 1.0% of GDP and manufacturing around 4%. While the economic outlook is generally positive, the economic base, reliant on tourism and fishing, is narrow and diversification is a challenge. The country has a shortage of labor and relies on workers from Bangladesh, Sri Lanka and elsewhere for manual labor, work on construction and service in the resorts. Access to education in the national as a whole is good, with enrolment in primary education close to 100% and literacy rates at about 98%. The health sector has shown significant improvement over recent decades with key indicators such as infant and maternal mortality rates declining rapidly and eradication of a number of infectious diseases.

D. Anticipated Environmental Impacts and Mitigation Measures

4. Method of Assessment

23. The potential impacts and mitigation measures have been identified through review of the Feasibility Study prepared for the project, discussion with the designers and stakeholder consultation. Design is to be finalized and this will require corresponding updating of the IEE.

5. Environmental Impacts Related to Location

24. Key considerations in assessing impacts related to location on Thilafushi are (i) the fact that the island was formed by reclamation, specifically to create land for waste management and industry, (ii) the sensitivity of the surrounding marine ecosystem and (iii) the critical role of the island in containing waste, enabling solid waste to be safely managed, provided it can be reliably transported to Thilafushi.
25. The effect on marine water quality will be long term, positive and significant, due to the reduced losses of waste through improved handling and processing. However, the waste vessel harbor and ELV workshop will handle harmful waste which could escape into nearby waters if these facilities are not properly operated and maintained.
26. Vegetation on the island will benefit from the provision of planting of trees in the concept design. No clearance of trees will take place. The effect is significant, positive and long term.
27. Birds attracted to the island as well as waterbirds that frequent surrounding waters will benefit from both the improved handling and treatment to remove hazardous fractions onto the landfill or into surrounding waters. The effect will be positive, significant and long term.
28. No private property will be affected and land acquisition will be required and there is therefore no impact.

6. Environmental Impacts Related to Construction

29. The methods to be used for site preparation, fabrication, construction and commissioning, as well as associated arrangements to ensure sound environmental management and safety at all times, are to be defined by the Contractor in a Contractor's Environmental Management Plan submitted to the PMDSC for approval. These will cover the following areas of impact which are potentially significant but can be mitigated by the adoption of good practice: (i) waste generation (ii) release of silt from excavations, (iii) water pollution, (iv) air and dust pollution, (v) community health and safety risks, and (viii) occupational health and safety. Impedance of traffic and noise/vibration effects are not likely to be significant as few people live in the vicinity.

7. Environmental Impacts Related to Operation

30. The proposed improvements are designed specifically to address the current poor condition of the waste vessel harbor at Thilafushi, the lack of separation and treatment of C&D waste, and improved collection of hazardous waste and separation of recyclable fractions of waste from end of life vehicles. The proposed improvements are necessary for achieving the planned further improvements to the entire SWM. Impacts will include (i) reduced loss of waste during handling, due to more efficient waste vessel harbor infrastructure; (ii) improved collection of liquid waste, avoiding discharge of untreated leachate and wastewater into the sea ; (iii) removal of C&D waste for re-use and sale as feasible; (iv) improved containment of hazardous waste; (v) separation of waste fractions from end of life vehicles including hazardous and recyclable fractions, and appropriate treatment of these; and (vi) improved site hygiene, reducing the extent to which pests such as birds and rodents are attracted to the site.

8. Global, Transboundary and Cumulative Impacts

31. The proposed improvements will occur within the Zone 3 area. However, the improvements in collection, treatment and disposal of waste, which will be facilitated by the improvements to the RWMF, will reduce the discharge of waste from these islands into the surrounding ocean waters. Capacity building for the EPA will assist in the build-up of capabilities required to further improve and manage waste management facilities throughout the Maldives.

E. Analysis of Alternatives

32. The proposed improvements examined in this IEE all relate to expanding the capacity and developing greater efficiency of the RWMF on Thilafushi. The improvement of the waste vessel harbor necessary to reduce losses of waste during handling, while the administration building also includes facilities that are required but not yet present including the store for hazardous waste, space for handling sale of marketable fractions and sanitary facilities for workers. Similarly, the C&D waste and the ELV plant are not yet present but are required to ensure separation of hazardous and marketable fractions from incoming waste.

33. The “no project” scenario is the exclusion of the improved waste vessel harbor, administration building, C&D waste plant and ELV plant. As these are pre-requisites for RWMF development, the RWMF would also not be developed. In this scenario, the existing practices of inefficient waste handling, which entails significant loss of waste to the sea, burning of waste on Thilafushi (and on other islands) and, most significantly, no means of expansion to handle growing volumes of waste. This scenario would have serious and growing consequences on the populated islands of Greater Malé and elsewhere in the country and the wider marine environment.

F. Information Disclosure, Consultation and Participation

34. During feasibility study preparation, the design team worked with key stakeholders such as MEE and WAMCO, and stakeholders are identified in a stakeholder analysis, including consultations with NGOs and residents of Thilafushi in relation to dredging and land reclamation on Thilafushi. This draft IEE and a Dhivehi translation of the executive summary will be provided to commune officials for public disclosure. Stakeholders will be kept informed of the construction program, including activities and made aware of the grievance redress mechanism. Consultations will take place regularly to gain feedback and ensure that impacts are being adequately managed.

G. Grievance Redress Mechanism

35. A grievance redress mechanism (GRM) will be established at two levels, one at the project site level and another at the level of the Project Management Unit (PMU), to receive, evaluate and facilitate the resolution of concerns, complaints and grievances of all affected persons. The GRM will aim to provide a time bound, transparent and thereby trusted way to voice and resolve concerns linked to the project, including environmental concerns, and to be an effective way to address affected the concerns of affected persons without allowing it to escalate and cause delays in project implementation. The GRM will operate on two levels, the first level handled on the island where the work is to take place, via a committee and the second level by the project steering committee.

H. Environmental Management Plan

36. The Executing Agency is the Ministry of Finance and Treasury and the implementing agency is the Ministry of Environment and Energy (MEE) who will establish a project management unit (PMU) comprising officials from MEE and WAMCO and consultant support. The PMU will have responsibility for overseeing project management, with support from project management, design and supervision consultants (PMDSC). These functions will include overseeing EMP implementation.

37. The IEE incorporates an EMP which sets out the needs for environmental management of transfer station improvements within the project in terms of institutional responsibilities to ensure mitigation and monitoring takes place during the pre-construction, construction and operation phases, meeting the requirements of the Government of the Maldives and the ADB Safeguard Policy Statement (SPS), 2009. A copy of the EMP will be kept on work sites at all times for reference and will be included in the bid documents for procurement of the works to ensure obligation for compliance. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

38. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

39. The EPA has few trained technical staff and relies on external consultants for functions such as environmental monitoring for projects. The EPA will therefore be provided with support from the PMDSC for overseeing EMP implementation.

40. An environmental monitoring system has been designed, based on an analysis of the key environmental performance issues associated with each stage of the project. Two areas of environmental monitoring are identified: compliance monitoring and community feedback, which are in addition to monitoring measures in the Design and Monitoring Framework for the project. These provide a means of gauging whether the stations operate more efficiently and with less loss of waste into the sea.

41. EMP compliance monitoring will be undertaken by the PMU, with support of the PMDSC. Effects will be monitored by means of community feedback and laboratory testing. Consistent with reporting requirements set out in the Project Administration Manual (PAM). The PMU will prepare reports to be sent to ADB on a semi-annual basis. To facilitate monitoring and enable responses to emerging issues, monthly reports will be prepared by the PMU.

I. Conclusion

42. The overall finding of the IEE is that the Project will result in significant environmental benefits, as it is conceived and designed to address major environmental issues associated with existing difficulties in waste handling and transfer and the rapidly growing volumes of waste that are projected in coming decades. It will not have significant adverse environmental impacts and potential adverse impacts are manageable through the effective implementation of the EMP. No further environmental assessment is therefore required, beyond the issues to be reviewed during detailed design. The works will be carried out as a design-build contract and the IEE and EMP will be updated to reflect detailed design. The classification of Category B is confirmed.

I. INTRODUCTION

1. The Greater Malé Environmental Improvement and Waste Management Project will establish a sustainable regional solid waste management (SWM) system in Greater Malé by (i) improving collection, transfer, disposal, treatment, recycling, and dumpsite rehabilitation; (ii) strengthening institutional capacities for solid waste services delivery and environmental monitoring; and (iii) improving public awareness and behaviors in reduce-reuse-recycle (3R).¹ The Project will be designed to reduce disaster risk and improve climate change resilience while creating a cleaner environment and reducing greenhouse gas emissions.

2. The Project will establish a sustainable SWM system in the Greater Malé capital region and its inhabited outer islands by (i) establishing a modern waste collection, transfer, and disposal system, (ii) improving community-based outer island waste management systems, (iii) building institutional capacity for sustainable services delivery, and (iv) raising public awareness in 3R behaviors.² Physical and non-physical investments are designed to curb climate change and disaster impacts while creating a cleaner environment in Maldives, one of the world's lowest-lying nations.³

3. The Greater Malé capital region (classified as Zone 3 in the National Solid Waste Management Policy and the most populated in the country),⁴ suffers from severe environmental pollution and deteriorating livability due to inadequate collection and haphazard disposal of solid waste. Open dumping and burning of garbage at the 30-year-old 10-hectare dumpsite on Thilafushi Island (6 km from Malé) creates a significant environmental and public health hazard. Plumes of smoke visible from the capital city Malé, the international airport, and surrounding resorts compromise air quality and pose a daily nuisance to residents and tourists, while toxic leachate contaminates soil and groundwater. Greater Malé and its 32 inhabited outer islands lack an organized and sustainable waste management system for the 774 tons of mixed solid waste generated per day (tpd).⁵ With rapid urbanization and tourism development in the region, waste generation is expected to grow to 924 tpd by 2022. This increasing pressure on an already stressed waste management system poses a significant threat to tourism and fisheries, both of which rely heavily on the country's pristine environment and are cornerstones to the Maldives economy.⁶ Poor communities in outer islands suffer from accumulated garbage with limited awareness and capacity to effectively manage solid waste.

¹ ADB. 2016. *Country Operations Business Plan: Maldives, 2017–2019*. Manila. The project is confirmed via letter dated 17 July 2016.

² The project area encompasses the inhabited islands of the Malé Atoll, North Ari Atoll, South Ari Atoll, and Vaavu Atoll with a total population of 216,000 inhabitants (51% of Maldives). It comprises the capital city of Malé, and 35 inhabited islands. There are 76 resorts in the project area. The Greater Malé capital region within the project area consists of seven islands (Thilafushi, Gulhifalhu, Villimalé, Malé, Funadhoo, Hulhulé and Hulhumalé) and is the most populated.

³ ADB. 2017. *Technical Assistance to Maldives for Preparing the Greater Malé Environmental Improvement and Waste Management Project*. Manila.

⁴ The National Solid Waste Management Policy (2015) divided the country into 7 regional waste management zones (map) each with a regional waste management facility and system for safe transfer to those facilities.

⁵ Breakdown of solid waste by type: household = 149 tpd (19%), commercial = 27 tpd (3%), resort = 48 tpd (6%), C&D waste = 530 tpd (68%), market = 2.5 tpd (0.3%), airport = 9.3 tpd (0.3%), hazardous = 1.5 (0.2%), end of life vehicles = 0.65 tpd (0.1%), industrial = 6 tpd (0.8%). Waste composition: organic (53%), paper and cardboard (12%), plastic (11%), hazardous (medical) waste (8%), metal (3%), glass (3%), and others (11%). *Source: Project Feasibility Study final report (2017)*.

⁶ Tourism and fisheries account for a quarter of total employment in the country (2014 Census). Tourism being the most rapidly expanding industry and being the highest contributing sector to the Maldivian gross domestic product.

4. **Existing waste collection, transfer, and disposal system.** High population density and narrow streets present unique challenges for waste collection in Malé. Waste collection is operated by the Waste Management Corporation Limited (WAMCO), a state-owned operator created in 2015 to collect and transport waste and manage the regional waste management facilities throughout the country.⁷ WAMCO has limited professional experience in modern and efficient waste collection systems. The lack of technical and managerial skills is a key issue affecting sector performance.⁸ While WAMCO is trying various initiatives to improve collection, the company received nearly 150 complaints per day (as of September 2017) on its hotline mostly related to non-collection. Collection equipment includes a fleet of aging vehicles unable to access narrow streets. There are no uniform refuse bins or formal transfer stations. Waste is transported to Thilafushi Island in open non-containerized vessels resulting in significant spillage into the ocean.⁹ Since 2008, fires have been deliberately set at the dumpsite to reduce growing mounds. On-site equipment and poor site logistics are severely inadequate to efficiently manage incoming waste and maximize use of limited space. There is no separate collection and processing of construction and demolition (C&D) waste and end-of-life vehicles (ELV).¹⁰ Household surveys in the project area show a high demand for 3R awareness and education programs.¹¹

5. **Impact and Outcome.** The Project is aligned with the following impact: a healthy living environment created in the Greater Malé capital region and its outer islands. The Project will have the following outcome: climate and disaster resilient SWM services improved.¹²

6. **Outputs.** The Project will have three outputs.

7. **Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient.** This will include (i) an efficient waste collection strategy designed and applied in Malé and Hulhumalé in consultation with local communities targeting women; (ii) waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhumalé and Villimalé provided; (iii) transfer stations in Malé and Villimalé constructed and transfer station in Hulhumalé designed; (iv) C&D waste processing plant and end of life vehicle (ELV) dismantling workshop constructed; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) 3 vessels for waste transport from outer islands to Thilafushi provided; (vii) heavy equipment (bulldozers, excavators, roll trucks) for controlled dumpsite management at Thilafushi provided; and (viii) construction of 2 administrative buildings for WAMCO at Malé transfer station and Thilafushi waste vessel harbor. All facilities designed will consider climate change and disaster resilient features.

8. **Output 2: Community-based outer island waste management systems targeting poor and women enhanced.**¹³ This output will provide comprehensive support to strengthen sustainable solid waste management in poor outer island communities. It includes (i) a minimum of 22 island waste management centers (IWMCs) with processing equipment (balers, glass crushers, metal presses) developed or upgraded in consultation with community targeting women

⁷ WAMCO does not operate collection within the outer islands. This is the responsibility of island councils.

⁸ Current collection coverage is estimated to be 89% in Malé, 89% in Villimalé, and 84% Hulhumalé though highly inefficient resulting in waste piles.

⁹ Government of Maldives, Ministry of Environment and Energy. 2016. *State of the Environment*. Malé.

¹⁰ The project will extend the life of the existing dumpsite in the medium term (8-11 years).

¹¹ Around half of TRTA household survey respondents highlighted increasing awareness and education is important. ADB. 2017. *TA-9327. Socioeconomic survey for Preparing the Greater Malé Environmental Improvement and Waste Management Project*. Manila

¹² The design and monitoring framework is in Appendix 1.

¹³ There are 32 outer islands in the project area eligible for support under Output 2.

and incorporating climate and disaster risk measures;¹⁴ (ii) collection equipment for outer islands (bins, refuse collection vehicles, dump trucks) provided; (iii) capacity building of eligible island councils targeting women in waste collection, segregation, composting, recycling, and O&M; and (iv) community awareness and behavior change campaigns in 3R targeting women in outer islands delivered. As subprojects under Output 2 will be prepared after Board approval, each island is required to meet minimum eligibility and selection criteria, including safeguards, to receive support from the Project.¹⁵ The criteria are intended to ensure sustainability and are outlined in the Project Administration Manual (PAM).¹⁶ Output 2 will be partially funded by a Trust Fund grant focusing on poverty reduction, which will support islands in the following areas:¹⁷ (i) IWMCs constructed in a minimum of 11 eligible islands, (ii) skills and capacity building in eligible islands targeting women provided, and (iii) awareness campaigns in 3R delivered in all outer islands.¹⁸

9. Output 3: Institutional capacity and public awareness in sustainable waste management strengthened. This will include (i) capacity building support to eligible WAMCO staff (including all eligible women staff) in waste collection, controlled dumpsite management, strategic and financial planning (tariffs, diversified revenue stream), and disaster risk management provided;¹⁹ (ii) a recycling market study conducted;²⁰ (iii) public awareness and behavior change campaigns in 3R targeting the poor and women in Greater Malé delivered;²¹ and (iv) project management, design, and supervision consultant support provided.

10. This initial environmental examination (IEE) relates to the improvements to the waste vessel harbor and waste processing facilities on Thilafushi Island including (i) waste vessel harbor improvements and construction of a C&D waste processing plant, (ii) an ELV dismantling workshop, and (iii) an administration building. This IEE has been prepared in accordance with ADB's Safeguard Policy Statement (SPS), 2009 and the appropriate legislations of the Republic of the Maldives, such as the Environmental Protection and Preservation Act (EPPA) of 1993 and the EIA Regulations (pursuant to the act) of 2007 (as amended in 2012). The examination is based on preliminary design undertaken by Water Solutions Ltd (Maldives) in association with Kocks Ingenieure (Germany), consultants to the Ministry of Environment and Energy (MEE).

11. This IEE has been prepared based on preliminary designs of the subproject and will be finalized based on the final detailed design. This IEE shall be attached in the bid and contract documents. The civil works package of the subproject will be awarded under a design-build (DB) contract. As such, the DB Contractor shall update this IEE based on the final detailed design and submit the final IEE to the executing agency through the project management unit (PMU). Subsequently, the PMU shall submit the final IEE to ADB for final review and disclosure.

¹⁴ Out of 32 outer islands, some have existing facilities but are not operational due to inadequate design and insufficient equipment which would be upgraded under the project.

¹⁵ All 32 outer islands will be screened through the selection criteria outlined in the PAM and EARF. Appraisal and safeguard reports will be approved by ADB prior to start of any project-related physical activities. Subprojects having resettlement impacts will not be included. IWMCs consist of concrete platforms, small covered sheds, segregated waste processing and storage areas, small office, fencing.

¹⁶ Project Administration Manual (accessible from the list of linked documents in Appendix 2.)

¹⁷ Additional selection criteria for Trust Fund supported islands includes climate change vulnerability, and women participation in island councils, and is outlined in the Project Administration Manual (accessible from the list of linked documents in Appendix 2.)

¹⁸ Upon confirmation from the government and the approval of Trust Fund.

¹⁹ Disaster risk management capacity building will include preparation of a SWM disaster action plan outlining prevention, preparedness, response and recovery tasks. DRM risk awareness activities will include first responders (police, fire fighters) on Thilafushi.

²⁰ The recycling market study will cover plastics, construction and demolition waste, and other primary recyclables.

²¹ Public awareness and behavior change activities under Outputs 2 and 3 will be implemented through a Public Awareness and Community Capacity Building consultant recruited by the PMU.

II. DESCRIPTION OF THE PROJECT

12. The proposed infrastructure improvements are to form part of an improved integrated system of waste management in Zone 3, one of seven zones into which the country is divided for waste management purposes and consisting of the atolls of Alifu Alifu, Alifu Dhaalu, Kaafu, and Vaavu). This description is based on a concept design, prepared by Water Solutions in association with Kocks Ingenieure, which uses a 30-year planning horizon, from 2017 to 2047.

13. The planned works comprise the following:

- (i) general site improvements to drainage and site security;
- (ii) rehabilitation of the waste vessel harbor and waste handling area to improve the docking facilities and the condition of the adjoining area;
- (iii) construction of administration building;
- (iv) construction of weigh bridges;
- (v) construction of C&D waste processing plant; and
- (vi) construction of ELV dismantling workshop.

14. The improvements are to take place on the southern part of Thilafushi island, allocated to the regional waste management facility (RWMF).

15. As part of the feasibility study for the RWMF²², a preliminary layout design has been prepared. Figure 1 below indicates the location of the proposed facilities and improvements, which are to the east of the area allocated to the RWMF. The locations of the C&D waste plant, ELV workshop, and administration building to the eastern end of the RWMF are shown in Figure 2. The existing quay, to be improved, is at the top (north) edge of the area.

²² Consultancy Services for Feasibility Study for an Integrated Solid Waste Management System for Zone III (including Greater Malé) and Preparation of Engineering Design of the Regional Waste Management Facility at Thilafushi. Feasibility Report. Ministry of Environment and Energy, Republic of Maldives. December 2017.

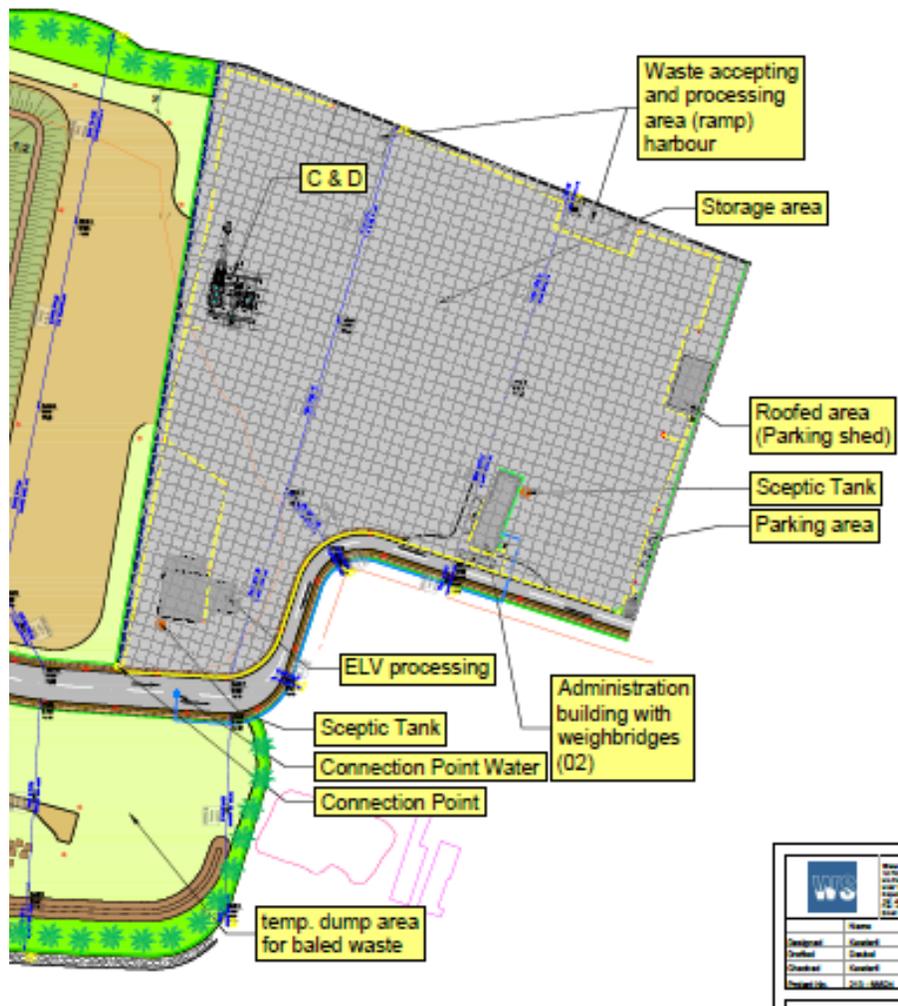
Figure 1: Area on Thilafushi Island allocated to the Regional Waste Management Facility



Figure 2: Aerial view showing approximate proposed locations of the facilities



Figure 3: Proposed layout of the eastern end of the RWMF showing locations of the proposed facilities



A. General Site Improvements

16. The waste vessel harbor and waste handling area will be fenced and storm water drainage will be improved. The fence, to be constructed in PVC coated mesh or metal panels supported by GI pipes (or similar) are required to demarcate the newly rehabilitated area from the surrounding area, and to serve as a barrier to windblown litter. The concept design recommends a green belt, to improve working conditions in the waste handling area.

17. Site drainage is to be achieved by incorporating an overall gradient (minimum 1%) sloping toward the sea and surface water ditches are to be included in the detailed design. It is envisaged that a 30m wide buffer zone will be allocated around the processing and recycling sites, to be incorporated in the land use plans to be drawn up during detailed design.

- (ii) essential facilities: changing rooms, a kitchen, showering and toilet facilities;
- (iii) a small area for the storage of hazardous waste (security and safety features remain to be added); and
- (iv) a sales area to handle sales of fractions of waste for which there is a market.

D. Weigh Bridge

21. Two weighbridges will be provided, one for incoming waste from sources on the island, and one for incoming and processed waste from the waste vessel harbor and the C&D waste processing area. These will be situated adjacent to the administration building.

E. Construction and Demolition Waste Plant

22. C&D waste is currently placed on the along with general waste. With rapid development taking place in Greater Malé, (particularly on Hulhumalé), the generation of C&D waste is likely to rise from a present level of 530 tons/day to 634 tons/day in 2020 and 731 tons/day in 2040. C&D waste is composed mainly of inert material such as aggregates and dust, making up 91.8% of the total by weight, while most of the rest is wood, making up 7.1%, paper and plastic film material make up a further 1% and the final 0.2% is metal waste. The design of the C&D waste plant envisages a through put of 600 t/day and consists of the following components:

- (i) a sorting plate to receive waste from the containers. The material is roughly presorted by using a wheel loader. Coarse concrete and stone chunks are removed and pre-crushed either using an excavator or by hand using chisels;
- (ii) A feeding hopper (minimum volume 15 m³);
- (iii) a pre-screening plant fed by a vibrating chute, fitted with flaps that can be manually adjusted to handle grain sizes of 0-10 and 10-60 millimeters (mm);
- (iv) a sorting station;
- (v) a pre-crusher for coarse concrete fragments, capable of handling material with a grain size of up to 300mm to reduce to between 150 mm approximately;
- (vi) a toggle jaw crusher;
- (vii) a separator fitted with magnets to remove magnetic metal waste;
- (viii) a sorting station using a vibrating screen, where wood, plastics and metals are sorted by hand and rejected materials are collected in containers;
- (ix) a power supply; and
- (x) belt conveyors and discharge shafts.

23. Wood and plastics removed by the process will be transported to the WTE plant for incineration.

24. Coarse material separated out at the sorting place with material from the pre-crushing process, together with material from the coarse fraction of the screening process are fed to the crusher, following which magnetic separation takes place, extracting scrap metal which will be sold, along with non-magnetic metals.

25. Following the magnetic separation, the material will be divided up in the following fractions:

- (i) 37.5 – 63 mm,
- (ii) 20 – 37.5 mm,
- (iii) 3.35 – 20mm, and
- (iv) < 3.35 mm.

26. The individual fractions will be stockpiled and then transported in containers to the site of re-use.

27. The plant will be housed in an open shed for protection against heavy rainfall and allowing air circulation to dissipate dust. The design is flexible, allowing for further screens and chutes to produce material of a different size range, should there be demand for it.

F. End-of-Life Vehicle dismantling workshop

28. While land is allocated in the layout design to an ELV workshop, the preliminary design and detailed designs remain to be done. The components envisaged are:

- (i) a small workshop building fitted with ramps, drains for the collection of waste oil, and equipment for dismantling of the mechanical components; and
- (ii) a crusher, or press, for the vehicle body once the chassis and other main components have been removed.

III. POLICY LEGAL AND ADMINISTRATIVE FRAMEWORK

A. Applicable National Laws, Rules and Regulations

29. The law governing the protection of the environment is the EPPA of 1993 (Act No 4/93). The law is brief and sets out the principles for sustaining and extending the benefits of the environment of the Maldives for the people and coming generations. The EPPA confers powers on the MEE to issue regulations and formulate policies for environmental protection and preservation. Such regulations include:

- (i) EIA regulations of 2007, updated in 2012 (Regulation No. 2012/R-27);
- (ii) By-law on Uprooting, Cutting and Transportation of Plants and Trees (2006);
- (iii) Regulation on Stone, Coral and Sand Mining (undated);
- (iv) Regulation for the Protection and Conservation of the Natural Life and character of Old Plants and Trees in the Maldives;
- (v) Dewatering Regulation (213/R-R1697);
- (vi) Environmental Damage Liabilities Regulation (2011/R-9); and
- (vii) Waste Management Regulation (2013-R58).

1. National Solid Waste Management Policy of 2008 and 2015

30. The National Solid Waste Management Policy was developed in 2008, by the Ministry of Environment, through consultations with the community and evaluation of existing waste management practices and scope for improved efficiency. The policy was then revised and adapted, and a new policy formulated and adopted in 2015.

31. The policy is in line with government commitment to provide the resources required for waste management in all inhabited islands of the Maldives and is founded on the following 10 principles:

- (i) Each person should be responsible for waste generated at the individual level and should comply with rules and regulations established locally;
- (ii) All household waste should be managed in accordance with the requirements of the local council;
- (iii) Each inhabited island should prepare and submit an island waste management plan for the island;
- (iv) Waste collection should be undertaken on a fee based system for all waste producers, including households and industries;

- (v) Agreements with government agencies in different inhabited islands to ensure management of waste in the islands;
- (vi) Establishment of a waste management system in each inhabited island that is appropriate for the needs of the population and quantity and type of waste generated;
- (vii) Establishment of regional waste management facilities (RWMF) in each waste management zone;
- (viii) Establishment of arrangements to transport all residual waste to a RWMF
- (ix) Promote adoption of waste management practices that generate revenue and to apply revenue to waste management at the island level; and
- (x) Undertake waste management training and awareness campaigns at the national level.

2. Waste Management Regulation

32. The Waste Management Regulation of the Maldives was enacted under Article 3 of the EPPA in 2013 and is implemented by the Environmental Protection Agency. The regulation focuses on the following five areas:

- (i) Waste management standards: Defines standards for waste collection, transfer, treatment, storage, waste site management, landfills and managing hazardous waste;
- (ii) Waste management Permits: Defines approval procedures for waste management sites;
- (iii) Waste transfer: Defines standards and permits required for waste transport on land and sea, including trans-boundary movements;
- (iv) Reporting: Defines reporting and monitoring requirements and procedures; and
- (v) Enforcement: Defines procedures to implement the regulations and penalties for non-compliance.

3. Other relevant legislation

33. **Cultural Heritage.** Items of cultural heritage significance are protected under the Law of Historical and Cultural Properties of the Republic of Maldives of 1979 (Law number 27/29) and its implementation is currently under the Ministry of Education. UNESCO state that there is a lack of rules and regulations, constraining the implementation of the law and that there is also no national inventory of heritage properties (no site has yet been inscribed under the World Heritage List). A new law is under preparation and awaiting completion as of June 2017.

34. **Health and Safety.** Legislation covering occupational health and safety is currently included in the Employment Act (2008), Chapter 8 "Work Place Safety and Employer Health". This requires employers to implement measures for the safety and protection of employees at the work place, including safe work place, procedures, safe equipment and materials, provision of protective equipment, safety training to employees, conducting health checks where work involves chemical or biological materials that may cause a hazard, providing medical care as well as first aid for employees injured while at work. The law also sets out employee's obligations with regard to safety at work.

35. **Land use and acquisition.** The Land Act (2002) covers matters relating to land including land use, land ownership, and permissible uses of land belonging to island councils, which includes environmental protection. The land act and processes relating to the project are described in the Resettlement Framework (RF).

B. Environmental Assessment Requirements

36. Responsibilities and procedures for conducting environmental assessments, together with the requirements for environmental monitoring of projects, are set out in the EIA Regulations of 2012. All projects that may have an impact on the environment are referred to the Minister of Environment and Energy (EPPA 5(a)).

37. The EIA Regulations assign primary responsibility for undertaking environmental assessment of projects to the project proponent and set out procedures, rights and responsibilities for the preparation and approval of environmental impact assessments (EIAs). The MEE undertakes review and approval of environmental assessment reports.

38. Project proponents are defined in the EIA regulations as a person, department or agency that is seeking to carry out or proposes to carry out the development proposal and in this case is the MEE, as implementing agency for the project. EIA work must be carried out by registered consultants, and the procedures and requirements for registration are set out in Part V of the regulations.

39. The EIA regulations include a schedule (Schedule D) of investment project types that require an EIA. These include landfills, waste incinerators and large-scale waste storage projects. However, some of these project types may be classified as environment Category A as per ADB SPS, 2009, and therefore, will not be considered under this subproject.

40. For schedule D projects and those identified by the IEE as requiring an EIA, a scoping meeting is convened by the MEE to determine the specific Terms of Reference for the EIA. On completion of investigations and reporting, the EIA report is subject to review by MEE, which invites comments from other relevant ministries and the public following which an environmental decision is made. Schedule D includes large scale waste storage and separation facilities. The C&D waste and ELV plants are large scale waste management facilities and as such may qualify as schedule D projects under the EIA regulations. Similarly, schedule D lists construction and dredging of waste vessel harbors. However, as the works involve rehabilitation of the existing waste vessel harbor area, confirmation should be provided by MEE that improvement works do not qualify as a schedule D project.

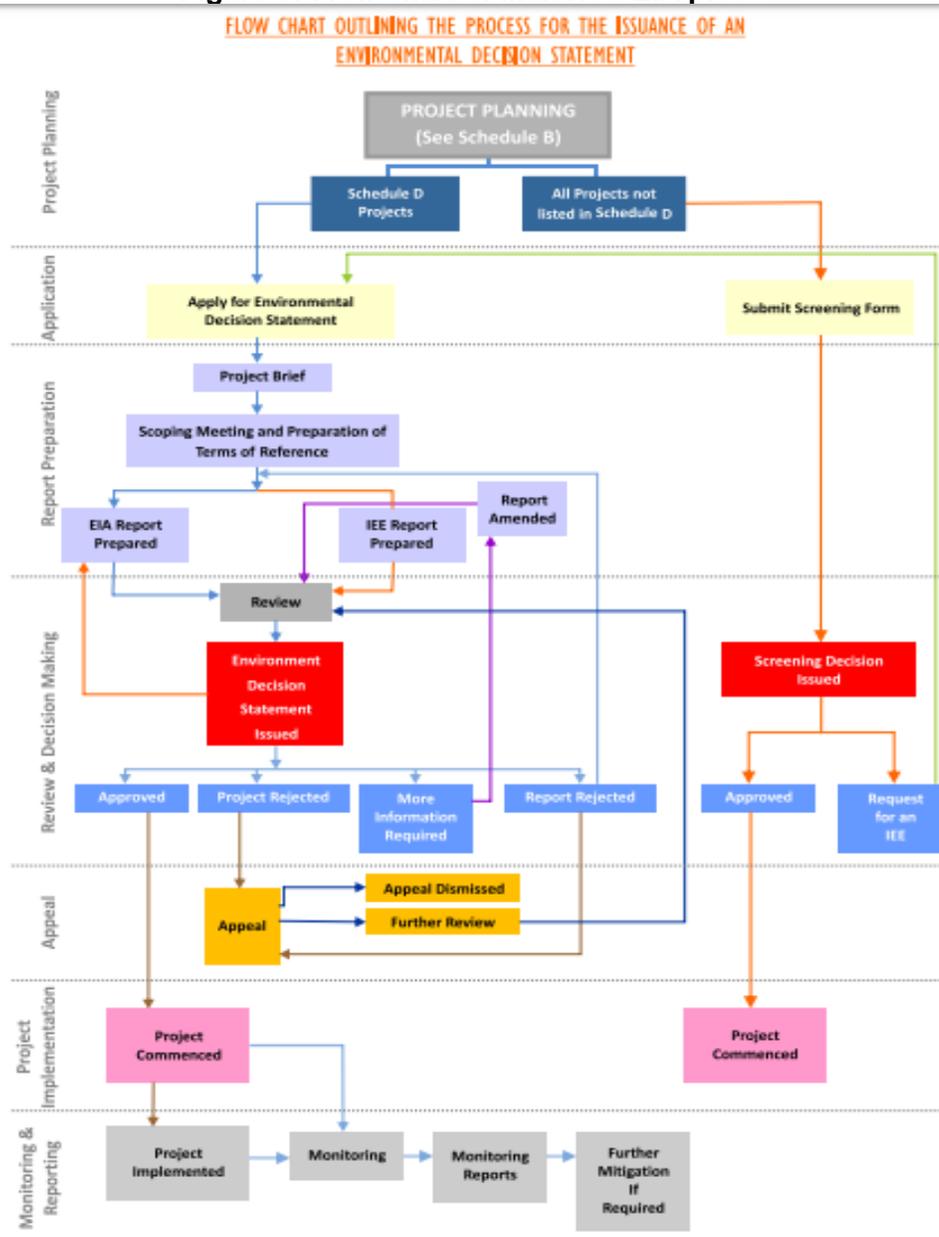
41. For project types not included schedule D, a screening form is submitted in a specified format on the basis of which the MEE decides whether an Environmental Management Plan is required or if further information is required, in which case an IEE will be carried out. The IEE is completed according to a specified format. If the IEE finds that the project may cause a significant environmental impact, a full EIA is required, prior to preparation of an environmental management plan (EMP). If an EIA is not required, an EMP is then prepared to address the impacts identified in the IEE.

42. The Environmental Management Plan, prepared following either the IEE or the EIA process, is prepared on a specified format and reviewed for compliance by MEE.

43. The MEE issues the decision in the form of a decision note issued to the proponent, which sets out specific binding requirements for the conduct of the project on the basis of review of the EIA report.

44. Summary of application stages and steps is outlined in Figure 3 below.

Figure 5: Flow chart of Maldives EIA process²³



45. The timelines for clearance and approvals are as follows:
- (i) On completion of a screening form for non-schedule D projects – 10 working days for a screening decision from MEE
 - (ii) For review of compliance of an EMP by MEE – 7 working days
 - (iii) For review of a project brief on Schedule D projects – 5 days to confirm the date of a scoping meeting
 - (iv) For consideration of Terms of Reference drafted by the project proponent following the scoping meeting – 10 days to confirm the Terms of Reference.
 - (v) For the review of a completed EIA report for completeness – 2 working days.

²³ Source: EIA Regulations (2007) Schedule A

- (vi) For circulation of an EIA report to other ministries and to the public for comment – 10 working days
- (vii) For issuance of a decision or to request revisions, following circulation of the EIA report and receipt of comments – 28 working days.

C. Applicable International Environmental Agreements

46. In addition to national laws, rules and regulations, the government of Maldives is also a signatory to various applicable international conventions, as follows:

- (i) UN Convention on the Law of the Sea – UNCLOS (1982);
- (ii) International Convention for the Prevention of Pollution of the Sea by Oil (1982);
- (iii) Vienna Convention for the Protection of the Ozone Layer (1985);
- (iv) Montreal Protocol on Substances that Deplete the Ozone Layer (1987);
- (v) Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (1989);
- (vi) The London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1990);
- (vii) Agenda 21 and the Rio Declaration of the United Nations Conference on Environment and Development (1992);
- (viii) Convention on Biological Diversity (1992);
- (ix) United Nations Framework Convention on Climate Change (1992);
- (x) The Copenhagen Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1992);
- (xi) The Montreal Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1997);
- (xii) The Beijing Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1999);
- (xiii) Washington Declaration on Protection of the Marine Environment from Land-Based Activities;
- (xiv) Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998);
- (xv) Cartagena Protocol on Biosafety (Maldives acceded on 2 September 2002); and
- (xvi) United Nation Convention to Combat Desertification (2002).

D. ADB Policy

47. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

48. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

- (i) **Category A.** A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.
- (ii) **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of Category A projects. These

impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.

- (iii) **Category C.** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
- (iv) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a financial intermediary (FI).

49. **Environmental management plan.** ADB SPS, 2009 further requires the development of an environmental management plan (EMP) specifying the required mitigation and monitoring and who is responsible for implementation.

50. **Public disclosure.** ADB will post the following safeguard documents on its website so affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:²⁴

- (i) final or updated IEE upon receipt; and
- (ii) environmental monitoring reports submitted by the project management unit (PMU) during project implementation upon receipt.

51. **Pollution Prevention and Control Technologies.** During the design, construction, and operation of the Project the PMU will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of Maldives regulations differ from these levels and measures, the PMU will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

²⁴ As per ADB SPS, 2009, prior to disclosure on ADB website, ADB reviews the "borrower's/client's social and environmental assessment and plans to ensure that safeguard measures are in place to avoid, wherever possible, and minimize, mitigate, and compensate for adverse social and environmental impacts in compliance with ADB's safeguard policy principles and Safeguard Requirements 1-4."

Table 1: Applicable WHO Ambient Air Quality Guidelines²⁵

Table 1.1.1: WHO Ambient Air Quality Guidelines ^{7, 8}		
	Averaging Period	Guideline value in $\mu\text{g}/\text{m}^3$
Sulfur dioxide (SO ₂)	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline)
Nitrogen dioxide (NO ₂)	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM ₁₀	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM _{2.5}	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

⁷ World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile.

⁸ Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

Table 2: World Bank Group's Noise Level Guidelines

Table 1.7.1- Noise Level Guidelines ⁵⁴		
Receptor	One Hour L _{Aeq} (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational ⁵⁵	55	45
Industrial; commercial	70	70

⁵⁴ Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999.

²⁵ World Bank Group's General Environmental, Health, and Safety Guidelines: www.ifc.org/ehsguidelines.

52. Requirements for the Project. All statutory clearances will be obtained prior to commencement of civil works. IEEs will be prepared for each package involving civil works and EMP to be attached in the bid and contract documents. IEE will be submitted to ADB for review and approval prior to issuance of bid documents. Monitoring of EMP implementation by the executing agency is reported to ADB.

IV. DESCRIPTION OF THE ENVIRONMENT

53. To establish specific baseline values for indicators of ambient air and water quality and noise levels at the proposed subproject site, measurements will be taken by the Contractor prior to construction.

A. Physical Resources

1. Geology, Topography and Soils

54. The Maldives archipelago comprises 22 atolls which are peaks of a vast submarine mountain range in the Indian Ocean, the Chagos-Maldives-Laccadive Ridge. The atolls collectively contain over 1,192 reef islands that have formed atop former peaks of former submarine mountains of the Chaagos-Maldives-Laccidive range, which is slowly subsiding. The reef islands form mainly at the periphery of each atoll, with the inner area, the eroded former mountain peak, occupied by a lagoon. Formation takes place by the deposition of shallow-water carbonates and successive coral deposits at the tidal level which gradually rise as a rock base forms from the calcium carbonate deposits of dead coral. Underlying rock is variable in consistency, reflecting the growth patterns of the coral, which forms dense colonies (coral heads) and large voids between the heads. The coral heads form hard rock, while the voids fill with coral derived fragments that form a softer rock. Thilafushi island is “artificial” having been reclaimed between 1992–1994 by placing dredged material on the lagoon, piling it to a sufficient height to overtop the water level. Thilafushi island made to form a landfill to cope with solid waste generated in the Greater Malé area and also to create land for industrial use.

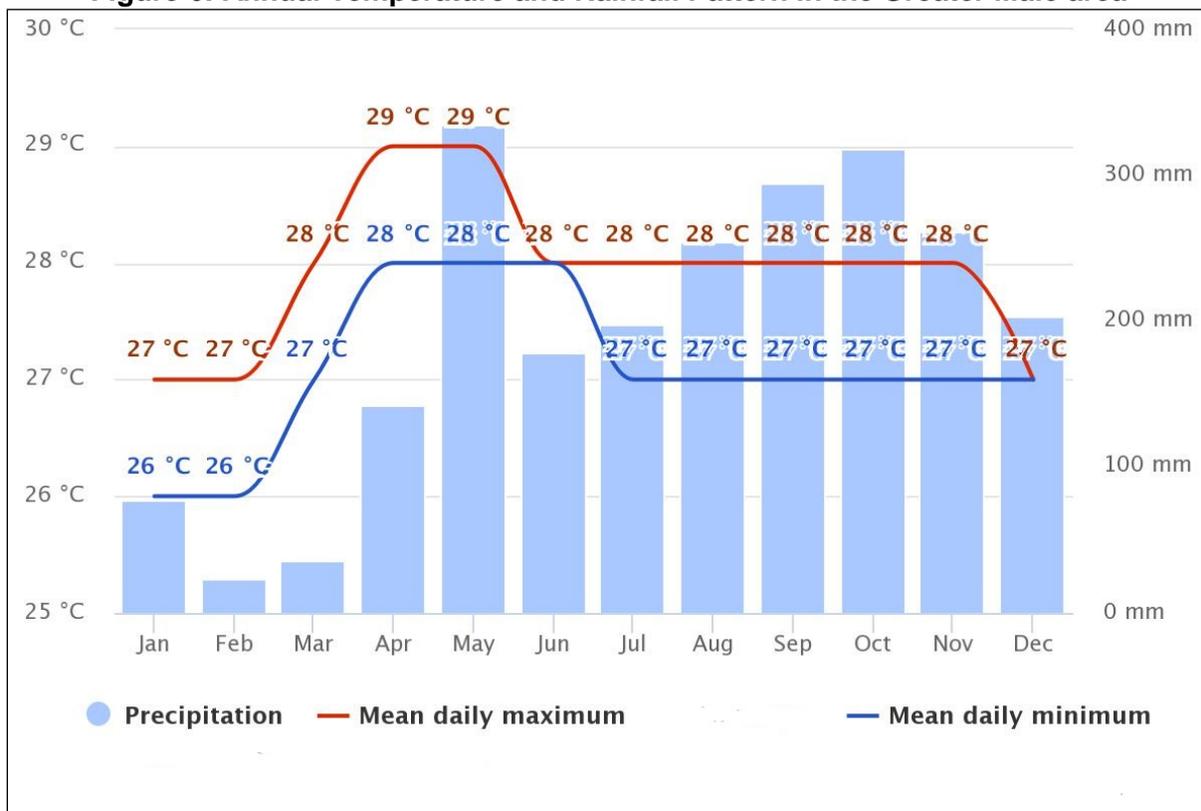
2. Climate

55. The Maldives have a maritime tropical climate featuring two monsoon seasons, originating over the Indian Ocean to the southwest between May and September (Halhangu), and the Bay of Bengal to the drier northeast between December and February (Iruvai). The southwest monsoon is the stronger and monthly rainfall typically exceeds 200mm towards the end of the southwest monsoon period and is lowest in February after the cessation of the northeast monsoon rains. Cyclones are a regular occurrence in the Indian Ocean, occurring mainly between April and December, although those that have affected the Maldives occur between October and January. These are more common either side of India, further north of the Maldives, though damage from “edge effects” of the larger cyclones is not uncommon. Cyclone Ockhi occurred in late November/early December 2017 and caused capsizing of vessels and damage to homes, including on Kaafu Atoll. The United Nations (2007)²⁶ estimate that there is a 10% probability of a level one storm on the Saffir-Simpson scale occurring over Kaafu Atoll in a 10-year period. Storms in the level one category are described as being “very dangerous” with wind speeds likely in the range of 119–153 kilometers per hour (kph), and pressures below 100 hectopascals (hPa), but not lower than 980 hPa.

²⁶ United Nations Office for the Coordination of Humanitarian Affairs - Regional Office for Asia and the Pacific (OCHA ROAP) (2007) Maldives: Composite Hazard Map.

56. Temperatures are relatively constant and range between 25 degrees Celsius (°C) and 30°C, with the hottest period occurring in March/April and the coolest, December/January. Monthly rainfall fluctuates between around 20mm in February to over 300mm in May, and is over 200mm for most of the year, the annual average in the Greater Malé area is 2,200mm. Figure 4 below shows the annual temperature and rainfall pattern in the Greater Malé area.

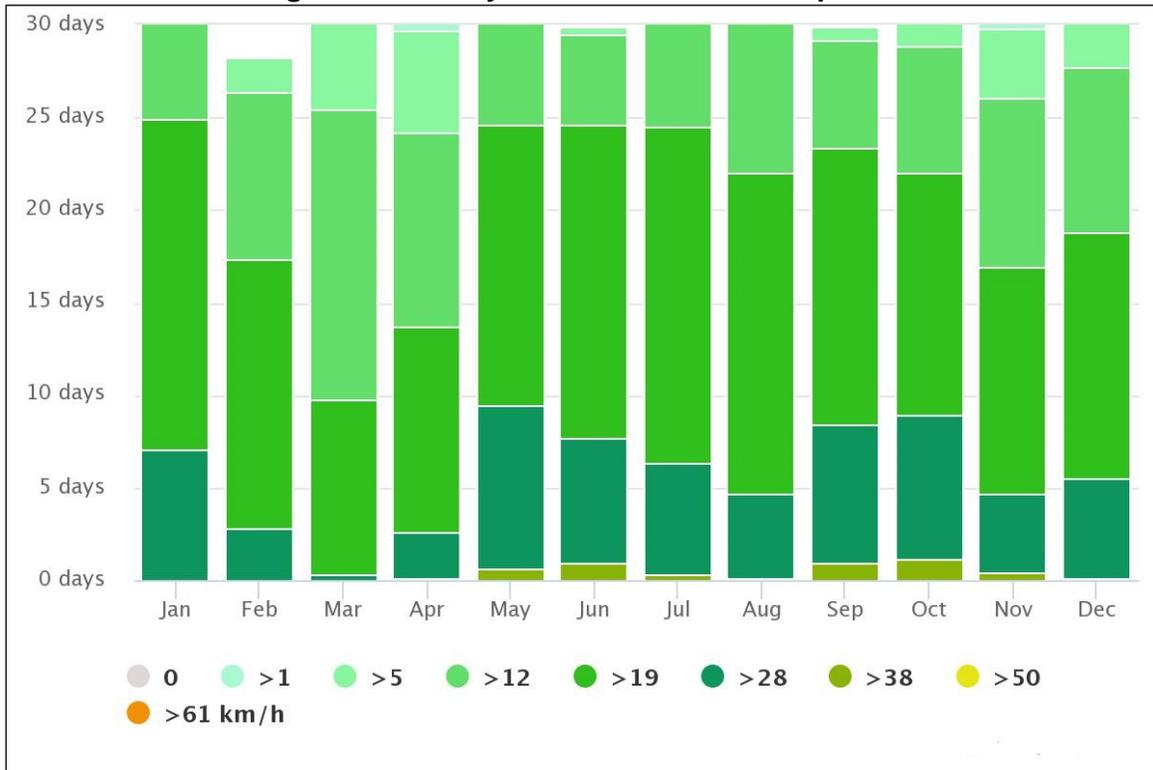
Figure 6: Annual Temperature and Rainfall Pattern in the Greater Malé area



Source: meteoblue.com.

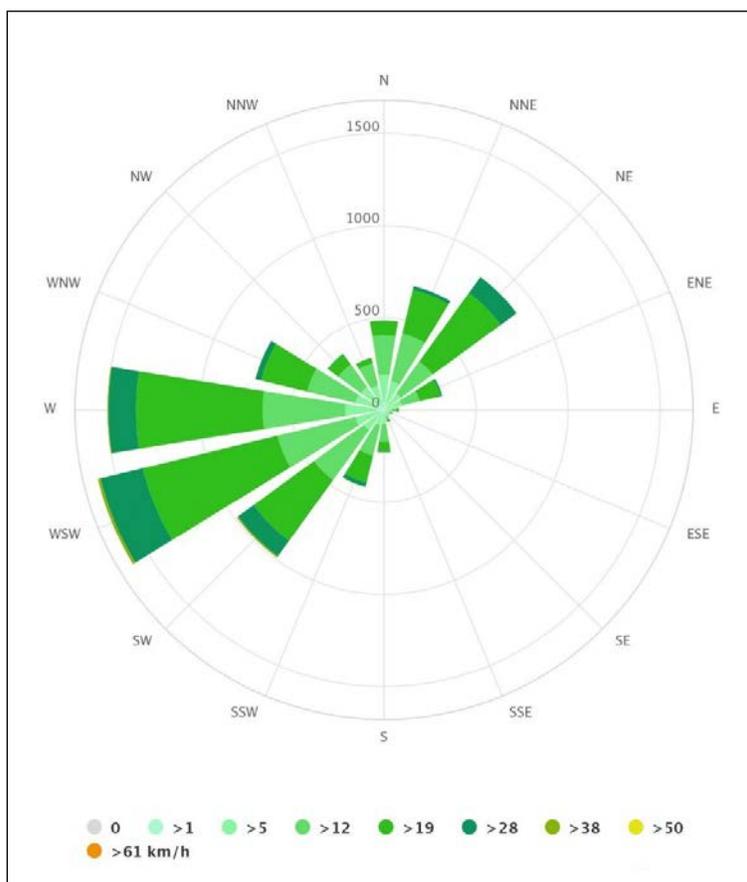
57. The prevailing winds are predominantly westerly for much of the year, with easterly winds rare and southeasterly winds almost nonexistent. Winds are influenced by the monsoon patterns. Figure 5 below shows the monthly distribution of wind speeds, and Figure 6 is a rose diagram, showing the prevailing direction of winds over an annual period.

Figure 7: Monthly Distribution of Wind Speeds



Source: meteoblue.com.

Figure 8: Rose Diagram of Prevailing Wind Direction over an Annual Period



Source: meteoblue.com.

58. The tidal regime is semi-diurnal – two high and two low tides a day. The range for spring tides is approximately 1m and for neap tides, 0.3 meters (m) while the extreme range between highest high water and lowest low water is 1.32m at the tidal gauge for the Malé area, on Hulhulé Island. Table 3 below gives the average tide levels at the station at Hulhulé which is approximately 13 kilometers (km) from Thilafushi.

Table 3: Average tide levels at Hulhulé²⁷

Tidal level	Water level from mean sea level (m)
Highest High Water (HHW)	0.62
Mean Highest High Water (MHHW)	0.34
Mean High Water (MHW)	0.33
Mean Low Water (MLW)	-0.36
Mean Lowest Low Water (MLLW)	-0.37
Lowest Low Water (LLW)	-0.72

²⁷ Source: University of Hawaii Sea Level Center Database, quoted in the Second National Communication of the Maldives to the United Nations Framework Convention on Climate Change. Ministry of Environment and Energy, 2016.

59. Wave heights are also influenced by variations in atmospheric pressure and strong winds. Atmospheric pressure at sea level at Malé typically varies between 1011 and 1017 hPa, and an increase in air pressure of 1 hPa typically lowers the water level by 1 centimeter (cm). Lower pressures can occur in storm events, and may drop below 1000 hPa, entailing an increase of around 10cm or more, adding to effective storm wave heights.

60. Surface currents reflect tides and wind, and generally follow the monsoon pattern, with westward currents dominant from January to March, and the reverse between April and December. Current direction and velocity at any one time depends on the interaction between the wind induced prevailing currents and tidal currents. Measurements taken around Thilafushi during June 2017²⁸ found current velocities around the island to range between 0.2 –0.4 meter per second (m/s) – though this gives only a “snapshot” indication.

3. Freshwater Resources

61. Thilafushi is reliant on rainwater collected from the roofs of industrial and other buildings for freshwater sources.

4. Marine Resources

62. Marine waters around the islands are used extensively for fishing and recreational diving.

63. The quality of water both in and around the islands is influenced by sewerage discharge, illegal dumping of solid waste and industrial activity. Marine water quality testing carried out by Water Solutions for the Reclamation of 15 hectares at Thilafushi (2017) provided the following results in Table 4. Table 5 compares the averaged results against international standards. Sample sites are indicated in Figure 6:

Table 4: Results of Marine Water Quality Testing at Thilafushi

Test	Unit	sw1 (M1)	Sw2 (M3)	Sw3 (M3)	Sw4 (M4)	Sw5 (M5)	Sw6 (M6)
Salinity	(‰)	34.2	33.3	33.2	27.2	33.9	33.6
Electrical Conductivity at 25°C	mS/cm	52.0	50.7	50.7	42.3	51.6	51.2
Turbidity	mg/l	ND	ND	ND	ND	ND	ND
pH at 25°C		8.15	8.08	7.86	8.12	8.16	8.17
Total Suspended Solids	mg/l	1	1	1	24	1	-
Phenolic Compound (as C6H5OH)	mg/l	ND	ND	ND	ND	ND	ND
Total Dissolved Solids	mg/l	38,735	38,120	37,085	28,830	38,297	38,112
Hexavalent Chromium (as Cr6+)	mg/l	ND	ND	ND	ND	ND	ND
COD	mg/l	70	-	67	1,460	85	-
Iron (Fe)	mg/l	ND	0.11	0.11	0.22	0.1	0.19
Boron (as B)	mg/l	2.9	2.8	2.7	2.5	2.7	2.4
Zinc (as Zn)	mg/l	ND	ND	ND	ND	ND	ND
Cadmium (as Cd)	mg/l	ND	ND	ND	ND	ND	ND
Arsenic (as As)	mg/l	0.001	0.001	0.001	0.004	0.001	-
Lead (as Pb)	mg/l	ND	ND	ND	ND	ND	ND

²⁸ Water Solutions Pvt Ltd (2017) Environment Impact Assessment: Reclamation of 15 hectares of land at Thilafushi for development of the Regional Waste Management Facility for Zone 3. Submitted to the Ministry of Environment and Energy.

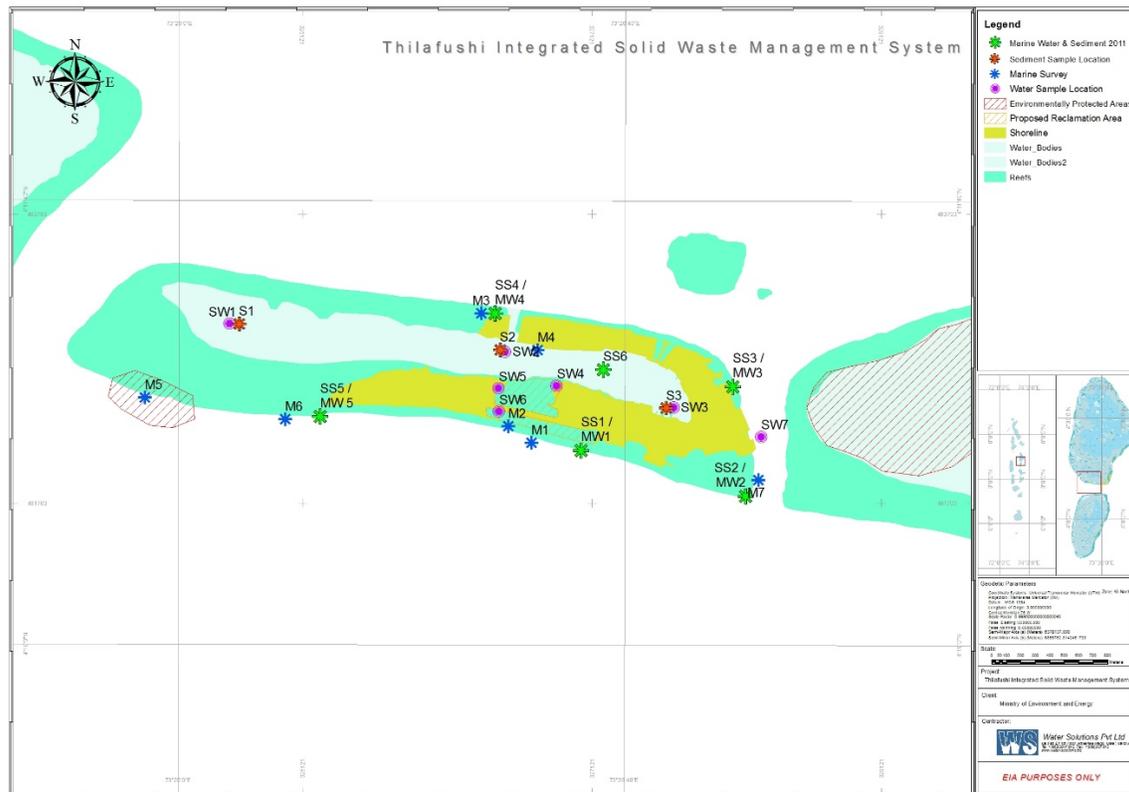
Test	Unit	sw1 (M1)	Sw2 (M3)	Sw3 (M3)	Sw4 (M4)	Sw5 (M5)	Sw6 (M6)
Mercury (as Hg)	mg/l	ND	ND	ND	ND	ND	ND
Chromium (as Cr)	mg/l	ND	ND	ND	ND	ND	ND

Table 5: Summary of Marine Water Quality Testing Results and comparison with international standards

Test	Unit	Average result from six sites	Comparable international standards ^a
Salinity	(‰)	32.6	-
Electrical Conductivity at 25°C	mS/cm	49.75	-
pH at 25°C		8.09	6.5 – 8.5
Total Dissolved Solids	mg/l	36,529.83	-
COD	mg/l	420.5	-
Iron (Fe)	mg/l	0.15	0.3
Boron (as B)	mg/l	2.67	1
Arsenic (as As)	mg/l	0.0016	0.05

^a The figures used for this comparison are those of recreational water quality standards of the Australian and New Zealand Environment and Conservation Council. Recreational water standards which apply to situations where users have body contact with water. Other standards for marine water quality relate to primary production are more stringent and would not apply to this situation.

Figure 9: Location of sampling sites for the assessment of the Reclamation of 15 hectares at Thilafushi (2017)



Source: Water Solutions / Kocks Ingenieure, Environmental Impact Assessment Reclamation of 15 hectares of land at Thilafushi for development of the Regional Waste Management Facility for Zone 3

64. The report states that biological oxygen demand (BOD) values and values for phosphate exceed the levels given in Maldivian Water Quality standards, but that temperature and turbidity are within the limits. For heavy metals, chromium, mercury, lead, cadmium and zinc were not detected, and nor were phenolic compounds. No values for these are given however. In comparison to international standards, none of the above values exceed trigger values above which damage to the marine ecosystem is expected. Turbidity, total Suspended solids, phenolic compounds, zinc, cadmium, lead, mercury and chromium, but not detected. The level of boron found significantly exceeds international standards.

5. Marine Sediment

65. Pollutants from industrial activity and waste, particularly hazardous waste, can accumulate in the sediment on the lagoon or sea floor. These can include heavy metals, organometallic compounds and aromatic benzene compounds. Samples of sediment taken by Water Solutions in 2017 and tested for a set of contaminants by a recognized international laboratory in Sri Lanka found some traces of copper and lead but did not detect other contaminants. Results are presented in. A comparison of the levels of copper and lead, which reached 31.3 and 2.7 mg/kg, respectively, against international standards²⁹ were below trigger values of 65 and 50 mg/kg,

²⁹ Australian and New Zealand Environment and Conservation Council (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. P 3.5-4 Table 3.5.1 Recommended Sediment Quality Guidelines

respectively. An earlier set of tests carried out in 2011 by CDE consultants for a greater range of contaminants on six sites detected ten heavy metals in the samples, but levels were below trigger values given in international standards.

Table 6: Results of sediment quality testing at Thilafushi

Site	Unit	S1	S2	S3
Lead	mg/kg	0.1	2.7	0.1
Cadmium	mg/kg	not detected	not detected	not detected
Copper	mg/kg	not detected	31.3	1.0
Mercury	mg/kg	not detected	not detected	not detected
Hexavalent Chromium	mg/L	not detected	not detected	not detected
Hexavalent Chromium	mg/kg	not detected	not detected	not detected

Source: Water Solutions / Kocks Ingenieure, Environmental Impact Assessment Reclamation of 15 hectares of land at Thilafushi for development of the Regional Waste Management Facility for Zone 3

6. Air Quality

66. Air quality on Thilafushi is heavily compromised by the practice of constantly burning solid waste on the landfill area. The island also has industrial sources of air pollution. The smoke is rapidly dissipated by wind action and is strongly apparent on neighboring islands where they are a constant concern to tourism operators.

67. Quantitative monitoring on the neighboring islands including Malé is not done. Air quality monitoring equipment and data logging had been set up for Malé but was discontinued due to a lack of suitably qualified technical staff.

68. Ambient air quality was studied by AECOM in 2010 on Malé, Hulhulé and Hulmumalé and compared with World Health Organization (WHO) standards for ambient air. Focusing on the main pollutants of potential concern, namely particulate matter of between 2.5 and 10 microgram (μg) in size, particulate matter of less than 2.5 μg , sulphur dioxide (SO_2), oxides of nitrogen (NO_x) and carbon monoxide (CO), none were found to exceed WHO guideline levels in terms of the average 24-hour mean. Levels of particulate matter were relatively constant for each island, though CO, NO_x and SO_2 levels were markedly higher in Malé than in the other islands. The most prominent factor in relation to emissions is much denser traffic on Malé compared to the other islands. On Thilafushi island, there are fewer vehicles, a much lower population and traffic is limited.

7. Noise

69. Industrial installations and movements of heavy equipment on Thilafushi generate noise though mainly during working hours. There are few vehicles on the island and therefore very little traffic noise. The island has relatively few residents (2,100 approximately).

B. Ecological Resources

1. Marine Ecosystems

70. Coral ecosystems have significant ecological significance and occur within lagoon waters and on the periphery of the islands. A survey of the status of the corals, using an established coral survey method, established by the international nongovernment organization (NGO) Reef

Check³⁰ to assess the coverage of coral and other substrates on the sea bed. Seven sites around Thilafushi island were surveyed, finding predominantly rock, rubble and sandy cover, with live corals accounting for up to 20% of cover in one location, to the south of the island.

71. Pelagic fish form an important part of the local economy, both through commercial fishing activities and game fishing. Fishing activity focuses on areas known to be abundant and these occur throughout the Maldives waters, usually distant to the coast. Fish populations in inshore waters around Thilafushi were assessed by Water Solutions in 2017, again using a method developed by Reef Check employing a transect method, undertaken by a diver travelling on a transect and stopping at 5m intervals, to count fish of indicator species. The transect was undertaken at three locations and identified 20 indicator species belonging to 7 families. None of the observed species are of conservation significance, as rated by the International Union for the Conservation of Nature (IUCN).

72. One transect was taken in the lagoon waters adjoining the waste vessel harbor (see site M4 on Figure 6). Based on the transect survey, the following description, indication of lagoon floor coverage and photographs of the site are given in the Water Solutions / Kocks report:

Site 4 was chosen from inside the deep lagoon area. Marine environment of this area was sourced from EIA for Undertaking Reclamation and Quay wall Construction at ALIA Thilafushi Site (Water Solutions Pvt Ltd, 2017). Bottom substrate of this area is dominated with sand. No live coral were observed on the site. During the survey, a lot of waste dumped in this area was observed. No IUCN listed critically endangered (CE) or endangered (EN) coral species were encountered within the survey area.

Live reef cover	Mean % per segment	SE
HC (Living Coral)	0%	0%
SC (Zoanthids but not anemones)	0%	0%
NIA (macro algae)	0%	0%
SP (erect/encrusting sponges)	0%	0%
OT (other sessile organisms)	0%	0%
Non-living reef cover	Mean % per segment	SE
RKC (Coral with structures still recognizable)	0%	0%
RC (hard substrate including dead coral)	0%	0%
RB (reef rocks)	3%	1%
SD (sediment of particles < 0.5mm in diameter; falls quickly when dropped)	97%	1%
SI (sediment that remains in suspension when disturbed)	0%	0%

³⁰ Hodgson, G., W. Kiene, J. Mihaly, J. Liebler, C. Shuman, L. Maun and J. Hill (2006). Reef Check Instruction Manual: A Guide to Reef Check Coral Reef Monitoring Published by Reef Check, Institute of the Environment, University of California at Los Angeles.



2. Avifauna

73. The Maldives has a diverse range of birds, including a significant seasonal population of migratory birds. The islands are important wintering grounds for a large number of migratory species that follow the Central Asian Flyway, a flyway covering a large continental area of Eurasia between the Arctic Ocean and the Indian Ocean, and comprising several important migration routes, extending from the northernmost breeding grounds in Siberia to the southernmost non-breeding wintering grounds in West and South Asia and the Indian Ocean Territory including the Maldives. Within Greater Malé, bird populations are influenced by urbanization, and birds (largely nonmigratory) common to urban areas in South Asia, such as crows and sparrows, are commonplace. The landfill at Thilafushi attracts significant numbers of birds. Uncollected waste, particularly floating waste, is a known hazard to birdlife in Greater Malé and is particularly abundant around Thilafushi on sea lane routes used by barges to transport waste to the island. The waste is hazardous to wildlife when toxic waste is ingested or when articles such as plastic bags and string can cause birds to be debilitated or where they cause damage to the digestive system, or when it damages a natural habitat. The habitat of the white-breasted waterhen (*Amaurornis phoenicurus*) is known to be threatened by floating, uncollected solid waste.³¹

3. Terrestrial Ecosystems

74. As an artificial island, the vegetation cover, which is sparse, has formed by weed colonization and some tree planting.

4. Protected Areas

75. There are 42 protected areas in the Maldives designated under the EPPA and covering around 24,500ha, or 0.2% of national territory totaling more than 24,494 hectares (0.2% of the national territory) designated under the Environment Protection and Preservation Act 4/93 (EPPA 4/93) to prevent over exploitation, and improve conservation and preservation, including banning of export of important baitfish as aquarium fish, protection of threatened marine species such as sharks, sea turtles, giant clams and black coral and also to enhance and sustain dive tourism.

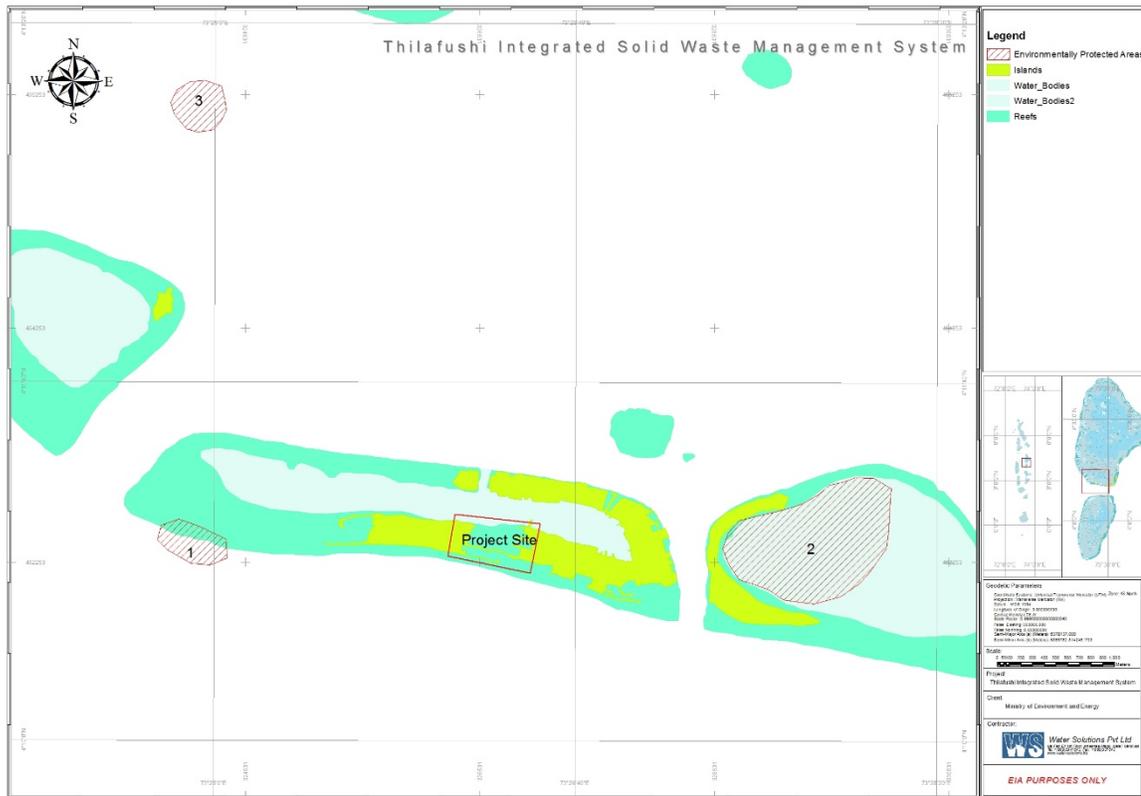
³¹ Common Birds of the Maldives. Live & Learn Environmental Education. www.livelearn.org.

76. Four protected areas occur in the vicinity of Thilafushi, all designated by the Government on 1 October 1995 and listed by the IUCN as dive sites. The IUCN has not set a category for any of the sites.

Table 7: Protected areas in the vicinity of Thilafushi

Name	Type	Area	Notes	Location relative to Greater Malé project area
Dhekunu Thilafalhuge Miayaruvani (Lions Head)	Reef	142	Situated on a reef face, favored as a dive site for shark viewing. Overhanging reef features.	Immediate Southwest of Thilafushi Island
Gulhee Falhu Kollavaani (Hans Hass Place)	Reef	102	Deep lagoon area	East of Gulhifalhu Island, itself 0.4km to the East of Thilafushi Island
Giraavaru Kuda Haa	Reef	200	Isolated reef approx. 30m above lagoon floor	4km North of Thilafushi island

Figure 10: Location of nearest protected areas



Source: Water Solutions / Kocks Ingenieure, Environmental Impact Assessment Reclamation of 15 hectares of land at Thilafushi for development of the Regional Waste Management Facility for Zone 3

C. Socio-Economic Factors

1. Population Levels

77. At the time of the most recent census, in 2014, there were 2,052 residents on Thilafushi Island, almost exclusively male (99.8%) and consisting mainly of overseas workers (84%).

78. There are no schools or hospitals on the island.

2. Economy

79. Tourism and fishing dominate the national economy, with the contribution to gross domestic product (GDP) of 17% and 15% respectively, and the tourism sector growing rapidly in recent years, with a sharp increase of visitor arrivals.

80. The manufacturing sector, for which Thilafushi is an important site, provides less than 4% of GDP, the larger areas of activity being boat building and handicrafts, while modern industry is limited to a few tuna canneries, bottling plants, and limited manufacturing industries (PVC pipe, soap, furniture, and some food products).

81. While the economic outlook is generally positive, the economic base, reliant on tourism and fishing, is now and diversification is a challenge. The country has a shortage of labor and relies on workers from Bangladesh, Sri Lanka and elsewhere for manual labor, work on construction, for service on the resorts and are a vital resource for industry and waste management activity on Thilafushi.

82. Access to education in the national as a whole is good, with enrolment in primary education close to 100% and literacy rates at about 98%.

3. Public Health

83. In the health sector, indicators also show improvements over recent decades. The Infant and maternal mortality rate has declined rapidly. With international assistance, authorities have succeeded in eradicating or heavily reducing the incidence of a number of infectious diseases including leprosy, measles and lymphatic filariasis, though tuberculosis, hepatitis, HIV/AIDS cases continue and dengue and the zika virus are emergent threats. Noncommunicable diseases including addictions and nutrition related conditions are also a current focus of health authorities.

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Method of Assessment

84. The potential impacts and mitigation measures have been identified through review of the Feasibility Study prepared for the Project, discussion with the designers and stakeholder consultation. The feasibility study presents the preliminary design. Initial screening and categorization was done using ADB Rapid Environmental Assessment Checklist and the assessment shows that the subproject is unlikely to cause significant adverse impacts. See Appendix 1. As such, the subproject is classified as environment category B as per ADB SPS, 2009. This IEE is based on this rapid environmental assessment, and on the preliminary design. Therefore, this EE will be updated based on the final detailed design, due for completion by quarter 3, 2020, and the classification will be reassessed or reconfirmed accordingly.

B. Environmental Impacts Related to Location

85. Key considerations in assessing impacts related to location on Thilafushi are (i) the fact that the island was formed by reclamation, specifically to create land for waste management and industry, (ii) the sensitivity of the surrounding marine ecosystem and (iii) the critical role of the island in containing waste, enabling solid waste to be safely managed, provided it can be reliably transported to Thilafushi.

86. **Effects on the surrounding seawater and marine ecosystems.** Thilafushi island plays a vital role in solid waste management in Greater Malé and more widely in Zone 3 and beyond. Improved management of the waste facility on Thilafushi increases its effectiveness in this role, without which risks of greater release of waste to the marine environment will significantly increase. At present however, waste is lost to the sea at the waste vessel harbor area due to inadequate docking facilities and infrastructure. Further, toxic components of general waste and particularly of ELVs are poorly managed and risks of contaminating surrounding waters are high. Improvements to the waste vessel harbor and facilities, enabling handling of large containers carrying waste from within Greater Malé and around Zone 3, will reduce this risk. The potential impact is long term, positive, significant and will cover both the immediate area around the islands and the wider marine environment in Zone 3 and beyond.

87. **Effects on vegetation.** The limited vegetation on Thilafushi comprises mainly weed growth with some trees. No clearance of trees is expected, while the concept design envisages the provision of a buffer zone in which the planting of trees and shrubs can take place. The impact will be positive, significant and long term.

88. **Effects on birdlife.** Birds attracted to the island as well as water birds that frequent surrounding waters will benefit from both the improved handling and treatment to remove hazardous fractions onto the landfill or into surrounding waters. The effect will be positive, significant and long term.

89. **Loss of land and effects on property.** No private property will be affected and no land acquisition will be required and there is therefore no impact.

90. Table 6 summarizes the impacts related to location.

Table 8: Summary of impacts related to location

Potential Impact	Assessment
Surrounding seawater and marine ecosystems	Long term, positive, significant
Vegetation	Long term, positive, significant
Birdlife	Long term, positive, significant
Loss of land and effects on property	Nil

C. Environmental Impacts Related to Construction

91. **Construction method.** The methods to be used for site preparation, fabrication, construction and commissioning, as well as associated arrangements to ensure sound environmental management and safety at all times, are to be defined by the Contractor in a Contractor's Environmental Management Plan submitted to the PMDSC for approval. The CEMP

must adhere to EHS general guidelines 1 to 4 (environmental, occupational health and safety, community health and safety and for construction and decommissioning).

92. **Impedance of traffic.** As there are few vehicles on Thilafushi, there will be no significant traffic impact.

93. **Noise pollution and vibration.** Construction operations, particularly excavations and compaction will cause noise and vibration. However, given the small population on Thilafushi and the fact that most residents are engaged in industrial activity, noise and vibration will not be a significant nuisance.

94. **Waste Generation.** Construction waste will include packaging of equipment, fuels, lubricants, materials, equipment and food and some rubble where existing structures need to be demolished. Some specialist lubricants and paint for marking may be hazardous. These will be disposed of at the appropriate locations on the island and therefore there is no significant risk to nearby waters or other islands. For toxic materials however, approval from the PMDSC must be obtained prior to importing materials rated as hazardous under the Globally Harmonized System of Classification and Labeling of Chemicals.

95. **Existing stored waste and contaminated sites.** Waste that is piled around the waste vessel harbor site and over the work area generally, must be separated according to C&D waste, organic and hazardous waste fractions and deposited at the existing dumpsite. Where land at construction sites is found to be contaminated, risk screening, detailed assessment of risks to the environment must be carried out and appropriate treatment, removal or containment measures identified and carried out, in accordance with EHS general guidelines for contaminated land.

96. **Release of silt.** Excavations to form foundations for structures will involve making temporary stockpiles of material that will either be removed or re-used. To prevent the release of silt into drains or the sea contractors will be required to ensure that (i) excavated areas are rapidly refilled on completion of works, (ii) to place silt fences around temporary piles of excavated material and (iii) avoid excavation in wet weather to the extent practicable.

97. **Water pollution.** The use of vehicles and plant can cause risks of water pollution, in the event of leaks and spills of fuel, lubricants, hydraulic fluid or other fluids used for vehicle operation. To reduce risks and limit impacts the contractor will be required to ensure that vehicles and plant are maintained in sound operable condition, free of leaks and that the condition of vehicles and equipment is regularly checked. The contractor will prepare and submit a plan for spill management, including provision of spill kits, training/briefing of workers on procedures on handling spills and allocation of responsibility within the contractor's team for ensuring that spill kits are available and that workers know how to use them.

98. **Air and dust pollution.** Vehicles and plant used for construction will release exhaust and cause dust, however ambient levels of air pollution are high.

99. **Community health and safety risks.** The use of plant and machinery, use of compressed air lines and cables and excavations are potentially hazardous but most work sites are within the RWMF area on Thilafushi island where public access is restricted. Furthermore, residents of Thilafushi are primarily those working on the island. However, the contractor will be required ensure that restrictions to access are enforced and will provide notices to the public identifying hazards and erect safety barriers/covers for areas of open excavation.

100. The Contractor shall establish its community health and safety plans following international best practices and the World Bank EHS guidelines on construction and decommissioning activities.³² As a minimum and whichever is applicable, the community health and safety plan shall ensure the following:

- (i) Implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning;
- (ii) Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community;
- (iii) Removing hazardous conditions on construction sites that cannot be controlled affectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials; and
- (iv) Implement measure to prevent proliferation of vectors of diseases at work sites.

101. **Occupational Health and Safety.** To reduce day to day risks associated with working with heavy equipment in trafficked areas, contractors will be required to appoint health and safety officers for each site and to ensure regular briefing of the construction workforce on health and safety issues. The Contractor shall establish its health and safety plan to be adopted at each site following international best practices and the World Bank EHS guidelines on construction and decommissioning activities. As minimum, the health and safety plan shall ensure the following, whichever are applicable:

- (i) Communication and Training
 - (a) Training of all workers on occupational health and safety prior to construction works;
 - (b) Conduct of orientation to visitors on health and safety procedures at work sites;
 - (c) Signages strategically installed to identify all areas at work sites, including hazard or danger areas;
 - (d) Proper labeling of equipment and containers at construction and storage sites; and
 - (e) Suitable arrangements to cater for emergencies, including: first aid equipment; personnel trained to administer first aid; communication with, and transport to, the nearest hospital with an accident / emergency department; monitoring equipment; rescue equipment; firefighting equipment; and communication with nearest fire brigade station.
- (ii) Physical Hazards
 - (a) Use of personal protective equipment (PPE) by all workers such as earplugs, safety shoes, hard hats, masks, goggles, etc. as applicable, and ensure these are used properly;
 - (b) Avoidance of slips and falls through good house-keeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from foot paths, cleaning up excessive waste

³² <http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES>

- debris and liquid spills regularly, locating electrical cords and ropes in common areas and marked corridors, and use of slip retardant footwear;
- (c) Use of bracing or trench shoring on deep excavation works;
 - (d) Adequate lighting in dark working areas and areas with night works;
 - (e) Rotating and moving equipment inspected and tested prior to use during construction works. These shall be parked at designated areas and operated by qualified and trained operators only;
 - (f) Specific site traffic rules and routes in place and known to all personnel, workers, drivers, and equipment operators; and
 - (g) Use of air pollution source equipment and vehicles that are well maintained and with valid permits.
- (iii) General Facility Design and Operation
- (a) Regular checking of integrity of workplace structures to avoid collapse or failure;
 - (b) Ensuring workplace can withstand severe weather conditions;
 - (c) Enough work spaces available for workers, including exit routes during emergencies;
 - (d) Fire precautions and firefighting equipment installed;
 - (e) First aid stations and kits are available. Trained personnel should be available at all times who can provide first aid measures to victims of accidents;
 - (f) Secured storage areas for chemicals and other hazardous and flammable substances are installed and ensure access is limited to authorized personnel only;
 - (g) Good working environment temperature maintained;
 - (h) Worker camps and work sites provided with housekeeping facilities, such as separate toilets for male and female workers, drinking water supply, wash and bathing water, rest areas, and other lavatory and worker welfare facilities; and
 - (i) Maintain records and make reports concerning health, safety and welfare of persons, and damage to property. Take remedial action to prevent a recurrence of any accidents that may occur.

102. Table 7 summarizes the impacts related to construction. As all can be mitigated by consistent application of the mitigation measures described, none are significant.

Table 9: Summary of impacts related to construction

Potential Impact	Assessment
Impedance of traffic	Minimal, not significant
Noise pollution and vibration	Minimal, not significant
Waste generation	No impact
Release of silt	Minimal, not significant
Water pollution	Negative, temporary, not significant
Air and dust pollution	No impact
Community health and safety risks	Minimal, not significant
Occupational health and safety	Negative, temporary, not significant

D. Environmental Impacts Related to Operation

103. **General.** The package of improvements to the waste vessel harbor and initial waste handling and processing facilities on Thilafushi are integral to the overall project and are necessary for achieving the planned improvements to the RWMF. The improvements will have both direct impacts in terms of greater capacity and efficiency in handling waste, and indirect impacts in terms of enabling the further WTE plant to function by removing non-combustible and hazardous fractions. Summary of impacts is in Table 8 below.

104. **Losses of waste during handling.** The upgrading of the waste vessel harbor will enable offloading of 25 m³ containers and transfer of waste to the landfill in trucks, avoiding the substantial losses that currently take place, resulting in a build-up of waste in the docking area and unsanitary conditions (illustrated in Figure 6 below). The impact is significant, long term and positive.

Figure 11: Build-up of discharged at the existing waste vessel harbor on Thilafushi



105. **Liquid waste.** During handling of the containers, it will not be practical to contain all the leachate from the waste, which will collect in the dock area. The concept design provides for two septic tanks, which can also accept and treat waste from toilet facilities used by workers at the facility, avoiding discharge of untreated leachate and wastewater into the sea. Effluent from the

septic tanks must comply with General Liquid Effluent Quality standards given in the EHS General Guidelines.

106. **C&D waste plant operation.** Separate handling of C&D waste will help ensure that a minimum of non-combustible waste goes to the final disposal facility that will be developed under a new project in the future. Processing of the C&D waste will separate out fractions that can be sold and/or re-used. The separation process however involves several stages of crushing and screening, which will generate dust, posing a hazard to workers. The impact of operating the C&D waste plant will be positive, significant and long term. The health hazard posed by the dust can be mitigated by ensuring that where feasible, all operators work inside cabins separated from air in the C&D waste plant by transparent screens, that masks fitted with particulate filters and exhalation valves are issued for any work that has to take place within the C&D waste plant outside the cabins and allocating responsibility to ensure that these masks are kept in good condition and worn whenever necessary.

107. **Hazardous waste.** The facilities provide for separation of hazardous waste from vehicles, C&D waste and other fractions, and separate handling, including a secure storage facility within the administration building. To be effective, workers and managers require established procedures for handling hazardous waste and training in their implementation.

108. **ELV plant operation.** The ELV plant remains to be designed. The process must involve (i) removal of vehicle parts likely to contain heavy metals such as the catalytic converter, (ii) de-pollution by removing fluids including lubricant oil, brake oil and fuel residues, and proper storage and removal of the fluids, (iii) separation of body panels from the chassis, and plastic/vinyl parts, (iv) processes such as crushing of body panels to allow transport to appropriate locations for recycling or landfilling. Due to the removal of toxic components and improved scope for recycling, the impact is positive, significant and it is long term.

109. **Handling of hazardous materials.** Hazardous materials, recovered from the dismantling of ELVs and those received from the transfer stations and IWMCs in Zone 3, are to be assessed, treated and stored. Plans provided in the Feasibility Study for the Integrated Solid Waste Management System for Zone III provides for storage of hazardous waste. Plans for operation of the RWMF need to identify procedures and resources for identifying, classifying, processing, storing or disposing of hazardous waste, such that air, water and land pollution is prevented.

110. **Pests.** Although improvements will enable cleaner conditions for waste handling, the area will still be subject to pests such as birds and rodents. Numbers of these can be kept down by improved operation regimes, including site hygiene and regular cleaning of surfaces and minimizing time that putrescible waste is stored.

111. **Occupational health and safety.** Improved site cleanliness and provision of facilities such as toilets and food preparation facilities in the administration building will reduce exposure to toxins and disease and improve the existing level of occupational health and safety for workers, including workers at the C&D waste and ELV plants. In the case of the C&D waste plant, dust will continually be produced by the crusher operations. Dismantling of ELVs will include release of dust and fumes from batteries and fuel tanks. The operators of these facilities and plants shall implement measures following international best practices and the World Bank EHS industry sector guidelines on waste management facilities and on ports, harbors and terminals.

Table 10: Summary of impacts related to operation of the improved facilities

Potential Impact	Assessment
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General	Positive, significant, long term
Losses of waste during handling	Positive, significant, long term
Liquid waste	Positive, significant, long term
C&D waste plant operation	Positive, significant, long term
Pests	Positive, significant, long term
Occupational health and safety	Positive, significant, long term

E. Global, Transboundary and Cumulative Impacts

112. The proposed improvements will occur within the Zone 3 area. However, the improvements in collection, treatment and disposal of waste, which will be facilitated by the improvements to the RWMF, will reduce the discharge of waste from these islands into the surrounding ocean waters. Improvements to the waste vessel harbor at Thilafushi will enable more efficient handling and removal of waste from the harbor area. Processing of C&D waste, removal of the wood fraction and preparation of components of C&D waste that can be re-sold will both reduce the burden of the landfill and increase the quantity and quality of combustible waste fed to the waste to energy plan. Similarly, improved dismantling of end of life vehicles and separation of their components will improve efficiency of disposal and recycling of vehicle components. The improved handling and processing of waste, the improvements to the dumpsite and the installation of a waste to energy plant in a separate project in the future will therefore have a cumulative, positive impact.

113. Capacity building for the EPA will assist in the build-up of capabilities required to further improve and manage waste management facilities throughout the Maldives.

VI. ANALYSIS OF ALTERNATIVES

114. The Feasibility Study prepared by Water Solutions and Kocks Ingenieure discusses the best practicable environmental option (BPEO) for the RWMF, with a focus on technologies for waste treatment – identifying WTE as the preferred option. The Feasibility Study also reviews further aspects such as options for transportation of waste, including the use of containers and transfer stations. The proposed improvements examined in this IEE all relate to expanding the capacity and developing greater efficiency of the RWMF on Thilafushi. The improvement of the waste vessel harbor is necessary to reduce losses of waste during handling, while the administration building also includes facilities that are required but not yet present including the store for hazardous waste, space for handling sale of marketable fractions and sanitary facilities for workers. Similarly, the C&D waste and the ELV plants are not yet present but are required to ensure separation of hazardous and marketable fractions from incoming waste.

115. For this IEE therefore, the “no project” scenario is considered, but not alternatives to the improved waste vessel harbor, administration building, C&D waste plant and ELV plant.

A. The no project alternative

116. This scenario envisages not only the exclusion of the improved waste vessel harbor, administration building, C&D waste plant and ELV plant but also of other project components, including the RWMF. In this scenario, the existing practices of inefficient waste handling, which entails significant loss of waste to the sea, burning of waste on Thilafushi (and on other islands) and, most significantly, no means of expansion to handle growing volumes of waste. This without doubt entails increased risk to the living environment for residents of Greater Malé and elsewhere in Zone 3 and to the surrounding marine environment.

VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Consultations and information disclosure during design

117. During feasibility study preparation, the design team worked with key stakeholders such as MEE and WAMCO, and stakeholders are identified in a stakeholder analysis, including consultations with NGOs and residents of Thilafushi in relation to dredging and land reclamation on Thilafushi.

118. Consultations relating to facility improvements on Thilafushi took place during July 2017 with NGOs and members of the community living on Thilafushi Island. This documented in the Environmental Impact Assessment Report for Reclamation of 15 hectares of land at Thilafushi for development of the Regional Waste Management Facility for Zone 3, prepared by Water Solutions / Kocks Consult. While these consultations were not undertaken in relation to the proposed waste vessel harbor improvements, C&D waste processing plant, ELV workshop and administration building, they do represent the views of key stakeholders and the resident community on improvements to solid waste management on the island which is approximately 2,000 in number and comprises almost exclusively workers, largely from overseas, who reside temporarily to work on the island.

Stakeholder	Views / concerns expressed	Responses / Appropriate Action
Parley Maldives	Very concerned about existing situation, including considerable losses of waste and pollution of the sea The group's primary interest is in recycling to reduce the burden on the solid waste management facility	Increased scope for recycling due to dismantling and separating components from ELVs, and improved waste vessel harbor operations. Reduced losses of waste to the sea at the harbor site through improved facilities and operations.
Bluepeace Maldives	Highly concerned about environmental and health situation associated with the waste management facility, including high levels of waste floating near the island and on routes to it. The organization feel a solution to the waste situation calls for a national framework for solid waste management. They support proposed improvements to the regional solid waste management facility	Reduced losses of waste at sea expected from the use of containers for loading/offloading at RWMF and transfer stations. Improvements to the RWMF under Phase 1 and Phase 2 to be carried out addressing key areas of waste disposal and treatment, arresting open burning and improved dumpsite management.
Members of the Diving Community	Dive customers tend not to favor the dive site (Lions Head) near Thilafushi island owing to its status as a waste facility, smoke from waste burning and abundant floating waste which dispel the appeal of the dive sites.	Improvements to include dumpsite remediation, including fire fighting and measures to prevent fires; waste vessel harbor improvements and transfer station improvements to increase efficiency of waste transportation and reduce incidence of floating waste.

Resident community	<p>Concern that waste is not being treated properly by the authorities.</p> <p>Concern that the area allocated to waste management is small, resulting in rising heights of piled waste.</p> <p>Major concern over the level of smoke and mosquitos.</p> <p>Concern over general low hygienic condition of the island</p> <p>Some businesses are able to make money from valuable waste fractions, when these can be separated.</p>	<p>Improvements in phase 1 and phase 2 include improved waste treatment, increased space for waste management, arresting of burning and improved sanitary conditions.</p> <p>Island sanitary conditions not addressed by improvements per se.</p> <p>C&D waste plant to increase availability of waste fractions that can be recycled.</p>
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B. Further Information Disclosure and Public Consultation

119. This IEE, once updated on the basis of detailed design, and a Dhivehi translation of the executive summary will be provided to commune officials for public disclosure. Similarly, the updated IEE based on detailed design will be shared with stakeholders, as will results of monitoring. Stakeholders will be kept informed of the construction program including activities that are likely to entail hazards and will be made aware of the grievance redress mechanism and consultations will take place regularly to gain feedback and ensure that impacts are being adequately managed.

120. **Information, Education and Communication (IEC).** The IEC component will address perceptions on solid waste management, communication channels within the island communities, the role of women and scope for public involvement in improved solid waste management activity, in line with the “3 Rs”. This will potentially include adopting practices at the household level that reduce waste generation (including in particular reduced use of disposable plastics) and the separation of compostable and recyclable waste, and eliciting participation in community level activity.

121. The IEC will also support island councils in the management of solid waste, particularly through partnerships with resorts, NGOs or other islands to support initiatives to manage solid waste safely and sustainably. Resorts could provide technical training to islands, help in repair of SWM equipment, joint transport of waste to treatment centers, and carry out joint awareness programs on SWM. Strategies may include:

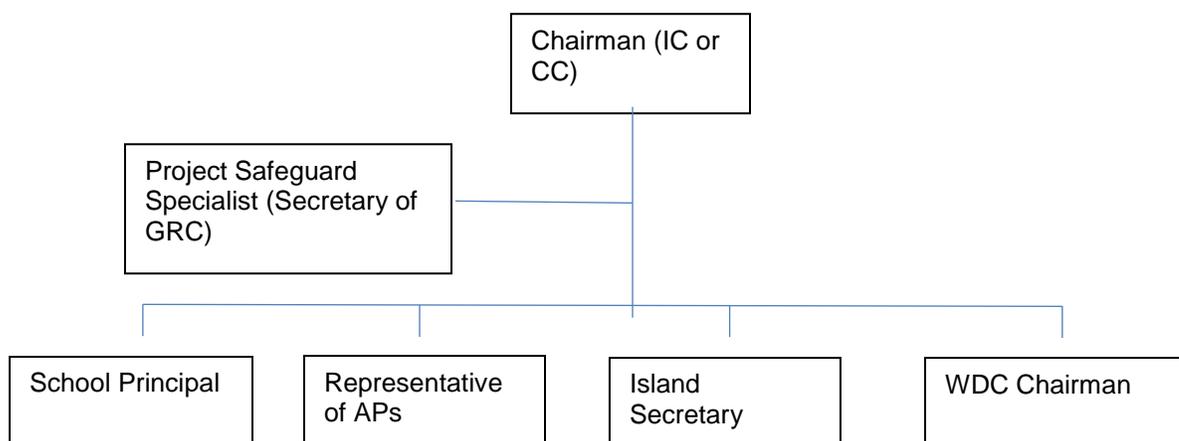
- (i) Involvement of environmental clubs that have been formed in schools;
- (ii) Use of social media, particularly those in common use already such as “facebook” and “viber”;
- (iii) Setting up a dynamic knowledge portal;
- (iv) Sharing information on the project, its activities and roll out schedule of the project components;
- (v) Partnerships between resorts and neighbouring islands on sustainable waste management;
- (vi) Promoting 3R practices, including reduction of plastic water bottles through use of reusable glass bottles and/or large, reusable bottles for drinking water; and
- (vii) Encouraging use of locally produced compost.

VIII. GRIEVANCE REDRESS MECHANISM

122. A grievance redress mechanism (GRM) will be established to receive and facilitate the resolution of affected persons (AP's) concerns, complaints, and grievances on negotiated/voluntary land donation or involuntary land acquisition, relocation, income restoration, environmental management and other construction and operation related issues. The GRM is accessible to all APs to address their concerns, grievances and issues effectively and swiftly, in accordance with ADP SPS, 2009.

123. **First Tier:** City Council/Island Council – grievances will be registered informally by contacting the city/island councils. If the grievance cannot be resolved informally then the APs can register a formal complaint. The council must screen the grievance to determine whether the concerns raised in the grievance are within the scope of the project. The council will determine solutions to the issues either by (i) discussing internally, or (ii) joint problem solving with aggrieved parties, or (iii) a combination of both options. If the complaint is resolved within a week, the council must communicate the decision to the aggrieved party formally or informally. Should matter be unresolved and/or the AP be unhappy with the result, the complaint will be referred to the next tier. The grievance redress committee (GRC) includes the island's representatives as well as project officers related to each island, as shown in the figure below.

Figure 12: Grievance Redress Committee (GRC) Composition for First Tier



124. **Second Tier:** The AP can elevate the grievance to the second tier, and submit a complaint on a letter addressed to MEE. MEE will forward the letter to the PMU. The PMU will be responsible to resolve the complaint within 15 days and communicate the decision to the aggrieved party. The PMU screens the grievance and determines if it is related to the project. If unrelated, the AP is notified in writing. If it is relevant to the project, the PMU will hold discussions with the MEE on the matter and if necessary, (i) arranges visit the site and hold on-site discussions and/or (ii) refers the matter to the project steering committee. The PMU then decides on the action that will be taken by the project to address the grievance, and the decision will be conveyed to the AP in writing.

125. The affected persons can also direct contact (in writing) the ADB Project Officer at ADB headquarters. The complaint can be submitted in any of the official languages of ADB's

Developing Member Countries. This may be done at any time by sending the written complaint to the following address:

Project Officer – Greater Malé Environmental Improvement and Waste Management Project
South Asia Urban Development and Water Division
South Asia Regional Department
Asian Development Bank
6 ADB Avenue, Mandaluyong City 1550
Metro Manila, Philippines

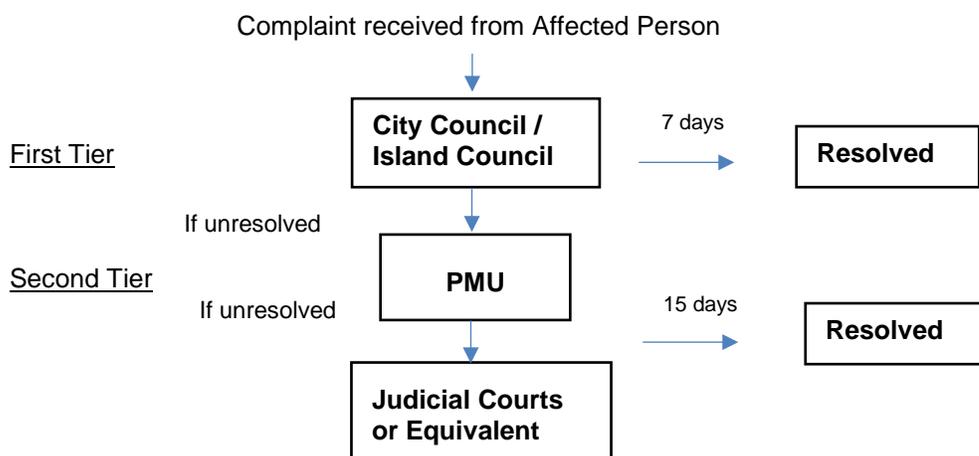
126. The APs can also use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB. The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the Project Information Document to be distributed to the affected communities, as part of the project GRM.

127. The legal system is accessible to all the APs. APs can seek legal redress through Maldives judicial or appropriate administrative system at any stage of the matter or issue concerned. The APs can also use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB. The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the PID to be distributed to the affected communities, as part of the project GRM.

128. The GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage through the Maldives judicial or appropriate administrative system. This can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

129. The flow diagram of resolving complaints under the GRC is shown in Figure below.

Figure 13: GRM Diagram for Complaints Resolution



130. The GRM will include group meetings and discussions with APs to address general and common grievances. These meetings and discussions will be announced in advance, conducted at the time of day agreed on with APs (based on their availability), and facilitated by the PMU and PMDSC at least are assisted to understand the grievance redress process, to register complaints and with follow-up actions at different stages in the process. Records will be kept by the PMU to

keep track of all grievances received, both informal and formal, including contact details of complainant, date when the complaint was received, nature of grievance, agreed corrective actions and the date when these were effected, and final outcome. A Sample Grievance Registration Form is attached in Appendix 2.

131. All costs involved in resolving the complaints (meetings, consultations, communication and reporting, and information dissemination) will be borne by the PMU.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Objectives

132. This EMP sets out the needs for environmental management of waste handling and processing improvements on Thilafushi within the project in terms of institutional responsibilities to ensure mitigation and monitoring takes place during the pre-construction, construction and operation phases, meeting the requirements of the Government of the Maldives and the ADB's SPS.

133. A copy of the EMP must be kept on work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

134. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

B. Institutional Arrangement

135. **Implementation arrangements.** The executing agency is the Ministry of Finance and Treasury (MOFT). The implementing agency is the Ministry of Environment and Energy (MEE) who will establish a project management unit (PMU) comprising officials from MEE and WAMCO. The PMU will be strengthened with external experts in the areas of finance, procurement, technical areas, and contract management. The project steering committee chaired by Minister, MEE will provide overall guidance and strategic directions to the project. Consultant firms will be recruited under the project to support engineering designs, supervision, project management, institutional capacity strengthening, and community awareness.

136. **Project Management Unit.** The Director General of the Solid Waste Department of MEE proposed that a dedicated full-time PMU for the ADB Zone 3 waste management project will be established (pending approval by MOFT) with eight staff as follows: (i) Project Director (part-time, Director General of Department), (ii) Project Manager (full time), (iii) Procurement Specialist, (iv) Finance Specialist, (v) Safeguard Specialist, (vi) Civil Engineer, (vii) IEC Specialist, and (viii) administrative assistant. The Project Director is a government official empowered to take official decisions, while remaining PMU staff are contracted staff recruited from the market. The PMU will be supported by consultants for project management, capacity building, monitoring, and technical

design and supervision support. The proposed PMU contract staff are to be recruited competitively without further delay in phases.

137. Terms of Reference for PMU Environment Officer. Key tasks and responsibilities of the PMU environment officer are as follows:

- (i) confirm existing IEEs/EMPs are updated based on detailed designs, and that new IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
- (ii) confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
- (iii) provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by island councils and contractors
- (iv) establish a system to monitor environmental safeguards of the project, including monitoring the indicators set out in the monitoring plan of the EMP;
- (v) facilitate and confirm overall compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant; e. supervise and provide guidance to the island councils to properly carry out the environmental monitoring as per the EARF;
- (vi) review, monitor, and evaluate the effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken as necessary;
- (vii) consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;
- (viii) ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public;
- (ix) address any grievances brought about through the grievance redress mechanism in a timely manner;
- (x) With assistance from the PMDSC, provide orientation to PCU and PIU staff in environmental management arrangements for the project;
- (xi) Provide inputs to progress reports and the project completion report;
- (xii) Visit worksites during construction and provide guidance relating to supervision and compliance monitoring; and
- (xiii) Visit completed works and assist with establishing environmental monitoring procedures for the operation phase of the improved infrastructure.

138. Terms of Reference for PMDSC Safeguard Consultants. The Social, Environmental and Occupational Health and Safety Expert in PMDSC will:

- (i) Ensure compliance with ADB safeguard requirements;
- (ii) Screen and categorize IWMCs for inclusion in the project;
- (iii) Ensure no Category A subproject per ADB SPS definition;
- (iv) Provide guidance on safeguards and issue instructions to the Contractors;
- (v) Assist in obtaining all necessary permissions and complying with statutory requirements;
- (vi) Prepare necessary IEE and EMP for each IWMC that will be considered in the project.
- (vii) Submit IEE and EMP to PMU for submission to ADB;
- (viii) Ensure IEE and EMP is included in the bid and contract document and) and such items are included in BOQ;

- (ix) Review the Contractor's Environmental Management Plan (CEMP) for adequacy in terms of compliance with the requirements of the EMP and instruct amendments and additions as necessary;
- (x) Monitor and ensure compliance with ADB SPS and contractors' implementation of the EMPs;
- (xi) As part of the EMP, prepare a project focused Occupational Health and Safety Plan (OHS) to be adopted by the Client and the Contractor;
- (xii) Ensure that relevant provisions in contracts on OHS are abided by the contractors during the construction works;
- (xiii) Facilitate meaningful consultations and carry out disclosure of safeguard documents;
- (xiv) Prepare environmental and social mentoring reports;
- (xv) Prepare corrective action plan/s as required to ensure compliance with ADB SPS, 2009 and national laws and regulations;
- (xvi) Assist in GRM implementation;
- (xvii) Conduct Safeguards Orientation to contractors prior to mobilization; and
- (xviii) Develop and conduct regular safeguards trainings (see indicative institutional capacity development program) to ensure PMU, island councils and other stakeholders have common understanding of ADB SPS requirements during all phases of project implementation.

Figure 14: Project organization structure

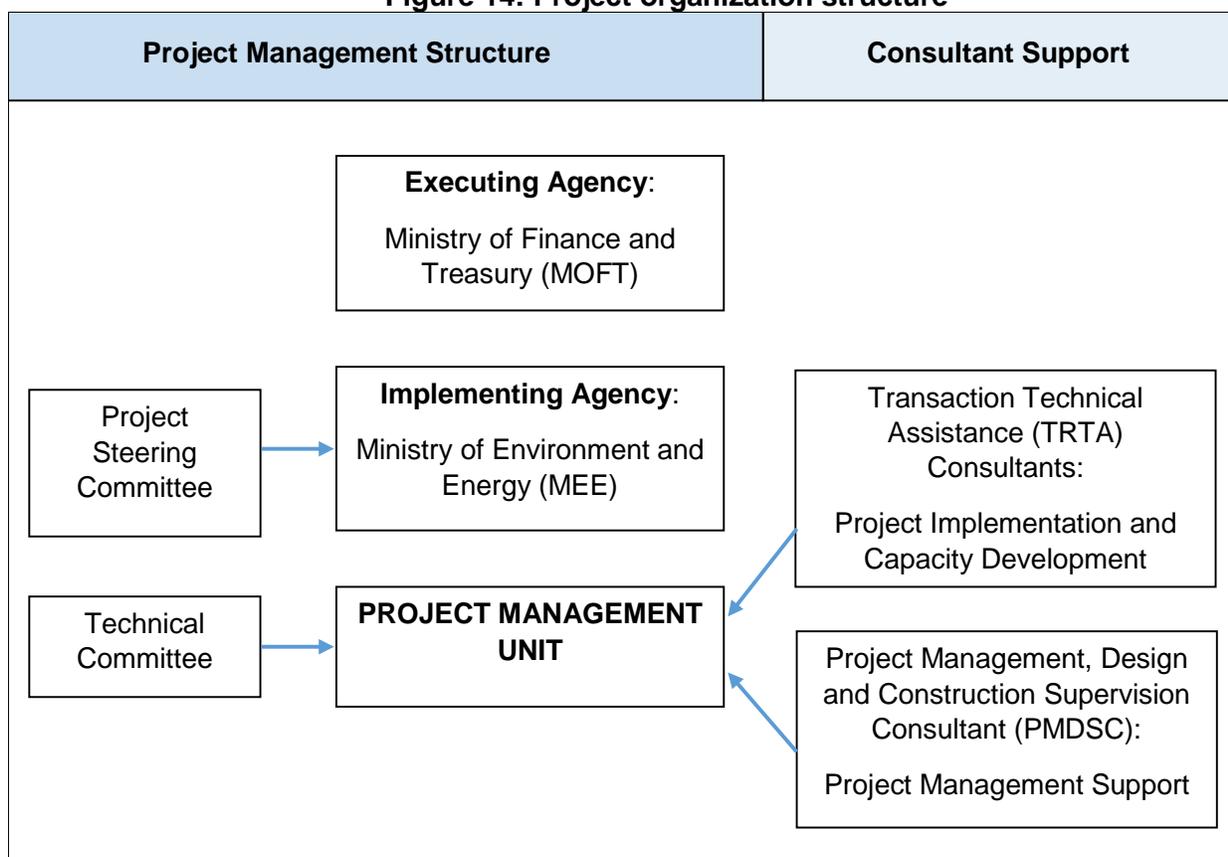


Table 11: Roles and Responsibilities of Project Implementation Organizations

Project Implementation Organizations	Management Roles and Responsibilities
Executing agency Ministry of Finance and Treasury (MOFT)	Guide and monitor overall project execution. Financial oversight. Ensure flow of funds to the implementing agency and timely availability of counterpart funding; ensure adequate budget for successful implementation of the project. Monitors compliance with project legal Agreements Procurement oversight. Responsible for approving procurement. Review and coordinate evaluation of bids for works, goods, and consultant services. Maintaining project accounts and project financial records; Review and sign withdrawal applications before submitting to Asian Development Bank (ADB). Approve project management unit (PMU).
Project steering committee [Chair: Minister, Ministry of	Provide policy direction to facilitate project implementation. High-level troubleshooting.
Environment and Energy (MEE)]	Meets quarterly (or as needed) to review project performance and resolve issues.
Implementing agency 1 (MEE)	Overall day-to-day project management, monitoring, and evaluation.
PMU in MEE	Responsible for overall project management, implementation and monitoring; Reviews the reports submitted by (project management, design and construction supervision consultant) PMDSC with respect to detailed design, costs, safeguards, financial, economic, and social viability Prepare, with the support of PMDSC, bidding documents, request for proposals, and bid evaluation reports; Serves as point of contact with ADB, maintains project documents, and submits timely reports (quarterly progress reports and project completion report) to ADB by consolidating relevant inputs from PMDSCs and island council; Consolidates expenditures and prepare withdrawal applications for direct payment, reimbursements and use of imprest advance; Opens and manages imprest account for ADB Grant; Organize project orientation for participating island councils by elaborating scope of the project and sharing about their obligation and including maintaining separate accounts for their respective contributions; Establishment and maintaining of project website by disclosing progress reports, safeguard monitoring reports and design reports; and Collect supporting documents and submit withdrawal applications to ADB via MOFT. Monitors and ensures the compliance of covenants, particularly timely submission of audited project accounts and compliance with safeguard requirements;
Technical committee	Advise and facilitate to resolve technical issues.
WAMCO	Operator for collection, transport, and disposal of waste services in project area Manage regional waste management facilities
Island Councils	Operators of solid waste services on outer islands Responsible for management and O&M of Island Waste Management Centers

Project Implementation Organizations	Management Roles and Responsibilities
ADB	<p>Conducts project review missions, midterm review mission and project completion review mission to assess project implementation progress of all outputs, compliance of grant covenants including actions required in terms of safeguards (environmental impacts and social mitigation measures applicable); timeliness of budgetary allocations and counterpart funding; project expenditures; progress with procurement and disbursement;</p> <p>Post on ADB website the updated project information documents and safeguards documents as per disclosure provision of the ADB safeguards policy statement.</p> <p>Reviews executing agency and implementing agency's submissions for procurement of goods, equipment, works and services and provides comments and no objection on the submissions</p> <p>Checks Statement of Expenditure on sampling basis</p>

139. **The Contractor.** The contractor will have the following roles and responsibilities:

- (i) obtain all statutory clearances prior to commencement of civil works;
- (ii) complies with all applicable legislation, is conversant with the requirements of the EMP, and briefs staff about the requirements of same;
- (iii) prepare a Contractor's EMP based on the EMP of this IEE, and submit to PMDSC for approval;
- (iv) carry out all of the monitoring and mitigation measures set forth in the approved CEMP;
- (v) ensures any sub-contractors/ suppliers, who are utilized within the context of the contract, comply with the environmental requirements of the CEMP/EMP. The Contractor will be held responsible for non-compliance on their behalf;
- (vi) implement any corrective or preventative actions set out in safeguards monitoring reports that the executing agency or implementing agency will prepare from time to time to monitor implementation of this IEE, EMP, and CEMP;
- (vii) provides environmental awareness training to staff;
- (viii) bears the costs of any damages/ compensation resulting from non-adherence to the EMP or written site instructions;
- (ix) conducts all activities in a manner that minimizes disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment;
- (x) ensures that its staff or engineers are informed in a timely manner of any foreseeable activities that will require input from the environment and safety officers (or equivalent);
- (xi) appoints one full time environment and safety officer (or equivalent) for implementation of EMP, community liaising, reporting and grievance redressal on day to day basis; and
- (xii) receives complaints/grievances from the public, immediately implements the remedial measures and reports to the PMU and PMDSC.

C. Institutional Capacity Development Program

140. The PMU, to be established by the MEE, will be responsible for the implementation of safeguards and ensuring that they comply with ADB requirements as well as the EPPA. The body responsible for approving environmental impact assessments and issuing of permits is the Environmental Protection Agency (EPA), which is under the Ministry of Environment and

Energy.³³ Capacities were assessed by the PPTA consultants during interviews that took place in July and September 2017. The EPA has few trained technical staff and at the time of capacity assessment work undertaken by the PPTA consultants, all senior members of the EPA's waste department were away from the office for study, which is indicative of a low staffing resource level. The agency relies on external consultants for functions such as environmental monitoring for projects; however this is usually confined to the construction phase. The EPA does have one team of field staff a laboratory and a boat for fieldwork, but laboratory operations and travel is constrained by budget constraints. The situation is reflected in other departments of the MEE.

141. The PMDSC will provide assistance during the project for the implementation of safeguards in compliance with ADB SPS 2009 requirements and with the requirements of the EPPA. This provision responds to lessons learned for project design to include support to PMU staff in project implementation particularly in procurement, contract management, and safeguards. The PMDSC will provide assistance to the PMU for overseeing EMP implementation.

142. Besides the IEC component which includes some capacity building measures for ICs (e.g. increasing outreach of IEC, closing feedback loop), the Transaction Technical Assistance (TRTA) for Strengthening Capacity for Sustainable Solid Waste Management in the Greater Malé Region will provide both implementation and safeguard guidance and assistance towards the PMU. Since recycling is of a major concern, a market sounding will be carried out during the TRTA to increase the knowledge in this regard and to inform the institutional stakeholders (mainly MEE, WAMCO and ICs) about the potential for recycling of certain waste components.

143. Capacity development support will be provided via the TRTA to support the improvement of the C&D waste plant, ELV workshop, waste vessel harbor improvements and the administration building. This will include implementation guidance specifically to the new PMU to be formed for the project. The TRTA team includes a national safeguards and gender expert.

D. Impacts and Mitigation

144. Table 10 summarizes the potential impacts and mitigation measures in relation to location, construction and operation identified in the IEE.

³³ Note that EPA, while it comes under MEE, has a governing board which is a statutory body.

Table12: Environmental Management Plan

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Pre-Construction Stage						
Dust hazard for C&D waste plant operation	Thilafushi RWMF	Incorporation into design of safe cabins for plant operators	Compliant with PMDSC / design company quality control standards	Project funds	Designers	PMDSC / MEE
Waste vessel harbor improvements	Thilafushi RWMF	Inclusion in design of treatment measures for water used to wash vehicles and containers Design to be consistent with EHS Industry Sector Guidelines for Ports Harbors and Terminals	Compliant with PMDSC / design company quality control standards	Project funds	Designers	PMDSC / MEE
Administration building	Thilafushi RWMF	Inclusion of provisions for canteen, meeting room and toilet facilities, including provisions for treatment/discharge of wastewater in design of the administration building	Compliant with PMDSC / design company quality control standards	Design cost	Designers	MEE
C&D waste plant	Thilafushi RWMF	Inclusion of provision of safety features for the plant including noise suppression, dust suppression guard rails, emergency shut-off and lighting	Compliant with PMDSC / design company quality control standards	Design cost	Designers	MEE

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
ELV Plant	Thilafushi RWMF	Design of the ELV for a process that includes (i) removal of vehicle parts likely to contain heavy metals such as the catalytic converter, (ii) de-pollution by removing fluids including lubricant oil, brake oil and fuel residues, and proper storage and removal of the fluids, (iii) separation of body panels from the chassis, and plastic/vinyl parts, (iv) processes such as crushing of body panels to allow transport to appropriate locations for recycling or landfilling. Measures to be consistent with EHS Industry Sector Guidelines for Waste Management Facilities.	Compliant with PMDSC / design company quality control standards	Project funds	Designers	PMDSC / MEE
Design of the overall site	Thilafushi RWMF	Site design, including drainage, access, safety features and security to comply with EHS guidelines for Waste Management Facilities	Compliant with PMDSC / design company quality control standards	Project funds	Designers	PMDSC / MEE
Hazardous waste provision	Thilafushi RWMF	Consider providing a separate secure building for hazardous waste storage, rather than an room within the Administration building as indicated in the Feasibility Study	Compliant with PMDSC / design company quality control standards			
Construction Impacts	Thilafushi RWMF	Preparation of Contractor's Environmental Management Plan providing specific detail in relation to chosen construction methods	Approval by PMDSC	Construction Cost	Contractor	PMDSC

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
General impacts on local residents	Thilafushi RWMF	Provision of information to the public on Grievance Redress Mechanism	Completion of disclosure measures as prescribed in the GRM	Project Management Cost	PMU	-
Climate risk and vulnerability mitigation	Thilafushi RWMF	Incorporation of recommendations from CRVA into detailed design	Compliant with PMDSC company quality control standards	Design cost	PMDSC	MEE
Confirmation of pre-construction stage updates	Thilafushi RWMF	IEE / EMP to be updated to reflect final detailed design and construction methods. ADB clearance obtained before proceeding.	Documented ADB clearance	Design cost	PMDSC	ADB and MEE
Construction stage impacts						
Waste generation from construction activities	Thilafushi RWMF	All solid waste must be disposed of at a landfill or approved disposal site. Importation of any materials rated as hazardous under the Globally Harmonized System of Classification and Labeling of Chemicals to be subject to approval by PMDSC, which will be conditional on stating adequate arrangements for disposal.	Sites free of construction waste on commissioning. Written PMDSC approval available for any hazardous chemical in use	Construction Cost	Contractor	PMDSC

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Accumulated waste at the construction site and contaminated land	All areas where construction is to take place	Accumulated waste to be separated into main fractions and disposed on existing dumpsite. For sites found to be contaminated, the contractor is to undertake a risk assessment, quantitatively assess risks to the environment and and arrange for appropriate treatment, removal or containment as appropriate	Risk assessments and plans for treatment, removal or containment approved by PMDSC and carried out	Construction Cost	Contractor	PMDSC
Release of silt	Thilafushi RWMF,	Excavated areas to be rapidly refilled on completion of works. Use of silt fences around temporary piles of excavated material. Avoid excavation in wet weather to the extent practicable.	No instances when silt release is uncontrolled	Construction Cost	Contractor	PMDSC
Water pollution	Thilafushi RWMF	Vehicles and plant are to be maintained in sound operable condition, free of leaks. The condition of vehicles and equipment will be periodically checked. Contractor to prepare and submit a plan for spill management, including provision of spill kits, training/briefing of workers on procedures on handling spills and allocation of responsibility within the contractor's team for ensuring that spill kits are available and that workers know how to use them.	Vehicles and construction plant to have at all times at a minimum: (i) intact and securely fitted exhaust pipes and mufflers (ii) operable brakes (iii) no fuel or lubricant leaks. Spill kits on site at all times	Construction Cost	Contractor	PMDSC

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Community health and safety hazards	Thilafushi RWMF	<p>Restriction of access to the RWMF. For work at the periphery of the sites, provide notices to the public identifying hazards and erect safety barriers / covers for areas of open excavation.</p> <p>Contractors to adopt the WB EHS Guidelines on Community Health and Safety, particularly those that relate to construction works.</p>	Barriers and notices to be in place at all times, entrance to sites actively controlled	Construction Cost	Contractor	PMDSC
Occupational health and safety hazards	Thilafushi RWMF	<p>Contractors to appoint health and safety officers for each site and to ensure regular briefing of construction workforce on health and safety issues. Adequate personal protective equipment to be provided to the workforce.</p> <p>Contractors to adopt the WB EHS Guidelines on OHS, particularly those that relate to construction works.</p>	Member of the Contractor's staff nominated as health and safety officer to be present on site. Appropriate protective equipment to each construction operation to be worn at all times (including steel toe capped boots at all times, hard hats when working near machinery or roofing work, eye protection for welding)	Construction Cost	Contractor	PMDSC
Impacts During Operation						

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Risks of loss of containers and contents	Thilafushi RWMF; surrounding waters	O&M training to include instruction on maintenance of containers, loaders, cranes and vessels and sound operation including licensing of vehicle and plant operators and restrictions on operation during stormy weather	O&M training completed Operators to have undergone training and have licenses to drive/operate vehicles and machinery.	Training budget	Implementation consultants / Contractor	MEE
Pests: Rodents and birds	Thilafushi RWMF	Maintenance of site cleanliness, minimizing storage time for putrescible waste, provision of enclosures for putrescible waste.	Sites to be clean and all putrescible waste enclosed at the close of operations each day	Operation Cost	WAMCO	MEE
Occupational health and safety	Thilafushi RWMF	Operators trained to recognize risks and hazards. Personal safety equipment issued and worn. Health and safety recognized as primary employer responsibility. Protection from dust to be provided for C&D waste plant, and from potentially toxic fumes in the ELV plant. Contractors to adopt the WB EHS Guidelines on OHS for SWM projects.	Allocation of responsibility for safety standards to a full time member of staff. Appropriate protective equipment to each construction operation to be worn at all times (including steel toe capped boots and hard hats at all times)	Operation Cost	Implementation consultants / Contractor WAMCO	MEE
Handling of liquid waste	Thilafushi RWMF	Regular maintenance of drains and septic tanks. Septic tank discharge to comply with general effluent liquid quality standards in the EHS general guidelines	Completion of regular tasks, confirmed according to an inspection regime to be established prior to commissioning	Operation Cost	WAMCO	MEE

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
C&D waste plant operation: dust hazard	Thilafushi RWMF	Provision of breathing apparatus and rules of operation; allocation of responsibility to ensure these are used	Provision of equipment in good repair and requirement of staff to wear them	Operation Cost	WAMCO	MEE
Handling of hazardous materials	Thilafushi RWMF	Plan to be developed for assessing, storing, treating and disposing of different types of hazardous waste and implemented.	Development of plans for hazardous waste management and regular implementation of them	Operation Cost	WAMCO	MEE

E. Environmental Monitoring

1. Monitoring Plan

145. The design of the environmental monitoring system is based on an analysis of the key environmental performance issues associated with each stage of the project, set out in Table 11 below.

Table 11: Analysis of Environmental Monitoring Needs

Phase	Key Environmental Performance Issues	Environmental Performance Indicator	Means of Monitoring
Design/ Preconstruction	Inclusion of mitigation measures in design/build and/or detailed design documentation and construction activities Air and water quality Noise	Compliance with EMP design measures Water Quality: BOD, TSS, TPH Faecal coliform/enterococci; Metals (Pb, Cu, Cd, Hg, Cr) Air Quality: SO ₂ , NO ₂ , PM ₁₀ , PM _{2.5} , O ₃ Noise L _{Aeq} 1hr (dBA)	Compliance monitoring Measurements Prior to Construction
Construction	Adherence to provisions in the EMP to mitigate construction impacts	Compliance with EMP	Compliance monitoring
	Direct effects on island residents from impacts such as accidental damage, dust generation, noise generation and safety	Views and opinions of island residents Contractor's records relating to minor and major pollution and health and safety incidents (with a target of zero incidents)	Community feedback Grievance redress mechanism
	Air and water quality; noise	As above	Measurements at monthly intervals
Operation	Effectiveness of operation of the improved facilities	Reduced occurrence of floating waste in the sea in the Greater Malé area	Site observations Community feedback
	Air and water quality; noise	As above	Regular measurements according to agreed monitoring plan for operation

BOD = biological oxygen demand; TSS = total suspended solids; TPH = Total Petroleum Hydrocarbons, L_{Aeq} = weighted continuous noise equivalent level dBA = decibels

146. Two areas of environmental monitoring are identified: compliance monitoring and community feedback, which are in addition to monitoring measures in the Design and Monitoring

Framework for the project. These provide a means of gauging whether the stations operate more efficiently and with less loss of waste into the sea.

147. Compliance monitoring is required during detailed design and construction of the improved facilities, to ensure that mitigation specified in the EMP is carried out to an adequate standard. Compliance monitoring is a function of the PMU and its cost of this monitoring is part of the running cost of the PMU.

148. Community feedback provides for the monitoring of environmental indicators gauged by public perception. Appropriate indicators are:

- (i) Reductions in the incidence of waterborne diseases; and
- (ii) Effectiveness of waste handling (appearance of floating waste in the sea between the Malé station and Thilafushi)

149. Costs of environmental assessment and monitoring during construction are project costs. Environmental monitoring during operation is carried out by the WAMCO, and costs will be met from O&M budgets prepared and managed by the WAMCO.

Table 12: Environmental Monitoring Plan

Impact to be Monitored	Means of Monitoring	Construction Phase			Operation Phase		
		Frequency	Responsible Agency	Indicative Annual Cost	Frequency	Responsible Agency	Indicative Annual Cost
General Construct-ion Impacts	Community Feed-back	To be established by PMDSC	PMU	Covered in project participation plan	To be established by PMDSC	WAMCO	Operational Cost
Compliance with EMP	Inspections	As set up by supervising engineers	PMU / PMDSC	Included in project management and consultancy cost	To be established by PMDSC	WAMCO	Operational Cost
Occurrence of floating waste	Community Feed-back	To be established by PMDSC	PIU	To be determined in design of community outreach component of Project 1	To be established by PMDSC	WAMCO	Operational Cost

2. Reporting

150. EMP compliance monitoring will be undertaken by the PMU, with support of the PMDSC. Effects will be monitored by means of community feedback and laboratory testing. Consistent with reporting requirements set out in the Project Administration Manual (PAM). PMU will prepare reports to be sent to ADB on a semi-annual basis during and immediately after construction. Semi-annual reports during operation are to be prepared by WAMCO until ADB issues a project completion report. The suggested outline of semi-annual reports is attached as Appendix 3. To facilitate monitoring and enable responses to emerging issues, monthly reports will be prepared by the PMU.

X. CONCLUSION

151. The overall finding of the IEE is that the Project will result in significant environmental benefits, as it is conceived and designed to enable efficient operation of the RWMF at Thilafushi, which is necessary for improved operation and increasing capacity to handle rapidly growing volumes of waste that are projected in coming decades. It will not have significant adverse environmental impacts and potential adverse impacts are manageable through the effective implementation of the EMP.

152. The classification of Category B is confirmed. No further environmental assessment is therefore required. However, this IEE will be finalized based on the final detailed design and this classification shall be reassessed or reconfirmed accordingly.

Rapid Environmental Assessment Checklist

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

Greater Malé Env. Improvement & Waste Managt. Project: RWMF harbour/logistics

Sector Division:

South Asia Department / Urban Development and Water Division

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area...			
▪ Densely populated?		✓	Thilafushi is an artificial island created as a municipal landfill situated to the west of Malé, and is located between Kaafu Atoll's Giraavaru and Gulhifalhu of the Maldives. The subproject components are located in Thilafushi Island. Approximately 2,200 people comprising mainly workers from other islands or overseas are in the island. There are no residential structures.
▪ Heavy with development activities?		✓	This is a 30-year old 10-hectare dumpsite.
▪ Adjacent to or within any environmentally sensitive areas?		✓	
• Cultural heritage site		✓	
• Protected Area		✓	
• Wetland		✓	
• Mangrove		✓	
• Estuarine		✓	
• Buffer zone of protected area		✓	
• Special area for protecting biodiversity		✓	
• Bay		✓	The island is situated within a large atoll (Kaafu Atoll).
B. Potential Environmental Impacts Will the Project cause...			
▪ impacts associated with transport of wastes to the disposal site or treatment facility	✓		The transport of waste from transfer stations to Thilafushi Island will have potential impact as the route will be by the sea through marine vessels. However, the Project will include the introduction of a containerized system to improve the efficiency of waste handling from collection points to the disposal site.

Screening Questions	Yes	No	Remarks
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?		✓	There are no historical and cultural monuments at the subproject sites.
▪ degradation of aesthetic and property value loss?		✓	The subproject will substantially improve the existing situation.
▪ nuisance to neighboring areas due to foul odor and influx of insects, rodents, etc.?		✓	There are no residential structures in Thilafushi Island. The Project will improve the existing situation.
▪ dislocation or involuntary resettlement of people?		✓	Not anticipated.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	Not anticipated.
▪ risks and vulnerabilities related occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓		OHS risks are inherent to construction activities. However, these risks can be reduced through implementation of good construction practices and adoption of internationally recognized OHS measures such as the WB EHS guidelines on OHS on construction activities and SWM operations. These are included in the EMP.
▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, insects, birds and rats?		✓	No public access. Unauthorized personnel are not allowed in Thilafushi Island. However, the EMP ensures good housekeeping measures are included to mitigate the impacts at all subproject sites.
▪ deterioration of water quality as a result of contamination of receiving waters by leachate from land disposal system?		✓	Not applicable. However, the subprojects will be designed with concrete flooring and provided with leachate management (leachate treatment will be finalized during detailed design stage).
▪ contamination of ground and/or surface water by leachate from land disposal system?		✓	Not applicable. However, the subprojects will be designed with concrete flooring and provided with leachate management (leachate treatment will be finalized during detailed design stage).
▪ land use conflicts?		✓	Not anticipated.
▪ pollution of surface and ground water from leachate coming from sanitary landfill sites or methane gas produced from decomposition of solid wastes in the absence of air, which could enter the aquifer or escape through soil fissures at places far from the landfill site?		✓	Not applicable.
▪ inadequate buffer zone around landfill site to alleviate nuisances?		✓	Not applicable. Design of the existing Thilafushi Island included buffer zone.
▪ road blocking and/or increased traffic during construction of facilities?	✓		Anticipated during construction activities. However, impacts are temporary and short in duration. The EMP ensures measures are included to mitigate the impacts. Construction contractors will be required to coordinate with the local traffic police and they will prepare Traffic Management Plan. This will be included in the Contractor's EMP.
▪ noise and dust from construction activities?	✓		Limited receptors in vicinity, high ambient noise levels and winds. Impact of noise can be avoided by undertaking activities during day time when background noise is high. Noise-suppression gadgets will also be used. Dust emission can be avoided with the implementation of dust control measures such as sprinkling of water on sites and regular hauling of spoils.

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ temporary silt runoff due to construction? 	✓		Run-off during construction will be more. However, impacts are temporary and short in duration. The EMP ensures measures are included to mitigate the impacts. Construction contractors will be prohibited from stockpiling loose materials along drain channels and will be required to immediately dispose any waste materials. Silt fences and traps to be used.
<ul style="list-style-type: none"> ▪ hazards to public health due to inadequate management of landfill site caused by inadequate institutional and financial capabilities for the management of the landfill operation? 		✓	Not applicable. No access to public. Unauthorized persons are not allowed in Thilafushi Island. Output 3 of the Project will ensure WAMCO will have the capacity to manage and improve existing situation.
<ul style="list-style-type: none"> ▪ emission of potentially toxic volatile organics from land disposal site? 		✓	Not applicable.
<ul style="list-style-type: none"> ▪ surface and ground water pollution from leachate and methane gas migration? 	✓		Not applicable. However, the subprojects will be designed with concrete flooring and provided with leachate management (leachate treatment will be finalized during detailed design stage). Methane gas is not expected to be generated from C&D waste processing plant and ELV dismantling workshop.
<ul style="list-style-type: none"> ▪ loss of deep-rooted vegetation (e.g. trees) from landfill gas? 		✓	Not applicable. No trees on site.
<ul style="list-style-type: none"> ▪ explosion of toxic response from accumulated landfill gas in buildings? 		✓	Not applicable. Design of the subprojects will consider vents and gas monitoring (gas from existing dumpsite).
<ul style="list-style-type: none"> ▪ contamination of air quality from incineration? 		✓	Not applicable. The subproject will not cover incineration.
<ul style="list-style-type: none"> ▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, rodents, insects and birds, etc.? 		✓	No access to public. There are no residential structures in Thilafushi Island. The Project will improve the existing situation.
<ul style="list-style-type: none"> ▪ health and safety hazards to workers from toxic gases and hazardous materials in the site? 	✓		The EMP ensures occupational health and safety measures are included following relevant WB EHS guidelines. Chemicals other than vehicle fuels will not be used during construction and operation activities. Fuels will be stored and handled properly as per EMP.
<ul style="list-style-type: none"> ▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 		✓	No significant increase in population of workers from overseas or off-island. Labor requirements will be sourced locally. Priority in employment will be given to local residents. Construction contractors will be required to provide workers camp with water supply and sanitation.
<ul style="list-style-type: none"> ▪ social conflicts if workers from other regions or countries are hired? 		✓	No significant increase in population of workers from overseas or off-island. Labor requirements will be sourced locally. Priority in employment will be given to local residents. Construction contractors will be required to provide workers camp with water supply and sanitation.
<ul style="list-style-type: none"> ▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation? 		✓	No community in Thilafushi Island. Chemicals other than vehicle fuels will not be used during construction and operation activities. Fuels will be stored and handled properly following WB EHS guidelines as included in the EMP.

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> ▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components (e.g., landfill or incinerator) of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning? 		✓	No community in Thilafushi Island. Chemicals other than vehicle fuels will not be used during construction and operation activities. Fuels will be stored and handled properly following WB EHS guidelines as included in the EMP.

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Greater Malé Environmental Improvement and Waste Management Project

Sector : Waste Management

Subsector: Water and urban infrastructure and services

Division/Department: South Asia Department / Urban Development and Water Division

Screening Questions		Score	Remarks ³⁴
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	1	All sites are located close to the coastline
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	1	Sea level rise and peak tide levels need to be considered in design
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	1	Design life of structures to take account of heat stress due to predicted temperature increases
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): Medium Risk

Other Comments: _____

Prepared by: _____

³⁴ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Grievance Redress Mechanism Complaint Form

(To be available in local language, if any)

The Greater Malé Environmental Improvement and Waste Management Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date		Place of registration			
Contact Information/Personal Details					
Name		Gender	Male Female	Age	
Home Address					
Village / Town					
District					
Phone no.					
E-mail					
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below:					
If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
If – then mode: <input type="checkbox"/> Note/Letter <input type="checkbox"/> E-mail <input type="checkbox"/> Verbal/Telephonic	
Reviewed by: (Names/Positions of Official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Means of Disclosure:	

GRIVENCES RECORD AND ACTION TAKEN

Sr. No.	Date	Name and Contact No. of Complainer	Type of Complain	Place	Status of Redress	Remarks

Appendix 1: Template for Semi-Annual Environmental Monitoring Report

Introduction

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number	Roles
1. PMU				
2. PIUs				
3. Consultants				

- Overall project and sub-project progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/List of Works	Contract Status (specify if under bidding or contract awarded)	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M) ^a	If On-going Construction	
				%Physical Progress	Expected Completion Date

^a If on-going construction, include %physical progress and expected date of completion.

Compliance status with National/State/Local statutory environmental requirements^a

Package No.	Subproject Name	Statutory Environmental Requirements ^b	Status of Compliance ^c	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish ^d

^a All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the “remarks” column.

^b Specify (environmental clearance, permit/consent to establish, forest clearance, etc.)

^c Specify if obtained, submitted and awaiting approval, application not yet submitted

^d Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.

Compliance status with environmental loan covenants

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

Compliance status with the environmental management plan (refer to EMP tables in APPROVED IEE/s)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise IEE Documentation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
	Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		

- For each package, provide name/s and contact details of contractor/s’ nodal person/s for environmental safeguards.

Package-wise Contractor/s’ Nodal Persons for Environmental Safeguards

Package Name	Contractor	Nodal Person	Email Address	Contact Number

- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

Summary of Environmental Monitoring Activities (for the Reporting Period)^a

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

^a Attach Laboratory Results and Sampling Map/Locations.

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

Approach and methodology for environmental monitoring of the project

- Briefly describe the approach and methodology used for environmental monitoring of each sub-project.

Monitoring of environmental Impacts on Project Surroundings (ambient air, water quality and noise levels)

- Discuss the general condition of surroundings at the project site, with consideration of the following, whichever are applicable:
 - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
 - Identify if muddy water is escaping site boundaries or if muddy tracks are seen on adjacent roads.
 - Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these are intact following heavy rain;
 - Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area in the Appendix.
 - Confirm spill kits on site and site procedure for handling emergencies.
 - Identify any chemical stored on site and provide information on storage condition. Attach photograph.
 - Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
 - Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
 - Provide information on barricades, signages, and on-site boards. Provide photographs in the Appendix.
 - Indicate if there are any activities being under taken out of working hours and how that is being managed.

- Briefly discuss the basis for environmental parameters monitoring.
- Indicate type of environmental parameters to be monitored and identify the location.
- Indicate the method of monitoring and equipment used.
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements.

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)						
			pH	Conductivity $\mu\text{S/cm}$	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L	Heavy Metals (Cu, Cr, Hg, Pb) mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)						
			pH	Conductivity $\mu\text{S/cm}$	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L	Heavy Metals (Cu, Cr, Hg, Pb) mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	L_{Aeq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	L_{Aeq} (dBA) (Monitoring Results)	
			Day Time	Night Time

Grievance Redress Mechanism

- Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

Complaints Received during the Reporting Period

- Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors
- Others

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name _____
 Contract Number _____

NAME: _____ DATE: _____
 TITLE: _____ DMA: _____
 LOCATION: _____ GROUP: _____

WEATHER CONDITION: _____

INITIAL SITE CONDITION: _____

CONCLUDING SITE CONDITION:
 Satisfactory _____ Unsatisfactory _____ Incident _____ Resolved _____ Unresolved _____

INCIDENT:
 Nature of incident: _____

Intervention Steps: _____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes No

Signature _____

Sign off

Initial Environmental Examination

Document Stage: Draft
Project Number: 51077-002
March 2018

**MLD: Greater Malé Environmental Improvement and
Waste Management Project**

**Island Waste Management Center in Thulusdoo
Island**

Prepared by the Ministry of Environment and Energy of the Republic of Maldives for the Asian Development Bank.

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ABBREVIATIONS

ADB	- Asian Development Bank
AHs	- affected households
BPEO	- best practicable environmental option
CDW	- construction and demolition waste
dB L _{eq}	- continuous noise equivalent level, expressed in decibels
DMS	- detailed measurement survey
EIA	- environmental impact assessment
EMP	- Environmental Management Plan
EPA	- Environmental Protection Agency
EPPA	- Environmental Protection and Preservation Act of 1993
GRC	- grievance redress mechanism
HHs	- households
IEE	- initial environmental examination
IMO	- independent monitoring organization
IRC	- Inter-Ministerial Resettlement Committee
IWMC	- Island Waste Management Centre
MEE	- Ministry of Environment and Energy
MPW/100ml	- most probable number (of bacteria) per 100 millilitres of water
NAPA	- National Action Programme of Action (for climate change)
NGO	- Nongovernment organization
O&M	- operation and maintenance
PMDSC	- Project Management, Design and Supervision Consultants
PMU	- project management unit
RWMF	- regional waste management facility
WAMCO	- Waste Management Corporation

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Appendixes

- Appendix 1: Criteria for Planning and Design for Subprojects
- Appendix 2: Rapid Environmental Assessment Checklist
- Appendix 3: Grievance Redress Mechanism Complaint Form
- Appendix 4: Template for Semi-Annual Environmental Monitoring Report

Executive Summary

A. Introduction

1. The Greater Malé Environmental Improvement and Waste Management Project (the project) will establish a sustainable solid waste management (SWM) system in the Greater Malé capital region and its inhabited outer islands by (i) establishing a modern waste collection, transfer, and disposal system, (ii) improving community-based outer island waste management systems, (iii) building institutional capacity for sustainable services delivery, and (iv) raising public awareness in reduce, reuse, recycle (3R) behaviors. Physical and non-physical investments are designed to curb climate change and disaster impacts while creating a cleaner environment in Maldives. The executing agency is the Ministry of Finance and Treasury (MOFT). The implementing agency is Ministry of Environment and Energy (MEE) who will establish a project management unit (PMU) comprising officials from MEE and Waste Management Corporation Limited (WAMCO). The PMU will have responsibility for overseeing project management, with support from Project Management, Design and Supervision Consultants (PMDSC).

2. The project will have three outputs: (i) Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient, (ii) Output 2: Community-based outer island waste management systems targeting poor and women enhanced, and (iii) Output 3: Institutional capacity and public awareness in sustainable waste management strengthened.

3. Output 2 will provide comprehensive support to strengthen sustainable solid waste management in poor outer island communities. It includes (i) a minimum of 22 island waste management centers (IWMCs) with processing equipment (balers, glass crushers, metal presses) developed or upgraded in consultation with community targeting women and incorporating climate and disaster risk measures;¹ (ii) collection equipment for outer islands (bins, refuse collection vehicles, dump trucks) provided; (iii) capacity building of eligible island councils targeting women in waste collection, segregation, composting, recycling, and O&M; and (iv) community awareness and behavior change campaigns in 3R targeting women in outer islands delivered. As subprojects under Output 2 will be prepared after Board approval, each island is required to meet minimum eligibility and selection criteria, including safeguards, to receive support from the project.² The criteria are intended to ensure sustainability and is outlined in the Project Administration Manual (PAM). Output 2 will be partially funded by a Trust Fund grant focusing on poverty reduction, which will support islands in the following areas:³ (i) IWMCs constructed in a minimum of 11 eligible islands, (ii) skills and capacity building in eligible islands targeting women provided, and (iii) awareness campaigns in 3R delivered in all outer islands.

4. This initial environmental examination (IEE) was prepared for Thulusdhoo Island IWMC based on information from the Feasibility Study⁴ and according to the ADB's Safeguard Policy Statement (2009) and the applicable legislation of the Republic of the Maldives, namely the

¹ Out of 32 outer islands, some have existing facilities but are not operational due to inadequate design and insufficient equipment which would be upgraded under the project.

² All 32 outer islands will be screened through the selection criteria outlined in the Project Administration Manual (PAM) and Environmental Assessment and Review Framework (EARF). Appraisal and safeguard reports will be approved by Asian Development Bank (ADB) prior to start of any project-related physical activities. Subprojects having resettlement impacts will not be included. IWMCs consist of concrete platforms, small covered sheds, segregated waste processing and storage areas, small office, fencing.

³ Additional selection criteria for Trust Fund supported islands includes climate change vulnerability, and women participation in island councils, and is outlined in the PAM.

⁴ Feasibility Report, 2017 prepared by Water solution and Kocks Consult GmbH for Maldives Ministry of Environment.

Environmental Protection and Preservation Act (EPPA) of 1993, and the EIA Regulations (pursuant to the act) of 2007. This IEE is based on preliminary design and will be updated during detailed engineering design and submitted to ADB for review and disclosure. No contracts can be awarded until ADB approves the final IEE.

B. Description of the Subproject

5. The scope of Thulusdhoo IWMC (the subproject) includes (i) construction of a new IWMC, based on a standard layout plan developed by the MEE comprising a secure enclosure with an impermeable concrete floors and facilities for sorting, storage and composting, (ii) provision of standardized durable waste containers, to facilitate easier loading onto transfer vessels, (iii) provision of improved collection vehicles, capable of carrying the new containers, (iv) training for council staff in composting, using simple windrows, (v) provision of selected equipment and training in their operation and maintenance, and (vi) an Information, Education and Communication (IEC) component to address perceptions on solid waste management, communication channels within the island communities, the role of women and scope for public involvement in improved solid waste management activity, in line with 3R.

C. Policy Legal and Administrative Framework

6. The law governing the protection of the environment in the Republic of the Maldives is the Environmental Protection and Preservation Act (EPPA) of 1993 (Act No 4/93) and responsibilities and procedures for conducting environmental assessments, together with the requirements for environmental monitoring of projects, are set out in the EIA Regulations of 2012. Completion of EIAs is the responsibility of project proponents and all EIA work must be carried out by registered consultants. The EIA regulations require all landfills, waste incinerators and large-scale waste storage projects to have full EIAs. The Environmental Management Plan (EMP), prepared following either the IEE or the EIA process, is prepared on a specified format and reviewed for compliance by MEE. For the subproject, all statutory clearances will be obtained prior to commencement of civil works.

7. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments and sets out the requirements for different categories (category A requiring an EIA, category B requiring an IEE, category C requiring a review of environmental implications and category F1 relating to investments through a financial intermediary). The SPS further requires the development of an environmental management plan (EMP) specifying the required mitigation and monitoring and who is responsible for implementation and public disclosure. Emphasis is placed on pollution prevention and control technologies to be incorporated during the design, construction, and operation of the project and adhering to recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines.

8. This IEE was prepared to meet requirements of both Maldives EPPA and ADB SPS. The IEE will be included in the bid and contract documents. This IEE will be submitted to ADB for review and approval prior to issuance of bid documents. As this IEE is based on preliminary design, it requires updating based on detailed engineering design. No contracts can be awarded until ADB approves the final IEE. EMP implementation will be reported by MEE on a semi-annual basis until ADB issues the Project Completion Report.

D. Description of the Environment

1. Physical Resources

9. In common with all islands in the Maldives, Thulusdhoo is a reef island that has formed by a process of deposition of shallow-water carbonates and successive coral deposits from coral colonies. Underlying rock is variable in consistency, reflecting the growth patterns of the coral, which forms dense colonies (coral heads) and large voids between the heads. The unconsolidated sand and gravel on top of the rock layer is subject to seasonal conditions, particularly monsoons as well as wave action, to continual erosion and accretion, making infrastructure around the island's coast vulnerable to erosion. Soils are sandy in texture with a significant silt component, have poor nutrient status and are alkaline.

10. The climate is tropical maritime featuring two monsoon seasons, the southwest monsoon between May and September (Halhangu), and the drier northeast monsoon between December and February (Iruvai). The southwest monsoon is the stronger and monthly rainfall typically exceeds 200mm towards the end of the southwest monsoon period. Cyclones are a regular occurrence in the Indian Ocean, occurring mainly between April and December, although those that have affected the Maldives occur between October and January.

11. Temperatures are relatively constant and range between 25oC and 30oC, with the hottest period occurring in March/April and the coolest, December/January. Monthly rainfall fluctuates between around 20mm in February to over 300mm in May and is over 200mm for most of the year.

12. The tidal regime is semi-diurnal – two high and two low tides a day. The range between high and low reaches approximately 1m and for neap tides.

13. Freshwater sources are rainwater collected from roofs and groundwater that accumulates through infiltration of rainwater into a freshwater lens that forms in underlying strata.

14. Marine waters around the islands are used extensively for fishing and recreational diving. The quality of water both in and around the islands is influenced by sewerage discharge, illegal dumping of solid waste and industrial activity. Pollutants from industrial activity and waste, particularly hazardous waste, can accumulate in the sediment on the lagoon or sea floor. Significant fishing recreational diving and other water supports such as surfing take place in the water around Thulusdhoo.

15. Air pollution sources such as vehicle emissions, and emissions from other plant and machinery including diesel power generators, and industrial activity are limited, as the island has a limited number of vehicles, and two light industrial installations. Noise pollution is similarly limited, and ambient levels of wind and wave noise are high.

2. Ecological Resources

16. Coral ecosystems are extensive throughout the Maldives and have strong conservation significance. Corals are adapted to low nutrient levels, and in areas where sewage, grey water and food waste is released, which usually have relatively high phosphate and nitrate levels, algal growth will often flourish and suppress coral growth. Thulusdhoo has a low population (1,400 residents), there is therefore little immediate threat to coral colonies around the island from these sources. Pelagic fish form an important part of the local economy, both through commercial fishing

activities and game fishing. The islands have a diverse avifauna, including a significant seasonal population of migratory birds as the islands are important wintering grounds for many species that follow the Central Asian Flyway. Waste is a common attractant to birds and a risk to birdlife when toxic or otherwise dangerous waste is ingested, and also when it causes habitat damage. Thus reducing uncontrolled dumping of waste or losses during transfers will reduce the risk on bird life. Present day vegetation cover on the islands is substantially influenced by human habitation and has little biodiversity conservation significance.

17. There are 42 protected areas in the Maldives to prevent over exploitation, and improve conservation and preservation. The nearest protected area to Thulusdhoo island is 6km away, a wetland on Huraa Island.

3. Socio-Economic Factors

18. The population of Thulusdhoo according to the 2014 census is 1,408 and is predicted to rise to 2000 by 2035. The island is the capital of Kaafu Atoll. Economic activity on Thulusdhoo is dominated by the presence of a soft drink bottling plant, a boat building business and guest houses and restaurants to serve tourism. The island also has administrative activity, through its role as the capital of Kaafu. Access to education, in keeping with the national average is good, with enrolment in primary education close to 100% and literacy rates at about 98%.

19. The population of Thulusdhoo have relatively easy access to major health facilities in Malé. Existing waste management practices, particularly regular burning of household waste including plastics, poses a mild risk to people living on the vicinity who regularly breathe air that contains smoke from the burning waste.

E. Anticipated Environmental Impacts and Mitigation Measures

1. Method of Assessment

20. The potential impacts of the subproject and mitigation measures have been identified through review of the Feasibility Study prepared for the project, discussion with the designers and stakeholder consultation. Design is to be finalised and this will require corresponding updating of the IEE.

2. Environmental Impacts Related to Location

21. A proposed site for the IWMC has been identified by the island council and is subject both to approval from the Ministry of Housing and the national EIA process. The proposed site is distant from residential areas, but close to the shore.

22. Due to the proposed location close to the shoreline, the risk of loss of waste or leachate from piled household waste or composting will be mitigated by (i) ensuring that waste enters and leaves the IWMC on the landward side of the facility (ii) that detailed design includes both a system for collecting and containing leachate from piled household waste awaiting collection and from composting and (iii) that site security and management is ensured by the island council. The measures must ensure no deterioration of water quality near the IWMC.

23. The site is to be on reclaimed land which has not been colonised by mature vegetation. No impact on vegetation is envisaged.

24. The surrounding land is partly reclaimed land, and not inhabited though likely to be developed for residential and recreational use. While improved management of the IWMC will reduce odour and attraction to pests such as rodents, the effect on existing land use can be mitigated by (i) ensuring security, regular cleaning operations and maintenance takes place and (ii) planning of further developments such that receptors such as dwellings are not placed close to the facility, and preferably separated by a belt of trees or open space.

25. Due to low levels of traffic on Thulusdhoo, the transport of waste to and from the facility is not expected to impede traffic. No private property will be affected, and land acquisition will be required and there is therefore no impact.

3. Environmental Impacts Related to Construction

26. The methods to be used for site preparation and construction of the IWMC are to ensure sound environmental management and safety at all times, and to be defined by the Contractor in a Contractor's EMP submitted to the PMDSC for approval. These will cover the following areas of impact which are potentially significant but can be mitigated by the adoption of good practice: (i) handling of construction waste (ii) release of silt from excavations, (iii) water pollution, (iv) air and dust pollution, (v) community health and safety risks, and (viii) occupational health and safety. Impedance of traffic and noise/vibration effects are not likely to be significant due to the low population level and distance of the proposed site from residential areas.

4. Environmental Impacts Related to Operation

27. The IWMCs and management of them are intended specifically to address existing poor practices of open incineration of waste and to ensure safe and efficient handling, collection of recyclables and shipment of waste to the RWMF at Thilafushi. Impacts will include (i) addressing existing smoke nuisance and health risk and damage to the habitat in the existing dump area, and pest issues (ii) reduced losses of waste from the use of containers, though risks of breakages or mishandling of containers will be mitigated by providing operation and maintenance training (iii) potential Occupational health and safety risks, including from the handling of compost and accidents associated with operations, which are to be mitigated by training in handling of compost and of machinery, and sound supervision and management of operation of the facilities.

28. In terms of wider, global impacts, IWMCs are to be established, where they do not exist or are not operational, on each inhabited island in Zone 3. Effective institution of sound management of the IWMCs will provide a demonstration of good practice, of value to island councils and workers on other islands who need to develop capacities for improved waste management.

F. Analysis of Alternatives

29. The main alternative is to rehabilitate and extend the existing and currently disused facility, however construction on a new site, more distant to existing dwellings reduces potential health and nuisance impacts to nearby homes.

30. The improvements envisage the use of containers to receive and transport waste. An alternative is an "open" system. The use of containers provides a much higher level of control, and greatly limits the risk of waste being lost to the sea during handling.

31. Under the “no project” scenario, the existing practice of open incineration of household waste will continue, as volumes of waste rise, and the opportunity to support the council as well as schools and the wider community through the ICT component will be foregone.

G. Information Disclosure, Consultation and Participation

32. Initial consultations were conducted during November 2017 with a representative of MEE and representatives of the island council, providing an understanding of the intentions and existing actions of the island council. The preparation of the project must include consultation with stakeholders, cover disclosure of proposed project plans including siting and layout of the IWMC, and the views and concerns of these parties should be recorded and addressed in subproject preparation and design. The IEE, once completed based on design and a Dhivehi translation of the executive summary will be provided to island officials for public disclosure. Similarly, the updated IEE based on detailed design will be shared with stakeholders, as will results of monitoring. Stakeholders will be kept informed of the construction program including activities and made aware of the grievance redress mechanism. Consultations will take place regularly to gain feedback and ensure that impacts are being adequately managed.

H. Environmental Management Plan

33. This IEE incorporates an EMP which includes mitigation measures, monitoring program and institutional responsibilities of PMU, PMDSC, Thulusdoo island council and contractor to ensure mitigation and monitoring takes place during the pre-construction, construction and operation phases, and meeting the requirements of the Government of the Maldives and ADB SPS. The EMP is to be updated based on detailed engineering design and site-specific conditions and will be included in the updated/final IEE to be submitted to ADB for review and disclosure prior to award of contract.

34. The contractor is required to submit to PMU for approval a Contractor’s EMP (CEMP) based on the EMP. No works can be started until PMU approves the CEMP. A copy of the CEMP shall be kept on work sites at all times for reference. Non-compliance with, or any deviation from, the conditions set out in CEMP constitutes a failure in compliance.

35. The contractor will be required to establish a system for managing environmental impacts, carry out monitoring specified in the CEMP and take corrective or preventative actions as necessary.

36. Support will be provided to MEE by the PMDSC for overseeing CEMP implementation.

37. The environmental monitoring system for the subproject will cover compliance monitoring and community feedback, which provide a means of gauging whether the IWMC is operating effectively.

38. EMP compliance monitoring will be undertaken by the PMU, with support of the PMDSC. PMU will prepare reports to be sent to ADB on a semi-annual basis until ADB issues the project completion report. To facilitate monitoring and enable responses to emerging issues, monthly reports will be prepared by the PMUs.

I. Conclusion

39. The overall finding of the IEE is that the subproject will result in significant environmental benefits, as it is conceived and designed to address environmental issues associated with existing practices of poor waste disposal including open burning of household and food waste. No further environmental assessment is therefore required, beyond the issues to be reviewed during detailed engineering design. However this IEE and EMP must be updated to reflect the detailed engineering design and result of consultations conducted after project preparation up to design stage. The classification of Category B is confirmed.

I. INTRODUCTION

1. The Greater Malé Environmental Improvement and Waste Management Project (the project) will establish a sustainable solid waste management (SWM) system in the Greater Malé capital region and its inhabited outer islands by (i) establishing a modern waste collection, transfer, and disposal system, (ii) improving community-based outer island waste management systems, (iii) building institutional capacity for sustainable services delivery, and (iv) raising public awareness in reduce, reuse, recycle (3R) behaviors. Physical and non-physical investments are designed to curb climate change and disaster impacts while creating a cleaner environment in Maldives. The executing agency is the Ministry of Finance and Treasury (MOFT). The implementing agency is Ministry of Environment and Energy (MEE) who will establish a project management unit (PMU) comprising officials from MEE and Waste Management Corporation Limited (WAMCO). The PMU will have responsibility for overseeing project management, with support from Project Management, Design and Supervision Consultants (PMDSC).

2. The project will have three outputs:

3. **Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient.** This will include (i) an efficient waste collection strategy designed and applied in Malé and Hulhumalé in consultation with local communities targeting women; (ii) waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhumalé and Villimalé provided; (iii) transfer stations in Malé and Villimalé constructed and transfer station in Hulhumalé designed; (iv) Construction and demolition waste processing plant and ELV dismantling workshop constructed; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) 3 vessels for waste transport from outer islands to Thilafushi provided; (vii) heavy equipment (bulldozers, excavators, roll trucks) for controlled dumpsite management at Thilafushi provided; and (viii) construction of 2 administrative buildings for WAMCO at Malé transfer station and Thilafushi waste vessel harbor. All facilities designed will consider climate change and disaster resilient features.

4. **Output 2: Community-based outer island waste management systems targeting poor and women enhanced.**⁵ This output will provide comprehensive support to strengthen sustainable solid waste management in poor outer island communities. It includes (i) a minimum of 22 IWMCs with processing equipment (balers, glass crushers, metal presses) developed or upgraded in consultation with community targeting women and incorporating climate and disaster risk measures;⁶ (ii) collection equipment for outer islands (bins, refuse collection vehicles, dump trucks) provided; (iii) capacity building of eligible island councils targeting women in waste collection, segregation, composting, recycling, and O&M; and (iv) community awareness and behavior change campaigns in 3R targeting women in outer islands delivered. As subprojects under Output 2 will be prepared after Board approval, each island is required to meet minimum eligibility and selection criteria, including safeguards, to receive support from the project.⁷ The criteria is intended to ensure sustainability and is outlined in the Project Administration Manual (PAM). Output 2 will be partially funded by a Trust Fund grant focusing on poverty reduction,

⁵ There are 32 outer islands in the project area eligible for support under Output 2.

⁶ Out of 32 outer islands, some have existing facilities but are not operational due to inadequate design and insufficient equipment which would be upgraded under the project.

⁷ All 32 outer islands will be screened through the selection criteria outlined in the PAM and EARF. Appraisal and safeguard reports will be approved by ADB prior to start of any project-related physical activities. Subprojects having resettlement impacts will not be included. IWMCs consist of concrete platforms, small covered sheds, segregated waste processing and storage areas, small office, fencing.

which will support islands in the following areas:⁸ (i) IWMCs constructed in a minimum of 11 eligible islands, (ii) skills and capacity building in eligible islands targeting women provided, and (iii) awareness campaigns in 3R delivered in all outer islands.⁹

5. **Output 3: Institutional capacity and public awareness in sustainable waste management strengthened.** This will include (i) capacity building support to eligible WAMCO staff (including all eligible women staff) in waste collection, controlled dumpsite management, strategic and financial planning (tariffs, diversified revenue stream), and disaster risk management provided;¹⁰ (ii) a recycling market study conducted;¹¹ (iii) public awareness and behavior change campaigns in 3R targeting the poor and women in Greater Malé delivered;¹² and (iv) project management, design, and supervision consultant support provided.

6. This initial environmental examination (IEE) was prepared for Thulusdhoo Island IWMC based on information from the Feasibility Study¹³ and according to the ADB's Safeguard Policy Statement (2009) and the applicable legislation of the Republic of the Maldives, namely the Environmental Protection and Preservation Act (EPPA) of 1993, and the EIA Regulations (pursuant to the act) of 2007. This IEE is based on preliminary design and will be updated during detailed engineering design and submitted to ADB for review and disclosure. No contracts can be awarded until ADB approves the final IEE.

II. DESCRIPTION OF THE PROJECT

7. **Existing situation.** The island has an IWMC, built with support from the Australian and Canadian Red Cross¹⁴ which is currently disused. At present, waste is brought by islanders to an area adjacent to the IWMC and set alight. Construction and demolition waste is separated and piled nearby. The Island Council has commenced, in late 2017, an initiative to promote separation of food waste which is placed in the sea a cage to contain floating waste as decomposes or is eaten by fish. There is at present a limited waste collection system, primarily for food waste. The IWMC has facilities for composting but is not used, nor is composting practiced on a community scale at any other location, although the council has intentions to commence this and two workers employed by the council have been sent to Fenfushi to gain experience in composting. The council has identified a new site for a new IWMC at the edge of a 33 ha area of newly reclaimed land (Figure 1 and Figure 2), and has submitted an application for a permit to use the site as a new waste management facility. However, the council is as yet unaware of the concept of an IWMC and of the MEE standard design. Detailed planning, including site access, operation and maintenance provisions and treatment is yet to take place. The specific siting of the IWMC will ensure that it will follow the selection criteria in the EARF. Once decision is made and detailed design is determined, this IEE will be updated and submitted to ADB for review and clearance.

⁸ Additional selection criteria for Trust Fund supported islands includes climate change vulnerability, and women participation in island councils, and is outlined in the Project Administration Manual (accessible from the list of linked documents in Appendix 2.)

⁹ Upon confirmation from the government and the approval of Trust Fund.

¹⁰ Disaster risk management capacity building will include preparation of a SWM disaster action plan outlining prevention, preparedness, response and recovery tasks. DRM risk awareness activities will include first responders (police, fire fighters) on Thilafushi.

¹¹ The recycling market study will cover plastics, construction and demolition waste, and other primary recyclables.

¹² Public awareness and behavior change activities under Outputs 2 and 3 will be implemented through a Public Awareness and Community Capacity Building consultant recruited by the PMU.

¹³ Feasibility Report, 2017 prepared by Water solution and Kocks Consult GmbH for Maldives Ministry of Environment.

8. The scope of the Thulusdoo IWMC (the subproject) will comprise:
- (i) Construction of a new IWMC, based on a standard layout plan developed by MEE comprising a secure enclosure with an impermeable concrete floors for waste handling including sorting, composting, secure storage, measures for exclusion of pests, indoor office space, roofed areas and provision for equipment for crushing and packaging the waste. The preliminary design indicates a footprint of 30m by 30m, which is to be varied depending on the size of the population on the respective island.¹⁵ Figure 3 shows the layout plan per Feasibility Study prepared by Water Solutions / Kocks Ingenieure in 2017.¹⁶ The Feasibility Study considered a planning process based on project waste generation, composting rate and sorting rates for recyclables. The subproject will follow the selection criteria for planning and designing of the IWMC discussed in detail in Appendix 1, which will include due diligence on the suitability of the reclaimed land where the IWMC will be located.
 - (ii) Provision of standardized durable waste containers, to facilitate easier loading onto transfer vessels with less loss of waste to the surrounding area and sea water, and to assist separation into different fractions.
 - (iii) Provision of improved collection vehicles, capable of carrying the new containers,
 - (iv) Training for council staff in composting, using simple windrows
 - (v) Provision of equipment such as balers for plastics, metal presses, wood chippers and glass crushers, and training in their operation and maintenance
 - (vi) An Information, Education and Communication (IEC) component to address perceptions on solid waste management, communication channels within the island communities, the role of women and scope for public involvement in improved solid waste management activity, in line with the "3 Rs". The scope of IEC component will be determined in the early stages of the project and may include (i) promoting the adoption of practices at the household level that reduce waste generation (including in particular reduced use of disposable plastics) and the separation of compostable and recyclable waste, (ii) eliciting participation in community level activity (iii) support to the activities of environmental clubs that have been formed in the schools, (iv) the use of social media to promote important messages and foster understanding (v) support to the council in the management of solid waste, particularly through partnerships with resorts, nongovernment organization (NGOs) or other islands, (vi) setting up a dynamic knowledge portal, (vi)i supporting the establishment of partnerships between the island and nearby resorts on sustainable waste management and (vii) encouraging use of locally produced compost.

¹⁵ World Bank Group's Environmental, Health and Safety (EHS) Guidelines requires IWMCs to consider standard design of 110% volume and banded for impermeable storage to avoid contaminated runoff entering the surface or groundwater.

¹⁶ Consultancy Services for Feasibility Study for an Integrated Solid Waste Management System for Zone III (including Greater Male) and Preparation of Engineering Design of the Regional Waste Management Facility at Thilafushi, Final Version December 2017, Water Solutions and Kocks Consult GmbH for Ministry of Environment and Energy



Figure 1: Aerial view of Thulusdhoo indicating the location of the existing open dump site and the approximate location of the proposed new IWMC



Figure 2. Actual ground photos taken at the proposed IWMC site.

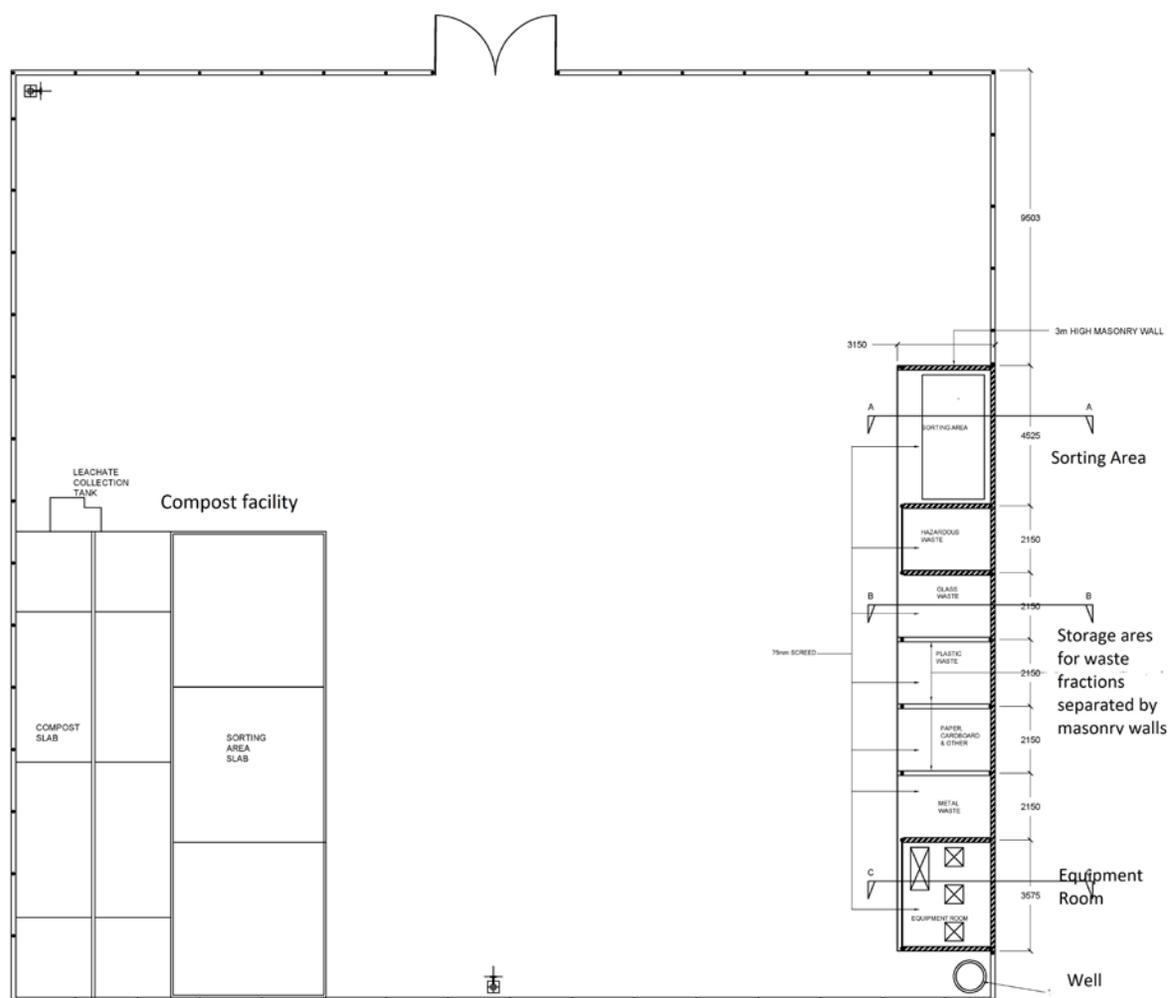


Figure 3: Outline Layout plan for the IWMC

Source: MEE. Dimensions in millimetres (mm)

III. POLICY LEGAL AND ADMINISTRATIVE FRAMEWORK

A. Applicable National Laws, Rules and Regulations

9. The law governing the protection of the environment is the Environmental Protection and Preservation Act (EPPA) of 1993 (Act No 4/93). The law is brief and sets out the principles for sustaining and extending the benefits of the environment of the Maldives for the people and coming generations. The EPPA confers powers on the MEE to issue regulations and formulate policies for environmental protection and preservation. Such regulations include:

- (i) Environmental impact assessment (EIA) regulations of 2007, updated in 2012 (Regulation No. 2012/R-27);
- (ii) By-law on Uprooting, Cutting and Transportation of Plants and Trees (2006);
- (iii) Regulation on Stone, Coral and Sand Mining (undated);
- (iv) Regulation for the Protection and Conservation of the Natural Life and character of Old Plants and Trees in the Maldives;
- (v) Dewatering Regulation (213/R-R1697);

- (vi) Environmental Damage Liabilities Regulation (2011/R-9); and
- (vii) Waste Management Regulation (2013-R58).

1. National Solid Waste Management Policy of 2008 and 2015

10. The National Solid Waste Management Policy was developed in 2008, by the Ministry of Environment, through consultations with the community and evaluation of existing waste management practices and scope for improved efficiency. The policy was then revised and adapted, and a new policy formulated and adopted in 2015.

11. The policy is in line with government commitment to provide the resources required for waste management in all inhabited islands of the Maldives and is founded on the following 10 principles:

- (i) Each person should be responsible for waste generated at the individual level and should comply with rules and regulations established locally;
- (ii) All household waste should be managed in accordance with the requirements of the local council;
- (iii) Each inhabited island should prepare and submit an island waste management plan for the island;
- (iv) Waste collection should be undertaken on a fee-based system for all waste producers, including households and industries;
- (v) Agreements with government agencies in different inhabited islands to ensure management of waste in the islands;
- (vi) Establishment of a waste management system in each inhabited island that is appropriate for the needs of the population and quantity and type of waste generated;
- (vii) Establishment of regional waste management facilities (RWMF) in each waste management zone;
- (viii) Establishment of arrangements to transport all residual waste to a RWMF
- (ix) Promote adoption of waste management practices that generate revenue and to apply revenue to waste management at the island level; and
- (x) Undertake waste management training and awareness campaigns at the national level.

2. Waste Management Regulation (No. 2013/R-58)

12. The Waste Management Regulation of the Maldives was enacted under Article 3 of the EPPA in 2013 and is implemented by the Environmental Protection Agency. The regulation focuses on the following five areas:

- (i) Waste management standards: Defines standards for waste collection, transfer, treatment, storage, waste site management, landfills and managing hazardous waste;
- (ii) Waste management Permits: Defines approval procedures for waste management sites;
- (iii) Waster transfer: Defines standards and permits required for waste transport on land and sea, including trans-boundary movements;
- (iv) Reporting: Defines reporting and monitoring requirements and procedures; and
- (v) Enforcement: Defines procedures to implement the regulations and penalties for non-compliance.

3. Other relevant legislations

13. **Cultural Heritage.** Items of cultural heritage significance are protected under the Law of Historical and Cultural Properties of the Republic of Maldives of 1979 (Law number 27/29) and its implementation is currently under the Ministry of Education. UNESCO state that there is a lack of rules and regulations, constraining the implementation of the law and that there is also no national inventory of heritage properties (no site has yet been inscribed under the World Heritage List). A new law is under preparation and awaiting completion as of June 2017.

14. **Health and Safety.** Legislation covering occupational health and safety is currently included in the Employment Act (2008), Chapter 8 “Work Place Safety and Employer Health”. This requires employers to implement measures for the safety and protection of employees at the work place, including safe work place, procedures, safe equipment and materials, provision of protective equipment, safety training to employees, conducting health checks where work involves chemical or biological materials that may cause a hazard, providing medical care as well as first aid for employees injured while at work. The law also sets out employee’s obligations with regard to safety at work.

15. **Land use and acquisition.** The Land Act (2002) covers matters relating to land including land use, land ownership, and permissible uses of land belonging to island councils, which includes environmental protection. The land act and processes relating to the project are described in the Resettlement Framework (RF).

16. **Decentralization.** The Decentralization Act of 2010 (Law 7/2010) devolves responsibility to island councils to carry out key functions related to their mandate to foster the social and economic well-being and development of the community and establish a safe, health and ecologically diverse environment. These functions include preparation of island development plans and implementing development projects planned and assigned by the government in line with the island development plans formulated by the islands. Services by the island councils under the Act including management of waste such that is disposed of in a safe manner at the island level and do not create inconvenience to the community.

B. Environmental Assessment Requirements

17. Responsibilities and procedures for conducting environmental assessments, together with the requirements for environmental monitoring of projects, are set out in the EIA Regulations of 2012. All projects that may have an impact on the environment are referred to the Minister of Environment and Energy (EPPA 5(a)).

18. The EIA Regulations assign primary responsibility for undertaking environmental assessment of projects to the project proponent and set out procedures, rights and responsibilities for the preparation and approval of EIAs. The MEE undertakes review and approval of environmental assessment reports.

19. Project proponents are defined in the EIA regulations as a person, department or agency that is seeking to carry out or proposes to carry out the development proposal and in this case is the MEE, as implementing agency for the project. The EIA regulations include a schedule (Schedule D) of investment project types that require an EIA. For waste projects, these are landfills, waste incinerators and large-scale waste storage projects. The IWMC for Thludhoo island however is a small-scale project and does not involve landfilling or incineration and therefore is not a schedule D project and as such does not require an EIA.

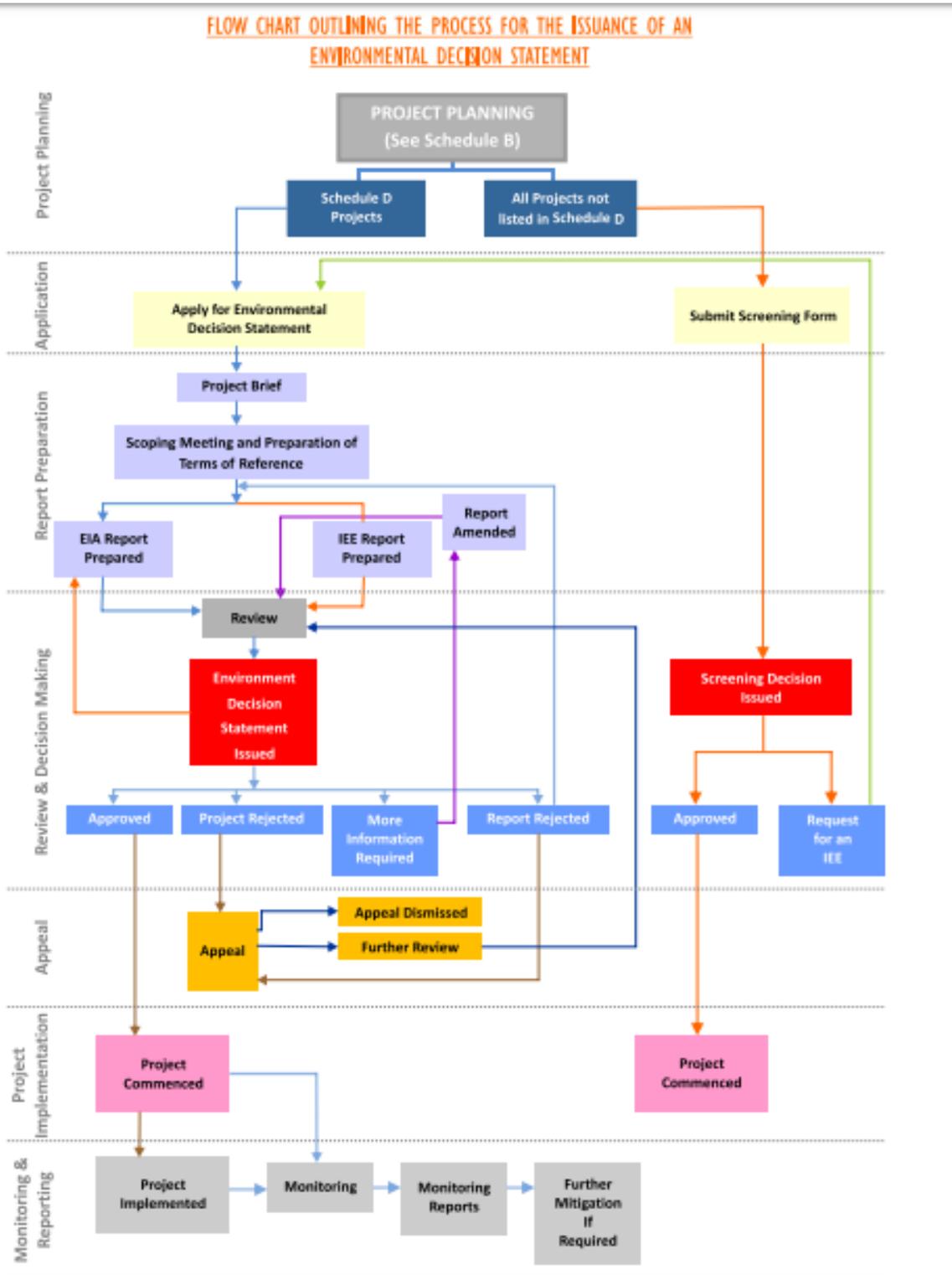
20. For the subproject, as one that is not included schedule D, a screening form is submitted in a specified format on the basis of which the MEE decides whether an Environmental Management Plan is required or if further information is required, in which case an Initial Environmental Examination (IEE) will be carried out. The IEE is completed according to a specified format. If the IEE finds that the project may cause a significant environmental impact, a full EIA is required, prior to preparation of an Environmental Management Plan (EMP). If an EIA is not required, an EMP is then prepared to address the impacts identified in the IEE.

21. The Environmental Management Plan, following either the IEE or the EIA process, is prepared on a specified format and reviewed for compliance by MEE.

22. The MEE issues the decision in the form of a decision note issued to the proponent, which sets out specific binding requirements for the conduct of the project on the basis of review of the EIA report.

23. Summary of application stages and steps is outlined in Figure 4 below.

Figure 4: Flow Chart of Maldives Environmental Impact Assessment Process¹⁷



¹⁷ Source: Environmental Assessment Regulations (2007), Schedule A

24. The timelines for clearance and approvals are as follows:
- (i) On completion of a screening form for non-schedule D projects – 10 working days for a screening decision from MEE;
 - (ii) For review of compliance of an EMP by MEE – 7 working days;
 - (iii) For review of a project brief on Schedule D projects – 5 days to confirm the date of a scoping meeting;
 - (iv) For consideration of Terms of Reference drafted by the project proponent following the scoping meeting – 10 days to confirm the Terms of Reference;
 - (v) For the review of a completed EIA report for completeness – 2 working days;
 - (vi) For circulation of an EIA report to other ministries and to the public for comment – 10 working days; and
 - (vii) For issuance of a decision or to request revisions, following circulation of the EIA report and receipt of comments – 28 working days.

C. Applicable International Environmental Agreements

25. In addition to national laws, rules and regulations, the government of Maldives is also a signatory to various applicable international conventions. Those applicable to the subproject as a waste facility close to the shore, are those relating to pollution and biosafety and are:

- (i) UN Convention on the Law of the Sea – UNCLOS (1982);
- (ii) International Convention for the Prevention of Pollution of the Sea by Oil (1982);
- (iii) Washington Declaration on Protection of the Marine Environment from Land-Based Activities;
- (iv) Cartagena Protocol on Biosafety (Maldives acceded on 2 September 2002); and

D. ADB Policy

26. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

27. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

- (i) **Category A.** A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.
- (ii) **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of Category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.
- (iii) **Category C.** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
- (iv) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a financial intermediary (FI).

28. **Environmental management plan.** The SPS further requires the development of an EMP specifying the required mitigation and monitoring and who is responsible for implementation.

29. **Public disclosure.** ADB will post the following safeguard documents on its website so affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:¹⁸

- (i) final or updated IEE upon receipt; and
- (ii) environmental monitoring reports submitted by the Project Management Unit (PMU) during project implementation upon receipt.

30. **Pollution Prevention and Control Technologies.** During the design, construction, and operation of the project the PMU will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

Table 1: Applicable WHO Ambient Air Quality Guidelines¹⁹

Table 1.1.1: WHO Ambient Air Quality Guidelines ^{7, 8}		
	Averaging Period	Guideline value in $\mu\text{g}/\text{m}^3$
Sulfur dioxide (SO ₂)	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline) 500 (guideline)
	10 minute	40 (guideline) 200 (guideline)
Nitrogen dioxide (NO ₂)	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM ₁₀	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM _{2.5}	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

⁷ World Health Organization (WHO). Air Quality Guidelines Global Update, 2005.
PM 24-hour value is the 99th percentile.

⁸ Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

Table 2: World Bank Group's Noise Level Guidelines

¹⁸ As per ADB SPS, 2009, prior to disclosure on ADB website, ADB reviews the "borrower's/client's social and environmental assessment and plans to ensure that safeguard measures are in place to avoid, wherever possible, and minimize, mitigate, and compensate for adverse social and environmental impacts in compliance with ADB's safeguard policy principles and Safeguard Requirements 1-4."

¹⁹ World Bank Group's General Environmental, Health, and Safety Guidelines: www.ifc.org/ehsguidelines

Table 1.7.1- Noise Level Guidelines ⁵⁴		
Receptor	One Hour L _{Aeq} (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational ⁵⁵	55	45
Industrial; commercial	70	70

⁵⁴ Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999.

31. All statutory clearances will be obtained prior to commencement of civil works. IEEs will be prepared for each package involving civil works and EMP to be attached in the bid and contract documents. IEE will be submitted to ADB for review and approval prior to issuance of bid documents. Monitoring of EMP implementation by the executing agency is reported to ADB.

IV. DESCRIPTION OF THE ENVIRONMENT

A. Physical Resources

1. Geology, Topography and Soils

32. In common with all islands in the Maldives, Thulusdhoo is a reef island that has formed mainly at the periphery of Kaafu Atoll by a process of deposition of shallow-water carbonates and successive coral deposits at the tidal level which gradually rose to reach the present-day level of the island. The underlying rock is variable in consistency, reflecting the growth patterns of the coral, which forms dense colonies (coral heads) and large voids between the heads. The unconsolidated sand and gravel on top of the rock layer is subject to seasonal conditions, particularly monsoons as well as wave action, and the beaches in their natural state are dynamic subject to continual erosion and accretion, making infrastructure around the island's coast vulnerable to erosion.

33. The island's soils are mainly sandy in texture, with a significant silt component formed as sand grains have ground against each other. Much of the inland part of the island has topsoil with an organic matter content, supporting thick vegetation in places as well as homes and gardens. The soils are free draining when uncompacted, have poor nutrient status and are alkaline. Surface relief is extremely low and below 2m above sea level.

2. Climate

34. The Climate is tropical maritime, featuring two monsoon seasons, originating over the Indian Ocean to the southwest between May and September (Halhangu), and the Bay of Bengal to the drier northeast between December and February (Iruvai). The southwest monsoon is the stronger and monthly rainfall typically exceeds 200mm towards the end of the southwest monsoon period and is lowest in February. Cyclones can occur, with the higher risk period being between October and January. The island can also experience "edge effects" of larger more distant

cyclones. The United Nations (2007)²⁰ estimate that there is a 10% probability of a level one storm on the Saffir-Simpson scale occurring over Kaafu Atoll in a 10-year period. Storms in the level one category are described as being “very dangerous” with wind speeds likely in the range of 119 – 153 kph, and pressures below 100hPa, but not lower than 980 hPa.

35. Temperatures are relatively constant and range between 25oC and 30oC, with the hottest period occurring in March/April and the coolest, December/January. Monthly rainfall fluctuates between around 20mm in February to over 300mm in May and is over 200mm for most of the year.

36. The prevailing winds are predominantly westerly for much of the year, with easterly winds rare and southeasterly winds almost non-existent. Winds are influenced by the monsoon patterns and west-south-westerly and westerly winds are the strongest over the year.

37. The tidal regime is semi-diurnal – two high and two low tides a day. The range for spring tides is approximately 1m and for neap tides, 0.3m while the extreme range between highest high water and lowest low water is 1.32m at the tidal gauge for the Malé area, on Hulhulé Island some 21km from Thulusdhoo. Table 3 below gives the average tide levels at Hulhulé.

Table 3: Average tide levels at Hulhulé²¹

Tidal level	Water level from mean sea level (m)
Highest High Water (HHW)	0.62
Mean Highest High Water (MHHW)	0.34
Mean High Water (MHW)	0.33
Mean Low Water (MLW)	-0.36
Mean Lowest Low Water (MLLW)	-0.37
Lowest Low Water (LLW)	-0.72

38. Wave heights are also influenced by variations in atmospheric pressure and strong winds. Atmospheric pressure at sea level around Kaafu Atoll typically varies between 1011 and 1017 hPa, and an increase in air pressure of 1 hPa typically lowers the water level by 1cm. Lower pressures can occur in storm events, and may drop below 1000 hPa, entailing an increase of around 10cm or more, adding to effective storm wave heights.

39. Surface currents reflect tides and wind, and generally follow the monsoon pattern, with westward currents dominant from January to March, and the reverse between April and December.

3. Freshwater Resources

40. Natural freshwater sources on the island comprise rainwater collected from roofs and groundwater that accumulates through infiltration of rainwater into a freshwater lens that forms in underlying strata of the island, though the integrity of the lens and the quality of its water are

²⁰ United Nations Office for the Coordination of Humanitarian Affairs - Regional Office for Asia and the Pacific (OCHA ROAP) (2007) Maldives: Composite Hazard Map.

²¹ Source: University of Hawaii Sea Level Center Database, quoted in the Second National Communication of the Maldives to the United Nations Framework Convention on Climate Change. Ministry of Environment and Energy, 2016.

threatened by the level of extraction and by pollution from human waste where proper sanitation facilities are not used. Islanders make use of commercially produced, bottled water to meet drinking water needs.

41. If applicable within the subproject location, baseline quality measurements for surface water and groundwater (from freshwater lens) will be undertaken by the contractor prior to commencement of construction works.

4. Marine Resources

42. Significant fishing recreational diving and other water supports such as surfing take place in the water around Thulusdhoo and the island is considered to be a surfing destination for tourists. The water quality is influenced by sewerage discharge and illegal dumping of solid waste (including from neighboring islands and passing vessels). Baseline marine water quality measurement around the vicinity of the subproject location will be undertaken by contractor prior to commencement of construction works.

5. Marine Sediment

43. Pollutants from industrial activity and waste, particularly hazardous waste, can accumulate in the sediment on the lagoon or sea floor. Boat building takes place on Thulusdhoo, albeit on a small scale, and can include pollutants such as aromatic benzene compounds, while more industry as well as waste management takes place on Thiafushi Island at the southern edge of the atoll, some 31km away.

6. Air Quality

44. Air pollution sources include vehicle emissions, emissions of other plant and machinery including diesel power generators, and construction activity, as well as industrial activity, all of which are limited on Thulusdhoo. Levels of ambient air quality studied on the more populated islands of Greater Malé at the south of the atoll by AECOM in 2010 on Malé, Hulhulé and Hulmumale²² and compared with World Health Organization (WHO) standards for ambient air, finding that the pollutants of potential concern did not exceed WHO guideline levels in terms of the average 24hr mean. For specific ambient air quality baseline at the subproject location, the contractor will conduct measurement prior to commencement of construction works.

7. Noise

45. Sources of noise pollution are similar to those for air quality, again very limited on Thulusdhoo, while wind and waves can contribute significantly to ambient noise levels. For specific ambient noise level baseline at the subproject location, the contractor will conduct measurement prior to commencement of construction works.

²² AECOM in association with Water Solutions (2011). Expansion and Modernization of Malé International Airport: Social and Environmental Impact Assessment, prepared for GMR Malé International Airport Private Limited.

B. Ecological Resources

1. Marine Ecosystems

46. Coral ecosystems have significant ecological significance and occur within lagoon waters and on the periphery of the islands. The corals are vulnerable to pollutants in the water, changes in radiation, changes in turbidity and in nutrient levels. Corals are adapted to low nutrient levels, and in areas where sewage, grey water and food waste is released, which usually have relatively high phosphate and nitrate levels, algal growth will often flourish and suppress coral growth. Thulusdhoo has a low population (1,400 residents), there is therefore little immediate threat to coral colonies around the island from these sources. Coral health can be gauged by established survey methods, such as the reef check protocol supported by the international NGO Reef Check²³ which provide standards to assess the coverage of coral and other substrates on the sea bed.

47. Pelagic fish form an important part of the local economy, both through commercial fishing activities and game fishing. Fishing activity focuses on areas known to be abundant and these occur throughout the Maldives waters, usually distant to the coast.

2. Avifauna

48. The Maldives has a diverse range of birds, including a significant seasonal population of migratory birds. The islands are important wintering grounds for a large number of migratory species that follow the Central Asian Flyway, a flyway covering a large continental area of Eurasia between the Arctic Ocean and the Indian Ocean, and comprising several important migration routes, extending from the northernmost breeding grounds in Siberia to the southernmost non-breeding wintering grounds in West and South Asia and the Indian Ocean Territory including the Maldives. Floating waste is a known hazard to birdlife on the atoll particularly when toxic waste is ingested or when articles such as plastic bags and string can cause birds to be debilitated or where they cause damage to the digestive system, or when it damages a natural habitat. These can travel considerable distances and therefore such waste released from more populated islands or from vessels can reach islands such as Thulusdhoo and cause damage. The habitat of the white-breasted waterhen (*Amaurornis phoenicurus*) is known to be threatened by floating, uncollected solid waste.²⁴

3. Terrestrial Ecosystems

49. The present-day vegetation cover on the islands is substantially influenced by human habitation and has little biodiversity conservation significance. Vegetation is dominated by pan-tropical species such as coconut (*Cocos nucifera*), Goats foot creeper (*Ipomea pes-caprae*), hibiscus (*Hibiscus tiliaceus*) and beach colophyllum (*Calophyllum inophyllum*).

4. Protected Areas

50. There are 42 protected areas in the Maldives designated under the EPPA and covering around 24,500ha, or 0.2% of national territory totalling more than 24,494 hectares (0.2% of the

²³ Hodgson, G., W. Kiene, J. Mihaly, J. Liebeler, C. Shuman, L. Maun and J. Hill. 2006. Reef Check Instruction Manual: A Guide to Reef Check Coral Reef Monitoring Published by Reef Check, Institute of the Environment, University of California at Los Angeles.

²⁴ Common Birds of the Maldives. Live & Learn Environmental Education. www.livelearn.org.

national territory) designated under the EPPA 4/93 to prevent over exploitation, and improve conservation and preservation, including banning of export of important baitfish as aquarium fish, protection of threatened marine species such as sharks, sea turtles, giant clams and black coral and also to enhance and sustain dive tourism.

51. Three protected areas occur in the vicinity of Thulusdhoo. The IUCN has not set a category for any of the sites.

Table 4: Protected Areas in the Vicinity of Greater Malé

Name	Type	Area	Notes	Location relative to Thulusdhoo Island
Lankan Thila (designated in 1999)	Reef	200	Favoured as a dive site for sea life and rock features.	Approx 8km to the South-Southwest (Atoll edge)
Thanburudhoo Thila (designated in 1995)	Reef	57	Deep lagoon area	Approx 8.5km to the Southwest (lagoon site)
Huraa Mangrove	Wetland / water body	4	Important natural mangrove habitat.	Approx 5km south on neighbouring island

C. Socio-Economic Factors

1. Population Levels

52. The population of Thulusdhoo according to the 2014 census is 1,408 predicted in the feasibility study for of an integrated Solid Waste Management System for Zone 3 to have reached around 1,461 at present day levels and to rise to 2000 by 2035. The island is the capital of Kaafu Atoll, and also has a number of guesthouses, serving a tourism market.

2. Economy

53. Thulusdhoo's economic activity is dominated by the presence of a soft drink bottling plant, and also a boat builder. The island also has administrative activity, through its role as the capital of Kaafu although by default administrative functions for the atoll are usually done on Malé. The island has some tourism, primarily a collection of guesthouses and it is also the nearest inhabited island to some resorts in the area. Access to education, in keeping with the national average is good, with enrolment in primary education close to 100% and literacy rates at about 98%.

3. Public Health

54. Thulusdhoo in general benefits both from relatively easier access to major health facilities in Malé and from the advances made in the sector over recent decades, which feature a rapid decline in maternal mortality rate, and eradication or heavy reduction of the incidence of a number of infectious diseases including leprosy, measles and lymphatic filariasis. However existing waste management practices, particularly regular burning of household waste including plastics, poses a mild risks to people living on the vicinity who regularly breathe air that contains smoke from the burning waste.

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Method of Assessment

55. The potential impacts and mitigation measures have been identified through a site visit, interviews with stakeholders and review of designs for the IWMC and associated facilities. The ADB Rapid Environmental Assessment Checklist for Solid Waste Management was used to screen the subproject for environmental impacts and to determine the scope of the IEE investigation. The completed checklist is attached in Appendix 2. The proposed subproject component will interact physically with the environment. The PMU will reassess the findings in the checklist and update this IEE upon completion of the detailed engineering design. The detailed monitoring program (locations, parameters, frequency of sampling) will be included in the updated IEE based on detailed engineering design.

B. Environmental Impacts Related to Location

56. A proposed site for the IWMC has been identified by the island council and is subject both to approval from the Ministry of Housing and the national EIA process. The proposed site is distant from residential areas, but close to the shore and therefore containing leachate from stored waste and composting is important.

57. **Effects on the surrounding seawater and marine ecosystems.** The IWMC is located to be located close to the shoreline. The risk of loss of waste or leachate from piled household waste or composting will be mitigated by (i) ensuring that waste enters and leaves the IWMC on the landward side of the facility (ii) that detailed design includes both a system for collecting and containing leachate from piled household waste awaiting collection and from composting and (iii) that site security and management is ensured by the island council. The measures must ensure no deterioration of water quality in the vicinity of the IWMC. The feasibility of using bioremediation of runoff water and leachate should be assessed during preliminary design, taking account of soil types and conditions, volumes and characteristics of runoff water and leachate and space requirements for bioremediation. Further, the subproject will adopt World Bank Group's Environmental, Health and Safety (EHS) Guidelines which will require the proposed IWMC to consider standard design of 110% volume and banded for impermeable storage to avoid contaminated runoff entering the surface or groundwater.

58. **Effects on vegetation.** The site is to be on reclaimed land which has not been colonized by mature vegetation. No impact on vegetation is envisaged.

59. **Surrounding land use.** The surrounding land is partly reclaimed land, and not inhabited though likely to be developed for residential and recreational use. While improved management of the IWMC will reduce odor and attraction to pests such as rodents, the effect on existing land use can be mitigated by (i) ensuring security, regular cleaning operations and maintenance takes place and (ii) planning of further developments such that receptors such as dwellings are not placed close to the facility, and preferably separated by a belt of trees or open space.

60. **Impedance of traffic.** Due to low levels of traffic on Thulusdhoo, the transport of waste to and from the facility is not expected to impede traffic.

61. **Loss of land and effects on property.** No private property will be affected and land acquisition will be required and there is therefore no impact.

C. Environmental Impacts Related to Construction

62. **Construction method.** The methods to be used for site preparation, and construction, as well as associated arrangements to ensure sound environmental management and safety at all times, are to be defined by the Contractor in a Contractor's Environmental Management Plan (CEMP) submitted to the PMDSC for approval. The CEMP must adhere to EHS general guidelines 1 to 4 (environmental, occupational health and safety, community health and safety and for construction and decommissioning).

63. **Impedance of traffic.** Construction vehicle movements are not expected to impede traffic, as levels of traffic on the island are very low.

64. **Noise pollution and vibration.** Construction operations, particularly excavations and compaction will cause noise and vibration, which will be potentially be a temporary use to some residents. To mitigate the impacts the contractors will be required to (i) identify households that are likely to be affected by noise and vibration (if any), (ii) provide information to these households on scheduled work (iii) limit construction activities to normal daylight working hours (iv) adhere to the planned work schedule and (iv) ensure that all construction equipment and vehicles are kept in good working order with working exhaust mufflers.

65. **Waste Generation.** Construction waste will include packaging of equipment, fuels, lubricants, materials, equipment and food and some rubble where existing structures need to be demolished. Some specialist lubricants and paint for marking may be hazardous. Contractors will be responsible for removing waste to Thilafushi. Approval from the PMDSC must be obtained prior to importing materials rated as hazardous under the Globally Harmonized System of Classification and Labeling of Chemicals.

66. **Release of silt.** Excavations to form foundations for structures will involve making temporary stockpiles of material that will either be removed or re-used. To prevent the release of silt into drains or the sea contractors will be required to ensure that (i) excavated areas are rapidly refilled on completion of works, (ii) to place silt fences around temporary piles of excavated material and (iii) avoid excavation in wet weather to the extent practicable.

67. **Water pollution.** The use of vehicles and plant can cause risks of water pollution, in the event of leaks and spills of fuel, lubricants, hydraulic fluid or other fluids used for vehicle operation. To reduce risks and limit impacts the contractor will be required to ensure that vehicles and plant are maintained in sound operable condition, free of leaks and that the condition of vehicles and equipment is regularly checked. The contractor will prepare and submit a plan for spill management, including provision of spill kits, training/briefing of workers on procedures on handling spills and allocation of responsibility within the contractor's team for ensuring that spill kits are available and that workers know how to use them.

68. **Air and dust pollution.** Potential sources of air pollution are exhaust fumes from vehicles and plant, dust from transport of construction and waste materials and areas around work sites where soil and debris are deposited. The effect will be limited due to the largely open environment where dust and fumes will be rapidly dispersed by wind. However, emissions will be mitigated by ensuring that vehicles and equipment to be well maintained and tuned and fitted with exhaust baffles.

69. **Community health and safety risks.** The use of plant and machinery, use of compressed air lines and cables and excavations are potentially hazardous but most work sites are within the transfer station areas where public access is restricted. The contractor will ensure that restrictions to access are enforced and provide notices to the public identifying hazards and, where warranted, erect safety barriers/covers around areas of open excavation.

70. Contractors shall establish their community health and safety plans following international best practices and the World Bank Environmental, Health and Safety (EHS) guidelines on construction and decommissioning activities²⁵. As a minimum and whichever is applicable, the community health and safety plan shall ensure the following:

- (i) Implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning;
- (ii) Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high risk structures or areas depending on site-specific situations, including fencing, signage, and communication of risks to the local community;
- (iii) Removing hazardous conditions on construction sites that cannot be controlled affectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials; and
- (iv) Implement measure to prevent proliferation of vectors of diseases at work sites.

71. **Occupational Health and Safety.** To reduce day to day risks associated with working with heavy equipment in trafficked areas, contractors will be required to appoint health and safety officers for each site and to ensure regular briefing of the construction workforce on health and safety issues. Contractors shall establish their occupational health and safety plan to be adopted at each site following international best practices and the World Bank EHS guidelines on construction and decommissioning activities.²⁶ As minimum and whichever are applicable, the occupational health and safety plan shall ensure the following:

- (i) Communication and Training
 - (a) Training of all workers on occupational health and safety prior to construction works;
 - (b) Conduct of orientation to visitors on health and safety procedures at work sites;
 - (c) Signages strategically installed to identify all areas at work sites, including hazard or danger areas;
 - (d) Proper labeling of equipment and containers at construction and storage sites; and
 - (e) Suitable arrangements to cater for emergencies, including: first aid equipment; personnel trained to administer first aid; communication with, and transport to, the nearest hospital with an accident / emergency department; monitoring equipment; rescue equipment; firefighting equipment; and communication with nearest fire brigade station.

²⁵ <http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES>

²⁶ Ibid.

- (ii) Physical Hazards
 - (a) Use of personal protective equipment by all workers such as earplugs, safety shoes, hard hats, masks, goggles, etc. as applicable, and ensure these are used properly;
 - (b) Avoidance of slips and falls through good house-keeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from foot paths, cleaning up excessive waste debris and liquid spills regularly, locating electrical cords and ropes in common areas and marked corridors, and use of slip retardant footwear;
 - (c) Use of bracing or trench shoring on deep excavation works;
 - (d) Adequate lighting in dark working areas and areas with night works;
 - (e) Rotating and moving equipment inspected and tested prior to use during construction works. These shall be parked at designated areas and operated by qualified and trained operators only;
 - (f) Specific site traffic rules and routes in place and known to all personnel, workers, drivers, and equipment operators; and
 - (g) Use of air pollution source equipment and vehicles that are well maintained and with valid permits.

- (iii) General Facility Design and Operation
 - (a) Regular checking of integrity of workplace structures to avoid collapse or failure;
 - (b) Ensuring workplace can withstand severe weather conditions;
 - (c) Enough work spaces available for workers, including exit routes during emergencies;
 - (d) Fire precautions and firefighting equipment installed;
 - (e) First aid stations and kits are available. Trained personnel should be available at all times who can provide first aid measures to victims of accidents;
 - (f) Secured storage areas for chemicals and other hazardous and flammable substances are installed and ensure access is limited to authorized personnel only;
 - (g) Good working environment temperature maintained;
 - (h) Worker camps and work sites provided with housekeeping facilities, such as separate toilets for male and female workers, drinking water supply, wash and bathing water, rest areas, and other lavatory and worker welfare facilities; and
 - (i) Maintain records and make reports concerning health, safety and welfare of persons, and damage to property. Take remedial action to prevent a recurrence of any accidents that may occur.

D. Environmental Impacts Related to Operation

72. **General.** The IWMCs and management of them are intended specifically to address existing poor practices of open incineration of waste and to ensure safe and efficient handling, collection of recyclables and shipment of waste to the regional waste management facility (RWMF) at Thilafushi. Existing impacts that are addressed including smoke nuisance and health risk, damage to the habitat in the existing dump area, and reduced pest issues.

73. **Use of containers.** While containers provide a more efficient system of handling and loading waste, reducing potential losses into the sea, any breakages or mishandling of containers

will result in significant discharge of waste into the sea. Operation and maintenance training must provide for instruction on maintenance of containers, loaders, cranes and vessels and sound operation including licensing of vehicle and plant operators and restrictions on operation during stormy weather.

74. **Pests.** Although improvements will reduce access to them, the transfer stations will still be subject to pests such as birds and rodents. Numbers of these can be kept down by improved operation regimes, including site hygiene and regular cleaning of surfaces.

75. **Contaminated Runoff.** Contaminated runoff or leachate entering the surface water, marine water, or groundwater may arise during the operation of the IWMC. These may contain traces of contaminants such as nutrients, metals, pathogens and hazardous chemicals that may contaminate surface water, seawater, and groundwater. Leachate from composting will have a high nutrient content. In order to mitigate these impacts, the project will adopt World Bank Group's Environmental, Health and Safety (EHS) Guidelines which will require the proposed IWMC to consider standard design of 110% volume and bunded for impermeable storage to avoid contaminated runoff entering the surface or groundwater. Other mitigating measures would be: (i) inclusion in the design of IWMC a leachate well for recovering and management of leachate; and (ii) training of site operators in leachate management including re-circulation and/or collection in dedicated containers

76. **Occupational health and safety.** Potential hazards to workers arise from the handling of compost, when workers can breathe micro-organisms that cause respiratory and other disorders, and accidents associated with the operation of collection trucks and loading containers into the vessels that take the waste to the RMWF at Thilafushi. Risks are mitigated by training in handling of compost and of machinery, and sound supervision and management of operation of the facilities. The operators of these transfer stations shall implement measures following international best practices and the World Bank EHS industry sector guidelines for infrastructure: waste management facilities²⁷.

E. Global, Transboundary and Cumulative Impacts

77. The IWMCs are to be established, where they do not exist or are not operational, on each inhabited island in Zone 3 under the project and also elsewhere in the country. Operation of the IWMC and efficient removal of waste to the RMWF will reduce risks to the island and marine environment. Effective institution of sound management of the IWMCs and of waste collection and handling will provide a demonstration of good practice, of value to island councils and workers on other islands who need to develop capacities for improved waste management.

78. Capacity building for the island council will assist in the build-up of capabilities required to further improve and manage waste management facilities throughout the Maldives.

VI. ANALYSIS OF ALTERNATIVES

A. Alternatives for the Island Waste Management Centre

²⁷ Ibid. Industry Sector Guidelines: Infrastructure; Waste Management Facilities

79. As stated in section 2, there is an existing but disused IWMC on Thulusdhoo. The alternative of rehabilitating and extending this facility and putting it back into operation has not been pursued, as the preferred site is on reclaimed land, more distant to existing dwellings.

B. Alternatives within the Project Scope

80. Improvements to waste management on Thulusdhoo envisage the use of containers, to receive waste from delivery trucks and transfer it to vessels. An alternative to this is an “open” system where trucks are offloaded mechanically, or they tip the waste to a central area or directly onto awaiting vessels. The use of containers however provides a much higher level of control, and greatly limits the risk of waste being lost to the sea during the offloading and loading processes.

C. The No Project Alternative

81. Under the “no project” scenario, the existing practice of open burning of household waste will continue, even as volumes of waste generation grow with population and economic growth. It is unlikely that composting will be done on a community scale, foregoing the opportunity to reduce the volume of plant waste that can be composted and re-used. While the island council has made moves and/or expressed intention to raise public awareness on waste reduction and separation, the opportunity to support the council as well as schools and the wider community through the information and communications technology component will also be foregone.

VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Consultations and information disclosure during design

82. Consultations took place between the TRTA consultants, a representative of MEE and representatives of the island council during a visit on 6th and 7th November 2017. These consultations enabled the TRTA consultants and MEE to understand the intentions and existing actions of the island council to improve waste management on the island and to gauge capacity development needs. Points arising from the consultation were as follows:

- (i) At present, waste is taken to a location near an existing disused IWMC and burned. The smoke is a nuisance, drawing complaints from the public and in particularly from guesthouse operators.
- (ii) Widespread littering and dumping takes place and is a concern to the public and to the council, both because of the accumulation of rubbish on the beach and release of floating waste which is perceived to affect the appeal of the island for tourism.
- (iii) The island council are not aware of the role of an IWMC in improved handling and transfer of waste, or of the importance of avoiding the burning of waste.
- (iv) An existing initiative is to encourage separation of food waste, and to dispose of this in a metal cage in seawater, newly installed and accessed by a jetty.
- (v) The council has held a ten-day information campaign to encourage separation of waste.
- (vi) Construction and demolition waste is treated separately from general household waste and dumped nearby. It is accumulating and also of concern to the public.

83. It is stressed that this IEE is prepared as an example, or “blueprint” and the preparation of the support to IWMC development on each island must include consultation with stakeholders, including community representatives, foreign nationals residing on the island, private sector (this

should include guesthouse operators, restaurant/café operators and industry) and NGOs. The views and concerns of these parties should be recorded and addressed in subproject preparation and design. The outcomes of consultations should be summarised in this section of the IEE.

B. Further Information Disclosure and Public Consultation

84. This IEE, once completed on the basis of design and a Dhivehi translation of the executive summary will be provided to community officials for public disclosure. Similarly, the updated IEE based on detailed design will be shared with stakeholders, as will results of monitoring. Stakeholders will be kept informed of construction activities that are likely to cause noise and dust nuisance and will be made aware of the grievance redress mechanism and consultations will take place regularly to gain feedback and ensure that impacts are being adequately managed.

85. In future public consultations, PMU will carry out meaningful consultations with affected persons and communities under the project. PMU will ensure to undertake a consultation process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

86. **Information, Education and Communication.** The Information, Education and Communication (IEC) component will address perceptions on solid waste management, communication channels within the island communities, the role of women and scope for public involvement in improved solid waste management activity, in line with the 3R. This will potentially include adopting practices at the household level that reduce waste generation (including in particular reduced use of disposable plastics) and the separation of compostable and recyclable waste, and eliciting participation in community level activity.

87. The IEC will also support island councils in the management of solid waste, particularly through partnerships with resorts, NGOs or other islands to support initiatives to manage solid waste safely and sustainably. Resorts could provide technical training to islands, help in repair of SWM equipment, joint transport of waste to treatment centers, and carry out joint awareness programs on SWM. Strategies may include:

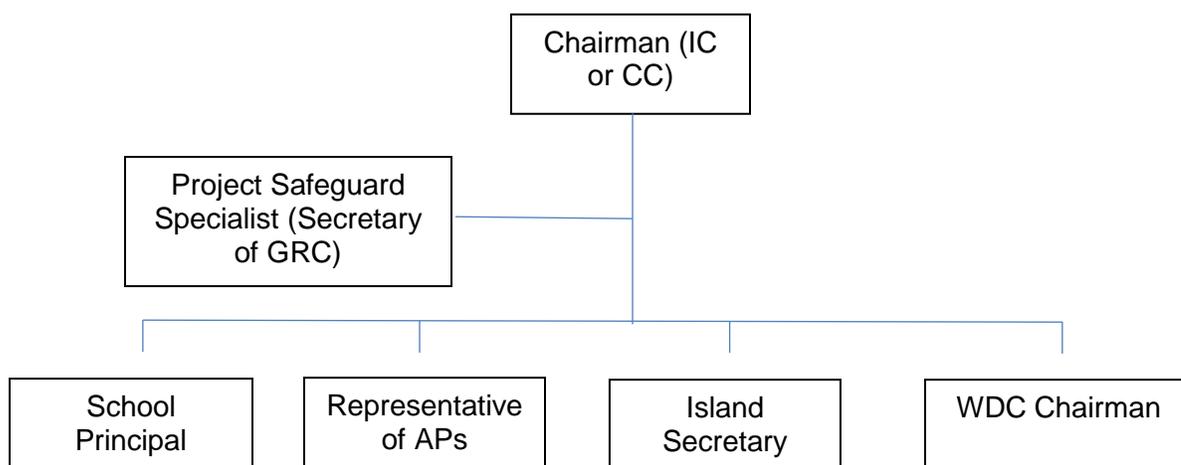
- (i) Involvement of environmental clubs that have been formed in schools;
- (ii) Use of social media, particularly those in common use already such as “facebook” and “viber”;
- (iii) Setting up a dynamic knowledge portal;
- (iv) Sharing information on the project, its activities and roll out schedule of the project components;
- (v) Partnerships between resorts and neighbouring islands on sustainable waste management;
- (vi) Promoting 3R practices, including reduction of plastic water bottles through use of reusable glass bottles and/or large, reusable bottles for drinking water; and
- (vii) Encouraging use of locally produced compost.

VIII. GRIEVANCE REDRESS MECHANISM

88. A grievance redress mechanism (GRM) will be established to receive and facilitate the resolution of affected person's concerns, complaints, and grievances on negotiated/voluntary land donation or involuntary land acquisition, relocation, income restoration, environmental management and other construction and operation related issues. The GRM is willing to be proactive and accessible to all APs to address their concerns, grievances and issues effectively and swiftly, in accordance with ADB SPS, 2009.

89. **First Tier:** City Council/Island Council – grievances will be registered informally by contacting the city/island councils. If the grievance cannot be resolved informally then the APs can register a formal complaint. The council must screen the grievance to determine whether the concerns raised in the grievance are within the scope of the project. The council will determine solutions to the issues either by (i) discussing internally, or (ii) joint problem solving with aggrieved parties, or (iii) a combination of both options. If the complaint is resolved within a week, the council must communicate the decision to the aggrieved party formally or informally. Should matter be unresolved and/or the AP be unhappy with the result, the complaint will be referred to the next tier. The grievance redress committee (GRC) includes the island's representatives as well as project officers related to each island, as shown in the figure below.

Figure 5 : Grievance Redress Committee (GRC) Composition for First Tier



90. **Second Tier:** The AP can elevate the grievance to the second tier, and submit a complaint on a letter addressed to MEE. MEE will forward the letter to the PMU. The PMU will be responsible to resolve the complaint within 15 days and communicate the decision to the aggrieved party. The 99. PMU screens the grievance and determines if it is related to the project. If unrelated, the AP is notified in writing. If it is relevant to the project, the PMU will hold discussions with the MEE on the matter and if necessary, (i) arranges visit the site and hold on-site discussions and/or (ii) refers the matter to the project steering committee. The PMU then decides on the action that will be taken by the project to address the grievance, and the decision will be conveyed to the AP in writing.

91. The affected persons can also direct contact (in writing) the ADB Project Officer at ADB headquarters. The complaint can be submitted in any of the official languages of ADB's

Developing Member Countries. This may be done at any time by sending the written complaint to the following address:

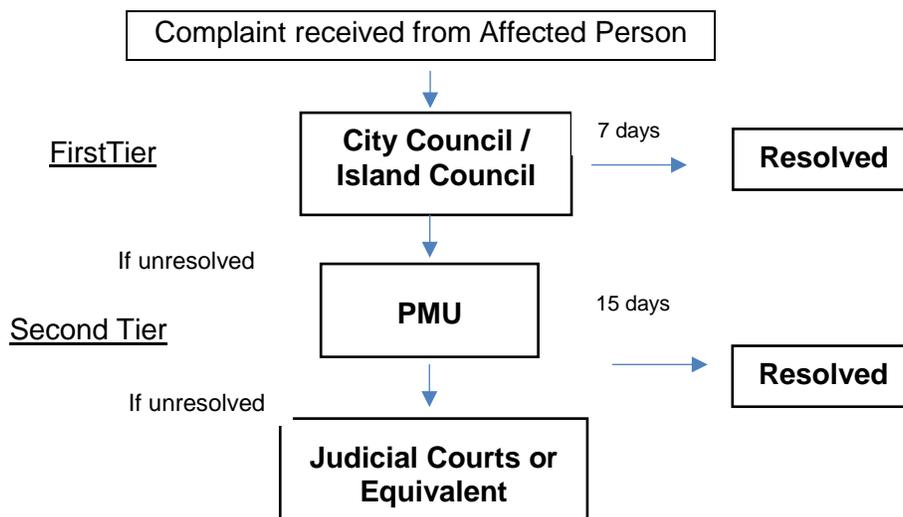
Project Officer – Greater Malé Environmental Improvement and Waste Management Project
South Asia Urban Development and Water Division
South Asia Regional Department
Asian Development Bank
6 ADB Avenue, Mandaluyong City 1550
Metro Manila, Philippines

92. The APs can also use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB. The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the Project Information Document to be distributed to the affected communities, as part of the project GRM.

93. The GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage through the Maldives judicial or appropriate administrative system. This can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

94. The flow diagram of resolving complaints under the GRC is shown in Figure below.

Figure 6: Grievance Redress Mechanism Diagram for Complaints Resolution



95. The GRM will include group meetings and discussions with APs to address general and common grievances. These meetings and discussions will be announced in advance, conducted at the time of day agreed on with APs (based on their availability), and facilitated by the PMU and PMDSC at least are assisted to understand the grievance redress process, to register complaints and with follow-up actions at different stages in the process. Records will be kept by the PMU to keep track of all grievances received, both informal and formal, including contact details of complainant, date when the complaint was received, nature of grievance, agreed corrective actions and the date when these were effected, and final outcome. A Sample Grievance Registration Form is attached in Appendix 3.

96. All costs involved in resolving the complaints (meetings, consultations, communication and reporting, and information dissemination) will be borne by the PMU.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Objectives

97. This EMP sets out the needs for environmental management of transfer station improvements within the GMEIWMP in terms of institutional responsibilities to ensure mitigation and monitoring takes place during the pre-construction, construction and operation phases, meeting the requirements of the Government of the Maldives and the ADB's SPS.

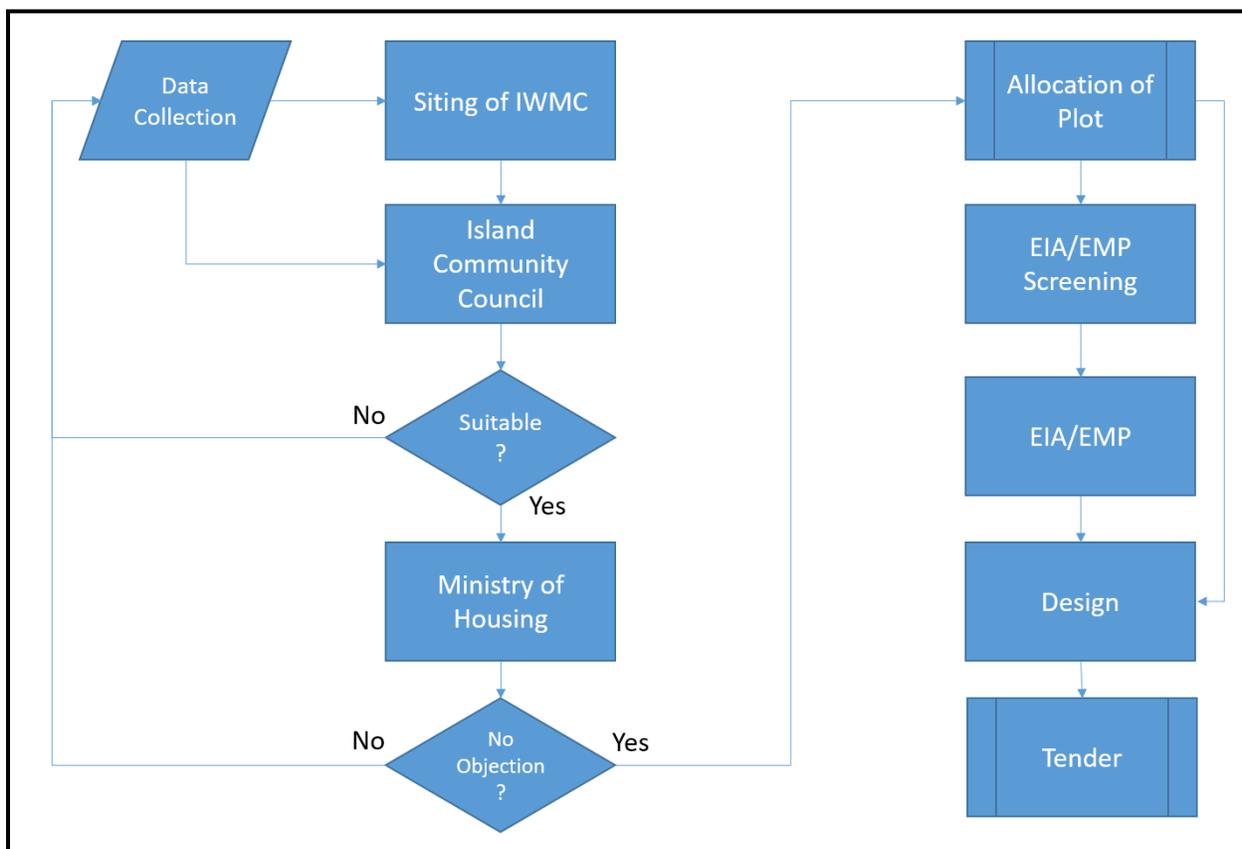
98. A copy of the EMP must be kept on work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

99. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

B. Institutional Arrangement

100. The planning, design and construction of IWMCs is set through a process that covers data collection, consultations, involvement of the island council, approvals, EIA preparation, design and tender. A flow diagram for this process is given in Figure 7. This IEE will be updated to reflect the findings of the EIA carried out as part of this process, and also detailed design.

Figure 7: Island Waste Management Centre Planning Process



Source: Ministry of Environment and Energy

101. **Implementation arrangements.** The executing agency is the Ministry of Finance and Treasury (MOFT). The implementing agency is MEE who will establish a PMU comprising officials from MEE and WAMCO. The PMU will be strengthened with external experts in the areas of finance, procurement, technical areas, contract management and safeguards. The project steering committee chaired by Minister, MEE will provide overall guidance and strategic directions to the project. Consultant firms will be recruited under the project to support engineering designs, supervision, project management, institutional capacity strengthening, and community awareness.

102. **Project Management Unit.** The Director General of the Solid Waste Department of MEE informed a dedicated full-time PMU for the ADB Zone 3 waste management project will be established (pending approval by MOFT) with eight staff as follows: (i) Project Director (part-time, Director General of Department), (ii) Project Manager (full time), (iii) Procurement Specialist, (iv) Finance Specialist, (v) Safeguard Specialist, (vi) Civil Engineer, (vii) IEC Specialist, and (viii) administrative assistant. The Project Director is a government official empowered to take official decisions, while remaining PMU staff are contracted staff recruited from the market. The PMU will be supported by consultants for project management, capacity building, monitoring, and technical design and supervision support. The proposed PMU contract staff are to be recruited competitively without further delay in phases.

103. **Terms of Reference for PMU Environment Officer.** Key tasks and responsibilities of the PMU environment officer are as follows:

- (i) confirm existing IEEs/EMPs are updated based on detailed designs, and that new IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
- (ii) confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
- (iii) provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by island councils and contractors
- (iv) establish a system to monitor environmental safeguards of the project, including monitoring the indicators set out in the monitoring plan of the EMP;
- (v) facilitate and confirm overall compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant; e. supervise and provide guidance to the island councils to properly carry out the environmental monitoring as per the EARF;
- (vi) review, monitor, and evaluate the effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken as necessary;
- (vii) consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;
- (viii) ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public.
- (ix) address any grievances brought about through the grievance redress mechanism in a timely manner\
- (x) with assistance from the PMDSC, provide orientation to PCU and PIU staff in environmental management arrangements for the project.
- (xi) provide inputs to progress reports and the project completion report.
- (xii) visit worksites during construction and provide guidance relating to supervision and compliance monitoring.
- (xiii) visit completed works and assist with establishing environmental monitoring procedures for the operation phase of the improved infrastructure.

104. **Consultants.** The PMDSC includes an environmental safeguards specialist. The PMDCSC shall (i) prepare, review and update the IEEs prepared during project preparation stage; (ii) prepare/update IEEs for Output 2 (IWMCs for 32 outer islands); (iii) ensure EMPs are included in the bid and contract documents; (iv) ensure all statutory clearances are obtained prior to award of contracts; (v) facilitate meaningful consultations and carry out disclosure of safeguard documents as necessary; (vi) monitor EMP implementation; (vii) prepare environmental and social mentoring reports; and (viii) prepare corrective action plan/s as required to ensure compliance with ADB SPS, 2009 and national laws and regulations. The consultants recruited for strengthening capacity for sustainable solid waste management in the Greater Malé region, recruited under a capacity building transaction technical assistance (TRTA) package, will provide implementation support including application of selection criteria, and environmental monitoring while support in community consultation will be provided by the PACCB consultants.

105. **Terms of Reference for PMDSC Safeguard Consultants.** The Social, Environmental and Occupational Health and Safety Expert in PMDSC will:

- (i) ensure compliance with ADB safeguard requirements.
- (ii) screen and categorize IWMCs for inclusion in the project.
- (iii) ensure no Category A subproject per ADB SPS definition

- (iv) provide guidance on safeguards and issue instructions to the Contractors.
- (v) assist in obtaining all necessary permissions and complying with statutory requirements.
- (vi) prepare necessary IEE and EMP for each IWMC that will be considered in the project.
- (vii) submit IEE and EMP to PMU for submission to ADB.
- (viii) ensure IEE and EMP is included in the bid and contract document and such items are included in BOQ.
- (ix) review the Contractor's Environmental Management Plan (CEMP) for adequacy in terms of compliance with the requirements of the EMP and instruct amendments and additions as necessary.
- (x) monitor and ensure compliance with ADB SPS and contractors' implementation of the EMPs.
- (xi) as part of the EMP, prepare a project focused Occupational Health and Safety Plan (OHS) to be adopted by the Client and the Contractor.
- (xii) ensure that relevant provisions in contracts on OHS are abided by the contractors during the construction works.
- (xiii) facilitate meaningful consultations and carry out disclosure of safeguard documents.
- (xiv) prepare environmental and social mentoring reports.
- (xv) prepare corrective action plan/s as required to ensure compliance with ADB SPS, 2009 and national laws and regulations.
- (xvi) assist in GRM implementation.
- (xvii) conduct Safeguards Orientation to contractors prior to mobilization
- (xviii) develop and conduct regular safeguards trainings (see indicative institutional capacity development program) to ensure PMU, island councils and other stakeholders have common understanding of ADB SPS requirements during all phases of project implementation.

106. **The Contractor.** The contractor will have the following roles and responsibilities:
- (i) complies with all applicable legislation, is conversant with the requirements of the EMP, and briefs staff about the requirements of same;
 - (ii) ensures any sub-contractors/ suppliers, who are utilized within the context of the contract, comply with the environmental requirements of the EMP. The Contractor will be held responsible for non-compliance on their behalf;
 - (iii) provides environmental awareness training to staff;
 - (iv) bears the costs of any damages/ compensation resulting from non-adherence to the EMP or written site instructions;
 - (v) conducts all activities in a manner that minimizes disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment;
 - (vi) ensures that its staff or engineers are informed in a timely manner of any foreseeable activities that will require input from the environment and safety officers (or equivalent);
 - (vii) appoints one full time environment and safety officer (or equivalent) for implementation of EMP, community liaising, reporting and grievance redressal on day to day basis; and
 - (viii) receives complaints/grievances from the public, immediately implements the remedial measures and reports to the PMU and PMDSC.

Figure 8: Project organizational structure

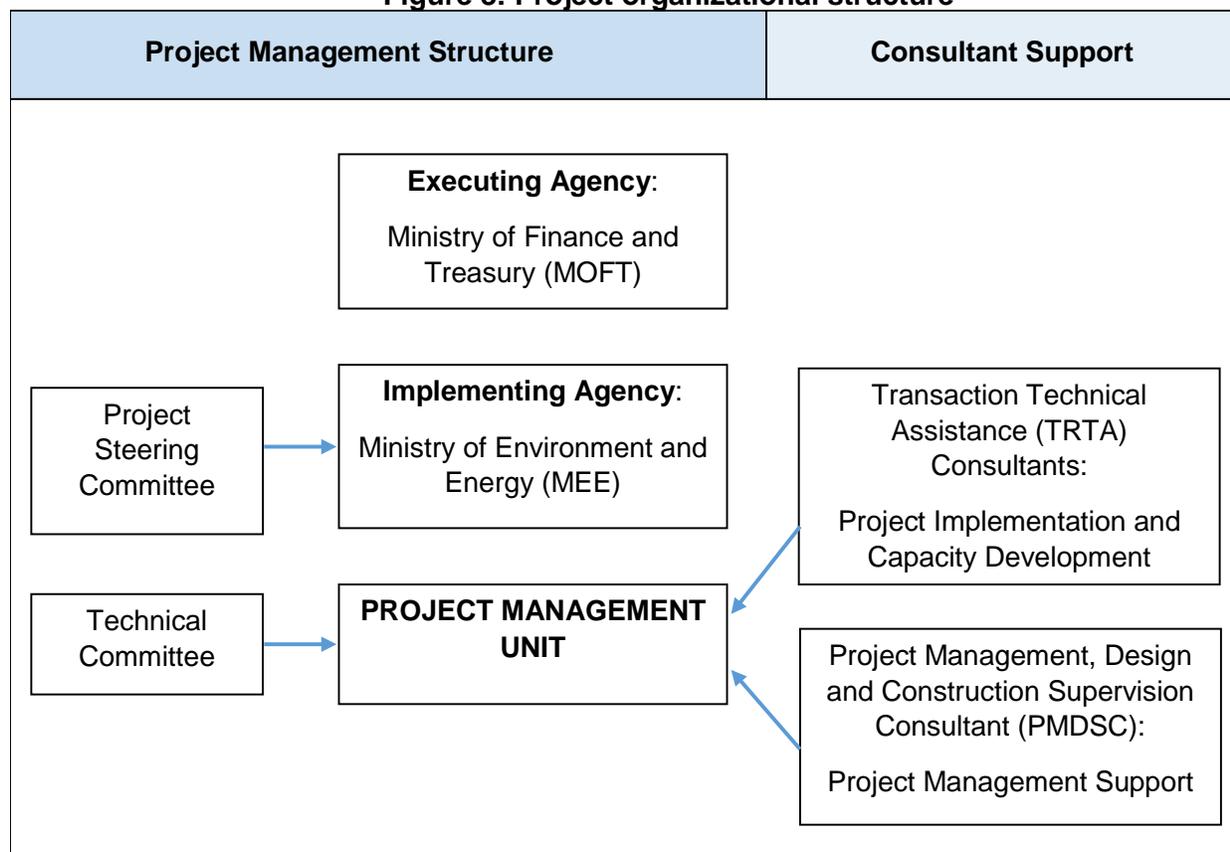


Table 5: Roles and Responsibilities of Project Implementation Organizations

Project Implementation Organizations	Management Roles and Responsibilities
Executing agency Ministry of Finance and Treasury (MOFT)	Guide and monitor overall project execution. Financial oversight. Ensure flow of funds to the implementing agency and timely availability of counterpart funding; ensure adequate budget for successful implementation of the project. Monitors compliance with project legal Agreements Procurement oversight. Responsible for approving procurement. Review and coordinate evaluation of bids for works, goods, and consultant services. Maintaining project accounts and project financial records; Review and sign withdrawal applications before submitting to Asian Development Bank (ADB). Approve project management unit (PMU).
Project steering committee [Chair: Minister, Ministry of Environment and Energy (MEE)]	Provide policy direction to facilitate project implementation. High-level troubleshooting.
Implementing agency 1 (MEE)	Meets quarterly (or as needed) to review project performance and resolve issues.
PMU in MEE	Overall day-to-day project management, monitoring, and evaluation. Responsible for overall project management, implementation and

	<p>monitoring;</p> <p>Reviews the reports submitted by (project management, design and construction supervision consultant) PMDSC with respect to detailed design, costs, safeguards, financial, economic, and social viability</p> <p>Prepare, with the support of PMDSC, bidding documents, request for proposals, and bid evaluation reports;</p> <p>Serves as point of contact with ADB, maintains project documents, and submits timely reports (quarterly progress reports and project completion report) to ADB by consolidating relevant inputs from PMDSCs and island council;</p> <p>Consolidates expenditures and prepare withdrawal applications for direct payment, reimbursements and use of imprest advance;</p> <p>Opens and manages imprest account for ADB Grant;</p> <p>Organize project orientation for participating island councils by elaborating scope of the project and sharing about their obligation and including maintaining separate accounts for their respective contributions;</p> <p>Establishment and maintaining of project website by disclosing progress reports, safeguard monitoring reports and design reports; and</p> <p>Collect supporting documents and submit withdrawal applications to ADB via MOFT.</p> <p>Monitors and ensures the compliance of covenants, particularly timely submission of audited project accounts and compliance with safeguard requirements;</p>
Technical committee	Advise and facilitate to resolve technical issues.
WAMCO	<p>Operator for collection, transport, and disposal of waste services in project area</p> <p>Manage regional waste management facilities</p>
Island Councils	<p>Operators of solid waste services on outer islands</p> <p>Responsible for management and O&M of Island Waste Management Centers</p>
ADB	<p>Conducts project review missions, midterm review mission and project completion review mission to assess project implementation progress of all outputs, compliance of grant covenants including actions required in terms of safeguards (environmental impacts and social mitigation measures applicable); timeliness of budgetary allocations and counterpart funding; project expenditures; progress with procurement and disbursement;</p> <p>Post on ADB website the updated project information documents and safeguards documents as per disclosure provision of the ADB safeguards policy statement.</p> <p>Reviews executing agency and implementing agency's submissions for procurement of goods, equipment, works and services and provides comments and no objection on the submissions</p> <p>Checks Statement of Expenditure on sampling basis</p>

C. Institutional Capacity Development Program

107. The PMU, to be established by the MEE, will be responsible for the implementation of safeguards and ensuring that they comply with ADB requirements as well as the EPPA. The body responsible for approving environmental impact assessments and issuing of permits is the Environmental Protection Agency (EPA), which is under the Ministry of Environment and

Energy.²⁸ Capacities were assessed by the PPTA consultants during interviews that took place in July and September 2017. The EPA has few trained technical staff and at the time of capacity assessment work undertaken by the PPTA consultants, all senior members of the EPA's waste department were away from the office for study, which is indicative of a low staffing resource level. The agency relies on external consultants for functions such as environmental monitoring for projects, however this is usually confined to the construction phase. The EPA does have one team of field staff a laboratory and a boat for fieldwork, but laboratory operations and travel is constrained by budget constraints. The situation is reflected in other departments of the MEE.

108. The PMDSC will provide assistance during the project for the implementation of safeguards in compliance with ADB SPS 2009 requirements and with the requirements of the EPPA. This provision responds to lessons learned for project design to include support to PMU staff in project implementation particularly in procurement, contract management, and safeguards. The PMDSC will provide assistance to the PMU for overseeing EMP implementation.

109. Besides the IEC component which includes some capacity building measures for ICs (e.g. increasing outreach of IEC, closing feedback loop), the Transaction Technical Assistance (TRTA) for Strengthening Capacity for Sustainable Solid Waste Management in the Greater Malé Region will provide both implementation and safeguard guidance and assistance towards the PMU. Since recycling is of a major concern, a market sounding will be carried out during the TRTA to increase the knowledge in this regard and to inform the institutional stakeholders (mainly MEE, WAMCO and ICs) about the potential for recycling of certain waste components.

110. Included in the capacity development for the island communities is a package to enhance the awareness and knowledge relating to solid waste management aspects and the O&M of the IWMCs which will help to facilitate a proper operation of and a well-defined input for the IWMCs (source separation of compostable fraction).

D. Impacts and Mitigation

111. Table 6 summarizes the potential impacts and mitigation measures in relation to location, construction and operation identified in the IEE.

²⁸ Note that EPA, while it comes under MEE, has a governing board which is a statutory body.

Table 5: Environmental Management Plan

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Pre-Construction Stage						
Compliance with EHS guidelines for Waste Management Facilities	Island as a whole and surrounding waters	Design to comply with EHS Guidelines for Waste Management Facilities	Compliant with PMDSC company quality control standards	PMDSC service cost	PMDSC	MOFT / MEE / ADB
Acceptance of local stakeholders	Island as a whole and surrounding waters	Meaningful consultations to be undertaken during planning and design, obtaining feedback and responding to it.	Consultations with representatives of the community undertaken in a non-coercive environment and documented.	PMU cost / PMDSC service cost	PMU / PMDSC	MOFC / MEE / ADB
Ensuring compatibility of design with updated EMP	Island as a whole and surrounding waters	Updating IEE/EMP to reflect agreed final detailed design that is responsive to feedback	Subject to peer review by PMU / PMDSC	Design cost / PMDSC service cost	PMU / PMDSC	MOFC / MEE / ADB
Effects on surrounding seawater and marine ecosystems	Sea surrounding the IWMC	(i) Ensuring that waste enters and leaves the IWMC on the landward side of the facility; (ii) detailed design to include both a system for collecting and containing leachate from piled household waste awaiting collection and from composting; and (iii) site security and management to be ensured by the island council. The feasibility of bioremediation of runoff and leachate is to be assessed during the design phase. The measures must ensure no deterioration of water quality in the vicinity of the IWMC.	Each item to be addressed in detailed design	Project funds	D&B designer	MEE

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Odor and attraction to pests	Nearest residential area	(i) Ensuring security, regular cleaning operations and maintenance takes place; and (ii) planning of further developments of the reclaimed land such that receptors such as dwellings are not placed close to the facility, and preferably separated by a belt of trees or open space.	Inclusion of regular O&M tasks in job descriptions and implementing them. Plans for further developments on the reclaimed land to address the need for separation from the facility	Island council	Island council / planners	MEE
Planning for construction stage mitigation	Island as a whole and surrounding waters	Preparation of a Contractor's Environmental Management Plan detailing methods of complying with EMP (Note: to include identification of sensitive receptors including households potentially affected by noise, odor and dust)	Approval by PMDSC	Construction Cost	Contractor	PMDSC
Construction stage impacts						
Air and noise pollution, and vibration	Nearest residential area	(i) providing information on operations; (ii) limiting construction activities to daylight hours; (iii) adhering to schedule; (iv) maintaining construction equipment and vehicles in good operable order; and (v) gathering baseline data for noise level and ambient air quality within the project vicinity.	No complaints registered via the GRM in respect of noise and vibration, or any such complaints addressed	Construction Cost	Contractor	PMDSC

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Construction waste	IWMC area	(i) All solid waste must be disposed of at the RWMF/Thilafushi; and (ii) importation of any materials rated as hazardous under the Globally Harmonized System of Classification and Labelling of Chemicals to be subject to approval by PMDSC, which will be conditional on stating adequate arrangements for disposal.	Site free of construction waste on commissioning. Written PMDSC approval available for any hazardous chemical in use	Construction Cost	Contractor	PMDSC
Release of silt	IWMC construction site	(i) Excavated areas to be rapidly refilled on completion of works; (ii) use of silt fences around temporary piles of excavated material; and (iii) avoid excavation in wet weather to the extent practicable.	No instances when silt release is uncontrolled	Construction Cost	Contractor	PMDSC

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Water pollution	IWMC construction site	(i) vehicles and plant are to be maintained in sound operable condition, free of leaks. The condition of vehicles and equipment will be periodically checked; (ii) prepare and submit a plan for spill management, including provision of spill kits, training/briefing of workers on procedures on handling spills and allocation of responsibility within the contractor's team for ensuring that spill kits are available and that workers know how to use them; and (iii) gather baseline data on water quality on all bodies of water (inland, marine, and groundwater) around the project vicinity.	Vehicles to have at all times at a minimum: (i) intact and securely fitted exhaust pipes and mufflers (ii) operable brakes (iii) no fuel or lubricant leaks	Construction Cost	Contractor	PMDSC
Community health and safety hazards	IWMC construction site and immediate surrounds	(i) Restriction of access to work site; (ii) warning notices to the public on hazards; and (iii) barriers when warranted. Contractors to adopt the World Bank EHS Guidelines on Community Health and Safety, particularly those that relate to construction works.	Barriers and notices to be in place at all times	Construction Cost	Contractor	PMDSC

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Occupational health and safety hazards	IWMC construction site	(i) Contractors to appoint health and safety officers for each site and to ensure regular briefing of construction workforce on health and safety issues. (ii) Adequate personal protective equipment to be provided to the workforce. Contractors to adopt the World Bank EHS Guidelines on OHS, particularly those that relate to construction works.	Member of the Contractor's staff nominated as health and safety officer to be present on site. Appropriate protective equipment to each construction operation to be worn at all times (including steel toe capped boots at all times, hard hats when working near machinery or roofing work, eye protection for welding)	Construction Cost	Contractor	PMDSC
Impacts During Operation						
Risks of loss of containers and contents	Dock area	O&M training to include instruction on maintenance of containers, loaders, cranes and vessels and sound operation including licensing of vehicle and plant operators and restrictions on operation during stormy weather	Corrective action to be taken in the event of any instance involving dropping or breaking of containers or loss overboard.	Training budget	Implementation consultants / Contractor	MEE
Pests: Rodents and birds	IWMC area	Maintenance of site cleanliness, minimizing storage time for putrescible waste, provision of enclosures for putrescible waste.	Inclusion of regular O&M tasks in job descriptions and implementing them. Plans for further developments on the reclaimed land to address the need for separation from the facility	Operation Cost	Island council	MEE

Impacts	Location	Mitigation Measures	Performance Standard	Source of Funds	Responsibility for Implementation	Responsibility for Supervision
Operator occupational health and safety	IWMC and dock area	(i) Operators trained to recognize risks and hazards. (ii) Personal safety equipment issued and worn. (iii) Health and safety recognized as primary employer responsibility. Contractors to adopt the World Bank EHS Guidelines on OHS for SWM projects/Waste Management Facilities.	Allocation of responsibility for safety standards to a full time member of staff. Appropriate protective equipment to each construction operation to be worn at all times (including steel toe capped boots at all times, face masks when handling compost)	Operation Cost	Implementation consultants / Contractor Island council	MEE
Community Health and safety issues	IWMC and surrounding area	(i) Inclusion of perimeter fence and gate in the design. (ii) Restriction of entry to workers and authorized personnel. (iii) Exclusion of burning (iv) Maintenance of site hygiene to deter pests.	Perimeter fence intact and site secure at all times No burning whatsoever	Operation Cost	Island Council	MEE

EHS = Bank Environmental, Health and Safety, IWMC = island waste management centre, MEE = Ministry of Environment and Energy, OHS = occupational health and safety, PMDSC = project management and design supervision consultant, SWM = solid waste management.

E. Environmental Monitoring

1. Monitoring Plan

112. The design of the environmental monitoring system is based on an analysis of the key environmental performance issues associated with each stage of the project, set out in Table 7 below.

Table 6: Analysis of Environmental Monitoring Needs

Phase	Key Environmental Performance Issues	Environmental Performance Indicator	Means of Monitoring
Design/ Preconstruction	Inclusion of mitigation measures in design/build and/or detailed design documentation and construction activities	Compliance with environmental management plan (EMP) design measures	Compliance monitoring
Construction	Adherence to provisions in the EMP to mitigate construction impacts	Compliance with EMP	Compliance monitoring
	Direct effects on communities from impacts such as accidental damage, dust generation, noise generation and safety	Views and opinions of communities Contractor's records relating to minor and major pollution and health and safety incidents (with a target of zero incidents)	Community feedback Grievance redress mechanism
Operation	Effectiveness of island waste management centre, collection system and removal to regional waste management facility (RWMF)	Cessation of practice of burning of waste, regular removal to RWMF, limited odor, effective pest control	Site observations Community feedback

113. Two areas of environmental monitoring are identified: compliance monitoring and community feedback, which are in addition to monitoring measures in the Design and Monitoring Framework for the project. These provide a means of gauging whether the stations operate more efficiently and with less loss of waste into the sea.

114. Compliance monitoring is required during detailed design and construction of the transfer station facilities, to ensure that mitigation specified in the EMP is carried out to an adequate standard. Compliance monitoring is a function of the PMU and its cost of this monitoring is part of the running cost of the PMU.

115. Community feedback provides for the monitoring of environmental indicators gauged by public perception. Appropriate indicators are:

- (i) Reduced incidence of nuisance of smoke from burning waste
- (ii) Clean area surrounding the IWMC
- (iii) Effectiveness of waste handling (regular collection and removal to RWMF)

116. Costs of environmental assessment and monitoring during construction are project costs. Environmental monitoring during operation is carried out by the island council, and costs will be met from O&M budgets prepared and managed by the island council.

Table 7: Environmental Monitoring Plan

Impact to be Monitored	Means of Monitoring	Construction Phase			Operation Phase		
		Frequency	Responsible Agency	Indicative Annual Cost	Frequency	Responsible Agency	Indicative Annual Cost
General Construction Impacts	Community Feedback	To be established by PMDSC	PMU	Included in project management and consultancy cost	To be established by PMDSC	Island Council	Operational Cost
Compliance with EMP	Inspections	As set up by supervising engineers	PMU / PMDSC	Included in project management and consultancy cost	To be established by PMDSC	Island Council	Operational Cost
Occurrence of floating waste	Community Feedback	To be established by PMDSC	PIU	To be determined in design ICT component of Project 1	To be established by PMDSC	Island Council	Operational Cost

EMP = environmental management plan, ICT = information and communications technology, PIU = project implementing unit, PMDSC = project management and design supervision consultant, PMU = project management unit.

2. Reporting

117. EMP compliance monitoring will be undertaken by the PMU, with support of the PMDSC. Effects will be monitored by means of community feedback and laboratory testing. Consistent with reporting requirements set out in the Project Administration Manual (PAM), PMU will prepare reports to be sent to ADB on a semi-annual basis (suggested outline is attached as Appendix 4). Semi-annual reporting to ADB shall be from construction phase to operation phase when ADB issues a project completion report. To facilitate monitoring and enable responses to emerging issues, monthly reports will be prepared by the PMU.

X. CONCLUSION

118. The overall finding of the IEE is that the Project will result in significant environmental benefits, as it is conceived and designed to address major environmental issues associated with existing difficulties in waste handling and transfer and the rapidly growing volumes of waste that are projected in coming decades. It will not have significant adverse environmental impacts and potential adverse impacts are manageable through the effective implementation of the EMP.

119. The classification of Category B is confirmed. No further environmental assessment is therefore required. However, this IEE will be finalized based on the final detailed design and this classification shall be reassessed or reconfirmed accordingly.

Criteria for Planning and Design for Subprojects

Criteria	Remarks
Pre-requisites	
(i) No subproject scope will include features that appear on schedule D of the EIA regulations (2007, updated 2012) (List of Development Proposals Requiring an Environmental Impact Assessment Study)	Development proposals on Schedule D of the EIA regulations related to solid waste management are landfills, incinerators and large scale waste storage and separation facilities.
(ii) A IEE and EMP must be prepared for each subproject, which must comply with EHS Guidelines on Waste Management Facilities	PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.
(iii) Sites must not have any land acquisition or significant involuntary resettlement and social safeguard issues.	Verify land ownership records. Prepare Due Diligence Report following the Resettlement Framework prepared for the
(iv) Any new facility must not be sited in an environmentally sensitive area, including all areas within 30m of the shoreline, or within 30m of areas such as thickly vegetated areas that are known to be habitats for bird species of conservation value	<p>The 30m distance should be exceeded where possible. The restriction may be reviewed depending on site availability and stakeholder consultation, and provision of design measures to prevent release of leachate into the sea or onto the vegetated area in the event of the capacity of the leachate collection tank being exceeded.</p> <p>On the island of Huraa, where space is restricted and there is a wetland which is a protected area, special attention must be paid to the size of the IWMC leachate collection tank and provisions to contain leachate overflow during storm events.</p>
(v) No new facility to be sited within 500m of areas of cultural significance, such as ancient religious artifacts	<p>Verification, through consulting island councils and the Ministry of Education²⁹, that no physical cultural heritage sites are situated within 500m of the IWMC site. The restriction may be reviewed on the basis of site availability and consultation with stakeholders. PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.</p> <p>Provide for use of “chance find” procedures in the EMP, such that any artifacts are preserved for future generations</p>
(vi) Sites must have sufficient capacity to contain or handle volumes of waste projected to be generated over at least a 20 year planning horizon	To be assessed based on projections on growth in waste generation for each island
(vii) Sites must be at least 100m from residences, schools, clinics or mosques	The distance restriction may be reviewed depending on site availability and stakeholder consultation. PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.
(viii) Sites must be least 100m from groundwater wells	The 100m limit is precautionary, however attention must be given in detailed design to

²⁹ Management of the arts and culture sector is currently under the Ministry of Education

		ensure that the leachate collection tank is protected to exclude flood waters, including during storm situations, to ensure that leachate does not enter the groundwater lens. PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.
(ix)	Sites must not intersect with power lines, water supply pipelines or sewer lines	Where these lie across proposed sites, they must be re-aligned to avoid the site
(x)	For initiatives that require the use of machinery such as shredders and presses, there must be established access to technical expertise for servicing and spare parts must be regularly available in-country	
(xi)	Consensus from island communities on proposed improvements.	Records of public consultations, issues raised, and measures taken to address them to be summarized in IEEs. These consultations shall ensure consultees include women as well as men.
(xii)	No other work, including road, pipeline, or power line improvements are planned at or near the proposed site	Island council to confirm. If such sites are planned, details must be taken account of in design to ensure adequate separation of the infrastructure
(xiii)	World Bank Group's Environmental, Health and Safety (EHS) Guidelines requires IWMCs to consider standard design of 110% volume and banded for impermeable storage to avoid contaminated runoff entering the surface or groundwater.	Final detailed design to confirm capacity is 110% and banded
Preferable		
(i)	Where IWMCs exist, any improvements should be to the existing infrastructure, rather than replacement on new sites.	New sites may be necessary if existing site has become unsuitable due to new developments around it or there is objection from communities to rehabilitate the existing IWMCs.
(ii)	Removal of trees to be avoided where possible.	When mature trees (of diameter at breast height of 40cm or greater) must be removed, new trees must be planted of a number and species agreed with the island community
(iii)	Where composting facilities are to be introduced or expanded, a high level of commitment from the community should be evident to ensure both cooperation in ensuring that waste to be composed is not contaminated and that compost will be purchased or used.	Evidence of commitment from the island community should be obtained, for example signed minutes from a public meeting, or signatures from household heads.

Rapid Environmental Assessment Checklist

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

MLD: Greater Malé Environmental Improvement and Waste Management Project :
Thulusdhoo Island Waste Management Center Subproject

Sector Division:

SAUW

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area...			
▪ Densely populated?		✓	Thulusdhoo island population is 1,400. Thulusdhoo Island is located just 28 km north of Male. It is the capital of Kaafu Atoll.
▪ Heavy with development activities?		✓	Thulusdhoo has an extensive area of newly reclaimed land. The size of Thulusdhoo is 700 x 400 meters. Thulusdhoo industrial sector is quite varied, it includes factories for tuna drying and sea cucumber drying and boat building workshops. A Coca-Cola factory, which was built in the 80s, is considered to be the heart of the island. Because of this factory the island is sometimes called Coke's Island. There are 8 guest houses on the island.
▪ Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site		✓	
• Protected Area		✓	
• Wetland		✓	
• Mangrove		✓	
• Estuarine		✓	
• Buffer zone of protected area		✓	
• Special area for protecting biodiversity		✓	
• Bay		✓	The island is included in Kaafu Atoll.
B. Potential Environmental Impacts Will the Project cause...			

<ul style="list-style-type: none"> ▪ impacts associated with transport of wastes to the disposal site or treatment facility 	✓		IWMC will consist of concrete platforms, small covered sheds, segregated waste processing and storage areas, small office, and fencing. Output 2 of the Project will ensure island council will have the capacity to manage SWM.
<ul style="list-style-type: none"> ▪ impairment of historical/cultural monuments/areas and loss/damage to these sites? 		✓	Not anticipated. There are no historical and cultural monuments at the subproject site.
<ul style="list-style-type: none"> ▪ degradation of aesthetic and property value loss? 		✓	The subproject will improve land aesthetics because of improved waste management infrastructure.
<ul style="list-style-type: none"> ▪ nuisance to neighboring areas due to foul odor and influx of insects, rodents, etc.? 	✓		Likely. However, the EMP ensures good housekeeping and site management measures are included to mitigate the impacts at subproject site.
<ul style="list-style-type: none"> ▪ dislocation or involuntary resettlement of people? 		✓	Not anticipated. All lands to be used for all subprojects are owned by the government and there are no APs in the land.
<ul style="list-style-type: none"> ▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups? 		✓	The project will benefit all sectors in the subproject areas.
<ul style="list-style-type: none"> ▪ risks and vulnerabilities related occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation? 	✓		OHS risks are inherent to construction activities. However, these risks can be reduced through implementation of good construction practices and adoption of internationally recognized OHS measures such as the WB EHS guidelines on OHS on construction activities and SWM operations. These are included in the EMP.
<ul style="list-style-type: none"> ▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, insects, birds and rats? 	✓		Likely, though these will be reduced through improved management associated with the IWMC which is expected to replace haphazard dumping and open burning of waste. Further, the EMP ensures good housekeeping and site management measures are included to mitigate the impacts at all subproject sites.
<ul style="list-style-type: none"> ▪ deterioration of water quality as a result of contamination of receiving waters by leachate from land disposal system? 		✓	Not applicable. The subproject will not include any land disposal system.
<ul style="list-style-type: none"> ▪ contamination of ground and/or surface water by leachate from land disposal system? 		✓	Not applicable. The subproject will not include any land disposal system.
<ul style="list-style-type: none"> ▪ land use conflicts? 		✓	Not anticipated. All lands to be used for all subprojects are owned by the government.
<ul style="list-style-type: none"> ▪ pollution of surface and ground water from leachate coming from sanitary landfill sites or methane gas produced from decomposition of solid wastes in the absence of air, which could enter the aquifer or escape through soil fissures at places far from the landfill site? 		✓	Not applicable. The subproject will not include any landfill facility.
<ul style="list-style-type: none"> ▪ inadequate buffer zone around landfill site to alleviate nuisances? 		✓	Not applicable. The subproject will not include any landfill facility. However the IWMC design includes buffer zone.
<ul style="list-style-type: none"> ▪ road blocking and/or increased traffic during construction of facilities? 		✓	Not anticipated. Volume of traffic in the island is very low.

<ul style="list-style-type: none"> ▪ noise and dust from construction activities? 	✓		<p>Few receptors in vicinity, high ambient noise levels and winds. Impact of noise can be avoided by undertaking activities during day time when background noise is high. Night time works is not expected. Noise-suppression gadgets may also be used.</p> <p>Dust emission can be avoided with the implementation of dust control measures such as sprinkling of water on sites. No significant volumes of spoil will be generated.</p>
<ul style="list-style-type: none"> ▪ temporary silt runoff due to construction? 	✓		<p>Run-off during construction will be more. However, impacts are temporary and short in duration. The EMP ensures measures are included to mitigate the impacts. Construction contractors will be prohibited from stockpiling loose materials along drain channels and will be required to immediately dispose any waste materials. Silt fences and traps to be used.</p>
<ul style="list-style-type: none"> ▪ hazards to public health due to inadequate management of landfill site caused by inadequate institutional and financial capabilities for the management of the landfill operation? 		✓	<p>Not applicable. The subproject will not include any landfill facilities.</p>
<ul style="list-style-type: none"> ▪ emission of potentially toxic volatile organics from land disposal site? 		✓	<p>Not applicable. The subproject will not include any landfill facilities. However, the IWMC design includes leachate collection and management.</p>
<ul style="list-style-type: none"> ▪ surface and ground water pollution from leachate and methane gas migration? 		✓	<p>Not applicable. The subproject will not include any landfill facilities. However, the IWMC design includes leachate collection and management.</p>
<ul style="list-style-type: none"> ▪ loss of deep-rooted vegetation (e.g. trees) from landfill gas? 		✓	<p>Not applicable. No trees will be cut.</p>
<ul style="list-style-type: none"> ▪ explosion of toxic response from accumulated landfill gas in buildings?. 		✓	<p>Not applicable. Landfill gas is not expected to be generated based on the quantity and type of waste. IWMC will not include landfill facility. Wastes will be disposed in Thilafushi facilities.</p>
<ul style="list-style-type: none"> ▪ contamination of air quality from incineration? 		✓	<p>Not applicable. The subproject will not cover incineration.</p>
<ul style="list-style-type: none"> ▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, rodents, insects and birds, etc.? 	✓		<p>Limited public access; reduced exposure of pests to waste</p> <p>The operation of the IWMC will ensure community health hazards are avoided with the adoption of WB EHS guidelines on SWM as indicated in the EMP.</p>
<ul style="list-style-type: none"> ▪ health and safety hazards to workers from toxic gases and hazardous materials in the site? 	✓		<p>The EMP ensures occupational health and safety measures are included following relevant WB EHS guidelines. Chemicals other than vehicle fuels will not be used during construction and operation activities. Fuels will be stored and handled properly as per EMP.</p>
<ul style="list-style-type: none"> ▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 		✓	<p>No significant increase in population of workers from overseas or off-island.</p> <p>Population influx due to project construction and operation is minimal. Labor requirements will be sourced locally.</p> <p>Priority in employment will be given to local residents. Construction contractors will be required to provide workers camp with water supply and sanitation.</p>
<ul style="list-style-type: none"> ▪ social conflicts if workers from other regions or countries are hired? 		✓	<p>Labor requirements will sourced locally.</p>

<ul style="list-style-type: none"> risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation? 	✓		The EMP ensures community health and safety measures are included following relevant WB EHS guidelines on waste management. Chemicals other than vehicle fuels will not be used during construction and operation activities. Fuels will be stored and handled properly following WB EHS guidelines as included in the EMP.
<ul style="list-style-type: none"> community safety risks due to both accidental and natural hazards, especially where the structural elements or components (e.g., landfill or incinerator) of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning? 	✓		During construction and operation of IWMC, community health and safety risks will be managed by adopting the WB EHS guidelines as indicated in the EMP.

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Greater Malé Environmental Improvement and Waste Management Project

Sector : Waste Management

Subsector: Water and urban infrastructure and services

Division/Department: South Asia Department / Urban Development and Water Division

Screening Questions		Score	Remarks ³⁰
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	1	The site is expected to be close to the shoreline
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	1	Sea level rise and peak tide levels need to be considered in design
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	1	

³⁰ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): Medium Risk

Other

Comments: _____

Prepared by: Ninette Pajarillaga

Grievance Redress Mechanism Complaint Form

(To be available in local language, if any)

The Greater Malé Environmental Improvement and Waste Management Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing ***(CONFIDENTIAL)*** above your name. Thank you.

Date		Place of registration			
Contact Information/Personal Details					
Name		Gender	Male Female	Age	
Home Address					
Village / Town					
District					
Phone no.					
E-mail					
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below: If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
If – then mode:	
<input type="checkbox"/> Note/Letter <input type="checkbox"/> E-mail <input type="checkbox"/> Verbal/Telephonic	
Reviewed by: (Names/Positions of Official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Means of Disclosure:	

GRIVENCES RECORD AND ACTION TAKEN

Sr. No.	Date	Name and Contact No. of Complainer	Type of Complain	Place	Status of Redress	Remarks

Template for Semi-Annual Environmental Monitoring Report

Introduction

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number	Roles
1. PMU				
2. PIUs				
3. Consultants				

- Overall project and sub-project progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/List of Works	Contract Status (specify if under bidding or contract awarded)	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M) ³¹	If On-going Construction	
				%Physical Progress	Expected Completion Date

³¹ If on-going construction, include %physical progress and expected date of completion

Compliance status with National/State/Local statutory environmental requirements³²

Package No.	Subproject Name	Statutory Environmental Requirements ³³	Status of Compliance ³⁴	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish ³⁵

Compliance status with environmental loan covenants

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

Compliance status with the environmental management plan (refer to EMP Tables in APPROVED IEE/S)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise IEE Documentation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
	Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		

³² All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.

³³ Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)

³⁴ Specify if obtained, submitted and awaiting approval, application not yet submitted

³⁵ Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.

- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.

Package-wise Contractor/s' Nodal Persons for Environmental Safeguards

Package Name	Contractor	Nodal Person	Email Address	Contact Number

- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

Summary of Environmental Monitoring Activities (for the Reporting Period)³⁶

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

³⁶ Attach Laboratory Results and Sampling Map/Locations

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

Approach and methodology for environmental monitoring of the project

- Briefly describe the approach and methodology used for environmental monitoring of each sub-project.

Monitoring of environmental IMPACTS on PROJECT SURROUNDINGS (ambient air, water quality and noise levels)

- Discuss the general condition of surroundings at the project site, with consideration of the following, whichever are applicable:
 - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
 - Identify if muddy water is escaping site boundaries or if muddy tracks are seen on adjacent roads.
 - Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these are intact following heavy rain;
 - Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area in the Appendix.
 - Confirm spill kits on site and site procedure for handling emergencies.
 - Identify any chemical stored on site and provide information on storage condition. Attach photograph.
 - Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
 - Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
 - Provide information on barricades, signages, and on-site boards. Provide photographs in the Appendix.
 - Indicate if there are any activities being under taken out of working hours and how that is being managed.
- Briefly discuss the basis for environmental parameters monitoring.
- Indicate type of environmental parameters to be monitored and identify the location.
- Indicate the method of monitoring and equipment used.

- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements.

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Monitoring Results)

			Day Time	Night Time

Grievance Redress Mechanism

- Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

Complaints Received during the Reporting Period

- Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors
- Others

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
 Contract Number

NAME: _____ DATE: _____
 TITLE: _____ DMA: _____
 LOCATION: _____ GROUP: _____

WEATHER CONDITION:

INITIAL _____ SITE _____ CONDITION: _____

CONCLUDING SITE CONDITION:
 Satisfactory ____ Unsatisfactory ____ Incident ____ Resolved ____ Unresolved ____

INCIDENT:
 Nature of incident:

Intervention Steps:

Incident Issues

Resolution	Project Activity Stage	Survey	
		Design	
		Implementation	
		Pre-Commissioning	
		Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes No

Signature

Sign off

Environmental Assessment and Review Framework

Document Stage: Draft
Project Number: 51077-002
March 2018

MLD: Greater Malé Environmental Improvement and Waste Management Project

Prepared by the Ministry of Environment and Energy of the Republic of Maldives for the Asian Development Bank.

ABBREVIATIONS

3R	-	reduce, reuse and recycle [solid waste]
ADB	-	Asian Development Bank
CW	-	civil works
DBI	-	design, build install
EIA	-	environmental impact assessment
EMP	-	environmental management plan
ESCAP	-	United Nations Economic and Social Commission for Asia and the Pacific
GRM	-	grievance redress mechanism
IEC	-	Information education and communication
IWMC	-	Island Waste Management Centre
MEE	-	Ministry of Environment and Energy
NGO	-	nongovernment organization
O&M	-	operation and maintenance
PAM	-	Program Administration Manual
PCU	-	Project Coordination Unit
PIA	-	Project Implementation Assistance
PMDSC	-	Project Management, Design and Construction Supervision Consultants
RWMF	-	Regional Waste Management Facility
SAARC	-	South Asian Association for Regional Cooperation
SACEP	-	South Asia Co-operative Environment Programme
UNCLOS	-	United Nations Convention on the Law of the Sea
WAMCO	-	Waste Management Corporation Limited

NOTES

- (i) In this report, "\$" refers to US dollars.

This environmental assessment and review framework is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

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I. INTRODUCTION

A. Overview of the Project

1. The Greater Malé Environmental Improvement and Waste Management Project (the project) will establish a sustainable regional solid waste management (SWM) system in Greater Malé by (i) improving collection, transfer, disposal, treatment, recycling, and dumpsite rehabilitation; (ii) strengthening institutional capacities for solid waste services delivery and environmental monitoring; and (iii) improving public awareness and behaviors in reduce-reuse-recycle (3R).¹ The project will be designed to reduce disaster risk and improve climate change resilience while creating a cleaner environment and reducing greenhouse gas emissions.

B. Rationale

2. The Greater Malé capital region (classified as Zone 3 in the National Solid Waste Management Policy and the most populated in the country),² suffers from severe environmental pollution and deteriorating livability due to inadequate collection and haphazard disposal of solid waste. Open dumping and burning of garbage at the 30-year-old 10-hectare dumpsite on Thilafushi Island (6 km from Malé) creates a significant environmental and public health hazard. Plumes of smoke visible from the capital city Malé, the international airport, and surrounding resorts compromise air quality and pose a daily nuisance to residents and tourists, while toxic leachate contaminates soil and groundwater. Greater Malé and its 32 inhabited outer islands lack an organized and sustainable waste management system for the 774 tons of mixed solid waste generated per day (tpd).³ With rapid urbanization and tourism development in the region, waste generation is expected to grow to 924 tpd by 2022. This increasing pressure on an already stressed waste management system poses a significant threat to tourism and fisheries, both of which rely heavily on the country's pristine environment and are cornerstones to the Maldives economy.⁴ Poor communities in outer islands suffer from accumulated garbage with limited awareness and capacity to effectively manage solid waste.

3. **Existing waste collection, transfer, and disposal system.** High population density and narrow streets present unique challenges for waste collection in Malé. Waste collection is operated by the Waste Management Corporation Limited (WAMCO), a state-owned operator created in 2015 to collect and transport waste and manage the regional waste management facilities throughout the country.⁵ WAMCO has limited professional experience in modern and efficient waste collection systems. The lack of technical and managerial skills is a key issue affecting sector performance.⁶ While WAMCO is trying various initiatives to improve collection,

¹ ADB. 2016. *Country Operations Business Plan: Maldives, 2017–2019*. Manila. The project is confirmed via letter dated 17 July 2016.

² The National Solid Waste Management Policy (2015) divided the country into 7 regional waste management zones (map) each with a regional waste management facility and system for safe transfer to those facilities.

³ Breakdown of solid waste by type: household = 149 tpd (19%), commercial = 27 tpd (3%), resort = 48 tpd (6%), C&D = 530 tpd (68%), market = 2.5 tpd (0.3%), airport = 9.3 tpd (0.3%), hazardous = 1.5 (0.2%), end of life vehicles = 0.65 tpd (0.1%), industrial = 6 tpd (0.8%). Waste composition: organic (53%), paper and cardboard (12%), plastic (11%), hazardous (medical) waste (8%), metal (3%), glass (3%), and others (11%). Source: *Project Feasibility Study final report (2017)*.

⁴ Tourism and fisheries account for a quarter of total employment in the country (2014 Census). Tourism being the most rapidly expanding industry and being the highest contributing sector to the Maldivian gross domestic product.

⁵ WAMCO does not operate collection within the outer islands. This is the responsibility of island councils.

⁶ Current collection coverage is estimated to be 89% in Malé, 89% in ViliMalé, and 84% Hulhumalé though highly inefficient resulting in waste piles.

the company received nearly 150 complaints per day (as of September 2017) on its hotline mostly related to non-collection. Collection equipment includes a fleet of aging vehicles unable to access narrow streets. There are no uniform refuse bins or formal transfer stations. Waste is transported to Thilafushi Island in open non-containerized vessels resulting in significant spillage into the ocean.⁷ Since 2008, fires have been deliberately set at the dumpsite to reduce growing mounds. On-site equipment and poor site logistics are severely inadequate to efficiently manage incoming waste and maximize use of limited space. There is no separate collection and processing of construction and demolition waste (CDW) and end-of-life vehicles (ELV).⁸ Household surveys in the project area show a high demand for 3R awareness and education programs.⁹

C. Impact and Outcome

4. The project is aligned with the following impact: a healthy living environment created in the Greater Malé capital region and its outer islands. The project will have the following outcome: climate and disaster resilient SWM services improved.¹⁰

D. Outputs

5. The project will have three outputs.

6. **Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient.** This will include (i) an efficient waste collection strategy designed and applied in Malé and Hulhumalé in consultation with local communities targeting women; (ii) waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhumalé and Villimalé provided; (iii) transfer stations in Malé and Villimalé constructed and transfer station in Hulhumalé designed; (iv) CDW processing plant and ELV dismantling workshop constructed; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) 3 vessels for waste transport from outer islands to Thilafushi provided; (vii) heavy equipment (bulldozers, excavators, roll trucks) for controlled dumpsite management at Thilafushi provided; and (viii) construction of 2 administrative buildings for WAMCO at Malé transfer station and Thilafushi waste vessel harbor. All facilities designed will consider climate change and disaster resilient features.

7. **Output 2: Community-based outer island waste management systems targeting poor and women enhanced.**¹¹ This output will provide comprehensive support to strengthen sustainable solid waste management in poor outer island communities. It includes (i) a minimum of 22 island waste management centers (IWMCs) with processing equipment (balers, glass crushers, metal presses) developed or upgraded in consultation with community targeting women and incorporating climate and disaster risk measures;¹² (ii) collection equipment for outer islands (bins, refuse collection vehicles, dump trucks) provided; (iii) capacity building of eligible island councils targeting women in waste collection, segregation, composting, recycling, and O&M; and (iv) community awareness and behavior change campaigns in 3R targeting women in outer islands delivered. As subprojects under Output 2 will be prepared after Board approval, each

⁷ Government of Maldives, Ministry of Environment and Energy. 2016. *State of the Environment*. Malé.

⁸ The project will extend the life of the existing dumpsite in the medium term (8-11 years).

⁹ Around half of TRTA household survey respondents highlighted increasing awareness and education is important. ADB. 2017. *TA-9327. Socioeconomic survey for Preparing the Greater Malé Environmental Improvement and Waste Management Project*. Manila

¹⁰ The design and monitoring framework is in Appendix 1.

¹¹ There are 32 outer islands in the project area eligible for support under Output 2.

¹² Out of 32 outer islands, some have existing facilities but are not operational due to inadequate design and insufficient equipment which would be upgraded under the project.

island is required to meet minimum eligibility and selection criteria, including safeguards, to receive support from the project.¹³ The criteria is intended to ensure sustainability and is outlined in the Project Administration Manual (PAM).¹⁴ Output 2 will be partially funded by a Trust Fund grant focusing on poverty reduction, which will support islands in the following areas:¹⁵ (i) IWMCs constructed in a minimum of 11 eligible islands, (ii) skills and capacity building in eligible islands targeting women provided, and (iii) awareness campaigns in 3R delivered in all outer islands.¹⁶

8. Output 3: Institutional capacity and public awareness in sustainable waste management strengthened. This will include (i) capacity building support to eligible WAMCO staff (including all eligible women staff) in waste collection, controlled dumpsite management, strategic and financial planning (tariffs, diversified revenue stream), and disaster risk management provided;¹⁷ (ii) a recycling market study conducted;¹⁸ (iii) public awareness and behavior change campaigns in 3R targeting the poor and women in Greater Malé delivered;¹⁹ and (iv) project management, design, and supervision consultant support provided.

E. Purpose of the Environmental Assessment and Review Framework

9. This EARF provides guidance the preparation of initial environmental examinations (IEEs), incorporating environmental management plans (EMPs) and review for the construction and commissioning of IWMCs for the 32 islands in Zone 3, in order to meet ADB requirements, and the requirements of the Ministry of Environment and Energy (MEE).

10. On most of the islands, waste disposal practices are at present inadequate, with waste being dumped in a haphazard fashion, and/or burned. While most islands have a designated dumpsite, much waste is dumped on the beach, or burned next to the homes, or buried. Some waste is collected by community groups or private entities (engaged by island councils), but often the waste placed for collection is in loose piles or various non-standard receptacles. Waste is brought to dumpsites by a combination of pushcarts, wheelbarrows or vehicles on some islands.

11. Several of the islands have existing waste management centers, some of which are abandoned, some sub-optimally used. IWMCs are being progressively constructed in zone 3, but with slow progress. Many of the existing IWMCs are “first generation” ones, which have various deficiencies including being too small, poorly sited, difficult to access by vehicle, inadequate storage capacity and no administration facilities). The IWMCs are essentially fenced enclosures with a concrete platform for composting, and concrete or masonry wall boxes inside a steel shed for storage of sorted fractions. Some are equipped variously with balers, glass crushers, metal can crushers and chippers.

¹³ All 32 outer islands will be screened through the selection criteria outlined in the PAM and EARF. Appraisal and safeguard reports will be approved by ADB prior to start of any project-related physical activities. Subprojects having resettlement impacts will not be included. IWMCs consist of concrete platforms, small covered sheds, segregated waste processing and storage areas, small office, fencing.

¹⁴ Project Administration Manual (accessible from the list of linked documents in Appendix 2.)

¹⁵ Additional selection criteria for Trust Fund supported islands includes climate change vulnerability, and women participation in island councils, and is outlined in the Project Administration Manual (accessible from the list of linked documents in Appendix 2.)

¹⁶ Upon confirmation from the government and the approval of Trust Fund.

¹⁷ Disaster risk management capacity building will include preparation of a SWM disaster action plan outlining prevention, preparedness, response and recovery tasks. DRM risk awareness activities will include first responders (police, fire fighters) on Thilafushi.

¹⁸ The recycling market study will cover plastics, construction and demolition waste, and other primary recyclables.

¹⁹ Public awareness and behavior change activities under Outputs 2 and 3 will be implemented through a Public Awareness and Community Capacity Building consultant recruited by the PMU.

12. Second generation ISWMCs, built generally between 2011 and 2015, have better vehicle accessibility, storage and composting facilities, however third generation IWMCs, being implemented since 2016, also have social and administration facilities, though none have as yet been constructed in Zone 3.

13. The MEE has developed standard layout plans for IWMCs, comprising fenced enclosures with impermeable concrete floors for waste handling including sorting, composting, secure storage, measures for exclusion of pests, indoor office space, roofed areas and provision for equipment for crushing and packaging the waste. per The preliminary design indicates a footprint of 30m by 30m, which is to be varied depending on the size of the population on the respective island.²⁰ Figure 1 shows the layout plan per Feasibility Study prepared by Water Solutions / Kocks Ingenieure in 2017.²¹ The Feasibility Study considered a planning process based on project waste generation, composting rate and sorting rates for recyclables.

14. The project includes 5 civil works packages as shown in Table 1. While the project will be covered under an ADB project loan modality, Output 2 detailed components and locations at each outer island may only be prepared after ADB Board approval. As such, this EARF will guide the government in undertaking environmental assessment of Output 2 subprojects per requirements of ADB SPS, 2009.²² This EARF relates to civil works package CW/03, of value US\$ 2.6 million, representing 6.5% of the total cost of the project of \$40 million. Table 1 includes subprojects under Output 1 where IEEs were prepared during project preparation stage.

15. Detailed preparations of Output 2 will be done after Board approval. The PMU will be supported by project management, design and construction supervision consultants (PMDSC) and public awareness and capacity building consultants (PACCB)²³ and implementation will follow a step-wise approach. All 32 outer islands will first be screened through the eligibility and selection criteria outlined in the PAM.²⁴ The PMDSC will oversee technical design issues and the PACCB consultants will support community consultation and capacity building. Only those islands

²⁰ World Bank Group's Environmental, Health and Safety (EHS) Guidelines requires IWMCs to consider standard design of 110% volume and bunded for impermeable storage to avoid contaminated runoff entering the surface or groundwater.

²¹ Consultancy Services for Feasibility Study for an Integrated Solid Waste Management System for Zone III (including Greater Malé) and Preparation of Engineering Design of the Regional Waste Management Facility at Thilafushi, Final Version December 2017, Water Solutions and Kocks Consult GmbH for Ministry of Environment and Energy

²² ADB Safeguard Policy Statement, 2009 Operations Manual Section F1/OP states that "For project loans where subprojects or components are prepared after Board approval and have limited anticipated environment, involuntary resettlement, and Indigenous Peoples impacts, the environmental assessment and review framework, resettlement framework, and indigenous peoples planning framework may be submitted in lieu of safeguard plans for such subprojects or components."

²³ Under recruitment at the time of project processing.

²⁴ For any island council to receive support for development of IWMCs under Output 2 (community-based outer island waste management systems targeting poor and women enhanced), the island councils are required to satisfy 3 entry criteria: (i) provide sufficient and adequate land allocated on island (as required by IWMC design) which will avoid impacts to indigenous peoples and land acquisition, resettlement and livelihood loss—both permanent and temporary; (ii) confirm electricity connection for operating IWMC equipment available on selected site; (iii) sign a memorandum of understanding (MOU) with MEE clearly stating the responsibilities and commitments of both parties. The purpose of the MOU is to ensure operational and financial sustainability of assets and management systems supported under the project. Selection/prioritization of outer islands for Trust Fund support will follow 2 further criteria: (i) high or moderate climate risk vulnerability (e.g. coastal erosion, flooding) and (ii) gender inclusive governance in the island council (e.g. established and functioning island women's development committee). All Trust Fund supported outer islands have also to satisfy the 3 entry criteria mentioned. The PMU and Trust Fund coordinator will review and confirm the 5 eligibility criteria are satisfied for Trust Fund outer islands and 3 eligibility criteria are satisfied for other outer islands.

who satisfy the criteria will receive IWMC and capacity building support from the project, while all islands (including non-eligible) will receive awareness building support. The PMDSC will prepare appraisal reports with findings of feasibility study and designs for eligible islands. Appraisal reports will be approved by ADB prior to start of any project-related physical activities. The appraisal report will include the following:

- i) Assessment of existing solid waste management services and characteristics including existing waste composition, generation, service delivery, infrastructure gaps, and future requirements for sustainable waste management on the Island for a IWMC component.
- ii) Assessment of the island council capacity for O&M including technical and financial capacity.
- iii) Assessment of suitable land availability.
- iv) Confirmation of compliance with the selection criteria outlined in the environmental assessment and review framework (EARF).
- v) Confirmation of compliance with the eligibility criteria.
- vi) Minutes of community consultations.
- vii) Proposed design and detailed description of the IWMC.
- viii) Confirmation the EMP is included in the bidding document.
- ix) Assessment of procurement readiness and implementation schedule.

16. The step-wise implementation plan for Output 2 is as follows:

- (i) **Step 1:** Screening period. Screen 32 outer islands for eligibility. Confirm MOUs (3 months)
- (ii) **Step 2:** Appraisal and design period. Prepare appraisal reports and finalize bidding document in consultation with island councils and local communities. (4 months)
- (iii) **Step 3:** Procurement (7 months)
- (iv) **Step 4:** Implementation period (12 months)

17. The project is categorized as category B in accordance with ADB SPS, 2009. No subproject classified as environment category A as per ADB SPS, 2009 or subproject that will involve land acquisition and significant social impact will be considered for funding under the project.

18. During project preparation, two draft initial environmental examinations (IEEs) for Output 1 and one sample IEE for Output 2 were prepared based on preliminary designs. The draft IEEs concluded that the subprojects will only have small-scale, localized impacts on the environment which are readily mitigated. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by the mitigating measures and environmentally sound engineering and construction practices. Mitigation measures and monitoring plans were proposed in the respective environmental management plans (EMPs) of the subprojects, which form part of the IEEs.

Figure 1: Sample Layout Plan for an IWMC
Source: Feasibility Study, 2017

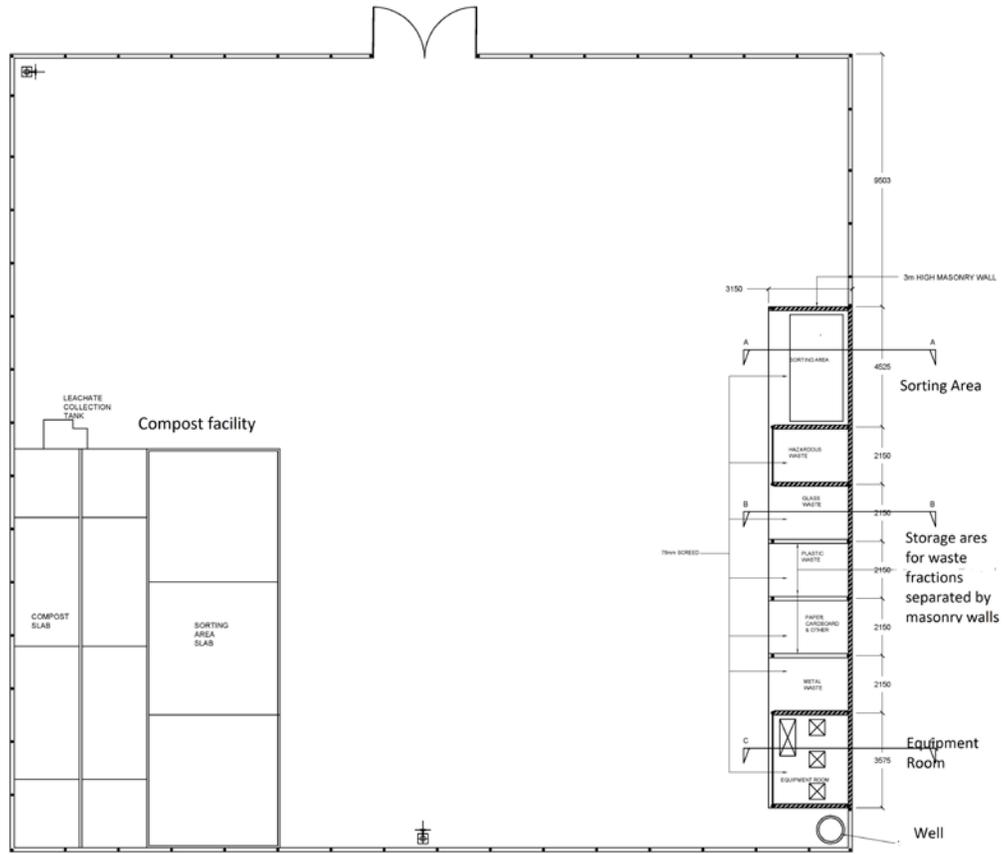


Table 1: Subprojects with Civil Works

Subproject / Outputs	Subprojects / Outputs	Value (US\$ million approx.)	Initial Environmental Examination Prepared
CW/01 (Output 1)	Harbor rehabilitation, waste processing, administration building, workshop and civil works platform for the construction and demolition waste (CDW) plant, recycling yard, and end-of-life vehicles (ELV) dismantling workshop (see output 4 below).	5.0	Yes. Draft initial environmental examination (IEE) prepared based on preliminary design. Final IEE to be prepared during detailed engineering design.
DBI/01 (Output 1)	Transfer stations in Malé and Villamalé, and Civil Works Contract (standard bidding documents for plant design, build and install) Malé and Vilimalé (incl. 6 storey admin Malé)	8.4	Yes. Draft IEE prepared based on preliminary design. Final IEE to be prepared during detailed engineering design.
DBI/02 Package 4 (Output 1)	CDW processing plant (includes equipment) (standard bidding documents for plant design, build and install, DBI) (includes pre-sorting, bag opening, screening, sorting, crushing, wind sifting, classifying)	2.0	Yes. Included in draft IEE prepared for Package CW/01 (Output 1).
CW/03 (Output 2)	Island waste management centre (IWMC) for 32 outer islands (including Disaster risk reduction and Climate Change costs)	2.6	Sample IEE prepared for Thulusdhoo. Remaining IWMC covered by this environmental assessment and review framework

19. This environmental assessment and review framework (EARF) has been prepared based on ADB Safeguard Policy Statement (SPS), 2009, and government of Maldives environmental acts, rules and regulations. This EARF

- (i) describes the proposed subprojects under Output 2;
- (ii) site selection and design criteria to ensure no adverse impacts from the IWMCs; explains the anticipated environmental impacts of the subprojects;
- (iii) specifies the requirements that will be followed in relation to subproject screening and categorization, assessment, and planning, including arrangements for meaningful consultation with affected people and other stakeholders and information disclosure requirements and, where applicable, safeguard criteria that are to be used in selecting subprojects and/or components;
- (iv) assesses the adequacy of the client's capacity to implement national laws and ADB's requirements and identify needs for capacity building;
- (v) specifies implementation procedures, including the budget, institutional arrangements, and capacity development requirements;
- (vi) specifies monitoring and reporting requirements; and
- (vii) describes the responsibilities of the client and of ADB in relation to the preparation, implementation, and progress review of safeguard documents of the subprojects.

F. Proposed Subprojects under Output 2

20. There are 32 inhabited islands defined as 'outer islands' for purpose of GMEIWMP (see Output 2). A list of the 32 islands is given in Table 2 below. All 32 outer islands will be screened

for support. No subproject classified as environment category A as per ADB SPS, 2009 or subproject that will involve land acquisition and significant social impact will be considered for funding under the project. Any land requirements for a project component will follow the guidelines and site selection criteria for the project.

Table 2: List of Administrative Islands within Waste Management Zone 3

Island	Population (2014 census)	Notes
Kaafu Atoll		
Hulhumalé	15,769	Urban island. One protected area, the “Banana reef” (Gaathu giri/Adhdhashu giri) is situated approximately 400m from the breakwater on the western side of the northern part of the island.
Kaashidhoo	1,865	Significant tourism activity. Site of ancient Buddhist artefacts.
Gaafaru	1,066	
Dhiffushi	1,053	Reclamation underway to form an industrial area.
Thulusdhoo	1,408	Atoll capital. Visited by TRTA team. Surfing destination. Coca cola factory; boatbuilding business
Huraa	1,300	A protected area – a wetland, is situated on the island
Himmafushi	1,725	
Gulhi	912	
Maafushi	3,025	Site of the country’s largest prison (approx. 500 inmates)
Guraidhoo	1,738	Site of mental hospital (approx. 175 resident patients)
Alif Alif Atoll		
Thoddoo	1,534	Significant agriculture – known for watermelon
Rasdhoo	1,067	Alif Alif atoll capital
Ukulhas	1,005	Former “Green Leaf” award winner for waste management programme (2014). IWMC was supported by the World Bank funded Ari Atoll Solid Waste Management Project
Mathiveri	662	
Bodufolhudhoo	608	Promotes a clean image and bans the use of plastic bags.
Feridhoo	441	
Maalhos	434	
Himandhoo	724	Receives tourists on day trips. Some ancient Buddhist artifacts.
Alif Dhaalu Atoll		
Hangnameedhoo	517	
Omadhoo	883	
Kuburudhoo	462	
Mahibadhoo	2,074	Capital of Alif Dhaalu atoll. Some industry (boat building and carpentry). Site of the atoll hospital.
Mandhoo	367	
Dhagethi	824	Some industry – boatbuilding and carpentry as well as tourism. Large school
Dhigurah	610	IWMC supported by World Bank funded Ari Atoll Solid Waste Management Project. Protected Marine area <i>Mushima migili Thila</i> close to the island.
Fenfushi	837	Visited by TRTA team. Island council active in waste management, with prior World Bank (Ari Atoll Solid Waste Management Project) and other donor support.
Dhidhdhoo	153	
Maamigili	2,359	Largest island of Alif Dhaalu atoll with the biggest population. Site of Villa International Airport (hub for the domestic carrier Flyme) and a large deep water harbor.
Vaavu Atoll		

Island	Population (2014 census)	Notes
Fulidhoo	372	
Thinadhoo	152	
Felidhoo	506	Capital of Vaavu atoll
Keyodhoo	675	
Rakeedhoo	106	

IWMC = Island Waste Management Center, TRTA = Transaction Technical Assistance

21. Zone 3 contains a total of 21 protected areas. Of these, all but one, a wetland and water body on Huraa Island, are in marine locations at least 600m from the inhabited islands. Maps of the four atolls of Zone 3, indicating the locations of the protected areas, are shown in Appendix 6.

II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

A. Applicable National Laws, Rules and Regulations

22. The law governing the protection of the environment is the Environmental Protection and Preservation Act (EPPA) of 1993 (Act No 4/93). The law is brief and sets out the principles for sustaining and extending the benefits of the environment of the Maldives for the people and coming generations. The EPPA confers powers on the MEE to issue regulations and formulate policies for environmental protection and preservation. Such regulations include:

- (i) Environmental Impact Assessment (EIA) regulations of 2007, updated in 2012 (Regulation No. 2012/R-27);
- (ii) By-law on Uprooting, Cutting and Transportation of Plants and Trees (2006);
- (iii) Regulation on Stone, Coral and Sand Mining (undated);
- (iv) Regulation for the Protection and Conservation of the Natural Life and character of Old Plants and Trees in the Maldives;
- (v) Dewatering Regulation (213/R-R1697);
- (vi) Environmental Damage Liabilities Regulation (2011/R-9); and
- (vii) Waste Management Regulation (2013-R58).

23. **Cultural Heritage.** Items of cultural heritage significance are protected under the Law of Historical and Cultural Properties of the Republic of Maldives of 1979 (Law number 27/29) and its implementation is currently under the Ministry of Education. UNESCO state that there is a lack of rules and regulations, constraining the implementation of the law and that there is also no national inventory of heritage properties (no site has yet been inscribed under the World Heritage List). A new law is under preparation and awaiting completion as of June 2017²⁵.

24. **Health and Safety.** Legislation covering occupational health and safety is currently included in the Employment Act (2008), Chapter 8 "Work Place Safety and Employer Health". This requires employers to implement measures for the safety and protection of employees at the work place, including safe work place, procedures, safe equipment and materials, provision of protective equipment, safety training to employees, conducting health checks where work involves chemical or biological materials that may cause a hazard, providing medical care as well as first aid for employees injured while at work. The law also sets out employee's obligations with regard to safety at work.

²⁵ UNESCO Country Programming Document for the Maldives (2017). UNESCO New Delhi Cluster Office for Bangladesh, Bhutan, India, Nepal, Maldives and Sri Lanka, New Delhi.

25. **Land use and acquisition.** The Land Act (2002) covers matters relating to land including land use, land ownership, and permissible uses of land belonging to island councils, which includes environmental protection.

26. **Decentralization.** The Decentralization Act of 2010 (Law 7/2010) devolves responsibility to island councils to carry out key functions related to their mandate to foster the social and economic well-being and development of the community and establish a safe, health and ecologically diverse environment. These functions include preparation of island development plans and implementing development projects planned and assigned by the government in line with the island development plans formulated by the islands. Services by the island councils under the Act including management of waste such that it is disposed of in a safe manner at the island level and does not create inconvenience to the community.

B. Environmental Assessment Requirements

27. Responsibilities and procedures for conducting environmental assessments, together with the requirements for environmental monitoring of projects, are set out in the EIA Regulations of 2012. All projects that may have an impact on the environment are referred to the Minister of Environment and Energy (EPPA 5(a)).

28. The EIA Regulations assign primary responsibility for undertaking environmental assessment of projects to the project proponent and set out procedures, rights and responsibilities for the preparation and approval of EIAs. MEE undertakes review and approval of environmental assessment reports.

29. Project proponents are defined in the EIA regulations as a person, department or agency that is seeking to carry out or proposes to carry out a development proposal or is the owner or person having charge, management or control of a development proposal. The EIA work must be carried out by registered consultants, and the procedures and requirements for registration are set out in Part V of the regulations.

30. The EIA regulations include a schedule (Schedule D) of investment project types that require an EIA. These include landfills, waste incinerators and large-scale waste storage projects. These project types may be classified as environment Category A as per ADB SPS, 2009, and therefore, will not be considered under the project.

31. For schedule D projects and those identified by the IEE as requiring an EIA, a scoping meeting is convened by the MEE to determine the specific Terms of Reference for the EIA. On completion of investigations and reporting, the EIA report is subject to review by MEE, which invites comments from other relevant ministries and the public following which an environmental decision is made.

32. Projects related to solid waste management listed on schedule D are landfills, incinerators and large scale waste storage and separation facilities. The IWMCs do not include landfills, incineration and are not large scale and therefore not schedule D projects.

33. For project types not included schedule D, a screening form is submitted in a specified format based on which the MEE decides whether an EMP is required or if further information is required, in which case an IEE will be carried out. The IEE is completed according to a specified format. If the IEE finds that the project may cause a significant environmental impact, a full EIA is

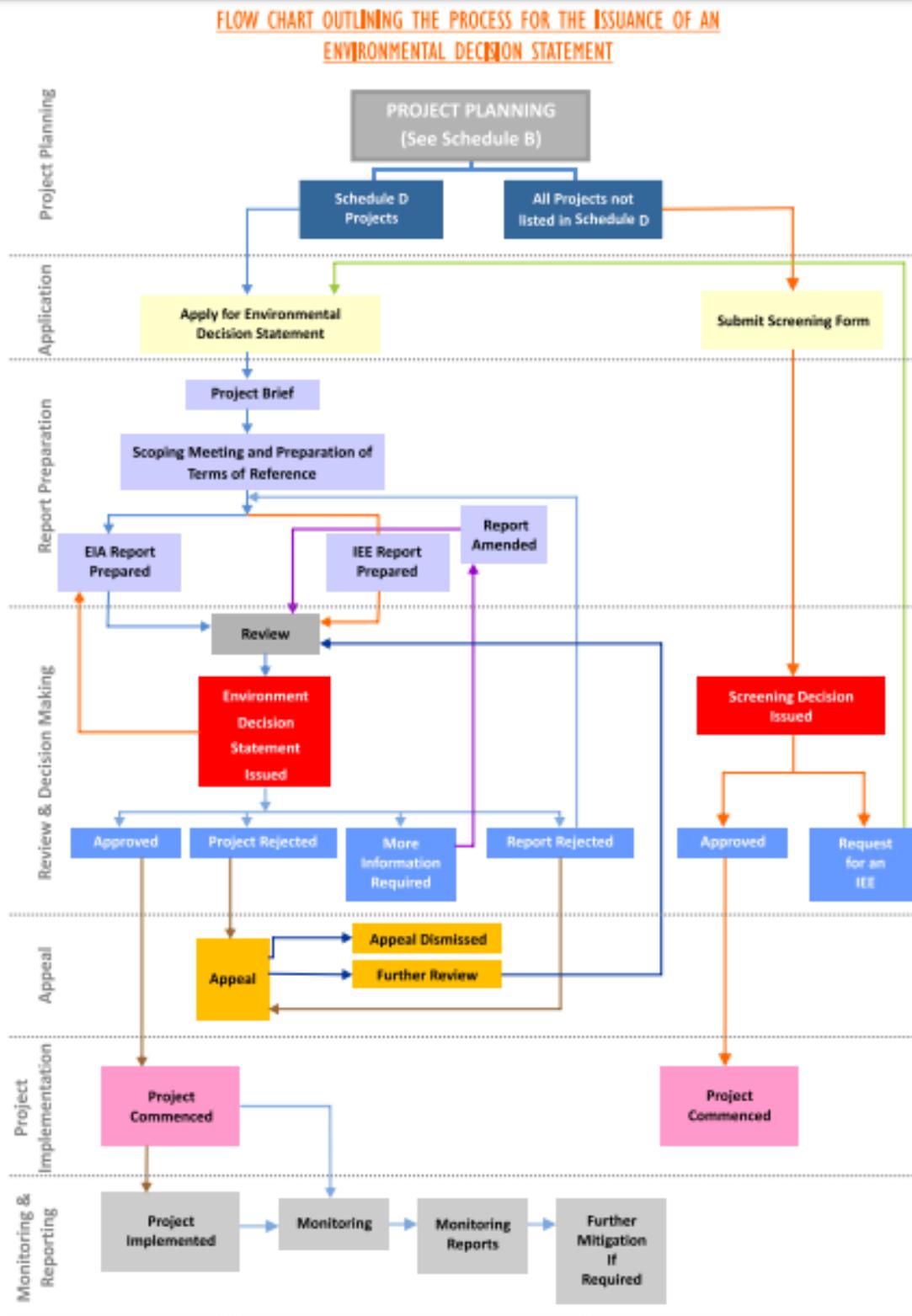
required, prior to preparation of an EMP. If an EIA is not required, an EMP is then prepared to address the impacts identified in the IEE.

34. The EMP, following either the IEE or the EIA process, is prepared on a specified format and reviewed for compliance by MEE.

35. The MEE issues the decision in the form of a decision note issued to the proponent, which sets out specific binding requirements for the conduct of the project based on review of the EIA report.

36. Summary of application stages and steps is outlined in Figure 2.

Figure 2: Flow chart of Maldives EIA process²⁶



²⁶ EIA Regulations (2007) Schedule A.

37. The timelines for clearance and approvals are as follows:
- (i) On completion of a screening form for non-schedule D projects – 10 working days for a screening decision from MEE
 - (ii) For review of compliance of an EMP by MEE – 7 working days
 - (iii) For review of a project brief on Schedule D projects – 5 days to confirm the date of a scoping meeting
 - (iv) For consideration of Terms of Reference drafted by the project proponent following the scoping meeting – 10 days to confirm the Terms of Reference.
 - (v) For the review of a completed EIA report for completeness – 2 working days.
 - (vi) For circulation of an EIA report to other ministries and to the public for comment – 10 working days
 - (vii) For issuance of a decision or to request revisions, following circulation of the EIA report and receipt of comments – 28 working days.

C. Applicable International Environmental Agreements

38. In addition to national laws, rules and regulations, the government of Maldives is also a signatory to various applicable international conventions, as follows:
- (i) UN Convention on the Law of the Sea – UNCLOS (1982);
 - (ii) International Convention for the Prevention of Pollution of the Sea by Oil (1982);
 - (iii) Vienna Convention for the Protection of the Ozone Layer (1985);
 - (iv) Montreal Protocol on Substances that Deplete the Ozone Layer (1987);
 - (v) Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (1989);
 - (vi) The London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1990);
 - (vii) Agenda 21 and the Rio Declaration of the United Nations Conference on Environment and Development (1992);
 - (viii) Convention on Biological Diversity (1992);
 - (ix) United Nations Framework Convention on Climate Change (1992);
 - (x) The Copenhagen Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1992);
 - (xi) The Montreal Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1997);
 - (xii) The Beijing Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1999);
 - (xiii) Washington Declaration on Protection of the Marine Environment from Land-Based Activities;
 - (xiv) Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998);
 - (xv) Cartagena Protocol on Biosafety (Maldives acceded on 2 September 2002); and
 - (xvi) United Nation Convention to Combat Desertification (2002).

D. ADB Policy

39. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

40. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

- (i) **Category A.** A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.
- (ii) **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of Category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.
- (iii) **Category C.** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
- (iv) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a financial intermediary (FI).

41. **Environmental management plan.** An EMP, which addresses the potential impacts and risks identified by the environmental assessment, shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks. EMPs should outline specific mitigation measures, environmental monitoring requirements, and related institutional arrangements, including budget requirements.

42. **Physical Cultural Resources.** The SPS requires that project components are to be sited and designed to avoid significant damage to physical cultural resources, defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Should avoidance of physical cultural resources be necessary, this can only be on condition that (i) there are no alternatives for removal, (ii) overall benefits outweigh anticipated cultural loss from removal and (iii) any removal is in accordance with national laws and regulations.

43. **Pollution Prevention and Control Technologies.** During the design, construction, and operation of the project the project management unit (PMU) will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in the World Bank Group's Environment, Health and Safety Guidelines²⁷. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of Maldives regulations differ from these levels and measures, the PMU will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

²⁷ World Bank Group (2007) Environmental Health and Safety (EHS) Guidelines: 1.6: Waste Management. http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines

44. ADB's Public Communication Policy (2011) aims to enhance stakeholders' trust in and ability to engage with ADB, and thereby increase the development impact of ADB operations. The policy promotes transparency, accountability, and participatory development. It establishes the disclosure requirements for documents ADB produces or requires to be produced.

45. ADB's Accountability Mechanism Policy's (2012) objectives is to provide an independent and effective forum for people adversely affected by ADB-assisted projects to voice their concerns and seek solutions to their problems, and to request compliance review of the alleged noncompliance by ADB with its operational policies and procedures that may have caused, or is likely to cause, them direct and material harm. The Accountability Mechanism a "last resort" mechanism.

46. Appendix 3 provides the comparative analysis, based on a summary equivalence assessment which compared Maldives' legal and regulatory framework to the ADB Safeguard Policy (2009), and actions to be implemented to ensure ADB SPS requirements are met. These include (i) requirements for screening and categorization - the national and ADB SPS, 2009 environmental requirements shall be reviewed and the more stringent amongst them shall be followed; (ii) preparation of IEEs and EMPs - ADB SPS, 2009 environmental requirements will be followed; and (iii) disclosure, consultations and participation, reporting and monitoring will follow ADB SPS, 2009 requirements.

III. ANTICIPATED ENVIRONMENTAL IMPACTS

47. Based on sample IEE prepared for Thulusdhoo Island and project preparatory team visits on multiple occasions on the 32 outer islands, IWMC construction and rehabilitation works will have limited and manageable negative environmental impacts. The proposed sites will be located well within island areas, away from residential and protected areas and will be environmental category B. The screening process, carried out during the preparation of support to each island, enabled rapid identification of impacts of potential concern and ensure that IWMCs are not located near sensitive areas, if any. However, the final IWMCs will be identified based on set criteria to be met by island councils for funding eligibility.²⁸ IEE preparation will include development of EMPs, which will provide for activity-specific mitigation measures which will be incorporated into the scope of work on each island. A list of potential impacts, prepared with reference to the EHS Guidelines on Waste Management Facilities (Waste Receipt, Unloading, Processing and Storage) and General Guidelines, is included as Table 3 below.

A. Impacts related to location and pre-construction activities

48. Works to rehabilitate existing IWMCs will be within the same sites/compounds unless the existing site has become unsuitable due to new developments around it or there is objection from communities to rehabilitate the existing IWMC. For new IWMCs, sites will be selected, with the involvement of local councils and with public consultation at suitable sites as far away as possible

²⁸ For any island council to receive support for development of IWMCs under Output 2 (community-based outer island waste management systems targeting poor and women enhanced), the island councils are required to satisfy 3 entry criteria: (i) provide sufficient and adequate land allocated on island (as required by IWMC design) which will avoid impacts to indigenous peoples and land acquisition, resettlement and livelihood loss—both permanent and temporary; (ii) confirm electricity connection for operating IWMC equipment available on selected site; (iii) sign a memorandum of understanding (MOU) with MEE clearly stating the responsibilities and commitments of both parties. Selection/prioritization of outer islands for Trust Fund support will follow 2 further criteria: (i) high or moderate climate risk vulnerability (e.g. coastal erosion, flooding) and (ii) gender inclusive governance in the island council (e.g. established and functioning island women's development committee). All Trust Fund supported outer islands have also to satisfy the 3 entry criteria mentioned.

from sensitive sites including the shoreline, areas with mature trees, residential areas and any sites of archaeological or cultural importance. These are likely to be at or near existing dumpsites. There will be localized impacts at the IWMC sites, mainly odor and visual impacts and increase in local traffic, however these are expected to be less severe than existing impacts associated with dumpsites. Compared with existing dumpsites, IWMCs will discourage vermin and reduce or halt the existing practice of burning of waste. It will be necessary to clear vegetation in some cases. For existing IWMCs that will require rehabilitation, environmental audit will be conducted in accordance with ADB SPS. to determine the existence of any areas where the project may cause or is causing environmental risks or impacts. If the project does not foresee any new major expansion, the audit constitutes the environmental assessment for the project. A typical environmental audit report includes the following major elements: (i) executive summary; (ii) facilities description, including both past and current activities; (iii) summary of national, local, and any other applicable environmental laws, regulations, and standards; (iv) audit and site investigation procedure; (v) findings and areas of concern; and (vi) corrective action plan that provides the appropriate corrective actions for each area of concern, including costs and schedule.

49. Where equipment is procured, this will be for use within the IWMCs and effects of noise and emissions will mainly be confined to the IWMC compounds. Operation will be during daylight hours only.

B. Impacts associated with construction

50. During construction, there will be increased vehicles and machinery activity to transport materials, carry out construction operations including excavation, compaction, concrete mixing and concrete laying. Contractors will be required to maintain vehicles and equipment in sound operable condition, free of leaks and fitted with exhaust baffles, to minimize noise and dust emissions during construction. Construction works will be limited to daylight hours. Fuels and fluids for vehicles and equipment will need to be stored on site for use. The Contractor will be required to arrange storage and handling in such a way that risks of spills are greatly reduced, and that materials to clean up spills are kept at fuel stores.

51. Water will be required for workers and construction operations. The need will be met through collecting rainwater supplemented by selected sources that entail limited or no impact on the availability of local water supplies. The Contractor will be required to make arrangements for safe disposal of wastewater, such as construction of latrines and of soak pits for grey water. These are to be closed on completion of construction work.

52. The release of silt from excavations and earthworks will be reduced by avoiding rainy conditions and the use of silt fences at water runoff points.

53. Construction workers, including plant operators, supervisors and some laborers will be brought to each island and will reside there during the construction period. The Contractor will be required to make arrangements for adequate accommodation, ensuring adequate, clean living conditions. Employment of island residents and use of their services, such as accommodation and catering, for construction workers will be encouraged and Contractors will be responsible to ensure that their staff do not engage in antisocial or harmful behavior.

C. Impacts associated with operation and decommissioning

54. The sound operation of the IWMCs is expected to result in reductions in existing practices of burning garden waste, burying waste and disposal of food waste to sea and improved collection and removal of plastic and other harmful waste, reducing the amount that is released to the sea. Composting activities, particularly the re-use of compost, will reduce the volume of residual waste that needs to be transported to the dumpsite at Thilafushi. Per Feasibility Study, the project will extend the life of the existing dumpsite in the medium term (8-11 years).²⁹ The area allocated for the project will be delineated from the existing dumpsite. .

55. The composting process involves the proliferation of certain micro-organisms including fungi and bacteria. Fungal spores can cause lung infections and certain bacteria can produce fever and a form of pneumonia that requires treatment in intensive care. Risks are mitigated or eliminated by ensuring awareness among workers and use of masks when turning or begging the compost.

56. The use of presses and shredders entails risks, again these can be greatly reduced by training including the use of protocols to allow only authorized persons to operate, service or repair the machinery, and use of barriers and safety fences. Training in operation and maintenance of machinery is important to reduce safety and other risks.

Table 3: List of Potential Impacts of Island Waste Management Center construction and operation to be addressed

Impacts	Mitigation Measures
Potential impacts from site operation	
Air Emissions	Mitigation by siting of the island waste management center (IWMC) as far as practicable from residential areas; regular sluicing of the sites and washing of collection vehicles
Contaminated Runoff	World Bank Group's Environmental, Health and Safety (EHS) Guidelines requires IWMCs to consider standard design of 110% volume and banded for impermeable storage to avoid contaminated runoff entering the surface or groundwater. Leachate may contain traces of contaminants such as nutrients, metals, pathogens and hazardous chemicals that may contaminate groundwater and seawater. Leachate from composting will have a high nutrient content. Mitigation includes (i) Inclusion in the design of IWMCs a leachate well for recovering and management of leachate (ii) Training of site operators in leachate management including re-circulation and/or collection in dedicated containers
Loss of waste / littering	(i) Provision for perimeter fence in IWMC design (ii) Use of containers; operation and maintenance training to include instruction on maintenance of containers, loaders, cranes and vessels and sound operation including licensing of vehicle and plant operators and restrictions on operation during stormy weather (iii) Good "housekeeping" on site
Noise and vibration	Limited scope for noise/vibration impacts during operation, due to the limited use of machinery (some IWMCs will have balers and crushers), siting away from residential areas and other receptors and high ambient noise levels from wave action.

²⁹ The regional waste management facility at Thilafushi as part of the long-term SWM project is being considered by MEE. This will be considered as a separate project in the future.

Impacts	Mitigation Measures
Risks of loss of containers and contents	O&M training to include instruction on maintenance of containers, loaders, cranes and vessels and sound operation including licensing of vehicle and plant operators and restrictions on operation during stormy weather
Pests: Rodents and birds	Maintenance of site cleanliness, minimizing storage time for putrescible waste, provision of enclosures for putrescible waste.
Fire risk	Limited due to small scale. Composting will involve the use of windrows well below the maximum 3m height recommended by EHS guidelines.
Operator occupational health and safety	(i) Operators trained to recognize risks and hazards. (ii) Personal safety equipment issued and worn, including face masks while handling compost. (iii) Health and safety recognized as primary employer responsibility. Island councils to adopt the World Bank EHS Guidelines on OHS for solid waste management projects.
Community Health and safety issues	(i) Inclusion of perimeter fence and gate in the design. (ii) Restriction of entry to workers and authorized personnel. (i) Exclusion of burning (ii) Maintenance of site hygiene to deter pests.
Construction impacts	
Noise pollution and vibration	(i) Identifying potentially affected households; (ii) providing information on operations; (iii) limiting construction activities to daylight hours; (iv) adhering to schedule; and (v) maintaining construction equipment and vehicles in good operable order.
Construction waste	(i) All solid waste must be transported to the dumpsite; and (ii) importation of any materials rated as hazardous under the Globally Harmonized System of Classification and Labelling of Chemicals to be subject to approval by PMDSC, which will be conditional on stating adequate arrangements for disposal.
Release of silt	(i) Excavated areas to be rapidly refilled on completion of works; (ii) use of silt fences around temporary piles of excavated material; and (iii) avoid excavation in wet weather to the extent practicable.
Water pollution	(i) Vehicles and plant are to be maintained in sound operable condition, free of leaks. The condition of vehicles and equipment will be periodically checked. (ii) Contractor to prepare and submit a plan for spill management, including provision of spill kits, training/briefing of workers on procedures on handling spills and allocation of responsibility within the contractor's team for ensuring that spill kits are available and that workers know how to use them.
Community health and safety hazards	(i) Restriction of access to work site; (ii) warning notices to the public on hazards; and (iii) barriers when warranted.
Occupational health and safety hazards	(i) Contractors to appoint health and safety officers for each site and to ensure regular briefing of construction workforce on health and safety issues. (ii) Adequate personal protective equipment to be provided to the workforce.

IV. ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS AND COMPONENTS

A. Selection Criteria for Subprojects

57. Table 4 shows the selection criteria for planning and design, including siting and types, of subproject to be considered for IWMCs on the non-urban inhabited islands. The application of these criteria will entail discussions with island councils to identify sites, detailed inspection of proposed sites and alternatives and checking to ensure no other infrastructure development plans affect the sites. Implementation will involve a step-wise approach comprising (i) screening the 32 islands for eligibility using these criteria; (ii) appraisal and design when appraisal reports will be prepared and designs finalized in consultation with island councils and communities; (iii)

procurement; and (iv) implementation. The PMU will receive implementation support from consultants recruited under a capacity building transaction technical assistance (TRTA) package and support from the PMDSC in technical aspects including design and bid document preparation including incorporation of environmental management plans in these. A third group, PACCB will support community consultation and capacity building.

Table 4: Criteria for Planning and Design for Subprojects

Criteria	Remarks
Pre-requisites	
(i) No subproject scope will include features that appear on schedule D of the EIA regulations (2007, updated 2012) (List of Development Proposals Requiring an Environmental Impact Assessment Study)	Development proposals on Schedule D of the EIA regulations related to solid waste management are landfills, incinerators and large scale waste storage and separation facilities.
(ii) An IEE and EMP must be prepared for each subproject, which must comply with EHS Guidelines on Waste Management Facilities	PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.
(iii) Sites must not have any land acquisition or involuntary resettlement and social safeguard issues.	Verify land ownership records. Prepare social safeguard document following the guidelines in the Resettlement Framework.
(iv) Any new facility must not be sited in an environmentally sensitive area, including all areas within 30m of the shoreline, or within 30m of areas such as thickly vegetated areas that are known to be habitats for bird species of conservation value	<p>The 30m distance should be exceeded where possible. The restriction may be reviewed depending on site availability and stakeholder consultation, and provision of design measures to prevent release of leachate into the sea or onto the vegetated area in the event of the capacity of the leachate collection tank being exceeded.</p> <p>On the island of Huraa, where space is restricted and there is a wetland which is a protected area, special attention must be paid to the size of the IWMC leachate collection tank and provisions to contain leachate overflow during storm events.</p>
(v) No new facility to be sited within 500m of areas of cultural significance, such as ancient religious artifacts	<p>Verification, through consulting island councils and the Ministry of Education³⁰, that no physical cultural heritage sites are situated within 500m of the IWMC site. The restriction may be reviewed on the basis of site availability and consultation with stakeholders. PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.</p> <p>Provide for use of “chance find” procedures in the EMP, such that any artifacts are preserved for future generations</p>
(vi) Sites must have sufficient capacity to contain or handle volumes of waste projected to be generated over at least a 20 year planning horizon	To be assessed based on projections on growth in waste generation for each island

³⁰ Management of the arts and culture sector is currently under the Ministry of Education.

Criteria		Remarks
(vii)	Sites must be at least 100m from residences, schools, clinics or mosques	The distance restriction may be reviewed depending on site availability and stakeholder consultation. PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.
(viii)	Sites must be least 100m from groundwater wells	The 100m limit is precautionary, however attention must be given in detailed design to ensure that the leachate collection tank is protected to exclude flood waters, including during storm situations, to ensure that leachate does not enter the groundwater lens. PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.
(ix)	Sites must not intersect with power lines, water supply pipelines or sewer lines	Where these lie across proposed sites, they must be re-aligned to avoid the site
(x)	For initiatives that require the use of machinery such as shredders and presses, there must be established access to technical expertise for servicing and spare parts must be regularly available in-country	
(xi)	Consensus from island communities on proposed improvements.	Records of public consultations, issues raised, and measures taken to address them to be summarized in IEEs. These consultations shall ensure consultees include women as well as men.
(xii)	No other work, including road, pipeline, or power line improvements are planned at or near the proposed site	Island council to confirm. If such sites are planned, details must be taken account of in design to ensure adequate separation of the infrastructure
(xiii)	World Bank Group's Environmental, Health and Safety (EHS) Guidelines requires IWMCs to consider standard design of 110% volume and bunded for impermeable storage to avoid contaminated runoff entering the surface or groundwater.	Final detailed design to confirm capacity is 110% and bunded
Preferable		
(i)	Where IWMCs exist, any improvements should be to the existing infrastructure, rather than replacement on new sites.	New sites may be necessary if existing site has become unsuitable due to new developments around it or there is objection from communities to rehabilitate the existing IWMCs.
(ii)	Removal of trees to be avoided where possible.	When mature trees (of diameter at breast height of 40cm or greater) must be removed, new trees must be planted of a number and species agreed with the island community
(iii)	Where composting facilities are to be introduced or expanded, a high level of commitment from the community should be evident to ensure both cooperation in ensuring that waste to be composed is not contaminated and that compost will be purchased or used.	Evidence of commitment from the island community should be obtained, for example signed minutes from a public meeting, or signatures from household heads.

B. Screening and Classification/Categorization

58. Subproject screening and categorization is done at the earliest stage of project preparation when sufficient information is available for this purpose. Screening and categorization is undertaken to (i) reflect the significance of potential impacts or risks that a project might present; (ii) identify the level of assessment and institutional resources required for the safeguard measures; and (iii) determine disclosure requirements. The consultant environment specialist of Project Management, Design and Construction Supervision Consultants (PMDSC) will conduct screening by completing ADB's rapid environmental assessment (REA) checklists (see Appendix 1) and submitting this for review to PMU to ensure subproject will not fall under ADB SPS, 2009 category A for environment.

59. To comply national requirements for environmental assessment and environmental clearance, the PMU with assistance from the PMDSC will initiate the application process under the national EIA Regulations by completing the screening form as required by schedule C 1 of the regulations.

60. PMU to submit the completed REA checklists and categorization results to ADB for concurrence or further discussion, as required.

C. Preparation of Environmental Assessment Report

61. Per ADB SPS, 2009, an IEE is required for each IWMC. While MEE may classify the IWMCs as non-Schedule D which will require IEEs. Preparation of IEEs for IWMCs will aim to meet both the government and ADB requirements. Appendix 2 provides the outline of an ADB IEE report following Appendix 1 of ADB SPS, 2009. Also, the sample IEE for Thulusdhoo prepared during project preparation provides a good sample which can be followed for preparation of IEEs for remaining IWMCs. Preparation of IEEs is to be informed by recent site visits to collect appropriate baseline information and to be done in conjunction with engineering appraisal and design, identifying specific impacts and to quantify them where possible. The IEE and EMP will be updated during the pre-construction phase should any design changes occur.

62. The IEE preparation will also involve carrying out meaningful consultation with affected people and other relevant stakeholders including civil society and facilitating their informed participation. PMU and PMCDSC will ensure affected people and stakeholders will have access to relevant project information prior to any decision-making that will affect them. The consultation process and its results will be documented and reflected in the IEE.

63. If an existing IWMC will be rehabilitated, an environmental compliance audit will be carried out and included in the IEE to determine whether the facilities are in accordance with ADB safeguard principles and requirements. The environmental audit will include (i) executive summary; (ii) facilities description, including both past and current activities; (iii) summary of national, local, and any other applicable environmental laws, regulations, and standards; (iv) audit and site investigation procedure; (v) findings and areas of concern; and (vi) corrective action plan that provides the appropriate corrective actions for each area of concern, including costs and schedule. The corrective action plan will define remedial actions, the budget for these actions, and timeframe for achieving compliance, and has to be concurred by ADB.

64. ADB and MEE require that an EMP must be developed as part of the IEE. The EMP will include the proposed mitigation measures, environmental monitoring and reporting requirements,

emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations include mitigation of potential adverse impacts to the level of “no significant harm to third parties”, the polluter pays principle, the precautionary approach, and adaptive management.

65. If some residual impacts are likely to remain significant after mitigation (however unlikely), the EMP will also include appropriate compensatory measures (offset) that aim to ensure that the project does not cause significant net degradation to the environment. Such measures may relate, for instance, to conservation of habitat and biodiversity and preservation of ambient conditions. Monetary compensation in lieu of offset is acceptable in exceptional circumstances, if the compensation is used to provide environmental benefits of the same nature and is commensurate with the project’s residual impact.

66. All IEEs and EMPs will be prepared prior to bid documents issuance. The bid documents will include the requirement to incorporate necessary resources for EMP implementation. The IEE as well as the EMP will form part of the contract document, and, if required, will need to be further updated during detailed engineering design stage. The update IEE will be submitted to ADB for concurrence. The contractor will be required to prepare site-specific contractor EMPs (CEMP) based on cleared updated IEE for submission to PMU. No works will be allowed until the CEMP has been approved by PMU.

67. The IEE prepared for Thulusdoo during project preparation provides a good sample which can be followed for preparation of environmental assessments in subsequent subprojects.

D. Review of Environmental Assessment Reports

68. The IEEs prepared by the PMDSC will be reviewed initially by the PMU. PMU will submit the IEEs to ADB for review and approval. In case an environmental clearance is required, the IEEs are to be forwarded to the MEE for approval.

69. No bid documents can be issued until ADB cleared the IEE. Contracts cannot be awarded until environmental clearance is issued by MEE.

E. Updating of Initial Environmental Examination reports

70. The IEEs prepared during project preparatory stage and/or based on preliminary design will be updated once detailed design is completed, or if there are any change in location/alignment, design or components. The final/updated IEE/s will be submitted to ADB for review and disclosure on its website. The PMU will be responsible to communicate to the contractors and stakeholders any update or revision in the IEE. No works can be started until ADB cleared the updated IEEs.

F. Disclosure of IEEs and relevant project information

71. Per ADB SPS, 2009, IEEs will be disclosed on ADB and project websites. The executive summaries, project-related and other environmental information will be available in an accessible place and in a form or language understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used. IEEs will

V. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation and Information Disclosure

72. Consultations will be carried out on an ongoing basis throughout the project cycle. Consultation will occur freely and voluntarily, without any external manipulation, interference, or threat of retribution, and is conducted in an atmosphere of transparency. PMU will ensure that consultations be inclusive of various segments of the affected community, including both women and men, and accessible to the disadvantaged and vulnerable groups within the community.

73. **During IEE preparation.** Meetings and consultations with stakeholders from the target outer islands will take place to inform them of the proposed subproject and the possible environmental and social impacts. The following agenda will be used to ensure that there is adequate exchange of information and opinion. The dates, attendees, topics and conclusions will be recorded and included in the IEE.

- (i) A summary of the proposed works under the subproject;
- (ii) A summary of subproject objectives and likely positive and negative; environmental impacts, covering the construction phase and operational impacts;
- (iii) Invitation for feedback in respect of any areas of concern that the public may have, and suggested means of implementation;
- (iv) Disclosure of and feedback on the Grievance Redress Mechanism; and
- (v) Acceptability of the proposed works to the public.

74. Participants of the consultations, particularly from community groups, should include both women and men, and numbers of each should be recorded. Consultations must be conducted in a non-coercive environment, and care taken to ensure that the views of both women and men are heard. To ensure this, conducting focus group discussions for groups such as women, youth and the elderly should be considered. Should there be an groups identified as vulnerable on the island, focus group discussions should be held with such groups to understand their needs ways in which they may be affected by the subproject and any actions that may need to be taken to address these. Guidance should sought from the PACCB consultants.

75. Once the IEE is completed, a summary should be prepared in Deivehi. The IEE and Deivehi language summary should be distributed to the district authorities for their information and for display to the public. The IEE will be revised if necessary to address comments received from the stakeholders.

76. **Consultations pre- and during construction.** Subproject design and the IEE will disclosed to the community and to stakeholders to seek their feedback. This will be conducted within 60 days after mobilization of the contractors and before any works commence. The EMP will be revised if necessary, to incorporate suggestions and comments received. During construction, contractors will be required to inform affected people and other stakeholders of project activities which are likely to create environmental and social impacts, and to allow them to access general information about the subproject. In addition, should people affected by the project have any grievances, they have the right of lodging complaints through the grievance redress mechanism established for the project.

77. The PMU will establish channels of communication and engagement with affected communities to disclose information, including the results of monitoring and receive feedback on

the effectiveness of mitigation measures, and affected communities' ongoing interests and concerns about the project.

78. Information, Education and Communication. The Information, Education and Communication (IEC) component will address perceptions on solid waste management, communication channels within the island communities, the role of women and scope for public involvement in improved solid waste management activity, in line with the 3R. This will potentially include adopting practices at the household level that reduce waste generation (including in particular reduced use of disposable plastics) and the separation of compostable and recyclable waste, and eliciting participation in community level activity.

79. The IEC will also support island councils in the management of solid waste, particularly through partnerships with resorts, NGOs or other islands to support initiatives to manage solid waste safely and sustainably. Resorts could provide technical training to islands, help in repair of SWM equipment, joint transport of waste to treatment centers, and carry out joint awareness programs on SWM. Strategies may include:

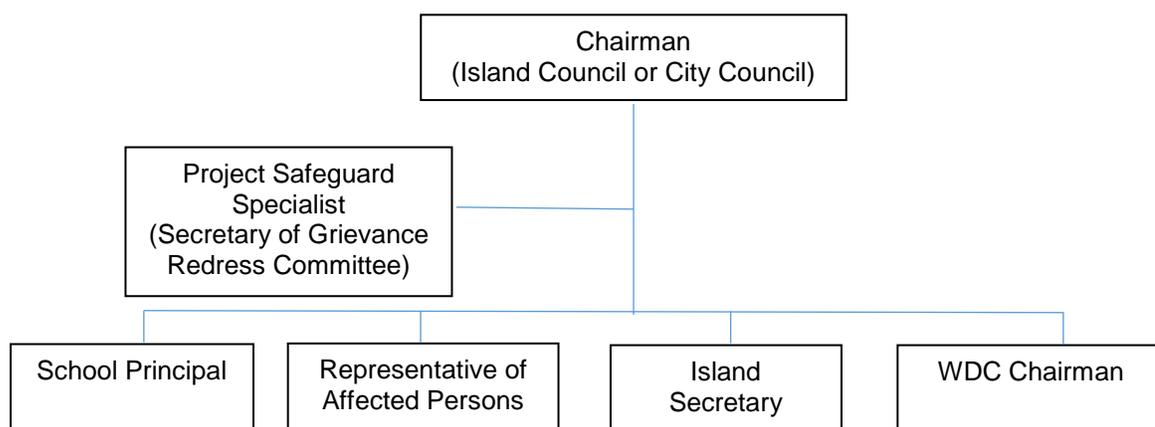
- (i) Involvement of environmental clubs that have been formed in schools;
- (ii) Use of social media, particularly those in common use already such as "facebook" and "viber";
- (iii) Setting up a dynamic knowledge portal;
- (iv) Sharing information on the project, its activities and roll out schedule of the project components;
- (v) Partnerships between resorts and neighbouring islands on sustainable waste management;
- (vi) Promoting 3R practices, including reduction of plastic water bottles through use of reusable glass bottles and/or large, reusable bottles for drinking water; and
- (vii) Encouraging use of locally produced compost.

B. Grievance Redress Mechanism

80. A grievance redress mechanism (GRM) will be established to receive and facilitate the resolution of affected persons (APs) concerns, complaints, and grievances on negotiated/voluntary land donation or involuntary land acquisition, relocation, income restoration, environmental management and other construction and operation related issues. The GRM is accessible to all APs to address their concerns, grievances and issues effectively and swiftly, in accordance with ADP SPS, 2009.

81. First Tier: City Council/Island Council – grievances will be registered informally by contacting the city/island councils. If the grievance cannot be resolved informally then the APs can register a formal complaint. The council must screen the grievance to determine whether the concerns raised in the grievance are within the scope of the project. The council will determine solutions to the issues either by (i) discussing internally, or (ii) joint problem solving with aggrieved parties, or (iii) a combination of both options. If the complaint is resolved within a week, the council must communicate the decision to the aggrieved party formally or informally. Should matter be unresolved and/or the AP be unhappy with the result, the complaint will be referred to the next tier. The grievance redress committee (GRC) includes the island's representatives as well as project officers related to each island, as shown in the Figure 3 below.

Figure 3: Grievance Redress Committee Composition for First Tier



82. **Second Tier:** The AP can elevate the grievance to the second tier, and submit a complaint on a letter addressed to MEE. MEE will forward the letter to the PMU. The PMU will be responsible to resolve the complaint within 15 days and communicate the decision to the aggrieved party. The PMU screens the grievance and determines if it is related to the project. If unrelated, the AP is notified in writing. If it is relevant to the project, the PMU will hold discussions with the MEE on the matter and if necessary, (i) arranges visit the site and hold on-site discussions and/or (ii) refers the matter to the project steering committee. The PMU then decides on the action that will be taken by the project to address the grievance, and the decision will be conveyed to the AP in writing.

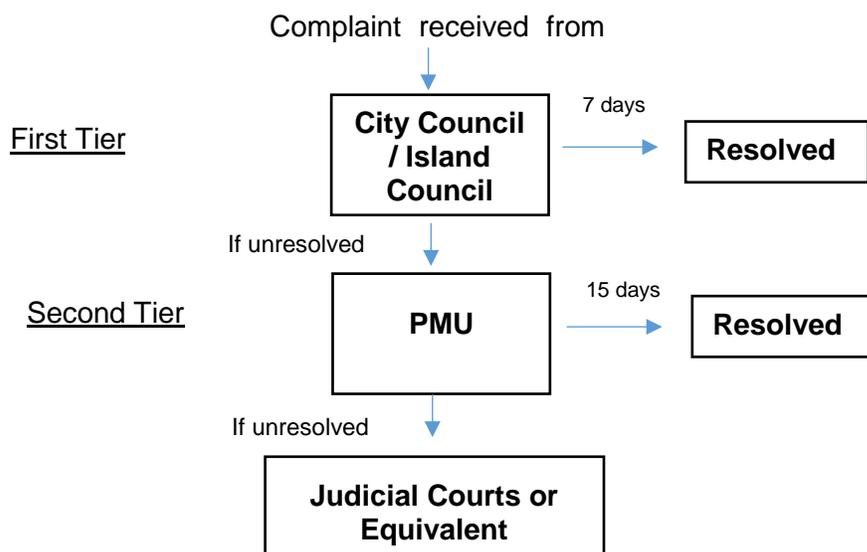
83. The affected persons can also direct contact (in writing) the ADB Project Officer at ADB headquarters. The complaint can be submitted in any of the official languages of ADB's Developing Member Countries. This may be done at any time [add appropriate address or method of contact].

84. The APs can also use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB. The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the Project Information Document to be distributed to the affected communities, as part of the project GRM.

85. The GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage through the Maldives judicial or appropriate administrative system. This can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

86. The flow diagram of resolving complaints under the GRC is shown in Figure 3.

Figure 4: Grievance Redress Mechanism Diagram for Complaints Resolution



87. The GRM will include group meetings and discussions with APs to address general and common grievances. These meetings and discussions will be announced in advance, conducted at the time of day agreed on with APs (based on their availability), and facilitated by the PMU and PMDSC at least quarterly. The PMU and PMDSC shall ensure that illiterate APs or vulnerable APs are assisted to understand the grievance redress process, to register complaints and with follow-up actions at different stages in the process. Records will be kept by the PMU to keep track of all grievances received, both informal and formal, including contact details of complainant, date when the complaint was received, nature of grievance, agreed corrective actions and the date when these were effected, and final outcome. A Sample Grievance Registration Form is attached in Appendix 4.

88. All costs involved in resolving the complaints (meetings, consultations, communication and reporting, and information dissemination) will be borne by the PMU.

VI. INSTITUTIONAL ARRANGEMENT AND RESPONSIBILITIES

A. Implementation Arrangements

89. The executing agency is the Ministry of Finance and Treasury (MOFT). The implementing agency is MEE who will establish a PMU comprising officials from MEE and WAMCO. The PMU will be strengthened with external experts in the areas of finance, procurement, technical areas, contract management and safeguards. The project steering committee chaired by Minister, MEE will provide overall guidance and strategic directions to the project. Consultant firms will be recruited under the project to support engineering designs, supervision, project management, institutional capacity strengthening, and community awareness.

90. **Project Management Unit.** The Director General of the Solid Waste Department of MEE informed a dedicated full-time PMU for the ADB Zone 3 waste management project will be established (pending approval by MOFT) with eight staff as follows: (i) Project Director (part-time, Director General of Department), (ii) Project Manager (full time), (iii) Procurement Specialist, (iv)

Finance Specialist, (v) Safeguard Specialist, (vi) Civil Engineer, (vii) IEC Specialist, and (viii) administrative assistant. The Project Director is a government official empowered to take official decisions, while remaining PMU staff are contracted staff recruited from the market. The PMU will be supported by consultants for project management, capacity building, monitoring, and technical design and supervision support. The proposed PMU contract staff are to be recruited competitively without further delay in phases.

91. **Terms of Reference for PMU Environment Officer.** Key tasks and responsibilities of the PMU environment officer are as follows:

- (i) confirm existing IEEs/EMPs are updated based on detailed designs, and that new IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
- (ii) confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
- (iii) provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by island councils and contractors
- (iv) establish a system to monitor environmental safeguards of the project, including monitoring the indicators set out in the monitoring plan of the EMP;
- (v) facilitate and confirm overall compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant; e. supervise and provide guidance to the island councils to properly carry out the environmental monitoring as per the EARF;
- (vi) review, monitor, and evaluate the effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken as necessary;
- (vii) consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;
- (viii) ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public;
- (ix) address any grievances brought about through the grievance redress mechanism in a timely manner;
- (x) with assistance from the PMDCSC, provide orientation to PCU and PIU staff in environmental management arrangements for the project;
- (xi) provide inputs to progress reports and the project completion report;
- (xii) visit worksites during construction and provide guidance relating to supervision and compliance monitoring; and
- (xiii) visit completed works and assist with establishing environmental monitoring procedures for the operation phase of the improved infrastructure.

92. **Consultants.** The PMDCSC includes an environmental safeguards specialist. The PMDCSC shall (i) prepare, review and update the IEEs prepared during project preparation stage; (ii) prepare/update IEEs for Output 2 (IWMCs for 32 outer islands); (iii) ensure EMPs are included in the bid and contract documents; (iv) ensure all statutory clearances are obtained prior to award of contracts; (v) facilitate meaningful consultations and carry out disclosure of safeguard documents as necessary; (vi) monitor EMP implementation; (vii) prepare environmental and social mentoring reports; and (viii) prepare corrective action plan/s as required to ensure compliance with ADB SPS, 2009 and national laws and regulations. The consultants recruited for strengthening capacity for sustainable solid waste management in the Greater Malé region, recruited under a capacity building transaction technical assistance (TRTA) package, will provide

implementation support including application of selection criteria, and environmental monitoring while support in community consultation will be provided by the PACCB consultants.

93. The PMDSC environmental safeguards specialist will:

- (i) screen and categorize IWMCs for inclusion in the project;
- (ii) ensure no Category A subproject per ADB SPS definition;
- (iii) prepare, review and update the IEEs prepared during project preparation stage;
- (iv) prepare/update IEEs for Output 2 (IWMCs for 32 outer islands);
- (v) as part of the EMP, prepare a project-focused Occupational Health and Safety Plan (OHS) to be adopted by PMU and contractors.
- (vi) ensure EMPs are included in the bid and contract documents;
- (vii) ensure all statutory clearances are obtained prior to award of contracts;
- (viii) facilitate meaningful consultations and carry out disclosure of safeguard documents as necessary;
- (ix) conduct Safeguards Orientation to contractors prior to mobilization
- (x) review the Contractor's Environmental Management Plan (CEMP) for adequacy in terms of compliance with the requirements of the EMP and instruct amendments and additions as necessary
- (xi) monitor contractors' implementation of the CEMPs.
- (xii) ensure that relevant OHS provisions in the contracts are abided by the contractors during the construction works.
- (xiii) develop and conduct regular safeguards trainings for PMU, island councils and other stakeholders to ensure common understanding of ADB SPS, 2009 requirements in all phases of project implementation.
- (xiv) monitor EMP implementation;
- (xv) assist PMU Safeguards Office in monitoring CEMP implementation by the contractors
- (xvi) prepare environmental and social mentoring reports
- (xvii) prepare corrective action plan/s as required to ensure compliance with ADB SPS, 2009 and national laws and regulations
- (xviii) assist in grievance redressal

94. The consultants recruited for strengthening capacity for sustainable solid waste management in the Greater Malé region, recruited under a capacity building transaction technical assistance (TRTA) package, will provide implementation support including application of selection criteria, and environmental monitoring while support in community consultation will be provided by the PACCB consultants.

95. **The Contractor.** The contractor will have the following roles and responsibilities:

- (i) complies with all applicable legislation, is conversant with the requirements of the EMP, and briefs staff about the requirements of same;
- (ii) ensures any sub-contractors/ suppliers, who are utilized within the context of the contract, comply with the environmental requirements of the EMP. The Contractor will be held responsible for non-compliance on their behalf;
- (iii) provides environmental awareness training to staff;
- (iv) bears the costs of any damages/ compensation resulting from non-adherence to the EMP or written site instructions;
- (v) conducts all activities in a manner that minimizes disturbance to directly affected residents and the public in general, and foreseeable impacts on the environment;

- (vi) ensures that its staff or engineers are informed in a timely manner of any foreseeable activities that will require input from the environment and safety officers (or equivalent);
- (vii) appoints one full time environment and safety officer (or equivalent) for implementation of EMP, community liaising, reporting and grievance redressal on day to day basis; and
- (viii) receives complaints/grievances from the public, immediately implements the remedial measures and reports to the PMU and PMDSC.

Table 5: Roles and Responsibilities of Project Implementation Organizations

Project Implementation Organizations	Management Roles and Responsibilities
Executing agency Ministry of Finance and Treasury (MOFT)	<ul style="list-style-type: none"> • Guide and monitor overall project execution. • Financial oversight. Ensure flow of funds to the implementing agency and timely availability of counterpart funding; ensure adequate budget for successful implementation of the project. • Monitors compliance with project legal Agreements • Procurement oversight. Responsible for approving procurement. Review and coordinate evaluation of bids for works, goods, and consultant services. • Maintaining project accounts and project financial records; • Review and sign withdrawal applications before submitting to Asian Development Bank (ADB). • Approve project management unit (PMU).
Project steering committee [Chair: Minister, Ministry of Environment and Energy (MEE)]	<ul style="list-style-type: none"> • Provide policy direction to facilitate project implementation. • High-level troubleshooting. • Meets quarterly (or as needed) to review project performance and resolve issues.
Implementing agency 1 (MEE)	<ul style="list-style-type: none"> • Overall day-to-day project management, monitoring, and evaluation.
PMU in MEE	<ul style="list-style-type: none"> • Responsible for overall project management, implementation and monitoring; • Reviews the reports submitted by (project management, design and construction supervision consultant) PMDSC with respect to detailed design, costs, safeguards, financial, economic, and social viability • Prepare, with the support of PMDSC, bidding documents, request for proposals, and bid evaluation reports; • Serves as point of contact with ADB, maintains project documents, and submits timely reports (quarterly progress reports and project completion report) to ADB by consolidating relevant inputs from PMDSCs and island council; • Consolidates expenditures and prepare withdrawal applications for direct payment, reimbursements and use of imprest advance; • Opens and manages imprest account for ADB Grant; • Organize project orientation for participating island councils by elaborating scope of the project and sharing about their obligation and including maintaining separate accounts for their respective contributions; • Establishment and maintaining of project website by disclosing progress reports, safeguard monitoring reports and design reports; and • Collect supporting documents and submit withdrawal applications to ADB via MOFT.

Project Implementation Organizations	Management Roles and Responsibilities
	<ul style="list-style-type: none"> Monitors and ensures the compliance of covenants, particularly timely submission of audited project accounts and compliance with safeguard requirements;
Technical committee	<ul style="list-style-type: none"> Advise and facilitate to resolve technical issues.
WAMCO	<ul style="list-style-type: none"> Operator for collection, transport, and disposal of waste services in project area Manage regional waste management facilities
Island Councils	<ul style="list-style-type: none"> Operators of solid waste services on outer islands Responsible for management and O&M of Island Waste Management Centers
ADB	<ul style="list-style-type: none"> Conducts project review missions, midterm review mission and project completion review mission to assess project implementation progress of all outputs, compliance of grant covenants including actions required in terms of safeguards (environmental impacts and social mitigation measures applicable); timeliness of budgetary allocations and counterpart funding; project expenditures; progress with procurement and disbursement; Post on ADB website the updated project information documents and safeguards documents as per disclosure provision of the ADB safeguards policy statement. Reviews executing agency and implementing agency's submissions for procurement of goods, equipment, works and services and provides comments and no objection on the submissions Checks Statement of Expenditure on sampling basis

B. Institutional Capacity Development Program

96. The PMU, to be established by the MEE, will be responsible for the implementation of safeguards and ensuring that they comply with ADB requirements as well as the EPPA. The body responsible for approving environmental impact assessments and issuing of permits is the Environmental Protection Agency (EPA), which is under the Ministry of Environment and Energy.³¹ Capacities were assessed by the PPTA consultants during interviews that took place in July and September 2017. The EPA has few trained technical staff and at the time of capacity assessment work undertaken by the PPTA consultants, all senior members of the EPA's waste department were away from the office for study, which is indicative of a low staffing resource level. The agency relies on external consultants for functions such as environmental monitoring for projects, however this is usually confined to the construction phase. The EPA does have one team of field staff a laboratory and a boat for fieldwork, but laboratory operations and travel is constrained by budget constraints. The situation is reflected in other departments of the MEE.

97. The PMDSC will provide assistance during the project for the implementation of safeguards in compliance with ADB SPS 2009 requirements and with the requirements of the EPPA. This provision responds to lessons learned for project design to include support to PMU staff in project implementation particularly in procurement, contract management, and safeguards. The PMDSC will provide assistance to the PMU for overseeing EMP implementation.

³¹ Note that EPA, while it comes under MEE, has a governing board which is a statutory body.

98. Besides the IEC component which includes some capacity building measures for ICs (e.g. increasing outreach of IEC, closing feedback loop), the Transaction Technical Assistance (TRTA) for Strengthening Capacity for Sustainable Solid Waste Management in the Greater Malé Region will provide both implementation and safeguard guidance and assistance towards the PMU. Since recycling is of a major concern, a market sounding will be carried out during the TRTA to increase the knowledge in this regard and to inform the institutional stakeholders (mainly MEE, WAMCO and ICs) about the potential for recycling of certain waste components.

99. Included in the capacity development for the island communities is a package to enhance the awareness and knowledge relating to solid waste management aspects and the O&M of the IWMCs which will help to facilitate a proper operation of and a well-defined input for the IWMCs (source separation of compostable fraction).

C. Indicative Budget Requirement

Table 6: Indicative Budget Requirement

Item	Unit cost per island (US\$)	Total Cost (US\$)
Site visits	135	4,320
IEE preparation for each IWMC	725	23,200
Environmental clearance for IEE	60	1,920
Consultations/Meetings	240	7,680
Establishment of GRM in each outer island	115	3,680
Updating of IEE/s	90	2,880
Disclosures	80	2,560
IEC Activities	165	5,280
Monitoring visits during construction	340	10,880
Capacity development	125	4,000
Contingency (10%)		6,640
Total		73,040

VII. MONITORING AND REPORTING

100. **Monitoring.** The objectives of monitoring in relation to the project are (i) gauge the performance of improved waste collection and treatment operations, (ii) ascertain the level of behaviour change that occurs and (iii) to obtain the benefit of views from local communities on changes that occur in living conditions as the improved IWMCs and related measures come into operation. The process of obtaining community feedback is also expected to help foster a sense of ownership among the user communities. Monitoring activities will therefore be observations of efficiency of waste collection and treatment and obtaining feedback from local communities.

101. To ensure that potential environmental problems are detected and addressed appropriately, environmental monitoring will take place during construction and operation and maintenance stages of each subproject. During construction stage, responsibility for monitoring shall be held by the PMU, through the PMDCSC, and the construction supervision team. Key tasks will be the monitoring of compliance with environmental mitigation measures as indicated in the EMPs for each island. During operation and maintenance stage, responsibility for monitoring shall rest with the island councils. Indicative summary of these monitoring activities and responsibilities is shown in Table 7.

Table 7: Indicative Summary of Monitoring Activities and Responsibilities

Impact to be Monitored	Means of Monitoring	Pre-construction		Construction		Operation	
		Frequency	Responsible Agency	Frequency	Responsible Agency	Frequency	Responsible Agency
Incidence of burning (at homes and	Community feedback / site observations	Once, to establish baseline	Island Councils / PMDSC	Quarterly consultations and reporting	Island Councils / PMCDS	Annual consultations and reporting	Island councils
Adoption and effectiveness of source separation	Community feedback / site observations	Once, to establish baseline	Island Councils / PMDSC	Quarterly consultations and reporting	Island Councils / PMCDS	Annual consultations and reporting	Island councils
Increased re-use and recycling of waste	Community feedback / site observations / shipping records	Once, to establish baseline	Island Councils / PMDSC	Quarterly consultations and reporting	Island Councils / PMCDS	Annual consultations and reporting	Island councils
Efficiency of handling, treatment and transfer of waste	Community feedback / site observations / IWMC operational records / shipping records	Once, to establish baseline	Island Councils / PMDSC	Quarterly consultations and reporting	Island Councils / PMCDS	Annual consultations and reporting	Island councils
Compliance with the provisions of the EMP	Regular inspections of ongoing and completed work	Once	MEE / PMDSC	Daily	PMCDS	Three-monthly	MEE

102. **Reporting.** PMU with the help of PMDSC will prepare periodic monitoring reports that describe progress with implementation of the EMP and compliance issues and corrective actions, if any. Semi-annual environmental monitoring reports shall be submitted to ADB for review and disclosure on the ADB website. PMU shall likewise disclose the reports on its website and in places accessible to the public. The suggested semi-annual environmental monitoring report format is in Appendix 4.

RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: Greater Malé Environmental Improvement and Waste Management Project

Sector Division: South Asia Urban Development and Water Division

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area...			
▪ Densely populated?			
▪ Heavy with development activities?			
▪ Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site			
• Protected Area			
• Wetland			
• Mangrove			
• Estuarine			
• Buffer zone of protected area			
• Special area for protecting biodiversity			
• Bay			
B. Potential Environmental Impacts Will the Project cause...			
▪ impacts associated with transport of wastes to the disposal site or treatment facility			
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?			
▪ degradation of aesthetic and property value loss?			

Screening Questions	Yes	No	Remarks
▪ nuisance to neighboring areas due to foul odor and influx of insects, rodents, etc.?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ risks and vulnerabilities related occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, insects, birds and rats?			
▪ deterioration of water quality as a result of contamination of receiving waters by leachate from land disposal system?			
▪ contamination of ground and/or surface water by leachate from land disposal system?			
▪ land use conflicts?			
▪ pollution of surface and ground water from leachate coming from sanitary landfill sites or methane gas produced from decomposition of solid wastes in the absence of air, which could enter the aquifer or escape through soil fissures at places far from the landfill site?			
▪ inadequate buffer zone around landfill site to alleviate nuisances?			
▪ road blocking and/or increased traffic during construction of facilities?			
▪ noise and dust from construction activities?			
▪ temporary silt runoff due to construction?			
▪ hazards to public health due to inadequate management of landfill site caused by inadequate institutional and financial capabilities for the management of the landfill operation?			
▪ emission of potentially toxic volatile organics from land disposal site?			
▪ surface and ground water pollution from leachate and methane gas migration?			
▪ loss of deep-rooted vegetation (e.g. trees) from landfill gas?			
▪ explosion of toxic response from accumulated landfill gas in buildings?			
▪ contamination of air quality from incineration?			
▪ public health hazards from odor, smoke from fire, and diseases transmitted by flies, rodents, insects and birds, etc.?			

Screening Questions	Yes	No	Remarks
▪ health and safety hazards to workers from toxic gases and hazardous materials in the site?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components (e.g., landfill or incinerator) of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: Greater Malé Environmental Improvement and Waste Management Project

Sector: Waste Management

Subsector: Water and urban infrastructure and services

Division/Department: South Asia Department / Urban Development and Water Division

	Screening Questions	Score	Remarks ³²
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

³² If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): _____

Other Comments: _____

Prepared by: _____

CONTENT AND FORMAT OF ENVIRONMENTAL ASSESSMENT DOCUMENTS

1. An environmental assessment report is required for all environment category A and B projects. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, and an IEE may have a narrower scope depending on the nature of the project. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown.
2. **Executive Summary.** This section describes concisely the critical facts, significant findings, and recommended actions.
3. **Policy, Legal, and Administrative Framework.** This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.
4. **Description of the Project.** This section describes CRDP-II; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project's layout and components, the project site, and the project's area of influence.
5. **Description of the Environment (Baseline Data).** This section describes relevant physical, biological, and socioeconomic conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.
6. **Anticipated Environmental Impacts and Mitigation Measures.** This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible; identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, trans boundary, and cumulative impacts as appropriate.
7. **Analysis of Alternatives.** This section examines alternatives to CRDP-II site, technology, design, and operation—including the no project alternative—in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. It also states the basis for selecting the particular project design proposed and, justifies recommended emission levels and approaches to pollution prevention and abatement.
8. **Information Disclosure, Consultation, and Participation.** This section: (i) describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders; (ii) summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with

special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and (iii) describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

9. **Grievance Redress Mechanism.** This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

10. **Environmental Management Plan.** This section deals with the set of mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks):

i) **Mitigation** identifies and summarizes anticipated significant adverse environmental impacts and risks; describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project.

ii) **Monitoring** describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.

iii) **Implementation arrangements** specify the implementation schedule showing phasing and coordination with overall project implementation; describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmental management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan.

iv) **Performance indicators** describes the desired outcomes as measurable events to the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

11. **Conclusion and Recommendation.** This section provides the conclusions drawn from the assessment and provides recommendations.

COMPARATIVE ANALYSIS OF MALDIVES FRAMEWORK AND ADB SAFEGUARD POLICY STATEMENT

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
<p>Key element (6)</p> <p>Identify socioeconomic impacts (including on livelihood through environmental health and safety, vulnerable groups, and gender issues)</p>	<p>In the EIA Regulations, “EIA” is defined as a means of identifying, predicting, evaluating and mitigating the biophysical, social, cumulative, economic and other relevant effects of a proposed development and “the Human Environment” as the natural and physical environment and the relationships of people. Schedule C.1 of the EIA Regulations Part 3 requires the EIA to identify and assess the impacts on public well-being, public health, public safety, public transport, employment and economic status.</p>	<p>Partial Equivalence</p> <p>There is no reference in the EIA legislation regarding need to assess impacts on vulnerable groups and gender issues.</p>	<p>For full equivalence, the EIA Regulations should include assessment of the impact on vulnerable groups and gender related impacts.</p>	<p>Para 84 describes consultations that need to take place, the findings of which need to be reflected in project / EMP design. Specific reference to gender impacts is included and reference to vulnerable groups has been added.</p>
<p>Key element (9)</p> <p>Assess potential trans-boundary impacts</p>	<p>There is no explicit reference to “assessment of trans-boundary impacts” in the legal framework.</p>	<p>No Equivalence.</p>	<p>For full compliance, new or revised legislation/regulations should require assessment of trans-boundary impacts</p>	<p>Given very limited scale of subprojects (mostly 30m x 30m facilities) no specific mention of transboundary impacts included.</p>

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
Key element (11) Use strategic environmental assessment	There is no explicit reference to conduct of strategic environmental assessment in the legislation	No equivalence	To achieve full compliance the EIA regulations or similar legislation should require the conduct of SEAs, including assessment of plans, programs and policies	Assume this is to be addressed at policy / sector level rather than under the project
Key Element (4) Prepare an environmental management plan (EMP) that includes... related institutional or organizational arrangements	Schedule I of the EIA Regulations "Review of IEE or EIA study" Number 7: "Mitigation" requires the mitigation measures or "EMP" Plan to define in specific, practical terms the costs, manpower, equipment, timing and technology needed	Partial Equivalence While, the EMP is required to provide for manpower requirements for its implementation, it is not explicit in terms of requiring institutional or organization arrangements for its implementation	To attain full equivalence, the EMP should explicitly require the definition of institutional or organization arrangement	Provided in Section VI (A) of the EARF
Key Element (5) Prepare an environmental management plan (EMP) that includes the proposed... capacity development and training measures	Schedule I of the EIA Regulations "Review of IEE or EIA study" Number 7: "Mitigation" requires an assessment of institutional capacity to carry out mitigation measures	Partial Equivalence The requirement for capacity development and training for implementation of EMP is implicit, rather than explicit in the legislation	To attain full equivalence, the legislation should made explicit reference for including capacity building and training needs in the EMP	Provided in VI (B) of the EARF
Key Element (9) Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm	The legislation is implicit in terms of the requirement to avoid or minimizing the impact on the environment or human health and safety	Partial Equivalence There is no explicit reference to the polluter pay principle	To attain full equivalence, the legislation should explicitly made requirement for ensuring that the developer or polluter pay if there is damage to the environment or third party	As this project involves eliminating (or at least reducing) existing polluting practices viz open burning of rubbish, placing

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
to third parties, and the polluter pays principle.				waste on soil this does not apply. Consideration could be given however to assisting with development of bylaws such as imposing fines for continued burning, or illegal dumping
Key element (1) Carry out meaningful consultation with affected people and facilitate their informed participation	Schedule E of the EIA Regulations lists the Public Consultation requirements as follows: That the IEE and EIA process and report should include: (a) A list of persons consulted including persons in statutory bodies, atolls and island offices, community groups and NGOs, local residents, local fishermen, tourism operators and others likely to be affected by the proposed development (b) Information on how, when and where consultations were conducted, e.g. stakeholder meetings in affected area, individual meetings,	Partial Equivalence There is no clear timeline established when consultation should occur, if consultation should take place throughout project implementation and the means for resolution of any affected person's concerns	For full equivalence, the EIA Regulations should explicitly identifying the different stages at which consultation should take place (e.g. early in EIA process, before finalization of EIA and during project implementation and monitoring) as well as means to address people's concerns and grievances	Section V (A) gives guidance on when & how consultations are to take place

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
	questionnaires; and (c) Summary of outcome of consultations, including the main concerns identified.			
Key element (2) Ensure women's participation in consultation	There is no explicit reference to women's participation in the consultative process, although reference to consultation in the EIA regulations.	No equivalence	For full equivalence the EIA Regulations should explicitly require consultation and participation of women in the EIA process and during project implementation	Section V(A) specifically mentions consultations with women as well as men
Key element (3) Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process.	While there is explicit reference in Schedule E of the EIA Regulations of the requirements for involving stakeholders and affected people as outlined below, it does not specify the stages (including early in project preparation process) that consultation is mandatory: That the IEE and EIA process and report should include: (a) A list of persons consulted including persons in statutory bodies, atolls and island offices, community groups and NGOs, local residents, local fishermen, tourism operators and others likely to	Partial equivalence There is no reference in the legislation to the stages and timing of consultations	To attain full equivalence, the EIA Regulations should explicitly identifying the different stages at which consultation should take place, including early in the project preparation process	As above

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
	be affected by the proposed development (b) Information on how, when and where consultations were conducted, e.g. stakeholder meetings in affected area, individual meetings, questionnaires; and (c) Summary of outcome of consultations, including the main concerns identified.			
Key element (4) Establish a grievance redress mechanism	There is no explicit reference to establishment of a grievance redress mechanism at the project level	No equivalence	For full equivalence the EIA Regulations should specify mechanisms for addressing people's grievances both during the EIA process and during project implementation	GRM included – Section V (B)
Key element (1) Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place.	The EIA Regulations require public consultations, and the intent that the project is complex and sufficiently controversial, the Ministry of Environment can request additional public consultation. This would take place before the EA report is finalized.	Partial equivalence There is no guidance on the disclosure of draft EA (and EMP), including timing, location and language	To achieve full equivalence, the EIA Regulations should clearly specify the timing, location, language and other specifics regarding the disclosure of the draft EA (and EMP)	Language and mode of disclosure given in V (A)
Key element (2) Disclose the final environmental	There is no guidance in the legislation	No equivalence	For full equivalence, the EIA Regulation should explicitly	As above

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
assessment, and its updates if any, to affected people and other stakeholders	regarding the disclose of the final EA report and EMP, although the decision of approval or environmental clearance has to be disclosed		specify the need for disclosure of the final EA and EMP reports in an accessible location and in a language that is understandable to the affected people and other stakeholders	
Key element (2) Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	<p>The EIA Regulations, Part IV Item 13 “Environmental Monitoring and Mitigation has the following instructions:</p> <p>(i) The proponent shall fund and conduct environmental monitoring and implementing mitigation measures for the development proposal if specified and required by virtue of the Environmental Decision Statement</p> <p>(ii) The proponent shall regularly submit summary environmental monitoring reports.</p> <p>(iii) The proponent shall maintain records of all monitoring data and on request make these available to the Ministry of Environment</p>	<p>Partial equivalence</p> <p>There is no requirement for public disclosure of the monitoring results, disclosure is limited to submission to government agencies</p>	For full equivalence, the EIA Regulations should specify requirement for public disclosure of monitoring results	Specific mention of results of monitoring added to para 56

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
	<p>(iv) The proponent shall submit a final environmental monitoring and mitigation report to the Ministry of Environment when the project is completed or at such time as may be specified in the Environment Decision Statement</p> <p>(v) The Ministry of Environment may request to put in place necessary additional measures based on the finding of the monitoring reports</p>			
<p>Key Element (2) If a project is located within a legally protected area, implement additional programs to promote and enhance conservation aims of the protected area</p>	<p>The EIA Regulations Schedule B further requires development to ensure that economic development is sustainable and that any development project assess the “presence or absence of critical ecosystems” that would “Environmental Sensitive Areas” (ESA) that have been identified by the Ministry of Environment. If such an ESA has been identified in the development</p>	<p>Partial Equivalence</p>	<p>To attain full equivalence, the legislation should be explicit if development can take place in protected areas or ESAs, and if so under what conditions and what added measures are necessary for enhancing conservation of the area</p>	<p>Conditions and criteria relating to ESAs set out in Table 3: planning and design criteria</p>

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
	<p>area, that that site should be either removed for consideration for future development or that development could to take place, taking into consideration the conservation of the sensitive area, there by mitigating the negative impacts.</p> <p>However Schedule B of the EIA Regulations clarifies that if a site/island or its surrounding reef is part of the island/reef ecosystem included in the ESA sites listed for special protection, such sites should not be considered for any development. Also, any site/island selected for development must have at least a 20 m space (measured from the seaward edge inland) for maintenance of an undisturbed band of vegetation that could serve as a “no-development” buffer zone, or else it should be removed from any</p>			

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
	development activity			
Key Element (3) In an area of natural habitats, there must be no conversion or degradation, unless (i) alternatives are not available; (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated	While, the legislation recognizes the need to ensure that development is excluded from specially designed environmentally sensitive sites, the EIA Regulations calls for evaluation of alternatives to development that cause less harm of the environment (that is defined as fauna, flora and natural habitats....)	Partial equivalence There is no explicit requirement for evaluating cost and benefits of damaging the environment (including natural habitats) in decision-making on conversion or degradation of natural habitats	To attain full equivalence, the legislation should specify the options for conversion and/or degradation of natural habitats including assessment of costs and benefits of conversion and mitigation options	Conversion of natural habitats excluded (Table 3)
Key Element (4) Use a precautionary approach to the use, development, and management of renewable natural resources	Schedule B of the EIA Regulations states that development that is in harmony with the natural environment is the preferred approach for the Maldives and environment is defined as the fauna, flora, natural habitat and the human environment. However, there is no specific reference to use of a precautionary approach to management of renewable natural resources	No Equivalence	To attain full equivalence, the legislation should require the explicit use of a precautionary approach to use and management of renewable natural resources	No significant ongoing use of natural resources involved in implementation
Key element (1) Apply pollution prevention and control	The main piece of legislation that provides regulations for the	Partial equivalence	For full equivalence, guidelines are required as stipulated by the EPP Act to manage	Reference to EHS General Guidelines included

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
<p>technologies and practices consistent with international good practices.</p>	<p>protection and prevention of pollution is the Environment Protection and Preservation Act of 1993</p> <p>Under section 1 of Act, requires the Government and citizens to give special attention to the protection of its environment including both sea and the atmosphere. The relevant Government authorities shall also provide guidelines for the protection and preservation and everyone is required to respect such guidelines.</p> <p>Under section 7(a), any type of wastes, oils, poisonous gases or any substance that may have harmful effects on the environment shall not be disposed of within the territory of the Maldives. In cases where the disposal of such substances becomes absolutely necessary, they shall be disposed of only within those areas</p>	<p>While the EPPA does not make reference to international standards of pollution management</p>	<p>and deal with the pollution of air, water, land based on internationally recognized standards</p>	

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
	designated for such purposes by the Government. If such waste is to be incinerated, appropriate precautions should be taken to avoid any harm to the health of the population. Similarly, the Act also states that wastes that are harmful to human health and the environment shall not be disposed of anywhere within the territory of the country and permission should be obtained from the relevant authority at least 3 months in advance of any trans-boundary movement of such wastes through the territory of the Maldives.			
Key Element (3) Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of	Environment Protection and Preservation Act in Article 7 and 8 address the issues related to waste disposal and hazardous toxins. Article 7 "Waste disposal, Oil and Poisonous Substances" states that (a) Any types of waste oil, poisonous gases	Partial Equivalence There is no recognition of load minimization and control, including measures for generation, release, handling and storage	To attain full equivalence, the legislation should require avoidance and control of emission and discharge loads and handling, production and storage of such materials	Steps for avoidance of use and control of hazardous materials in construction provided in list of potential impacts and in the sample IEE

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
hazardous materials from their production, transportation, handling, and storage.	<p>or any substance that may be harmful on the environment shall not be disposed within the territory of the country</p> <p>(b) In case, where the disposal of substances stated in (a) becomes absolutely necessary, they shall be disposed within the areas designated by the government. If such wastes are incinerated, appropriate precautions should be taken to avoid harm to the health of the population</p> <p>Article 8 Hazardous/Toxic or Nuclear Wastes states that such wastes that is harmful to human health and the environment shall not be disposed in the territory of the country, Permission is required for any transboundary movement of such wastes through the territory of the Maldives</p>			
Key Element (4) Avoid the use of hazardous materials subject to international bans or phase-outs	The legislation (Environmental Protection and Preservation Act) refers to disposal of hazardous wastes and	Partial Equivalence	To attain full equivalence, the legislation should deal explicitly with the use of hazardous materials on the basis of	As above

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
	transboundary movement of such wastes, but is silent on its use and phase-outs		international norms and phase out schedules	
Key Element (5) Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	<p>There is no specific legislation that governs the purchase, use and management of pesticides in the Maldives.</p> <p>The Environment Protection and Preservation Act deals more broadly with the impacts of development related activities on the environment (fauna, flora, natural resources, etc.) and on the health and well being of the people. The direct and indirect impacts on air, water, and other natural systems (that likely refers to soil, renewable and non-renewable natural resources</p>	No Equivalence	To attain full equivalence, the legislation should provide guidance on the purchase, use and management (production, transport, storage, handing, disposal) of chemicals use in agriculture	Not applicable – no (or very limited) agriculture involved on project islands and not related to IWMC operation
Key Element (1) Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that	The EIA regulations requires the need to conserve and protect cultural resources	<p>Partial equivalence</p> <p>The legislation lacks mention of the need to use field-based surveys and qualified experts during the EIA process</p>	To attain full equivalence, the legislation should require the use of field based surveys and qualified experts to assess impacts on cultural resources during EIA preparation	Requirements for surveys given in Table 3

ADB Safeguard Policy Statement	Corresponding Legal Provisions of the draft of the Law on EIA / EIA regulations of 2008 / 2015	Extent of Equivalence	Recommended Gap Filling Measures	Confirmation / Action taken / where covered in EARF
employ qualified and experienced experts during environmental assessment.				
Key Element (2) Provide for the use of “chance find” procedures that include a pre- approved management and conservation approach for materials that may be discovered during project implementation	None	There is no guidance on how to deal with “chance finds”	For full equivalence, the EIA regulations or other legislation should provide for the us of “chance find” procedures	Provided in Table 3

GRIEVANCE REDRESS MECHANISM COMPLAINT FORM

(To be available in local language, if any)

The Greater Malé Environmental Improvement and Waste Management Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing ***(CONFIDENTIAL)*** above your name. Thank you.

Date	Place of registration				
Contact Information/Personal Details					
Name		Gender	Male Female	Age	
Home Address					
Village / Town					
District					
Phone no.					
E-mail					
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below:					
If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
If – then mode:	
<input type="checkbox"/>	Note/Letter
<input type="checkbox"/>	E-mail
<input type="checkbox"/>	Verbal/Telephonic
Reviewed by: (Names/Positions of Official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Means of Disclosure:	

GRIVENCES RECORD AND ACTION TAKEN

Sr. No.	Date	Name and Contact No. of Complainer	Type of Complain	Place	Status of Redress	Remarks

SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT FORMAT

INTRODUCTION

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number	Roles
1. PMU				
2. PIUs				
3. Consultants				

- Overall project and sub-project progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/List of Works	Contract Status (specify if under bidding or contract awarded)	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M) ³³	If On-going Construction	
				%Physical Progress	Expected Completion Date

³³ If on-going construction, include %physical progress and expected date of completion

COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS³⁴

Package No.	Subproject Name	Statutory Environmental Requirements ³⁵	Status of Compliance ³⁶	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish ³⁷

COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT PLAN (REFER TO EMP TABLES IN APPROVED IEE/S)

- Confirm if IEE/s require Contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise IEE Documentation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
	Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		

³⁴ All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.

³⁵ Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)

³⁶ Specify if obtained, submitted and awaiting approval, application not yet submitted

³⁷ Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.

- For each package, provide name/s and contact details of Contractor/s' nodal person/s for environmental safeguards.

Package-wise Contractor/s' Nodal Persons for Environmental Safeguards

Package Name	Contractor	Nodal Person	Email Address	Contact Number

- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

Summary of Environmental Monitoring Activities (for the Reporting Period)³⁸

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

³⁸ Attach Laboratory Results and Sampling Map/Locations

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

- Briefly describe the approach and methodology used for environmental monitoring of each sub-project.

MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS (AMBIENT AIR, WATER QUALITY AND NOISE LEVELS)

- Discuss the general condition of surroundings at the project site, with consideration of the following, whichever are applicable:
 - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
 - Identify if muddy water is escaping site boundaries or if muddy tracks are seen on adjacent roads.
 - Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these are intact following heavy rain;
 - Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area in the Appendix.
 - Confirm spill kits on site and site procedure for handling emergencies.
 - Identify any chemical stored on site and provide information on storage condition. Attach photograph.
 - Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
 - Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
 - Provide information on barricades, signages, and on-site boards. Provide photographs in the Appendix.
 - Indicate if there are any activities being under taken out of working hours and how that is being managed.
- Briefly discuss the basis for environmental parameters monitoring.
- Indicate type of environmental parameters to be monitored and identify the location.
- Indicate the method of monitoring and equipment used.
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements.

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Monitoring Results)	
			Day Time	Night Time

GRIEVANCE REDRESS MECHANISM

- Provide information on establishment of grievance redress mechanism and capacity of

grievance redress committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

COMPLAINTS RECEIVED DURING THE REPORTING PERIOD

- Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or Contractors
- Others

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name _____
 Contract Number _____

NAME: _____ DATE: _____
 TITLE: _____ DMA: _____
 LOCATION: _____ GROUP: _____

WEATHER CONDITION: _____

INITIAL SITE CONDITION: _____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____ Incident _____ Resolved _____ Unresolved _____

INCIDENT:
 Nature of incident: _____

Intervention Steps: _____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes No

Signature _____

Sign off

Name
Position

Name
Position

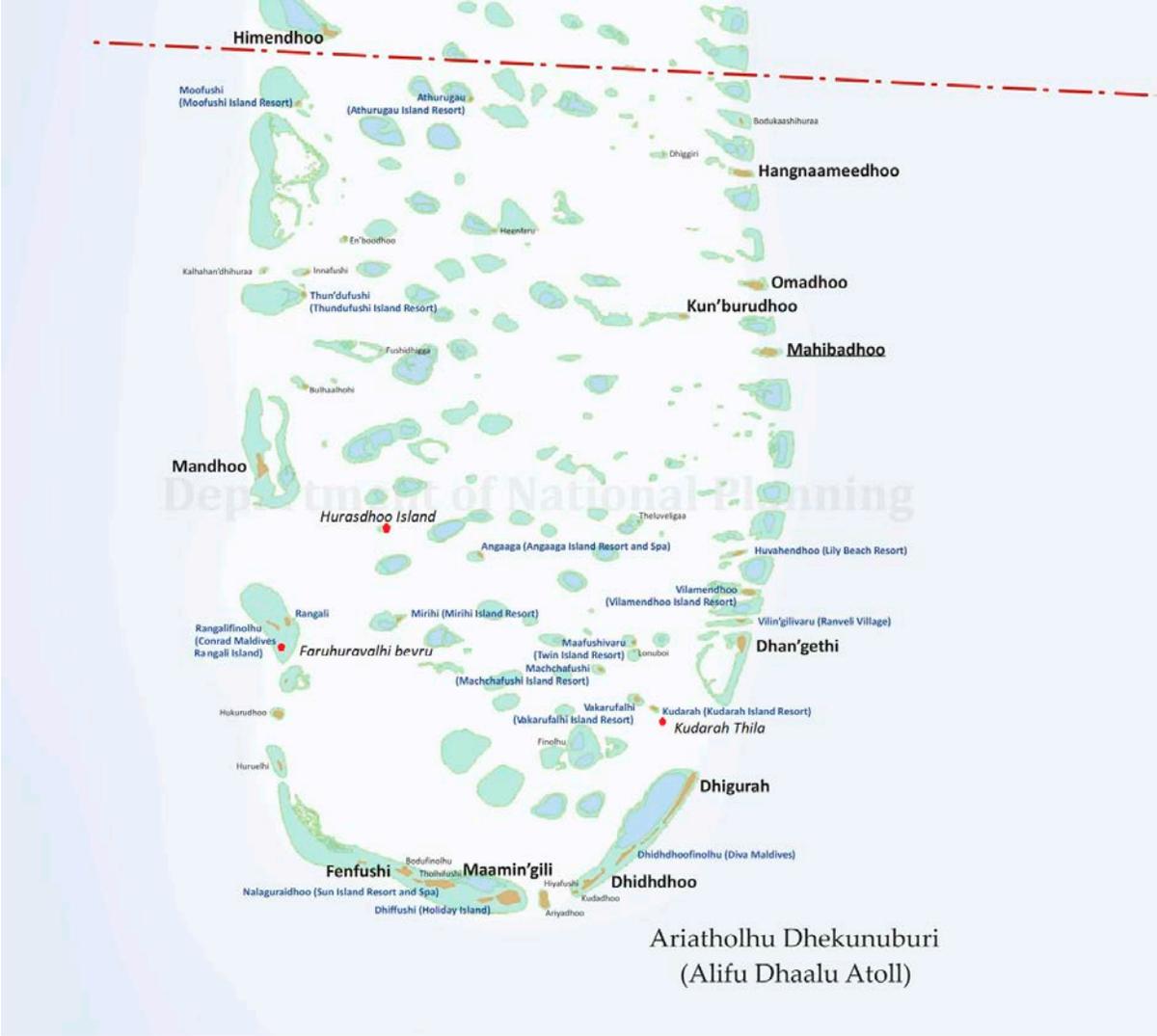
LOCATIONS OF PROTECTED AREAS WITHIN ZONE 3



Map of Kaafu Atoll showing protected areas
Map sourced from Department of National Planning



Map of Alifu Alifu Atoll showing protected areas
Map sourced from Department of National Planning



Map of Alifu Dhaalu Atoll showing protected areas
Map sourced from Department of National Planning



Map of Vaavu Atoll showing protected areas
Map sourced from Department of National Planning

Resettlement Framework

Document Stage: Draft for Consultation
Project Number: 51077-002

March 2018

MLD: Greater Malé Environmental Improvement and Waste Management Project

Prepared by Ministry of Environment and Energy for the Asian Development Bank.

This draft Resettlement Framework is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "terms of use" section of this website.

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ACRONYMS

ADB	Asian Development Bank
CBO	Community Based Organization
EPA	Environmental Protection Agency
GAP	Gender Action Plan
GRC	Grievance Redressal Committee
GRM	Grievance Redress Mechanism
IWMC	Island Waste Management Centre
MLA	Maldives Land Act
MEE	Ministry of Environment and Energy
MOFT	Ministry of Finance and Treasury
NGO	Non-Governmental Organization
PMDSC	Project Management, Design and Construction Supervision Consultants
PSC	Project Steering Committee
SPS	Safeguard Policy Statement, 2009
WAMCO	Waste Management Corporation Ltd

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EXECUTIVE SUMMARY

- 1. The Project.** The Greater Male Environmental Improvement and Waste Management Project (the Project) will establish an integrated solid waste management system in Greater Male including collection, transfer, treatment using advanced waste-to-energy technology, disposal, recycling, dumpsite closure and remediation, public awareness in reduce-reuse-recycle, and strengthen institutional capacities for service delivery and environmental monitoring. The scope includes the following components: (i) improved waste collection and transfer in Greater Malé, (ii) improved dumpsite management and logistics on Thilafushi Island, (iii) improved outer island waste management systems; outer islands defined as those inhabited islands outside the Greater Malé region. (iv) strengthened institutional capacity of Waste Management Corporation Limited (WAMCO), (v) awareness campaign and behavior change, and (vi) project management, design, and supervision support for the project management unit (PMU). The total estimated base cost is \$30.45 million. The project will be funded through a grant from Asian Development Bank (ADB). A separate follow-on ADB project in 2019 will include the regional waste management facility including waste-to-energy plant and dumpsite rehabilitation, subject to availability of land.
- 2. The Resettlement Framework.** This Resettlement Framework reflects the principles and procedures found in the national legal enactments and policies in Maldives related to social safeguards that need to be addressed in the project and ADB Safeguard Policy Statement (SPS) requirements. The project does not expect to have any significant impact due to land acquisition and involuntary resettlement under any component and also in all selected islands for the project. According to the Maldives Land Act (MLA), lands belong to the Government of Maldives and it is very rare that private land will be acquired for subprojects. However, as subprojects under Output 2 will be prepared after Board approval, if there is any land acquisition or involuntary resettlement for such subprojects, the Executing Agency will be responsible for preparing resettlement plans per this framework and submit to ADB for review and approval prior to contract awards.
- 3.** As per the ADB SPS, baseline socioeconomic surveys, census, inventory of losses and valuation of assets, and collection of qualitative data is required. These data will help to prepare resettlement plans, gender empowerment and social inclusion plan, poverty reduction strategies, and plans for indigenous peoples and vulnerable groups, as needed. In addition, the Resettlement Framework focuses on consultation, information disclosure and grievance redress mechanism for the project. The proposed grievance redress committee of the project is headed by the Chairman of the Island Council or City Council while representatives include four members from the community.
- 4.** Capacity development related to social safeguards focuses on all project staff at the Executing Agency, PMU and WAMCO project staff and the senior management staff. The goal of capacity development program is to ensure the smooth function of project social safeguards requirements and establish a satisfactory participation of stakeholders in subproject activities while ensuring project sustainability.
- 5.** Finally, the Resettlement Framework suggests necessary institutional arrangements and monitoring requirements of the project including key monitoring indicators.

I. INTRODUCTION

1. This Resettlement Framework has been prepared for the Greater Malé Environmental Improvement and Waste Management Project as required under ADB's sector lending modality. The Resettlement Framework describes the objectives, policy principles and procedures for land acquisition and involuntary resettlement, if any, compensation and other resettlement assistance measures and method for preparation of additional subprojects under the Loan. According to the Maldives Land Act (MLA), land belongs to the Government of Maldives and it is very rare that private land will be acquired for subprojects. However, as subprojects under Output 2 will be prepared after Board approval, if there is any land acquisition or involuntary resettlement for any of such subprojects, the Executing Agency will be responsible for preparing resettlement plans per this framework and submit to Asian Development Bank (ADB) for review and approval prior to contract awards.

A. The Project

2. The Maldives has a total population of around 341,256 with 35% of the total population living in the capital city of Malé. The Government of Maldives is committed to improve the environmental conditions of the country and strengthen its solid waste management (SWM) and requested support from ADB to implement the “*Greater Male Environmental Improvement and Waste Management Project*” (“the Project”). The Project aims to improve the critical situation of Thilafushi dumpsite and strengthen SWM in Zone 3¹, which covers Greater Male’ (Male’, Villingili & Hulhumalei including inhabited islands in Kaafu, AlifuAlifu, AlifuDhaalu and Vaavu atolls.

3. Zone 3 population is approximately 216,000, distributed over 32 islands, 73 tourist resorts, 14 city hotels, and 177 guest houses, and expected to grow to 300,000 in the next five years. Atolls included in Zone 3 are (see Figure 1): Kaafu, Alifu, Alifu Dhaalu and Vaavu. Solid waste generation from

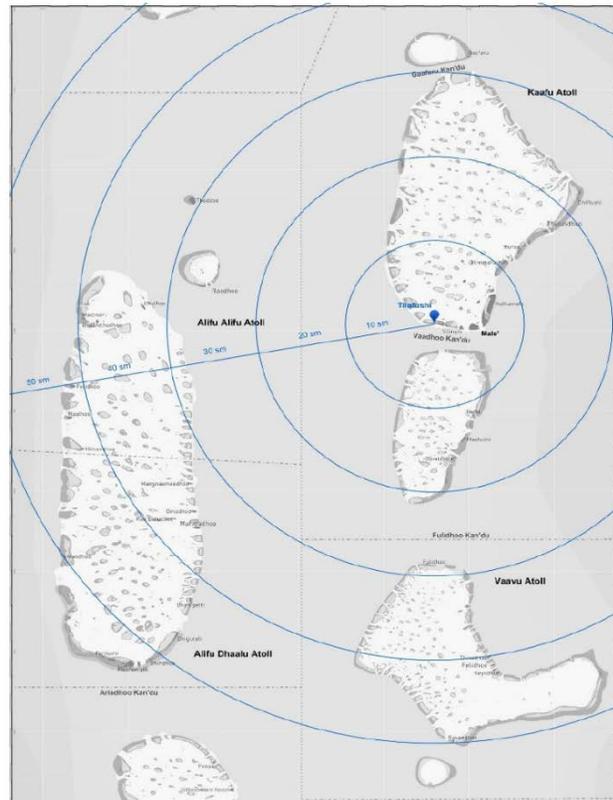


Figure 1: Atolls in Zone 3

domestic, institutional, commercial and industrial activities is 75,000 tons per year and projected to reach 115,000 tons per year by 2022. Construction and demolition (C&D) waste generation is also estimated to be 70,000 to 100,000 tons per year. Male's overburdened dumpsite on Thilafushi island is creating significant environmental and public health hazards with negative impacts on residents and surrounding resorts. So, the Government and ADB agreed to prioritize and provide immediate actions to address the nuisances of smoke, smell, and flies on Thilafushi.

¹ Solid Waste Management in Maldives was divided into seven zones.

4. The Government will implement the Project in two phases: (Phase 1) identify feasible quick-fix solutions to control nuisances of Thilafushi Island dumpsite, manage incoming waste on Thilafushi Island, provide equipment for island waste management centers, and install an appropriate transfer and collection system in Malé and islands/resorts; (Phase 2) rehabilitate the existing dump site, implement a long-term comprehensive waste management strategy for Zone 3 including, treatment, disposal, and reduce-reuse-recycle (3R). The waste management strategy will consider advanced treatment options including waste-to-energy. The Project will include facilities such as air pollution control residue (fly ash) landfill, a bottom ash processing plant integrated with C&D waste facility, a recycling center and an end-of-life vehicle dismantling plant which will be located on the same site on Thilafushi.

5. The project will have three outputs: (a) Waste collection, transfer, and disposal systems improved and made climate and disaster resilient; (b) Community-based outer island waste management systems targeting poor and women enhanced; and (c) Institutional capacity and public awareness in sustainable waste management strengthened.

6. **Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient.** This will include (i) an efficient waste collection strategy designed and applied in Malé and Hulhumalé in consultation with local communities targeting women; (ii) waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhumalé and Villimalé provided; (iii) transfer stations in Malé and Villimalé constructed and transfer station in Hulhumalé designed; (iv) C&D waste processing plant and end of life vehicle dismantling workshop constructed; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) three vessels for waste transport from outer islands to Thilafushi provided; (vii) heavy equipment (bulldozers, excavators, roll trucks) for controlled dumpsite management at Thilafushi provided; and (viii) construction of two administrative buildings for WAMCO at Malé transfer station and Thilafushi waste vessel harbor. All facilities designed will consider climate change and disaster resilient features.

7. **Output 2: Community-based outer island waste management systems targeting poor and women enhanced.**² This output will provide comprehensive support to strengthen sustainable solid waste management in poor outer island communities. It includes (i) a minimum of 22 island waste management centers (IWMCs) with processing equipment (balers, glass crushers, metal presses) developed or upgraded in consultation with community targeting women and incorporating climate and disaster risk measures;³ (ii) collection equipment for outer islands (bins, refuse collection vehicles, dump trucks) provided; (iii) capacity building of eligible island councils targeting women in waste collection, segregation, composting, recycling, and O&M; and (iv) community awareness and behavior change campaigns in 3R targeting women in outer islands delivered. As subprojects under Output 2 will be prepared after Board approval, each island is required to meet minimum eligibility and selection criteria, including safeguards, to receive IWMC support under the project.⁴ The criteria is intended to ensure sustainability and is

² There are 32 outer islands in the project area eligible for support under Output 2.

³ Out of 32 outer islands, some have existing facilities but are not operational due to inadequate design and insufficient equipment which would be upgraded under the project.

⁴ All 32 outer islands will be screened through the selection criteria outlined in the project administration manual and environmental assessment review framework (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President). Appraisal and safeguard reports will be approved by ADB prior to start of any project-related physical activities. Subprojects having resettlement impacts will not be included. Non-eligible islands will still receive awareness building support under the project. IWMCs consist of concrete platforms, small covered sheds, segregated waste processing and storage areas, small office, fencing.

outlined in the Project Administration Manual.⁵ Output 2 will be partially funded by a Trust Fund grant focusing on poverty reduction, which will support islands in the following areas:⁶ (i) IWMCs constructed in a minimum of 11 eligible islands, (ii) skills and capacity building in eligible islands targeting women provided, and (iii) awareness campaigns in 3R delivered in all outer islands.⁷

8. Output 3: Institutional capacity and public awareness in sustainable waste management strengthened. This will include (i) capacity building support to eligible WAMCO staff (at least 50% eligible women staff) in waste collection and disaster risk management provided;⁸ (ii) public awareness and behavior change campaigns in 3R targeting the poor and women in Greater Malé delivered;⁹ and (iii) project management, design, and supervision consultant support provided.

B. Project Objective and Components

9. The overall project will fill infrastructure gaps in solid waste collection, transfer, disposal, and treatment; and provide public awareness programs to promote 3R behaviors and improve willingness to pay for improved waste services. Activities will promote leadership roles for women in community sanitation programs. An attached technical assistance will strengthen institutional capacities of WAMCO for sustainable service delivery and of EPA for environmental monitoring of environmental pollution. Engineering designs will consider the risks of sea-level rise from climate change as well as natural disasters such as tsunamis and extreme climate events.

10. The Project components are (i) improved waste collection and transfer in Greater Male, (ii) improved dumpsite management and logistics on Thilafushi Island, (iii) improved outer island waste management systems: Outer islands defined as inhabited islands outside the Greater Male region. (iv) strengthened institutional capacity of WAMCO, (v) awareness campaign and behavior change, and (vi) project management, design, and supervision support for PMU.

11. In achieving these targets, the Project aims to avoid land acquisition and resettlement impacts to a maximum possible extent. Thus, the Project will adopt the following resettlement criteria in the selection of subproject sites: (i) sufficient and adequate government land is allocated on island (as required by IWMC design); and (ii) there is no private land acquisition and/or physical displacement, livelihood loss, or temporary impacts.

C. Purpose of the Resettlement Framework

12. The Resettlement Framework has been formulated based on (i) ADB's SPS and laws, policies, and regulations of the Government of Maldives. The Resettlement Framework provides guidance on how to formulate satisfactory resettlement plans (if required) for each subproject identified under the project in accordance with the ADB's SPS. The Resettlement Framework(i)

⁵ Project administration manual (accessible from the list of linked documents of the report and recommendation of the President).

⁶ Additional selection criteria for Trust Fund supported islands includes climate change vulnerability, and women participation in island councils, and is outlined in the Project Administration Manual (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

⁷ Upon confirmation from the government and the approval of Trust Fund.

⁸ Disaster risk management capacity building will include preparation of a SWM disaster action plan outlining prevention, preparedness, response and recovery tasks. DRM risk awareness activities will include first responders (police, fire fighters) on Thilafushi.

⁹ Public awareness and behavior change activities under Outputs 2 and 3 will be implemented through a Public Awareness and Community Capacity Building consultant recruited by the PMU.

explains the general resettlement impacts of project components; (ii) specifies requirements for subproject screening, categorization, assessment, and social impact assessment and census, resettlement planning, including arrangements for stakeholder consultation and information disclosure; (iii) outlines objectives, policy principles, and procedures for land acquisition, compensation at replacement cost, and other assistance measures for affected persons; (iv) assesses adequacy of executing agency capacity to implement resettlement plans; and (v) describes implementation aspects and procedures of an resettlement plan including a resettlement budget, institutional capacity development, monitoring and reporting requirements. As subprojects under Output 2 will be prepared after Board approval, this resettlement framework was prepared to ensure that any involuntary resettlement impact will be addressed

D. Scope of Land Acquisition and Resettlement

13. The project is not expected to have significant impact due to land acquisition and involuntary resettlement. Based on due diligence by the project team, no permanent impact such as land acquisition, physical displacement, livelihood loss, or temporary impact is identified in the project areas. Thus, the project is categorized as C for involuntary resettlement. All civil works under Output 1 are proposed within available land belonging to the government. The government will initially provide written certification of land ownership, to be followed by land records for project sites. Consultations with surrounding landowners / users / communities if any, around project sites will be conducted and documented. For Output 2, site selection criteria were agreed, requiring no development on private land, physical displacement, livelihood loss, or temporary impacts (Appendix 1). For Output 2, due diligence is conducted only for 1 IWMC. For the remaining IWMCs for which sites are yet to be identified, resettlement framework is prepared to guide the preparation of safeguard documents.

II. OBJECTIVES, POLICY FRAMEWORK AND ENTITLEMENTS

A. Legal and Policy Framework

14. Under the legal framework, a summarized description on most relevant enactments related to social safeguards is explained as follows.

1. Constitutional Guarantees

15. The first written Constitution of Maldives was adopted on 22 December 1932. Since then, there were seven Constitutions created in the years 1932, 1942, 1953, 1954, 1968, 1997 and 2008. The current Constitution came into force on 7 October 2008.

16. The Constitution is the supreme law of the land. Article 268 of the Constitution provides as follows:

- (a) All laws of the Maldives must be enacted in accordance with this Constitution. Any law or part of any law inconsistent with this Constitution is, to the extent of its inconsistency, void and of no force and effect. The obligations imposed by this Constitution must be fulfilled. Any conduct contrary to this Constitution shall be invalid.
- (b) The Constitution of Maldives guarantees fundamental rights and freedom to all persons in the Chapter II of the Constitution.

17. Furthermore, the Constitution of Maldives provides for powers, obligations and duties of the Parliament, the President and the Judiciary. It also provides the functions and mandates of the Constitutional Bodies, those tasked to run the State smoothly and uphold the Constitution.

2. Local Councils

18. Under 230 (a) of the Constitution, the administrative division of the Maldives shall be administrated decentrally. Schedule II of the Constitution provides a list of the administrative divisions (known as "Atolls") in the Maldives. By virtue of Article 230 (b) of the Constitution, the President has the power to create Constituencies, posts, Island Councils, Atoll Councils and City Councils. The Decentralization Act (Law N0.7/2010) provides for three types of local authorities in the Maldives namely; (a) Atoll's Councils (section 6), (b) Island's Council (section 21) and (c) City's Council (section 39).

3. Maldivian Land [Acquisition] Act

19. The 2008 Constitution vests all land in the State and bans foreign ownership of land. It is understood that Government is reviewing land-related legislation to align it with the constitution and current development policy. Meanwhile, matters relating to land are governed by the provisions of the Maldivian Land Act (MLA) and Regulations of 2002, as subsequently amended.

20. Section 4 of the Act provides the several purposes and uses of lands in the country. They are for:

- (i) construction of households and buildings for residential purposes,
- (ii) commercial use,
- (iii) social use,
- (iv) environmental protection, and
- (v) government use.

21. As per the MLA, land belonging to the island council or city council can be used for government purposes and such lands can be transferred to the relevant Ministry with the permission of Ministry of Housing, Department of Surveys, and respective island council or city council.

22. Under the Act, all Maldivian citizens who do not have a place of residence are entitled to a parcel of land for residential purposes, entitled a "state dwelling". Such parcels are issued by the respective Atoll office and must not exceed 4,000 ft² (372 m²). The parcel is forfeited if not developed ("settled") within five years. State dwellings are heritable and divisible, down to no smaller than 600 ft² (56 m²).

23. State dwellings can be privatized by purchase from the government. Conversion to non-residential purposes is possible subject to compliance with land use policy, and a permit. Sales of private land draws a 15% tax.

24. Buildings, trees and other assets on land belong to the owner of the land or official user of the land, unless third-party ownership can be proven under Shari'ah.

25. Land for agriculture is allocated to residents by island administrations on an annual renewable basis. The land remains government property. No rent is paid, but the plots are generally small and the system provides little security or incentive to invest in and improve the

land. When land is required for public projects, it is understood that the legal owner or registered user is compensated on a land-for-land basis, with fixed assets being paid for at fair market price.

26. According to a recent President's Office Press Release (Ref. No. 2011-374), the Cabinet has decided to establish the Maldives Land and Survey Authority (the Authority). The Authority will conduct surveys; collect and update information on the most beneficial use of lands, lagoons and reefs of the Maldives; and formulate and implement cadastral survey standards.

4. Land Use Planning and Management and Traditional Rights to Land

27. Land management on inhabited islands (apart from the capital island, Malé) comes under the purview of the Ministry of Atolls Development (MOAD). Land use planning of inhabited islands is guided by the Ministry of Planning and National Development (MPND) and Ministry of Housing and Infrastructure (MOHI). Land allocations and registrations are finalized by the MOAD with consultations and necessary approvals from both the MPND and the MOHI and sometimes also from line ministries. There are no traditional governance structures in the Maldives for coastal land and resource use. However, local island and atoll offices play a major role in the planning stages of land allocation and management on their respective islands. Locally formed and selected Island Development Committees and Atoll Development Committees play a critical advisory role in land management on inhabited islands.

28. A large proportion of uninhabited islands are managed under a traditional system called *Varuvaa*. Under the *Varuvaa* system land is leased out to individuals not to undertake major economic activities, but to obtain benefits from the island in terms of the coconuts they generate from the islands. However, lessees undertake annual crop cultivation on islands where cleared agricultural land is available. The land tenure systems on inhabited islands are complex. Homestead plots are given free of charge. Plot sizes depend on the availability of land, with an average size of 50 x 100 feet. Trees grown on homestead plots belong to the owner and the homestead allotment is inheritable. *Goi* land refers to a particular area of the inhabited island with special vegetative characteristics. Coconut palms and tree species grown on *Goi* land belong to the government. *Goi* land is rented to the highest bidder by the Ministry of Atolls Development. The lessee rents smaller plots for farming. In general, the lessee gets 12.5 % of the income generated by farmers. *Faalabba* is a land area generally located close to residential areas. Islanders grow coconut palms and tree species with the permission of the Island Office. Half of the trees grown belong to the person who planted them and the other half is the property of the state. Most islands have communal land for the cultivation of annual crops. No rent is charged for cultivation on this land and no standard regulation exists for its use. On some islands plots change hand every year, whereas on other islands farmers can hold the plots as long as they continue cultivation.

29. Although the land tenure system is complex in the Maldives, this will have little implications on the project, as all activities will be undertaken by the PMU and EA. However, close coordination with Island Councils is expected for the effective implementation of project activities.

B. ADB's Safeguard Policy Statement, 2009

30. The objectives of ADB's SPS (2009) with regard to involuntary resettlement are to:

- (i) Avoid involuntary resettlement wherever possible;
- (ii) Minimize involuntary resettlement by exploring project and design alternatives;
- (iii) Enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and

- (iv) Improve the standards of living of the displaced poor and other vulnerable groups.

31. The SPS of ADB covers both physical displacement (relocation, loss of residential land, or loss of shelter) and economic displacement (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of; (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas. It covers displaced persons whether such losses and involuntary restrictions are full or partial, permanent or temporary. The three important elements of ADB's SPS are: (i) compensation at replacement cost for lost assets, and livelihood and income restoration prior to displacement; (ii) assistance for relocation, including the provision of relocation sites with appropriate facilities and services; and (iii) rehabilitation assistance to achieve at least the same level of well-being with the project as without it. The SPS gives special attention to poor and vulnerable households to ensure their improved well-being as a result of project interventions.

32. The Land Acquisition Act is the primary legal framework for all land acquisition, compensation determination and relocation of affected persons in Maldives. The Act has a limited scope in resettlement and rehabilitation of affected persons.

33. Considering the differences between the laws, regulations and guidelines of the Government of Maldives and the safeguard policies of ADB, a detailed gap analysis has been conducted and is attached as Appendix 4. This Resettlement Framework addresses the identified gaps, mainly through provisions in the entitlement matrix.

C. Involuntary Resettlement Safeguard Principles for the Project

34. The Maldives laws and regulations on land acquisition and ADB's SPS will form the basic principles for the Project which will include the following elements:

- (i) Screen the project early on to identify past, present, and future involuntary resettlement impacts and risks. Determine the scope of resettlement planning through a survey and/or census of displaced persons, including a gender analysis, specifically related to resettlement impacts and risks.
- (ii) Carry out meaningful consultations with affected persons, host communities, and concerned nongovernment organizations (NGOs). Inform all displaced persons of their entitlements and resettlement options. Ensure their participation in planning, implementation, and monitoring and evaluation of resettlement programs. Pay particular attention to the needs of vulnerable groups, especially those below the poverty line, the landless, the elderly, the disabled, women and children, and indigenous peoples, and those without legal title to land, and ensure their participation in consultations. Establish a grievance redress mechanism (GRM) to receive and facilitate resolution of the affected persons' concerns. Support the social and cultural institutions of displaced persons and their host population. Where involuntary resettlement impacts and risks are highly complex and sensitive, compensation and resettlement decisions should be preceded by a social preparation phase.
- (iii) Improve, or at least restore, the livelihoods of all displaced persons through (i) land-based resettlement strategies when affected livelihoods are land based where possible or cash compensation at replacement value for land when the loss of land does not undermine livelihoods, (ii) prompt replacement of assets with access to assets of equal or higher value, (iii) prompt compensation at full replacement cost for assets that cannot be restored, and (iv) additional revenues and services through benefit sharing schemes where possible.

- (iv) Provide physically and economically displaced persons with needed assistance, including the following: (i) if there is relocation, secured tenure to relocation land, better housing at resettlement sites with comparable access to employment and production opportunities, integration of resettled persons economically and socially into their host communities, and extension of project benefits to host communities; (ii) transitional support and development assistance, such as land development, credit facilities, training, or employment opportunities; and (iii) civic infrastructure and community services, as required.
- (v) Improve the standards of living of the displaced poor and other vulnerable groups, including women, to at least national minimum standards. In rural areas provide them with legal and affordable access to land and resources, and in urban areas provide them with appropriate income sources and legal and affordable access to adequate housing.
- (vi) Develop procedures in a transparent, consistent, and equitable manner if land acquisition is through negotiated settlement to ensure that those people who enter into negotiated settlements will maintain the same or better income and livelihood status.
- (vii) Ensure that displaced persons without titles to land or any recognizable legal rights to land are eligible for resettlement assistance and compensation for loss of nonland assets.
- (viii) Prepare a resettlement plan elaborating on displaced persons' entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation schedule.
- (ix) Disclose a draft resettlement plan, including documentation of the consultation process in a timely manner, before project appraisal, in an accessible place and a form and language(s) understandable to affected persons and other stakeholders. Disclose the final resettlement plan and its updates to affected persons and other stakeholders.
- (x) Conceive and execute involuntary resettlement as part of a development project or program. Include the full costs of resettlement in the presentation of project's costs and benefits. For a project with significant involuntary resettlement impacts, consider implementing the involuntary resettlement component of the project as a stand-alone operation.
- (xi) Pay compensation and provide other resettlement entitlements before physical or economic displacement. Implement the resettlement plan under close supervision throughout project implementation.
- (xii) Monitor and assess resettlement outcomes, their impacts on the standards of living of displaced persons.

35. This framework and resettlement procedural guidelines shall apply to all subprojects under the loan so as to ensure that persons affected by land acquisition and/or involuntary resettlement will be eligible for appropriate compensation and rehabilitation assistance.

36. ADB's Involuntary Resettlement Impact Screening/Categorisation Checklist will be adopted for the subproject. Screening will be conducted immediately after identification of project site. If the screening is done simultaneously when the project site is being identified, then the magnitude of impacts can be estimated and if required alternative options can be examined. This will be done by the Project Management, Design and Construction Supervision Consultants (PMDSC) Environment Safeguard Expert who will also be responsible for social safeguards and

submitted to PMU. Based on the ADB's Operational Manual Section F1/Operational Procedures¹⁰ the following criteria for screening and categorization of subprojects will be followed:

- (i) **Category A.** A proposed project is classified as category A if it is likely to have significant involuntary resettlement impacts. A resettlement plan, including assessment of social impacts, is required.
- (ii) **Category B.** A proposed project is classified as category B if it includes involuntary resettlement impacts that are not deemed significant. A resettlement plan, including assessment of social impacts, is required.
- (iii) **Category C.** A proposed project is classified as category C if it has no involuntary resettlement impacts. No further action is required.
- (iv) **Category FI.** A proposed project is classified as category FI if it involves the investment of ADB funds to, or through, a financial intermediary.

37. All subprojects identified with significant¹¹ or marginal resettlement impacts require preparation of resettlement plans and approval from ADB prior to award of contracts for that subproject. If a subproject has no impact, a due diligence report (DDR) will be submitted confirming the same and also stating reasons for the same. The resettlement plans/DDR must comply with ADB's SPS-2009. A DDR outline is provided in Appendix 5.

38. **Negotiated Settlement:** If necessary, land and other assets will be purchased through a negotiated settlement wherever possible. The Executing Agency will ensure adequate and fair price for land and other assets through meaningful consultation with affected persons, including those without legal title to assets. Any negotiation with displaced persons will openly address the risks of asymmetry of information and bargaining power of the parties involved in such transactions. An independent external party will be engaged to document the negotiation and settlement processes. The Executing Agency will agree with ADB on consultation processes, policies, and laws that are applicable to such transactions; third-party validation; mechanisms for calculating the replacement costs of land and other assets affected; and record-keeping requirements.

39. **Land donation.** For a project that directly benefits communities, land may be voluntarily donated to the project. In the Project, land¹² donation wherein the community or affected person agrees to donate a part of their land for the project an external party will be engaged to ensure and validate these requirements: (i) The donation will not cause significant impacts on the livelihood of the donor(s); (ii) the donor is fully understood on the value of their donated land(s) and that, had it not been donated, the land will be compensated under the project; (iii) the donation does not come from the land owner categorized as poor or vulnerable family; (iv) the donation will not cause any economic or physical displacement of the renters, tenant and other types of current land users; (v) the land donor(s) will get direct benefits from the proposed project activities; (vi) meaningful consultations are conducted with the land owner(s); and (vii) the land donation(s) does not come from coercion or asymmetrical power relation between the land owner(s) and the government. The above information must be included in a due diligence report to be prepared by an external party, preferably from reputed and qualified NGO, for ADB review and approval. The

¹⁰ Issued on 1st October 2013

¹¹ Source: Asian Development Bank Operations Manual –Operational Procedure on Involuntary Resettlement
 Involuntary Resettlement Category A: Significant means 200 or more affected people will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating). Involuntary Resettlement Category B: Not Significant include involuntary resettlement impacts that are not deemed significant as per the ADB Operational Manual Involuntary Resettlement Category C: No involuntary resettlement impacts. A resettlement plan is required in case of both category A and B project.

¹² Including other types of assets attached to the land.

land transfer and updated records of the donated lands will have to be completed/obtained prior to the start of civil works.

D. Eligibility and Entitlements

1. Eligibility

40. The following displaced persons are eligible for compensation, assistance, and benefits. All persons described in the definition of a family will be also eligible for assistance/compensation in addition to those mentioned in this section. Eligible persons include:

- (i) persons who will lose land/assets/income in their entirety or in part, who have formal legal rights to the land;
- (ii) persons who will lose the land they occupy in its entirety or in part who have no formal legal rights to such land, but who have claims to such lands that are recognized or recognizable under national laws, e.g. tenants and leaseholders;
- (iii) persons occupying land over which they neither have legal title, nor have claims recognized or recognizable under national law e.g. sharecroppers, squatters, encroachers, wage labor without formal contracts; and
- (iv) vulnerable households.¹³

41. Compensation eligibility is limited by a cut-off date. The cut-off date for non- title-holders, is the date of the start of the census survey. The date of formal notification of land acquisition will be the cut-off date for all titleholders losing land and structures.

2. Entitlements

42. The entitlement matrix (EM) summarizes the main types of potential losses and corresponding entitlements, which reflect the Maldives laws and regulations, and ADB’s SPS. The standard of entitlements listed in the entitlement matrix will not be lowered, but could be enhanced when resettlement plans are formulated based on the approved Resettlement Framework. The detailed Entitlement Matrix is described in Table 1.

43. Damages/unanticipated losses caused during construction, if any will be eligible for compensation. Unanticipated losses, if any, will be mitigated/compensated as per the Entitlement Matrix of this resettlement framework.

Table 1: Entitlement Matrix

Type of Impact/Loss	Nature of Ownership	Type of Loss	Compensation Entitlements ^a
LOSS OF LAND			
Agricultural/ Commercial /Residential land	Titleholders and customary or usufruct right holders	Permanent	1. Land-for-land compensation of equal productivity/commercial value, with all fees, taxes, registration charges and other costs incurred for replacement borne by the Project; OR

¹³ Vulnerable groups those below the poverty line, the landless, the elderly, the disabled, women and children, indigenous peoples, and those without legal title to land. The Vulnerability and Poverty Assessment 2004 of the National Bureau of Statistics, Government of Maldives used a “low” poverty line of Rf10 and a “high” poverty line of Rf15 per person per day to characterize the income poor.

Type of Impact/Loss	Nature of Ownership	Type of Loss	Compensation Entitlements ^a
			<p>Cash compensation at replacement cost^b or open market value of land, including all transaction costs, such as applicable fees and taxes:</p> <ol style="list-style-type: none"> One-time cash assistance (MVR 10000) towards land development charges in case of agricultural/commercial land. One-time subsistence allowance based on minimum wage rate per day for 6 months.
	Tenants, leaseholders and sharecroppers	Permanent	<ol style="list-style-type: none"> Cash assistance based on 3 months' income from land Reimbursement for unexpired lease/advance rent, if any Assistance to find new land This provision is also applicable to tenants of the negotiated land settlement.
	Non-titleholder	Permanent	No compensation for loss of land. Subsistence cash allowance based on 3 months' income from lost plot
Partial loss of land – Less than 10% of the total holding	Titleholders and customary or usufruct right holders	Permanent	<ol style="list-style-type: none"> Cash compensation at replacement cost or open market value of land, including all transaction costs, such as applicable fees and taxes One-time subsistence allowance to cushion immediate loss, computed on the basis of minimum wage rate for 3 months.
LOSS OF STRUCTURE			
Residential / Commercial / Other	Titleholder/ Non-titleholder	Permanent	<ol style="list-style-type: none"> Cash compensation for the affected structure at replacement cost One-time shifting grant for transportation of building materials and other belongings. Structure to be demolished only after new structure has been constructed or at least six months' notice to demolish the existing house Right to salvage material from structure
	Tenants/ leaseholders	Permanent	<ol style="list-style-type: none"> Reimbursement of unexpired lease/advance rent Free transport facility or shifting assistance (one-time payment) Replacement cost of assets created by lessee/tenant Right to salvage material from structure created by lessee
LOSS OF COMMON PROPERTY RESOURCES			
Loss of cultural and community structures/ facilities	Community	Island Councils or City Councils	<ol style="list-style-type: none"> Before initiating any civil work, local community will be consulted to ensure that access to private or community property is maintained.

Type of Impact/Loss	Nature of Ownership	Type of Loss	Compensation Entitlements ^a
			2. Civil works plan will be shared with the local community. 3. Structures/facilities should be replaced if it is permanently affected by the project
OTHER IMPACTS			
Loss of crops and trees or any improvements made – private/community	Titleholder/ Tenant/ Leaseholder/ Sharecropper/ Non-titleholder/community		Cash compensation at replacement cost
Loss of source of livelihood	Affected Person	Permanent	1. Cash compensation equivalent to income lost for one year 2. One-time cash grant for economic rehabilitation of MVR10,000 3. Affected persons will be eligible for income restoration training for self-employment (one person per family) 4. The executing agency/implementing agency would prepare specific plan for livelihood restoration for each affected person that would include training, assessment of vulnerability and any other measures.
	Affected Person	Temporary	Cash compensation equivalent to duration of income loss
Loss of access	Individual households or group of households		Before initiating any civil work, local community will be consulted to ensure that access to private or community property is maintained. Civil works plan will be shared with the local community.
Vulnerable ^c Affected Persons			Rehabilitation assistance for affected persons categorized as vulnerable in form of cash assistance to purchase income generating equipment ^d (limit of Rf15000) OR acquire skill training of their choice and job placement.
Unanticipated impacts			1. To be determined in accordance with the IR safeguards requirements of the ADB SPS and project resettlement framework 2. Project resettlement plan to be updated and disclosed on ADB website 3. Standards of the entitlement matrix of the resettlement plan not to be lowered

^a All cash compensation in this entitlement matrix will be adjusted for inflation till the year of compensation payment.

^b Replacement Cost is calculated based on the following elements: (i) fair market value; (ii) transaction costs; (iii) interest accrued, (iv) transitional and restoration costs; and (v) other applicable payments, if any.

^c Vulnerable groups those below the poverty line, the landless, the elderly, the disabled, women and children, indigenous peoples, and those without legal title to land.

^d NGO will assist in identification and purchase of income generating equipment/asset

44. All compensation and other assistances¹⁴ will be paid to all affected persons prior to commencement of civil works. After payment of compensation, affected persons would be allowed to take away the materials salvaged from their dismantled houses and shops and no charges will be levied upon them for the same. The value of salvaged materials will not be deducted from the overall compensation amount due to the affected persons. A notice to that effect will be issued intimating that affected persons can take away the materials. Affected persons receiving compensation for trees will be allowed to take away timber of their acquired trees for their domestic use. Trees standing on the land owned by the government will be disposed of through open auction by the concerned Forest Department.

III. SOCIOECONOMIC INFORMATION

45. The most important aspect of social safeguard measures is to generate well documented socioeconomic information related to each subproject. As highlighted in the SPS and OM/F1 the following steps are essential to follow in safeguard compliance.

A. Surveys

46. A social impact assessment (SIA) survey of all affected persons will be undertaken in the subproject area to determine the magnitude of displacement and prospective losses, identify vulnerable groups, ascertain costs of compensation, livelihood restoration and improvement and relocation (if required), and to prepare a resettlement plan for implementation. The SIA survey will comprise of baseline socioeconomic sample survey and census.

47. **Baseline Socioeconomic Sample Survey:** The purpose of the baseline socioeconomic sample survey of affected persons is to establish monitoring and evaluation parameters. It will be used as a benchmark for monitoring the socioeconomic status of project influenced persons throughout the project implementation and after project completion. The survey will cover 20% of affected persons. The survey will also collect gender-disaggregated data to address gender issues in resettlement. The survey has several components: (i) preparation of accurate maps of the subproject area; and (ii) analysis of socioeconomic conditions of affected persons and income resources of the population. For this purpose, Appendix 7 provides the model of questionnaire that can be used for socioeconomic sample survey.

48. **Census:** in this purpose, a census should be carried out to identify the actual number of affected persons and their assets including the income and livelihood patterns. The purpose of the census is to: (i) identify and list all potentially affected persons; (ii) assess their income and livelihoods; (iii) assess land ownership and other immovable properties; (iv) make an inventory of their affected assets; (v) collect gender-disaggregated information pertaining to the economic and socio-cultural conditions of displaced persons and households; and (vi) understand affected persons perception, attitudes and preparedness to face project related challenges. Appendix 8 provides a model questionnaire for the assets verification survey/census.

¹⁴ While compensation is required prior to dispossession or displacement of affected people from their assets, the full resettlement plan implementation, which may require income rehabilitation measures, might be completed only over a longer period of time after civil works have begun. Displaced people will be provided with certain resettlement entitlements, such as land and asset compensation and transfer allowances, prior to their displacement, dispossession, or restricted access.

49. **Qualitative Data Collection:** The required qualitative data will be determined on the basis of the components of the subproject. Qualitative data collection tools include: 1). Focused Group Discussions (FGDs) with subproject specific groups from the target community considering gender and poverty as cross cutting issues; 2). Key-informant Interviews (KIIs) with all government, private, Community Based Organization (CBO) leaders, and non-government agencies representatives (if required). For conducting these FGDs and KIIs, it is essential to develop a checklist for each specific discussion or interview. The outcome of FGDs and KIIs should be recorded and transform such data into written form including participant/s general information.

50. The qualitative data collected through these two channels should be used to explore gender, poverty, social and cultural factors related to the subproject.

B. Resettlement Plan Preparation

51. The resettlement plan will be prepared based on the results of the census, baseline socioeconomic sample surveys, and land and other asset valuations collected from district or country level line agencies as well as market surveys. It will include the results and findings of the census of affected persons, and their entitlements to restore losses, institutional mechanisms and schedules, budget, assessment of feasible income restoration mechanisms, grievance redress mechanisms, and results monitoring mechanisms. The resettlement plan should be formulated as outlined in Appendix 6.

52. Resettlement plans will closely follow the resettlement principles outlined in this agreed resettlement framework. Each resettlement plan will be submitted to ADB for review and approval after endorsed by the Executing Agency(MOFT). In addition, all resettlement plans should translate into local language (*Devehi*) and make available for the public for their knowledge and understanding.

C. Gender Impacts and Mitigation Measures

53. Women and female-headed households are considered as a vulnerable group according to this Resettlement Framework. Any negative impacts of a subproject on female-headed households will be dealt with on a priority basis. The resettlement plan will ensure that socioeconomic conditions, needs and priorities of women are identified and the process of land acquisition will ensure that gender impacts are adequately addressed and mitigated. Women's FGDs will be conducted to address specific issues related to women during the SIA stage. During disbursement of compensation and provision of assistance, priority will be given to female-headed households. Joint ownership in the name of husband and wife will be provided in cases of non-female-headed households.

IV. CONSULTATION, INFORMATION DISCLOSURE AND GRIEVANCES

A. Meaningful Consultation and Participation of key stakeholders

54. Meaningful consultations will be undertaken with all affected persons, their host communities, if any, and the civil society for every subproject identified as having involuntary resettlement impacts. The consultation process established for the program will employ a vast range of formal and informal consultative methods. Different techniques of consultation with stakeholders are proposed during project preparation according to the socioeconomic conditions

of the community affected, viz., KIIs, public meetings, FGDs, etc. Particular attention will be paid to the need of the disadvantaged or vulnerable groups, especially those who are below the poverty line, the landless, the elderly, female-headed households, women and children, and those who are without legal title to land. The key informants who are to be consulted, during the project preparation phase and during the Resettlement Plan implementation are:

- (i) Heads and members of households who are likely to be affected by the project;
- (ii) Vulnerable households;
- (iii) Affected women;
- (iv) Island Council and City Council members, WDCs members, community leaders, and representatives of community-based organizations; and
- (v) CBOs and NGOs, and Government agencies and departments.

55. The resettlement plan will be implemented in close consultation with the key (primary) stakeholders. Women's participation will be ensured by involving them in public consultation at various level and stages of project preparation and by arrangements, which would enhance their ability to attend such meetings. The Executing Agency will ensure that views of the affected persons, particularly those vulnerable, related to the resettlement process are looked into and addressed. The design and supervision consultants will also ensure that groups and individuals consulted are informed about the outcome of the decision-making process and confirm how their views were incorporated. This will be ensured through FGDs and multi stakeholders meetings in the project area. All such meetings and consultation will be documented for future references.

B. Information Disclosure and Resettlement Plan Disclosure

56. Copies of the approved Resettlement Framework and resettlement plans will be made available in Maldives language (*Devehi*) at accessible locations to affected persons. The draft and final Resettlement Framework and RPs will disclose on ADB's (and Government website – MEE) and will make available to affected persons; information dissemination and consultation will continue throughout the program implementation. Dissemination of information will be done by the PMU through WDCs deploy in each subproject island. The WDCs are statutory grass-roots governmental organizations identify and appointed by Island Councils or City Councils on island or city basis. Executing Agency is planned to use WDCs in all relevant islands to cover community mobilization and gender empowerment activities that come under the capacity development program of the Project.

C. Grievance Redress Mechanism

57. A grievance redress mechanism (GRM) will be established to receive and facilitate the resolution of affected persons (APs) concerns, complaints, and grievances on negotiated/voluntary land donation or involuntary land acquisition, relocation, income restoration, environmental management and other construction and operation related issues. The GRM is accessible to all APs to address their concerns, grievances and issues effectively and swiftly, in accordance with ADP SPS, 2009.

58. **First Tier:** City Council/Island Council – grievances will be registered informally by contacting the city/island councils. If the grievance cannot be resolved informally then the APs can register a formal complaint. The council must screen the grievance to determine whether the concerns raised in the grievance are within the scope of the project. The council will determine solutions to the issues either by (i) discussing internally, or (ii) joint problem solving with aggrieved parties, or (iii) a combination of both options. If the complaint is resolved within a week, the council

must communicate the decision to the aggrieved party formally or informally. Should matter be unresolved and/or the AP be unhappy with the result, the complaint will be referred to the next tier. The grievance redress committee (GRC) includes the island’s representatives as well as project officers related to each island, as shown in the Figure 2 below.

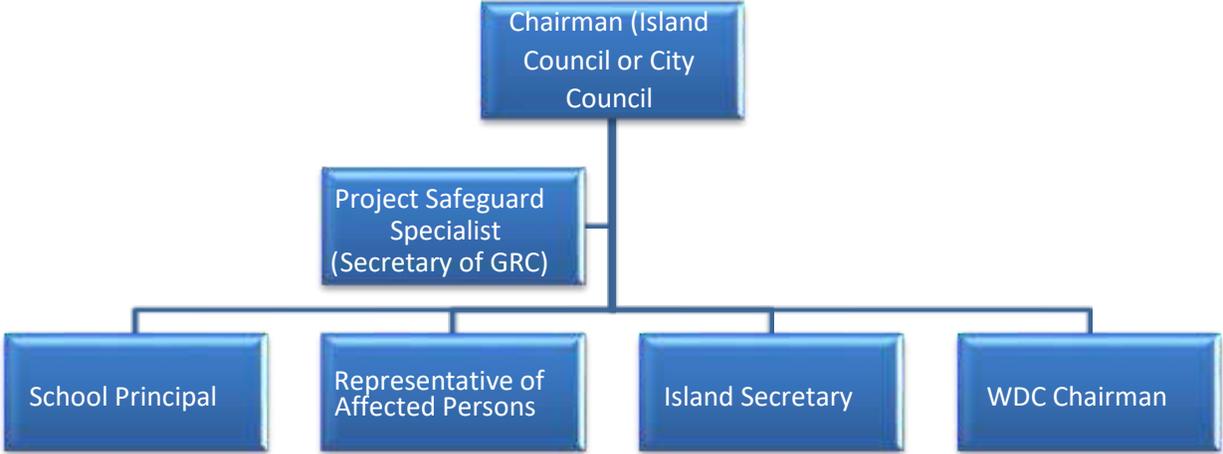


Figure 2: Grievance Redress Committee Composition for First Tier

59. **Second Tier:** The affected person can elevate the grievance to the second tier, and submit a complaint on a letter addressed to MEE. The MEE will forward the letter to the PMU. The PMU will be responsible to resolve the complaint within 15 days and communicate the decision to the aggrieved party. The PMU screens the grievance and determines if it is related to the project. If unrelated, the AP is notified in writing. If it is relevant to the project, the PMU will hold discussions with the MEE on the matter and if necessary, (i) arranges visit the site and hold on-site discussions and/or (ii) refers the matter to the project steering committee. The PMU then decides on the action that will be taken by the project to address the grievance, and the decision will be conveyed to the AP in writing.

60. The affected persons can also direct contact (in writing) the ADB Project Officer at ADB headquarters. The complaint can be submitted in any of the official languages of ADB’s Developing Member Countries. This may be done at any time [add appropriate address or method of contact].

61. The APs can also use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB. The complaint can be submitted in any of the official languages of ADB’s DMCs. The ADB Accountability Mechanism information will be included in the Project Information Document to be distributed to the affected communities, as part of the project GRM.

62. The GRM notwithstanding, an aggrieved person shall have access to the country’s legal system at any stage through the Maldives judicial or appropriate administrative system. This can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

63. The flow diagram of resolving complaints under the GRC is shown in Figure 3.

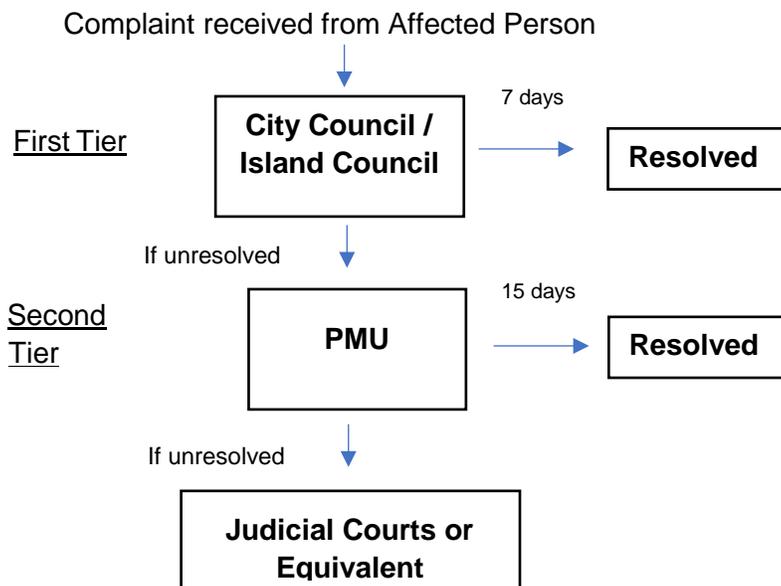


Figure 3: Grievance Redress Mechanism Diagram for Complaints Resolution

64. The GRM will include group meetings and discussions with APs to address general and common grievances. These meetings and discussions will be announced in advance, conducted at the time of day agreed on with APs (based on their availability), and facilitated by the PMU and PMDSC at least quarterly. The PMU and PMDSC shall ensure that illiterate APs or vulnerable APs are assisted to understand the grievance redress process, to register complaints and with follow-up actions at different stages in the process. Records will be kept by the PMU to keep track of all grievances received, both informal and formal, including contact details of complainant, date when the complaint was received, nature of grievance, agreed corrective actions and the date when these were effected, and final outcome. A Sample Grievance Registration Form is attached in Appendix 12.

65. All costs involved in resolving the complaints (meetings, consultations, communication and reporting, and information dissemination) will be borne by the PMU.

V. COMPENSATION, INCOME RESTORATION AND RELOCATION

A. Compensation

66. The project will take its best effort to use government land and buildings for the project. The Island Councils and City Councils will play a major role with Executing Agency in negotiating or involuntary land acquisition issues. When the Island Councils and City Councils settle the negotiation or involuntary land acquisition, the affected persons are entitled to get certain benefits as shown in Entitlement Matrix (Table 1). Compensation for loss of land will be determined on the basis of replacement cost.¹⁵

67. Affected persons identified under involuntary land acquisition/loss of structures, will be provided with an advance notice prior to possession being taken of the land/properties. In

¹⁵ A market survey will be conducted to determine prices and costs. Full replacement cost will be paid. Replacement Cost is calculated based on the following elements: (i) fair market value; (ii) transaction costs; (iii) interest accrued; (iv) transitional and restoration costs; and (v) other applicable payments, if any.

addition, they would be allowed to take away the materials salvaged from their dismantled houses and shops and no charges will be levied upon them for the same. A notice to that effect will be issued clarifying that they can salvage the materials. The Executing Agency will provide satisfactory evidence to ADB that voluntary land donation and provision of assistance stated in the entitlement matrix are fully completed before commencing the civil works.

B. Income Restoration and relocation

68. Each affected person whose income or livelihood is affected by a subproject will be assisted to improve or at least to restore it to pre-project level. Income restoration schemes will be designed in consultation with affected persons and considering their resource base and existing skills. It should be addressed in the resettlement plan of concerned subproject with a financial allocation for the implementation of income restoration program. The measures for income restoration will be as indicated in the Entitlement Matrix.

69. Income restoration activities are of two types (i) short-term; and (ii) long-term. Short-term income restoration activities are intended to restore affected person's income in the period immediately before and after relocation focusing on relocation and providing short-term allowances such as (i) subsistence/transitional allowance; and (ii) shifting assistance. Long-term options depend on the degree of disruption to the economic activity. All affected persons facing livelihood loss and vulnerable affected persons would be eligible for income restoration options. These will be derived from detailed socioeconomic survey information, conducted as a part of the resettlement plan, and may include provision of income generating assets and/or training to operate them. The time frame will be decided based on the training to be provided, which will also be outlined in the resettlement plan. The resettlement plan budget will reflect the cost of providing income generating assets and training. Strategies for promoting economic recovery of affected persons should also include skill upgrading through training. Project officials will ensure affected persons' access to Government schemes that could help them restore income and livelihoods.

VI. INSTITUTIONAL ARRANGEMENTS AND IMPLEMENTATION

A. Institutional Arrangements

70. The Ministry of Finance and Treasury (MOFT) will be the Project Executing Agency while Ministry of Environment and Energy (MEE) will be the Implementing Agency. Whereas Waste Management Corporation Limited (WAMCO) will be service provider and operator of future waste management assets (e.g. for collection and transfer, C&D waste processing etc.) created under the project. The Environmental Protection Agency (EPA) is an important stakeholder in charge of regulatory compliance.

71. A project steering committee (PSC) will be set up with the Minister of MEE as chair, and a policy level representation from the MOFT, Ministry of Tourism, Ministry of Health, Ministry of Gender and Family, Local Government Authority, and EPA as members, and the project director as member and the convener of the PSC. The PSC will review overall implementation progress and recommend key policy decisions.

72. A dedicated full-time project management unit (PMU) will be established within the MEE, consisting of 8 staff as follows: (i) Project Director (part-time, DG of Department), (ii) Project Manager (full time), (iii) Procurement Specialist, (iv) Finance Specialist, (v) Safeguard Specialist, (vi) Civil Engineer, (vii) IEC Specialist, and (viii) administrative assistant. The Project Manager

reports to the Director General of MEE. The PMU staff will be financed from the grant proceeds. The PMU will be strengthened with external experts in the areas of finance, procurement, technical areas, and contract management. The PMU will work closely with Island Councils for the community-based outer island waste management systems targeting poor and women (Output 2).

73. Technical committee (TC) with the representation from Ministry of Environment and Energy, Ministry of Tourism, Ministry of Health, Ministry of Gender and Family, Local Government Authority, Environmental Protection Agency, WAMCO, Thilafushi Corporation Limited, and environmental NGOs (this will be selected through Maldives NGO Federation) will be established to advise PMU on technical matters.

74. For Output 2 implementation, one focal person will be assigned by each outer island council to coordinate with PMU and work closely with Public Awareness and Capacity Building Consultant (PACCB). The PMU Safeguards Specialist (PMUSS) will be responsible for compliance with ADB SPS and national laws and will oversee all environmental and social safeguards with support of PMDSC. The PMU SS will be supported by the PMDSC Environmental Safeguard Expert (National), who, among other things, will review and update the safeguards documents, prepare social safeguard documents for the components for which sites are not yet identified based on surveys, consultations and due diligence; and ensure sub-projects are compliant with the resettlement framework and ADB SPS. The PMU will submit island-specific social safeguard documents to ADB for approval.

75. Consultant firms will be recruited under the project to support engineering designs, supervision, project management, institutional capacity strengthening, and community awareness. The outline terms of reference are described in the Project Administration Manual (footnote 5). Recruitment method will be through quality- and cost-based (90:10) selection and cost quality selection for the NGO. All consultants will be recruited in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).

B. Institutional Capacity

76. Capacity to handle environmental/involuntary resettlement impacts, gender and vulnerability issues, etc., needs to be built in the Project. Training of PMU staff on aspects such as environmental planning/resettlement planning/implementation, social protection and gender, including the specific recording, reporting, and disclosure requirements therefore need to be planned separately.

77. For the capacity building of designated social safeguards officer and engineers, SGC PMU will organize training programs on safeguards. Services of consultant trainers may be procured for coordinating and imparting required trainings to the staff.

78. Owing to the complexity of Projects spread across a large area, there is a need to specially focus on capacity building on social (distinct social, economic and cultural traits and traditions of people and the importance of preserving these, including indigenous knowledge systems, etc.), legal (traditional rights over land and land tenure issues) and technical aspects in such Projects with an adequate budgetary provision. Training on provisions of EARF/resettlement framework. Further, capacity building of CBOs in the Project area will be considered to ensure that they are able to represent the affected groups more effectively. If required external resources, e.g., anthropologists and development practitioners with relevant experience will be employed.

Activity	Months															
clearance prior to award of contracts.																
Issue notice to displaced persons.										◆						
Compensation prior to displacement and income rehabilitation ongoing.											◆	◆	◆			
Written confirmation from PMU to ADB that all compensation paid in sections ready for construction. Permission to contractor to begin works once compensation to displaced persons is confirmed.													◆			
Relocation as required													◆	◆	◆	
Takeover possession of acquired property													◆	◆	◆	
Handover land to contractors														◆		
Start of civil works															◆	
Skills training as required for income restoration													◆	◆	◆	◆
Grievance Redress Mechanism		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Internal monitoring				◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Monthly monitoring reports				◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Semi-annual monitoring reports (PMU to ADB)				◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Rehabilitation of temporarily occupied lands															Immediately after construction	

ADB = Asian Development Bank, GRC = Grievance Redress Committee, PMU = Project Management Unit.

Note: The Resettlement Plan will be updated based on final detailed design and displaced person census and surveys. Endorsement and disclosure of finalized Resettlement Plans consistent with the Resettlement Framework to be undertaken.

IX. MONITORING AND REPORTING

82. Monitoring of a development project implemented with certain goals and objectives in general, needs to assess the output, effects and impact of the strategies. Therefore, monitoring is a major part of the resettlement management system to ensure its goals and objectives are adequately met. Resettlement plan implementation will be monitored internally. The safeguards staff within the PMU will monitor resettlement plan implementation with support of WAMCO and EA. The project safeguard specialist will prepare a semi-annual progress reports and submit them to the PMU. The Executing Agency will prepare semi-annual monitoring reports and submit to ADB. These reports will describe the progress of the implementation of resettlement activities and compliance issues, if any, and corrective actions taken to address them. These reports will closely follow the involuntary resettlement monitoring indicators agreed at the time of resettlement plan approval. Sample monitoring indicators are in Appendix 9.

CRITERIA FOR PLANNING AND DESIGN OF SUBPROJECTS, INCLUDING SITE SELECTION

Criteria	Remarks
Pre-requisites	
(i) No subproject scope will include features that appear on schedule D of the EIA regulations (2007, updated 2012) (List of Development Proposals Requiring an Environmental Impact Assessment Study)	Development proposals on Schedule D of the EIA regulations related to solid waste management are landfills, incinerators and large scale waste storage and separation facilities.
(ii) A IEE and EMP must be prepared for each subproject, which must comply with EHS Guidelines on Waste Management Facilities	PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.
(iii) Sites must not have any land acquisition or involuntary resettlement and social safeguard issues.	Verify land ownership records. Prepare social safeguard document following the guidelines in the Resettlement Framework.
(iv) Any new facility must not be sited in an environmentally sensitive area, including all areas within 30m of the shoreline, or within 30m of areas such as thickly vegetated areas that are known to be habitats for bird species of conservation value	<p>The 30m distance should be exceeded where possible. The restriction may be reviewed depending on site availability and stakeholder consultation, and provision of design measures to prevent release of leachate into the sea or onto the vegetated area in the event of the capacity of the leachate collection tank being exceeded.</p> <p>On the island of Huraa, where space is restricted and there is a wetland which is a protected area, special attention must be paid to the size of the IWMC leachate collection tank and provisions to contain leachate overflow during storm events.</p>
(v) No new facility to be sited within 500m of areas of cultural significance, such as ancient religious artifacts	<p>Verification, through consulting island councils and the Ministry of Education^[1], that no physical cultural heritage sites are situated within 500m of the IWMC site. The restriction may be reviewed on the basis of site availability and consultation with stakeholders. PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.</p> <p>Provide for use of “chance find” procedures in the EMP, such that any artifacts are preserved for future generations</p>
(vi) Sites must have sufficient capacity to contain or handle volumes of waste projected to be generated over at least a 20 year planning horizon	To be assessed based on projections on growth in waste generation for each island
(vii) Sites must be at least 100m from residences, schools, clinics or mosques	The distance restriction may be reviewed depending on site availability and stakeholder consultation. PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.
(viii) Sites must be least 100m from groundwater wells	The 100m limit is precautionary, however attention must be given in detailed design to ensure that the leachate collection tank is protected to exclude flood waters, including during storm situations, to ensure that leachate does not enter the groundwater lens. PMU to seek clearance from ADB on project siting if the criterion cannot be met due to space constraints.
(ix) Sites must not intersect with power lines, water supply pipelines or sewer lines	Where these lie across proposed sites, they must be re-aligned to avoid the site
(x) For initiatives that require the use of machinery such as shredders and presses,	

^[1] Management of the arts and culture sector is currently under the Ministry of Education.

Criteria	Remarks
there must be established access to technical expertise for servicing and spare parts must be regularly available in-country	
(xi) Consensus from island communities on proposed improvements.	Records of public consultations, issues raised, and measures taken to address them to be summarized in IEEs. These consultations shall ensure consultees include women as well as men.
(xii) No other work, including road, pipeline, or power line improvements are planned at or near the proposed site	Island council to confirm. If such sites are planned, details must be taken account of in design to ensure adequate separation of the infrastructure
(xiii) World Bank Group's Environmental, Health and Safety (EHS) Guidelines requires IWMCs to consider standard design of 110% volume and bunded for impermeable storage to avoid contaminated runoff entering the surface or groundwater.	Final detailed design to confirm capacity is 110% and bunded
Preferable	
(i) Where IWMCs exist, any improvements should be to the existing infrastructure, rather than replacement on new sites.	New sites may be necessary if existing site has become unsuitable due to new developments around it or there is objection from communities to rehabilitate the existing IWMCs.
(ii) Removal of trees to be avoided where possible.	When mature trees (of diameter at breast height of 40cm or greater) must be removed, new trees must be planted of a number and species agreed with the island community
(iii) Where composting facilities are to be introduced or expanded, a high level of commitment from the community should be evident to ensure both cooperation in ensuring that waste to be composed is not contaminated and that compost will be purchased or used.	Evidence of commitment from the island community should be obtained, for example signed minutes from a public meeting, or signatures from household heads.

PROCEDURES FOR SCREENING AND DUE DILIGENCE ON INVOLUNTARY RESETTLEMENT IMPACTS

The project is categorized as C for involuntary resettlement impacts as per ADB Safeguard Policy Statement (2009). For all subprojects under Output 1 and one subproject under Output 2 for which sites are identified and preliminary designs are available, draft due diligence reports are prepared and will be updated based on detailed design.

Involuntary resettlement screening and due diligence will be conducted for all remaining subproject components, when the sites are identified. This Appendix provides guidance in screening and conduct of due diligence.

Screening of components will be undertaken at an early stage, immediately after potential sites/components are identified. ADB's involuntary resettlement impact screening checklist will be used for screening. The site selection criteria specified in the Environmental Assessment Review Framework will be applied to ascertain whether sites have any land acquisition or involuntary resettlement and social safeguard issues. The results of screening confirming that there are no land acquisition or involuntary resettlement impacts, will be presented in the Due Diligence Report.

Due diligence will be based on the engineering design and civil works footprints, field verification, study of Google Earth maps, land ownership and transfer records, confirmation of land availability as per requirement, and details of meaningful consultations with local communities, particularly those living around proposed project sites. ADB's involuntary resettlement impact screening checklist will be filled and appended to the respective due diligence reports, to confirm and support the due diligence.

Draft screening and due diligence reports will be submitted to ADB for review. These draft reports will be updated based on detailed design and ADB's approval obtained prior to start of construction.

SUGGESTED OUTLINE OF LAND ACQUISITION AND INVOLUNTARY RESETTLEMENT DUE DILIGENCE REPORT (DDR)

- (i) **Introduction:** Overview / general description of the project, stage of preparation of DDR (preliminary design/detailed design etc).
- (ii) **Description of Sub-project/Package:** Description of components and sites. Include Google Earth maps and photographs showing landuse of each site and its surroundings (depicting status before start of construction)
- (iii) **Land requirements, ownership and availability:** include a table with land requirement (area of land required per site/location), ownership of each site and area of land available at each location, existing landuse at the site and surrounding landuses. Establish that the land was not acquired in anticipation of ADB project and that there are no legacy issues with respect to land acquisition, no pending compensation or court cases or litigation pertaining to the land.

- (iv) **Socio-economic profile:** This section is to be included in case of any land donation or negotiated settlement. The socio-economic profile should cover economic status and vulnerability of land donor/land seller for land donation / negotiated settlement. It should help establish that no donor/seller was vulnerable or likely to be rendered vulnerable as a result of the donation/negotiated settlement.
- (v) **Screening and assessment of impacts.** Summarize results of screening. Confirm that the component complies with the project's site selection criteria and that no land acquisition and involuntary resettlement impacts are anticipated.
- (vi) **Consultations and disclosure:** Summary of consultations held with local/surrounding communities, key issues and concerns raised and how these were resolved/are proposed to be addressed, disclosure activities undertaken.
- (vii) **Summary and conclusions:** Summarize results of screening and due diligence.

Annexures to Due Diligence Report

1. Involuntary Resettlement Impact Screening Checklist
2. Land records for project sites showing plot number(s), area, ownership records; documents showing chronology of land acquisition and details of compensation payment OR land possession certificate with date of possession.
3. In case of negotiated settlement, include sale deed. In case of land donation, include gift deed.
4. Land registration/transfer record.
5. No Objection Certificates for project sites (for sites that belong to a different government department)
6. Minutes of meetings with community members, with consultation photographs and signatures of participants
7. Third party certification of land donation/negotiated settlement, if applicable

INVOLUNTARY RESETTLEMENT IMPACT SCREENING CHECKLIST

Probable Involuntary Resettlement Effects	Yes	No	Not Known	Remarks
Involuntary Acquisition of Land				
1. Will there be land acquisition?				
2. Is the site for land acquisition known?				
3. Is the ownership status and current usage of land to be acquired known?				
4. Will easement be utilized within an existing Right of Way (ROW)?				
5. Will there be loss of shelter and residential land due to land acquisition?				
6. Will there be loss of agricultural and other productive assets due to land acquisition?				
7. Will there be losses of crops, trees, and fixed assets due to land acquisition?				
8. Will there be loss of businesses or enterprises due to land acquisition?				
9. Will there be loss of income sources and means of livelihoods due to land acquisition?				
Involuntary restrictions on land use or on access to legally designated parks and protected areas				
10. Will people lose access to natural resources, communal facilities and services?				
11. If land use is changed, will it have an adverse impact on social and economic activities?				
12. Will access to land and resources owned communally or by the state be restricted?				
Information on Displaced Persons:				
<i>Any estimate of the likely number of persons that will be displaced by the Project? [] No [] Yes</i>				
If yes, approximately how many? _____				
<i>Are any of them poor, female-heads of households, or vulnerable to poverty risks? [] No [] Yes</i>				
<i>Are any displaced persons from indigenous or ethnic minority groups? [] No [] Yes</i>				

GAP ANALYSIS OF MALDIVES LAND ACT, ADB SAFEGUARD POLICY STATEMENT (2009) REQUIREMENTS

International Best Practice	Maldives Land Act Provisions	ADB SPS 2009 requirements	Gaps between Maldives laws, and ADB safeguard policy requirements	Gap filling measures for Harmonization
Avoidance or minimization of involuntary resettlement impacts of projects	No clause in the Act.	Explore viable alternative project designs to avoid and/or minimize involuntary resettlement impacts.	Local laws are silent on this key international best practice	Multiple technical options must be examined to avoid or minimize involuntary resettlement and physical, or economic displacement and to choose a better project option while balancing environmental social and financial costs and benefits. This practice applies to the project
Social Impact Assessment (SIA) to identify the impacts, risks and views of potential project affected persons and communities	The Act has no provision to conduct a social impact assessment in the proposed project areas	The borrower/client will conduct socioeconomic surveys and a census, with appropriate socioeconomic baseline data to identify all persons who will be displaced by the project and to assess the project's socioeconomic impacts on them. As part of the social impact assessment, the borrower will identify individuals and groups who may be differentially or disproportionately affected by the project because of their disadvantaged or vulnerable status.	No legal requirement to undertake SIA in the Maldives Land Act.	Social impact assessment will be conducted as early as possible during project processing and will specifically consider any impacts upon particularly poor and vulnerable affected persons and their needs.
Census survey to identify all affected persons	Island Council and City Council Officer (Chairman or Mayor) and PMU shall be responsible to identify, survey and notify the concerned parties and other works related to acquisition	Census survey to cover all affected persons, and it will be updated, based on the final detailed design data of the project.	No census is required under Maldives laws. Affected persons are identified using land records (which may not be updated).	Undertake a census survey of all affected persons and update the same based on changes, if any, found in the project final design or components. The Census survey will be based on land ownership (as on date of census) and accordingly all land records will be updated.

International Best Practice	Maldives Land Act Provisions	ADB SPS 2009 requirements	Gaps between Maldives laws, and ADB safeguard policy requirements	Gap filling measures for Harmonization
Categorization of the project according to the significance of IR impacts	No legal requirement in the Act to categorize projects according to the significance of IR impacts.	Categories A, B, and C are awarded to projects based on the level of the significance of potential IR impacts of a project.	Under the law, no categorization is done of project impacts including IR impacts	Categorize impacts by “significance” and define the volume of IR impacts – both direct and indirect – with particular attention to impacts on economic conditions and livelihoods of affected persons.
Preparation of a resettlement plan to address adverse IR impacts	No provision to formulated a resettlement plan	Prepare a resettlement plan elaborating on displaced persons’ entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget, and time-bound implementation plan.	The state laws do not require the preparation of a resettlement plan.	Prepare a resettlement plan to avoid or mitigate negative impacts of physical and economic displacement arising from the project. The resettlement plan will elaborate all affected persons’ entitlements, including that of host communities, squatters, customary users and encroachers by paying special attention to the needs of the poor and the vulnerable households and communities. The resettlement plan will be submitted to ADB for review and approval prior to project approval.
Consult with affected persons	No clause in the Act. However, the Act has no provisions for a process of formal consultation with affected persons.	Meaningful consultations with all affected persons, host communities, if any, and concerned non-government organizations. Inform all displaced persons of their entitlements and relocation options.	Under national laws Information dissemination is limited to legal notification.	Consult project-affected persons, host communities, if any, and local non-governmental organizations [WDC], as appropriate. Provide them with opportunities to participate in planning of resettlement programs. Pay particular attention to the needs of vulnerable groups among those displaced, especially those below the poverty line, the landless, the elderly, women and children, or other displaced persons who may not be protected through national land compensation legislation.

International Best Practice	Maldives Land Act Provisions	ADB SPS 2009 requirements	Gaps between Maldives laws, and ADB safeguard policy requirements	Gap filling measures for Harmonization
Disclose involuntary resettlement information to project affected persons	No provision for the preparation or disclosure of involuntary resettlement information to project affected persons.	Also disclose the final resettlement plan to the affected persons and other stakeholders. Project monitoring reports are also disclosed.	No requirements for formal disclosure.	Disclose the Resettlement Plans (if any) including documentation of the consultation processes in a form and language (Divehi) accessible to key stakeholders, civil society, particularly affected groups and the general public in an accessible place.
Compensation at replacement Cost for property acquired.	No clause in the Act (MLA).	Compensation at full replacement cost for all affected property. Market value for trees and crops.	Island Council or City Council is the main body to decide the compensation. However, the Ministry of Home Affairs and Housing is the authorized body to allocate lands for all purposes and the Ministry needs to decide the compensation with the support of MEE, PMU and Island Councils and City Councils.	Value of land/property is to be agreed with the owner of the property through a process of consultation and negotiation. The process will be documented and verified. The compensation for structures such as houses are determined on the current market value, based on latest basic schedule rates.
All compensation is paid prior to actual displacement of affected households and the commencement of civil work	Acquisition of asset after notification and payment of compensation.	Pay compensation and provide other resettlement entitlements before physical or economic displacement of affected households.	There is no provision that such compensation will be paid to the project-affected persons prior to acquisition	No physical or economic displacement till full compensation is paid to all affected person (except in case of legally disputed cases).
Provision of full compensation without any deduction	No clause in the Act (MLA).	Full compensation is to be paid with no deductions unless land is provided in lieu of land acquired.	No clause in the Act (MLA).	No deduction to be done from cash compensation and all legal cost for acquisition to be borne by the executing agency. The value of salvaged materials or harvested from the acquired land will not be deducted from the compensation package.

Special assistance for vulnerable households	No clause in the Act (MLA).	Improve the standards of living of the displaced poor and other vulnerable groups, including women, to at least national minimum standards	No clause in the Act (MLA).	Special attention should be given as highlighted in the Gender Action Plan (GAP) and the PMU is responsible to identify such families.
International Best Practice	Maldives Land Act Provisions	ADB SPS 2009 requirements	Gaps between Maldives laws, and ADB safeguard policy requirements	Gap filling measures for Harmonization
Livelihood restoration	No clause in the Act (MLA).	Improve or at least restore the livelihoods of all displaced persons	The national standards are silent on livelihood restoration	All affected persons having significant impact on livelihood will be entitled for special assistance for livelihood restoration as indicated in EM.
Grievance Redressal Mechanism	No clause in the Act (MLA).	Establish a grievance redress mechanism to receive and facilitate resolution of the affected persons' concerns.	ADB policy provide for adequate and accessible grievance redressal mechanism.	Any grievances regarding land and property acquisition could be reported to Island Councils and City Councils within 7 days of public notification. MEE will decide on such grievances within 15 days.
Monitoring	No legal requirement in the Law for involuntary resettlement implementation monitoring.	In the projects with significant involuntary resettlement impacts, the borrower will retain qualified and experienced external experts. The borrower will prepare semi-annual monitoring reports. All monitoring reports are to be disclosed.	The local law does not provide for any monitoring mechanism.	Project with significant impacts to have external monitor or else internal monitoring by executing agency. All monitoring reports are to be disclosed

OUTLINE OF A RESETTLEMENT PLAN

This outline is part of the ADB SPS Safeguard Requirements 2. A resettlement plan is required for all projects with involuntary resettlement impacts. Its level of detail and comprehensiveness is commensurate with the significance of potential involuntary resettlement impacts and risks. The substantive aspects of the outline will guide the preparation of the resettlement plans, although not necessarily in the order shown.

Executive Summary

This section provides a concise statement of project scope, key survey findings, entitlements and recommended actions.

Project Description

This section provides a general description of the project, discusses project components that result in land acquisition, involuntary resettlement, or both and identify the project area. It also describes the alternatives considered to avoid or minimize resettlement. Include a table with quantified data and provide a rationale for the final decision.

Scope of Land Acquisition and Resettlement

This section: discusses the project's potential impacts and includes maps of the areas or zone of impact of project components or activities; describes the scope of land acquisition (provide maps) and explains why it is necessary for the main investment project; summarizes the key effects in terms of assets acquired and displaced persons; and provides details of any common property resources that will be acquired.

Socioeconomic Information and Profile

This section outlines the results of the social impact assessment, the census survey, and other studies, with information and/or data disaggregated by gender, vulnerability, and other social groupings, including:

- define, identify, and enumerate the people and communities to be affected;
- describe the likely impacts of land and asset acquisition on the people and communities affected taking social, cultural, and economic parameters into account;
- discuss the project's impacts on the poor, indigenous and/or ethnic minorities, and other vulnerable groups; and
- identify gender and resettlement impacts, and the socioeconomic situation, impacts, needs, and priorities of women.

Information Disclosure, Consultation, and Participation

This section: identifies project stakeholders, especially primary stakeholders; describes the consultation and participation mechanisms to be used during the different stages of the project cycle;

describes the activities undertaken to disseminate project and resettlement information during project design and preparation for engaging stakeholders; summarizes the results of consultations with affected persons (including host communities), and discusses how concerns raised and 36 recommendations made were addressed in the resettlement plan; confirms

disclosure of the draft resettlement plan to affected persons and includes arrangements to disclose any subsequent plans; and describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for consultation with affected persons during project implementation.

Grievance Redress Mechanisms

This section describes mechanisms to receive and facilitate the resolution of affected persons' concerns and grievances. It explains how the procedures are accessible to affected persons and gender sensitive.

Legal Framework

This section: describes national and local laws and regulations that apply to the project and identify gaps between local laws and ADB's policy requirements; and discuss how any gaps will be addressed. describes the legal and policy commitments from the executing agency for all types of displaced persons; outlines the principles and methodologies used for determining valuations and compensation rates at replacement cost for assets, incomes, and livelihoods; and set out the compensation and assistance eligibility criteria and how and when compensation and assistance will be provided. Describes the land acquisition process and prepare a schedule for meeting key procedural requirements.

Entitlements, Assistance and Benefits

This section: defines entitlements and eligibility of displaced persons, and describes all resettlement assistance measures (includes an entitlement matrix); specifies all assistance to vulnerable groups, including women, and other special groups; and. outlines opportunities for affected persons to derive appropriate development benefits from the project.

Relocation of Housing and Settlements

This section: describes options for relocating housing and other structures, including replacement housing, replacement cash compensation, and/or self-selection (ensure that gender concerns and support to vulnerable groups are identified); describes alternative relocation sites considered; community consultations conducted; and justification for selected sites, including details about location, environmental assessment of sites, and development needs; provides timetables for site preparation and transfer; describes the legal arrangements to regularize tenure and transfer titles to resettled persons; outlines measures to assist displaced persons with their transfer and establishment at new sites; describes plans to provide civic infrastructure; and explains how integration with host populations will be carried out.

Income Restoration and Rehabilitation

This section: identifies livelihood risks and prepare disaggregated tables based on demographic data and livelihood sources; describes income restoration programs, including multiple options for restoring all types of livelihoods (e.g. project benefit sharing, revenue sharing arrangements, joint stock for equity contributions such as land, discuss sustainability and safety nets); outlines measures 37

to provide social safety net through social insurance and/or project special funds; describes special measures to support vulnerable groups; explains gender considerations; and describes training programs.

Resettlement Budget and Financing Plan

This section: provides an itemized budget for all resettlement activities, including for the resettlement unit, staff training, monitoring and evaluation, and preparation of resettlement plans during loan implementation. describes the flow of funds (the annual resettlement budget should show the budget-scheduled expenditure for key items) includes a justification for all assumptions made in calculating compensation rates and other cost estimates (taking into account both physical and cost contingencies), plus replacement costs. includes information about the source of funding for the resettlement plan budget.

Institutional Arrangements

This section: describes institutional arrangement responsibilities and mechanisms for carrying out the measures of the resettlement plan; includes institutional capacity building program, including technical assistance, if required; describes role of NGOs, if involved, and organizations of affected persons in resettlement planning and management; and describes how women's groups will be involved in resettlement planning and management,

Implementation Schedule

This section includes a detailed, time bound, implementation schedule for all key resettlement and rehabilitation activities. The implementation schedule should cover all aspects of resettlement activities synchronized with the project schedule of civil works construction, and provide land acquisition process and timeline.

Monitoring and Reporting

This section describes the mechanisms and benchmarks appropriate to the project for monitoring and evaluating the implementation of the resettlement plan. It specifies arrangements for participation of affected persons in the monitoring process. This section will also describe reporting procedures.

** Special Note: For more details see ADB Safeguard Policy Statement 2009.*

SOCIOECONOMIC SURVEY OF HOUSEHOLDS

Questionnaire Number											
S. N.	Description										Instructions
GENERAL INFORMATION											
1	Island's name:										Write
2	Atoll's name:										Write
3	House number and address:										Write
4	Household head's name:										Write
5	Name of the Respondent:										Write
6	Relationship to the household head (HHH):										Write
7	Family members' details:										Write and use numerical codes given
S. N.	Name of HH members	Relation to HHH *	Age	Sex*	Marital Status*	Any disabilities*	Education*		Occupation*		
1		HHH					School*	Vocational	Primary	Secondary	
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
8	Type of Family:	Extended			Nuclear						√
9	If extended family, number of nuclear families:										Write
10	Vulnerability: (mark all applicable answers):										√
	Vulnerability	Answer	Vulnerability		Answer						
	Disabled		Female headed household								
	Elderly		Male headed household								
	Poor		No vulnerability								
11	Type of vulnerability:										√
	Type of Vulnerability	Answer	Type of Vulnerability		Answer						
	Single		Multiple								
	Not applicable										
DETAILS OF ASSETS AVAILABLE AND ENERGY USE:											
12	How much total land your family members own? (in Sq. Ft.)										Write
13	Who has ownership of lands?	Male		Female		Both Male and Female				√	
14	Details of land owned	Homestead		Agriculture		Commercial				√	
15	Have you rented in any land?	Yes		No		How much (Sq. Ft.)?				√	
16	Have you rented out any land?	Yes		No		How much (Sq. Ft.)?				√	
17	Own house?	Yes		No		Number of total rooms				√	
18	Do you own any vehicles?	Yes		No		Type*				√ and write	

19	Do you own vessels?	Yes		No		Type*				√ and write	
20	Do you have electricity?	Yes		No		Type*				√ and write	
21	If yes, any load shedding?	Yes		No		Frequency*				√ and write	
22	When you got the connection? Write the year.									Write	
23	What is the monthly bill? Total Units			Subsidy		Paid amount				Write	
24	What are the available utilities (electric)? Write the number available or planned to buy.									√	
	Availability	TV/VCD/DVD	Computer	Radio	Water pump	Cooker	Washing Machine	Grinder	Oven/Grill	Electric iron	Fans
	Now										
	Planned										
25	Do you have following utilities at the moment or planned to have?									√	
	Availability	A/C Machines	Refrigerator	Defreezer	Other (specify)						
	Now										
	Planned										
26	Do you have basic sanitary facilities?									√	
	Availability			Yes	No	If yes, type					
	General facilities (non-electrified)					Linked to sea	Septic tank	Commode	Hole/Pit	Other	
	General facilities (Electrified)					Linked to sea	Septic tank	Commode	Hole/Pit	Other	
27	Do you have telephone facilities?									√ and write	
	Availability			Yes	No	If yes, number (within Family)					
	Land phone (wire connection)										
	Mobile/cell phone										
28	Do you use internet facilities?									√	
	Yes	No	Supposed to get a link								
29	Type of main energy source mostly used for cooking: (mark in priority order – 1, 2, and 3)									√ and write	
	Source			Yes	No						
	LPG (Gas)										
	Kerosene (Oil)										
	Firewood										
	Biogas										
	Electricity										
	Other (specify)										
30	What is your opinion on existing diesel power house in the island?									√ and write	
	Opinion				Yes	No	Don't know/can't say				
	Running in good condition										
	Having maintenance issues frequently										
	Make noise and air pollution										
	Tariff is too high even though we get subsidy										
	Tariff is too high										
	Other (specify)										
31	Do you know what renewable energy is?									√	
	Yes	No									
32	Have you heard about solar and wind power?									√	
	Sola	Yes	No								
	Win	Yes	No								
33	Will you be happy if the government replace solar or wind power instead diesel power house in your island/city?									√	
	Sola	Yes	No								
	Win	Yes	No								
34	If yes, are you ready to have a partnership with this upcoming project?									√	
	Yes	No	Don't know/can't say								
35	What is the main source of drinking water?									√ and write	
	Source			Yes	No						

	livestock than usual (e.g. chicken and other fowl) in order to have enough food to eat?																									
	5. In the past year, did your family sell off some household possessions, in order to buy food?																									
	6. In the past year, did your family borrow food or money for food from relatives, friends or neighbours?																									
GENDER RELATED INFORMATION:																										
43	What kind of work do the women of the household undertake outside home? (Can tick more than one according to the priority order)?					√																				
	<table border="1"> <thead> <tr> <th>Work/Task</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>Agriculture</td> <td></td> <td></td> </tr> <tr> <td>Manual labour</td> <td></td> <td></td> </tr> <tr> <td>Commercial activities (including self-employment)</td> <td></td> <td></td> </tr> <tr> <td>Office related work in gov. or private institutions</td> <td></td> <td></td> </tr> <tr> <td>Child rearing and caring</td> <td></td> <td></td> </tr> <tr> <td>Other (specify)</td> <td></td> <td></td> </tr> </tbody> </table>	Work/Task	Yes	No	Agriculture			Manual labour			Commercial activities (including self-employment)			Office related work in gov. or private institutions			Child rearing and caring			Other (specify)						
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Other (specify)																										
44	Are the women of the household free to move alone outside the house for other purposes?					√																				
	Yes	No	Occasionally/family functions only																							
45	Who are the main decision makers in the family?					√																				
	<table border="1"> <thead> <tr> <th>Person</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>Mostly men</td> <td></td> <td></td> </tr> <tr> <td>Mostly women</td> <td></td> <td></td> </tr> <tr> <td>Both men and women</td> <td></td> <td></td> </tr> <tr> <td>Other (specify)</td> <td></td> <td></td> </tr> </tbody> </table>	Person	Yes	No	Mostly men			Mostly women			Both men and women			Other (specify)												
Person	Yes	No																								
Mostly men																										
Mostly women																										
Both men and women																										
Other (specify)																										
46	If both, what kinds of decision are taken by each?					Write																				
	<table border="1"> <thead> <tr> <th>Men</th> <th>Women</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> </tr> <tr> <td>2</td> <td></td> </tr> <tr> <td>3</td> <td></td> </tr> <tr> <td>4</td> <td></td> </tr> </tbody> </table>	Men	Women	1		2		3		4																
Men	Women																									
1																										
2																										
3																										
4																										
47	Do the women of the household attend/participate in village/community level events?					√																				
	Mostly	No	Occasionally, when there is a need																							
48	What are the organizations that women mostly involved in this island/city?					Write																				
	<table border="1"> <thead> <tr> <th>Organisation Name</th> <th>Any designation bearing at the moment</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> </tr> <tr> <td>2</td> <td></td> </tr> <tr> <td>3</td> <td></td> </tr> <tr> <td>4</td> <td></td> </tr> </tbody> </table>	Organisation Name	Any designation bearing at the moment	1		2		3		4																
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1																										
2																										
3																										
4																										
49	How important you think women should get some opportunities for training or capacity development that aims livelihood improvement?					√																				
	Yes	No	Don't know/can't say																							
50	How important you think that women can play a major role in energy saving at household level?					√																				
	Yes	No	Don't know/can't say																							
51	If women get an active participation in this project, do you support them?					√																				
	Yes	No	Don't know/can't say																							
PERCEPTION ON PROPOSED PROJECT'S IMPACT ON LIVELIHOOD:																										
52	Could you name three most positive impact of the proposed project?					Write																				
	1																									
	2																									
	3																									

53	Could you name three most negative impact of the proposed project?	Write	
	1		
	2		
	3		
54	Any other specific issue?	Write	
	Name of the enumerator	Date	Write

CENSUS SURVEY QUESTIONNAIRE FOR PROJECT AFFECTED FAMILIES

Questionnaire Number		Atolls' Name	
Subproject island		Ward No.	

S.N.	Description	Answer	Remarks				
GENERAL INFORMATION							
1	Name of Village:		Write				
2	Name of the Respondent:		Write				
3	Sex:	Male <input type="checkbox"/> Female <input type="checkbox"/>	√				
4	Name of Household head		Write				
5	Sex of HH head:	Male <input type="checkbox"/> Female <input type="checkbox"/>	√				
6	Age of HH head		Write				
7	Relationship of the Respondent with the Household Head		Write				
11	Family Type	Nuclear <input type="checkbox"/> Extended <input type="checkbox"/>	√				
	Vulnerability	Female HH <input type="checkbox"/> Disable <input type="checkbox"/>	√				
		Elderly <input type="checkbox"/> No vulnerability <input type="checkbox"/>	√				
12	Demographic information of family members:		Write				
	Name	Sex	Age	Marital Status	Main Occupation	Highest Education	Vocational Education
LAND AND ASSETS OWNERSHIP							
17	Type of Land and Assets:		Write				
	Type of Land and Assets	Name of Current Owner	Sex	Acreage (Perch/Sq Mt/No.)	Type of Ownership*	Current Status#	
	Agricultural land						
	Commercial land						
	Residential land						
	Residential structure (House)						
	Commercial structure						
	RS+CS						
	Trees						
	Orchards						
	Shed						
	Well/Water tank						
	Others (specify) 1						

	Others (specify) 2											
	* Titled/Squatter/Encroacher/Tenant/Leased/Community/Other (specify)											
	#Occupied/Not occupied											
18	Type of Household Equipment and Vehicles Available (if available put the number):						Write					
	TV	Radio	Refrigerator	Mobile Phone	Landline Phone	Vehicles (including boats)						
INFORMATION OF AFFECTED LAND AND ASSETS												
19	Information of Affected Land:						Write					
	Total Holding by Types	Total land owned by HH (P)	Affected Cadastral total area (P)	Parcel No. and Map ref.	Actual Land Loss (P)	Remaining Area of the parcel (P)	Remaining Land of the HH (P)					
								Map Ref.	Parcel No.	Total Area		
	Agricultural land											
	Commercial land											
	Residential land											
	Other (specify)											
	Total											
20	Information of Affected Structure:						Write					
	Type of Affected Structure	Total Floor Area (Sq Mt)	Type of Structure*	Area Affected (Sq Mt)	Magnitude of Impact #	Replacement Cost						
	Residential Structure											
	Commercial Structure											
	Residential cum Commercial											
	Shed											
	Boundary wall											
	Other (Specify)											
	* 1. Thatched simple hut, 2. Mud/brick/tiled roof, 3. Cement/brick or cement block /tiled roof or Asbestos roof, 4. Cement/brick or cement block /GI sheet roof 5. Cement/ brick or cement block/concrete roof, 6. Tiled/brick or cement block /tiled roof or Asbestos roof 7. Tiled/ brick or cement block/tiled roof or asbestos roof, 8. Others (specify)											
	# Major/Moderate/Minor											
21	Is there any tenant in your house?			Yes		No					√	
22	If yes, how many families?										Write	
23	Do they have a land and house to resettle in another place?				Yes		No				√	
25	Have you taken any loan?			Yes		No					√	
26	If yes, balance remaining?										Write	
27	Source of loan taken?										Write	
28	In case of significant loss of the residential asset, thereby making it unviable, what kind of relocation option would you prefer?				Self relocation						√	
					Project assisted							
					Other							
					Not decided yet							
29	In case of self managed relocation, where would you relocate?				Within island						√	
					Other island							
					Male							
					Not decided yet							
30	If you have a commercial structure affected name the type of business?						Write					
	Type	Number	Impact*	Type	Number	Impact*						

	Shop/s			Hotel/ Restaurant				
	Pvt. Clinic			STD booth				
	Workshop			Office Complex				
	Factory			Other (specify)				
	* Major/Moderate/Minor							
31	Total Monthly Income	1.						Write
32	Is there any tenant in your Commercial Structure affected?	Yes		No			√	
33	If yes, how many?							Write
34	Do they have another place/structure to resettle their business activities?	Yes		No			√	
35	Are there any employees?	Yes		No			√	
36	Total monthly salary paid for them?	1.		2.			Write	
37	Total monthly income?							Write
38	Have you taken any commercial loan?	Yes		Yes			√	
39	If yes, balance remaining?							Write
40	Source of loan taken							Write
41	In case of significant loss of the commercial asset, thereby making it unviable, what kind of relocation option would you prefer?	Self relocation					√	
		Project assisted						
		Other						
		Not decided yet						
42	In case of self managed relocation, where would you relocate?	Within island					√	
		Other island						
		Male						
		Not decided yet						
INFORMATION OF AFFECTED CROPS AND TREES								
43	Information of Affected Crops and Trees:						Write	
	Type	Total Quantity *	Affected quantity	Lost Value				
	Timber							
	Other trees							
	Fruits 1 (specify)							
	Fruits 2 (specify)							
	Other (specify)							
	* (Perch/No.)							
INFORMATION OF LIVESTOCK AND POULTRY								
44	Do you own any livestock and poultry? (e.g. Cow, goat, pigs etc.):	Yes					√	
		No						
45	If yes, how many? Please specify the number by types:						Write	
	Types	No./Quantity Owned	Project Impact*					
	Cow							
	Goat							
	Poultry							
	Others							
	* Major/Moderate/Minor							
INFORMATION OF INCOME AND EXPENDITURE								

46	Occupational Pattern of Household Members:						Write	
	Name of Person	Sex	Age	Primary Source#	Durability*	Secondary Source#		Durability*
	# write * Round the year/seasonal/when attend/own account							
47	Source of income:				Write			
	Person	Primary Income	Type*(write)	Secondary Income		Type* (write)		
	1							
	2							
	* Yearly/Monthly/Daily							
48	Is the primary or secondary source of your income getting affected by the project				Yes		√	
					No			
49	If yes, name them:			Write				
	Person	Primary	Secondary					
	1							
	2							
	INFORMATION ABOUT THE PROPOSED SUBPROJECT							
50	Have got any information regarding the proposed Project?				Yes		No	√
51	If yes, from where did you hear about the Project?			Island Officers		√		
				FENAKA Officers				
				MOEE Officers				
				News paper				
				Other (Specify)				
52	What are positive impacts you anticipate in terms of your family and income: Please circle in applicable responses.			Better education for children		√		
				Better health				
				Access to resources/markets				
				Price increase in assets' value				
				Increase in farm production/sale				
				Employment and income				
				Better mobility				
Community development								
	Other (specify)							
53	What are the negative impacts you anticipate in terms of your family and income. Please circle in applicable responses.			Loss of assets and income		√		
				Loss of access to resources/facilities				
				Relocation				
				Shifting of assets and belongings				
				Break in cultural & social ties				
				Decrease in sales/production				
	Community disintegration							

		Other (specify)			
54	Do you have electric supply to your house?	Yes		No	√
56	What are the energy sources being using?	1			Write
		2			
57	Specific Comments (if any):				Write
58	Enumerator's Observation:				Write

Date:

Name:

Signature:

SAMPLE MONITORING INDICATORS

Type	Indicator	Examples of Variables
Process Indicator	Staffing	Number of social safeguard staff and subordinate staff enrolled in the Ministry of Environment and Energy and subproject locations Number of other line agency officials available for tasks
	Consultation and Mobilization	Number of WDC consulted at subproject islands and meetings held Grievances by type and resolution Number of field visits by project staff
	Procedures in Operation	Socioeconomic surveys, census and asset verification procedures in place Number of IR screening and categorization checklists have completed
Output Indicators; data disaggregated by sex of owner/ head of Household	Acquisition of Land	Number of agreements and land transfers (owner to the Government of Maldives) effected Coordination between Island Councils, City Councils and other line agencies Area of cultivation land acquired Area of other private land acquired Area of common/government land acquired Area of the land donated Area of the land compensated
	Trees and Crops	Number and type of private trees acquired Number and type of government/community trees acquired Crops destroyed by area, type and number of owners
	Compensation and Rehabilitation	Number of HHs affected (land, buildings, trees, crops) Number of owners assisted by type of loss Amount compensated by type and owner Number and amount of allowances paid Number of replacement houses constructed by concerned owners/contractor Number of replacement businesses constructed by concerned owners Number of owners requesting assistance with purchasing of replacement land Number of replacement land purchases effected Number of HHs and persons included for income restoration program Income restoration cost
Impact Indicator – data disaggregated by sex of owner/ head of HH	HH Earning Capacity	Employment status of economically active members Changes to income-earning activities (agriculture) – pre- and post-disturbance Changes to income-earning activities (Fishing) – pre- and post-disturbance Amount and balance of income and expenditure Range of increase land value Number of HHs received electricity supply Number of institutions received electricity supply Number of students benefited Number of cottage or small-scale industries commenced after the project Number of agri-business commenced after the project Number of WDC members participated in capacity development programs Number of executing agency staff under gone in capacity development program Number of subprojects planned Number of subprojects implemented and completed
	Capacity development	Number of WDC members participated in capacity development programs Number of executing agency staff under gone in capacity development program
	Subproject implementation	Number of subprojects planned Number of subprojects implemented and completed Number of subprojects compliance involuntary resettlement

TOR FOR INDEPENDENT THIRD PARTY FOR NEGOTIATED PURCHASE OR VOLUNTARY LAND DONATION

For any voluntary donation of land, an external independent entity will supervise and document the consultation process and validate the negotiated purchase / land donation process as per legal requirement.

TOR for Independent Third-Party Witness

An independent third party is sought to be appointed to oversee and certify the process of negotiated purchase / land donation. The third party shall be briefed about his/her expected role and deliverables by the PMU.

Eligibility: The third party shall be a representative of the community (for example, a senior government officer, a leader of the community, a representative of a local NGO/CBO), without any direct interest in the negotiation process, who is acceptable to each of the concerned parties (MEE and concerned land owner/donor).

Scope of work: The role of the third party shall be to ensure a fair and transparent process of negotiation/donation. The envisaged scope of work shall entail the following:

- (i) witness and keep a record of meetings held with the concerned parties,
- (ii) ensure there is no coercion involved in the process of negotiated purchase / land donation,
- (iii) ensure that the preferences and concerns of the land owner / donor related to access, selection of site within lands held, etc. are recorded and any stipulated conditions met,
- (iv) ensure that the negotiated purchase / land donation agreement is drafted in a fair and transparent manner,
- (v) identify and recommend mitigation measures to land owner / donor, if required,
- (vi) ensure that taxes, stamp duties and registration fees for purchased / donated land are borne by government, and
- (vii) submit a certificate as witness to the purchase / donation and transfer process.

Deliverables: The details of the meetings, and a certificate as witness to the purchase / donation process and mitigation measures to owner / donor, if any, shall be submitted by the third party to the PMU and owner/donor in the local language.

SAMPLE CERTIFICATION FORMATS

This is to certify that Mr./Ms. xxxxxxxxxxxxxxxxxxxx, (profession, designation, address) is appointed as independent third party to certify the process of negotiated purchase/donation of plot no.....area.....owned / donated by XXXXXXXXXX (names of owner), who is a signatory to this certificate. It is also placed on record that none of the signatories to this certificate have any objection to appointment of xxxx as third-party witness.

Date

Officers MEE and land donor/owner

I, _____ of _____ (address) certify that I was witness to the process of negotiated purchase / land donation (details of plot _____ from XXXXXXXXXX land owners' names).

I certify that:

1. The process of purchase / donation of the said land was transparent; the landowner(s) was/were happy to sell/donate the land for the welfare of the community.
2. No coercion was used in the purchase/donation process.
3. Land transfer costs (registration fee and stamp duty) were borne by the government and not by the owner/donor.
4. All concerns expressed by the owner/donor as agreed, were addressed and no pending issues remain.
5. The following mitigation measures were identified and implemented / provided to the land owner/donor.
6. Attached are the minutes of meetings held between project proponents and the land owner/donor, which I was witness to.

Signed/

Name

xxxxxxxxxxxxxxxxxxxxxxxx

Date: _____ Place: _____

Encl: Minutes of meetings held between land owner/donor and project proponents

SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Dhivehi and English)

The _____ Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	Place of registration	Project Town		
		Project:		
Contact information/personal details				
Name		Gender	* Male * Female	Age
Home address				
Place				
Phone no.				
E-mail				
Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below:				
If included as attachment/note/letter, please tick here:				
How do you want us to reach you for feedback or update on your comment/grievance?				

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
Mode of communication: Note/letter E-mail Verbal/telephonic	
Reviewed by: (Names/positions of officials reviewing grievance)	
Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	

SUGGESTED RESETTLEMENT INFORMATION LEAFLET

I. Background

1. The Government of Maldives with a grant from the Asian Development Bank (ADB) is implementing the Greater Malé Environmental Improvement and Waste Management Project (the project) in the inhabited islands in the North Ari Atoll.

2. The project will establish a sustainable regional solid waste management (SWM) system in Greater Male by (i) improving collection, transfer, disposal, treatment (using advanced waste-to-energy technology), recycling, and dumpsite rehabilitation; (ii) strengthening institutional capacities for solid waste services delivery and environmental monitoring; and (iii) improving public awareness and behaviors in reduce-reuse-recycle (3R). The Project will be designed to reduce disaster risk and improve climate change resilience while creating a cleaner environment and reducing greenhouse gas emissions.

II. Executing and implementing agencies

3. The Ministry of Finance and Treasury (MOFT) will be the executing agency of the project while the Ministry of Environment and Energy (MEE) will be the implementing agency.

III. Project safeguard category as per ADB SPS, 2009

4. During project preparation stage, sites of proposed subprojects were assessed and results indicate that Project is considered safeguard category XX for involuntary resettlement, XX for environment and XX (indigenous people/small ethnic communities).

5. There are no significant land acquisition or resettlement impacts anticipated. However, Resettlement Framework has been prepared to provide guidance in the preparation of resettlement plans, if required. The basic objectives of the Resettlement Framework are to: (i) guide the executing agency and implementing agencies in properly compensating project-displaced persons; (ii) serve as binding document to ensure displaced persons will be assisted and paid compensation; and (iii) provide direction in preparing, implementing, and monitoring the resettlement plans. The executing agency and the implementing agencies will be responsible for ensuring the preparation and implementation of resettlement plans are consistent with this Resettlement Framework. The Resettlement Framework is a formally agreed document between Government of Bangladesh and ADB.

IV. Involuntary resettlement impacts of proposed subproject components

6. Proposed subproject components include XX, XXX. The Project considers involuntary resettlement¹⁶ due to (i) physical and economic displacement as a result of (a) involuntary acquisition of land, or (b) involuntary restrictions on land use or on access to legally designated parks and protected areas; (ii) permanent or temporary displacement; (iii) full or partial

¹⁶ ADB SPS, 2009 considers resettlement involuntary when the displaced persons have no right to refuse the land acquisition by the state that result in their displacement. This occurs when land is acquired through (i) expropriation by invoking the eminent domain power of the state, or (ii) land is acquired through negotiated settlement when the pricing is negotiated in a process where expropriation will be the consequence of a failure in the negotiation.

displacement; and (iv) all affected persons with land to be affected permanently or temporarily due to any project activity, including purchase and temporary use during construction.

V. Eligibility

7. Affected persons are those who are physically relocated, or lose residential land, or shelter and/or economically displaced (with loss of structure, assets, access to assets, income sources, or means of livelihood). The absence of formal and legal title to the land should not prevent the affected person to receive compensation and resettlement assistance from the project.

VI. Entitlement

8. The entitlement matrix (Table 1) of the resettlement framework and to be included in each resettlement plan and in case any impacts are identified, to be included as an appendix to this PID leaflet) summarizes the main types of losses and the corresponding nature and scope of entitlements in accordance with government and ADB policies. Where the entitlement matrix does not cover a particular impact, it can be enhanced in the resettlement plans based on the findings of the socioeconomic assessment and detailed census survey. Standards described will not be lowered but can be enhanced in the subproject resettlement plans as required.

9. The entitlement matrix specifies that any displaced person will be entitled to (i) land-for-land compensation or cash compensation (at replacement cost) for loss of land; (ii) compensation for loss of structure (residential/commercial) and other immovable assets at their replacement cost (without counting the depreciation value); (iii) compensation for loss of business/wage income; (iv) assistance for shifting of structure; (v) rebuilding and/or restoration of community resources/facilities; and (vi) livelihood/ transitional cash assistance.

VII. Institutional Arrangement

10. A project steering committee (PSC) will be set up with the Minister of MEE as chair, and a policy level representation from the MOFT, Ministry of Tourism, Ministry of Health, Ministry of Gender and Family, Local Government Authority, and Environmental Protection Agency (EPA) as members, and the project director as member and the convener of the PSC. The PSC will review overall implementation progress and recommend key policy decisions.

11. A dedicated full-time project management unit (PMU) will be established within the MEE. The PMU will be strengthened with external experts in the areas of finance, procurement, technical areas, and contract management. The PMU will work closely with Island Councils for the community-based outer island waste management systems targeting poor and women.

VIII. Grievance Redress Mechanism

12. The project grievance redress mechanism (GRM) will receive and facilitate the resolution of affected persons' concerns, complaints, and grievances on negotiated/voluntary land donation or involuntary land acquisition, relocation, income restoration, environmental management and other construction and operation related issues. The GRM is accessible to all affected persons to address their concerns grievances and issues effectively and swiftly, in accordance with ADB SPS. In case of any grievance, the following persons may be contacted and acknowledgement / confirmation on receipt and registration of grievance obtained: XXXXXXXX (provide name, designation and contact number).

IX. Disclosure

13. The project resettlement framework and other relevant documents will be made available at public locations in the project sites and posted on the websites of MEE and ADB. The consultation process will be continued and expanded during the project implementation to ensure stakeholders participate fully in project execution, as well as to implement comprehensive information, education, and communication plan.

14. Relevant information from the Resettlement Framework/resettlement plan translated to Dhivehi will be made available at (i) offices of MOFT and MEE, (ii) area offices, (iii) consultant teams' offices and (iv) contractor's campsites. It will be ensured that the hard copies of this resettlement plan are kept at places which are conveniently accessible to people, as a means to disclose the document and at the same time creating wider public awareness. An electronic version of the Resettlement Framework/resettlement plan will be placed in the official website of MEE, and ADB's website after approval by ADB.

X. Monitoring and Reporting

15. Monitoring of a development project implemented with certain goals and objectives in general, needs to assess the output, effects and impact of the strategies. Therefore, monitoring is a major part of the resettlement management system to ensure its goals and objectives are adequately met. Resettlement plan implementation will be monitored internally. The safeguards staff within the PMU will monitor resettlement plan implementation with support of WAMCO and EA.

16. The project safeguard specialist will prepare semi-annual progress reports and submit them to the PMU. The Executing Agency will prepare semi-annual monitoring reports and submit to ADB. These reports will describe the progress of the implementation of resettlement activities and compliance issues, if any, and corrective actions taken to address them. These reports will closely follow the involuntary resettlement monitoring indicators agreed at the time of resettlement plan approval

Land Acquisition and Resettlement Due Diligence Report

Document Stage: Draft
Project Number: 51077
March 2018

Republic of the Maldives: Greater Malé Environmental Improvement and Waste Management Project - Thulusdhoo Island Waste Management Improvements Subproject

This Due Diligence Report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, management, or staff, and may be preliminary in nature.

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CURRENCY EQUIVALENTS
(as of 15 March 2018)

Currency unit = Rufiyaa (Rf)
Rf1.00 = \$0.065 USD
USD 1.00 = Rf15.449

ABBREVIATIONS

ADB	- Asian Development Bank
DDR	- due diligence report
IWMC	- Island Waste Management Centre
SWM	- Solid waste management
tpd	- tons per day
WAMCO	- Waste Management Corporation Limited

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I. INTRODUCTION

A. Project Background

1. The Republic of Maldives has a total population of around 341,256 with 35 percent of the total population living in the capital city of Malé. The Government of Maldives is committed to improve the environmental conditions of the country and strengthen its solid waste management (SWM), and requested support from the Asian Development Bank (ADB) to implement the Greater Malé Environmental Improvement and Waste Management Project. The project aims to improve the critical situation of Thilafushi dumpsite and strengthen SWM in Zone 3,¹ which covers Greater Malé (Malé, Villingili and Hulhumalé including inhabited islands in Kaafu, AlifuAlifu, AlifuDhaalu and Vaavu atolls).

2. Zone 3 is distributed over 32 islands and is the most important region in terms of economic and social development in the Maldives. Solid waste remains the most visible environmental threat. With increasing population, developing industries and activities, waste management became a major challenge in the protection of the environment. Solid waste generation from domestic, institutional, commercial and industrial activities is 75,000 tons per year and projected to reach 115,000 tons per year by 2022. Malé's overburdened dumpsite on Thilafushi island is creating significant environmental and public health hazards with negative impacts on residents and surrounding resorts. So the Government and ADB agreed to prioritize and provide immediate actions to address the solid waste management on Thilafushi. along with construction of a new regional waste management facility including a waste to energy plant on the island of Thulusdhoo.

B. Project Description

3. The Project will establish a sustainable regional SWM system in Greater Malé by (i) improving collection, transfer, disposal, treatment (using advanced waste to energy technology), recycling, and dumpsite rehabilitation; (ii) strengthening institutional capacities for solid waste services delivery and environmental monitoring; and (iii) improving public awareness and behaviors in reduce-reuse-recycle. The Project will be designed to reduce disaster risk and improve climate change resilience while creating a cleaner environment and reducing greenhouse gas emissions.

4. The project area encompasses the inhabited islands in the North Ari Atoll (Alifu Alifu Atoll), South Atoll (Alifu Dhaalu Atoll), Malé Atoll (Kaafu Atoll) and Vaavu Atoll which are classified as Zone 3 in the national waste management system. The Greater Malé region consisting of seven islands (Thilafushi, Gulhifalhu, Villingili, Malé, Funadhoo, Hulhulé and Hulhumalé) is the most populated. The total population of the project area is 216,000 (nearly 51% of country) comprising the capital city Malé, 35 inhabited islands, 76 resorts (42 proposed), along with institutions and industry, and the country's largest international airport. Total population in the project area is expected to grow on average by 5.4% annually to reach 422,000 in 2030.

5. The Greater Malé capital region suffers from severe environmental pollution and deteriorating liveability from inadequate collection and haphazard disposal of solid waste. Open dumping and burning of garbage at the 30-year old 10-hectare dumpsite² on Thilafushi Island presents a daily nuisance to Malé's residents and tourists, with plumes of smoke visible from Malé's international airport and surrounding resorts. The region lacks an organized and sustainable waste management system for the 774 tons of mixed solid waste generated per day (tpd).³ With rapid urbanization and tourism development this amount is expected to grow to 924 tpd by 2022.⁴ Moreover, poor communities in the region's outer islands suffer from piling garbage heaps as a result of limited awareness and weak capacity for waste management. Considering Maldives reputation as a pristine high-end tourist destination and its heavy demand

¹ The Ministry of Environment divided the country into 7 zones for waste management. The project area is Zone 3 and the most populated.

² There are no leachate control systems at the dumpsite.

³ Breakdown of solid waste by type: household = 149 tpd (19%), commercial = 27 tpd (3%), resort = 48 tpd (6%), C&D = 530 tpd (68%), market = 2.5 tpd (0.3%), airport = 9.3 tpd (0.3%), hazardous = 1.5 (0.2%), end of life vehicles = 0.65 tpd (0.1%), industrial = 6 tpd (0.8%). *Source: Project Feasibility Study final report (2017).*

⁴ Waste composition: organic (53%), paper and cardboard (12%), plastic (11%), hazardous (medical) waste (8%), metal (3%), glass (3%), and others (11%). *Source: Project Feasibility Study final report (2017).*

on sustainable fisheries for food and export,⁵ the pollution caused from improper waste management poses significant threats to the economy and day-to-day living in the capital region.

6. **Greater Malé development strategy.** As part of its national strategy to achieve efficient public spending on economic and social services, the Government of Maldives targeted 70% of its total population to reside in Greater Malé.⁶ The plan seeks to create spatial agglomeration and generate economic opportunities for faster growth and poverty reduction. Tourism accounts for 30% of gross domestic product and is expected to expand, particularly in the project area.⁷ The near doubling of Malé's population will significantly increase pressure on the already stressed solid waste services.

7. The impact of the project will be a healthy living environment created in Greater Malé Region.⁸ The outcome will be climate and disaster resilient solid waste management services improved.

8. The project will have three outputs.

9. **Output 1:** Waste collection, transfer, and disposal systems improved and made climate and disaster resilient. This will include (i) waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhumalé and Villimalé delivered and efficient collection system designed in consultation with local community (equal representation from women); (ii) two transfer stations in Malé and Villimalé constructed, and one transfer station in Hulhumalé designed; (iii) one C&D processing plant; (iv) one end of life vehicle dismantling workshop; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) heavy equipment (bulldozers, excavators, roll trucks, etc.) for controlled dumpsite management at Thilafushi delivered; and (vii) construction of two administrative buildings for Waste Management Corporation Limited (WAMCO) at Malé transfer station and Thilafushi waste vessel harbor. All facilities designed will consider climate change and disaster risk.

10. **Output 2:** Community-based outer island waste management systems targeting poor and women enhanced. This will include (i) 32 community-based island waste management centers (IWMCs) developed with waste processing equipment (balers, glass crushers, wood chippers, metal presses, etc.) in consultation with community targeting the poor and women, and (ii) awareness and skills strengthened in waste collection, segregation, composting, recycling, and operation and maintenance targeting the poor and women. This component will be partially funded by a grant from a Trust Fund focusing on poverty reduction.

11. Output 2 will follow a sector approach where each island will be required to meet minimum eligibility and selection criteria to receive support under the project. The criteria is outlined in the Project Administration Manual.⁹

12. **Output 3:** Institutional capacity and public awareness in sustainable waste management strengthened. This will include (i) institutional capacity support provided to WAMCO in waste collection, controlled dumpsite management, and strategic planning including participation of relevant women employees, (ii) recycling market study (plastics, C&D) conducted, (iii) capacity building and awareness raising on disaster risk management activities for WAMCO and first responders (police, fire fighters) on Thilafushi conducted targeting women, (iv) SWM risk action plan prepared outlining response, recovery and prevention tasks with consideration of specific risks for women, and (v) project management, design, and supervision consultant support provided.

⁵ Tourism and fisheries account for a quarter of total employment in the country (2014 Census). Tourism being the most rapidly expanding industry and being the highest contributing sector to the Maldivian gross domestic product.

⁶ The government did not specify a timeframe for achieving this target but estimated over next 15-20 years.

⁷ To prepare for the increase in population, the government is embarking on major infrastructure projects including three mega transport and residential housing projects amounting to \$1.5 billion. The projects include the International Airport Expansion Project, the Malé-Hulhumalé Bridge Project, and the Hulhumalé Phase 2 development with 15,000 housing units. Other plans include redevelopment of Malé, and the development of Hulhumalé into a mixed-use modern city and special economic zone. ADB is supporting the government in preparing an integrated Greater Malé Region Development Concept Plan. ADB. 2012. *Strengthening Capacity for Operations Management*. Manila (TA 8070-MLD).

⁸ Progressive Party of the Maldives. Manifesto of the Progressive Party of Maldives, 2013–2017. Unpublished (Unofficial English Translation).

⁹ Project Administration Manual (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

C. Scope of this Report

13. This draft land acquisition and resettlement due diligence report is prepared for one of the 32 integrated waste management centres (IWMC) proposed under Output 2 of the Greater Malé Environmental Improvement and Waste Management Project in Maldives. The scope of this report is limited to the proposed civil works for construction of IWMC on the island of Thulusdhoo. This draft due diligence report (DDR) is prepared based on the preliminary information available from several documents and field visit to Thuslosdhoo island. This draft DDR will be updated during detailed design, when the exact design footprint is known, and the assessment of involuntary resettlement impacts confirmed. The updated DDR will be submitted to ADB for review and approval and the final document disclosed on IA and ADB websites. No civil works contract package will be awarded or construction started before the approval of final social safeguards document for the said package by ADB. The IA is responsible to hand over the project land/site to the contractor free of any encumbrance.

14. The Environmental Assessment and Review Framework for the Greater Malé Environmental Improvement and Waste Management Project specify the site selection criteria for selection of project sites. It must be noted that site selection criteria specify that no sites involving private land acquisition, physical displacement, livelihood loss, or temporary impacts can be selected.

II. SUBPROJECT DESCRIPTION

15. This draft due diligence report is prepared for the proposed community-based island waste management centre (IWMC) at Thulusdhoo. Due diligence reports will have to be prepared for each of the 32 proposed IWMCs under Output 2.¹⁰

16. The island of Thulusdhoo has a population of 1408 as per Census 2014, which is likely to increase to 2000 people by 2035. Thulusdhoo island currently has an arrangement of island waste management centre (IWMC), built with support from the Australian and Canadian Red Cross¹¹ which is currently disused. At present, waste is brought by islanders to an area adjacent to the IWMC and set alight. Construction and demolition waste is separated and piled nearby. In late 2017, the Island Council started promoting separation of food waste, which is placed in the sea in a cage to contain floating waste as it decomposes or is eaten by fish. There is at present a limited waste collection system, primarily for food waste. The IWMC has facilities for composting but is not used, nor is composting practiced on a community scale at any other location, although the council has intentions to commence this. Two workers employed by the council have been sent to Fenfushi to gain experience in composting. The council has identified a site for a new IWMC at the edge of a 33 Ha area of newly reclaimed land.

17. The proposed subproject has a hardware component that involves construction of IWMC along with procurement of waste processing equipment, and soft components that will involve awareness and skills building of poor women and men on issues related waste handling, recycling, and operation and maintenance. The aerial view of Thulusdhoo indicating the location of the existing open dump site and the approximate location of the proposed new IWMC is provided in **Figure 1** and layout design in **Figure 2**.

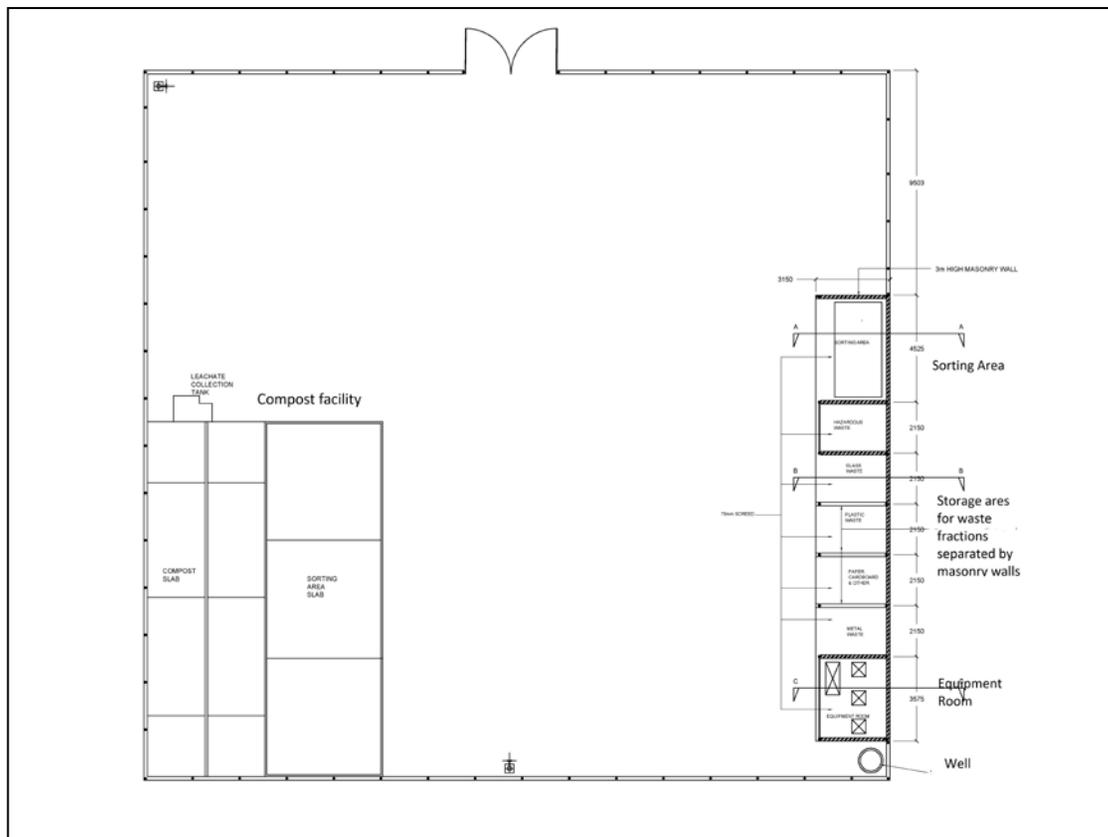
¹⁰ Each IWMC will be a fenced area of 900 to 2000 sqm, with a concrete slab and some housed facilities.

¹¹ The Australian and Canadian Red Cross Clean-up and Sustainable Waste Management Program took place following the 2004 Tsunami and included the construction of 79 IWMCs across the Maldives.

Figure 1: Aerial View of Proposed Location of New IWMC



Figure 2: Outline Layout Plan for IWMC



Source: Ministry of Environment and Energy

III. SITE VISIT AND STAKEHOLDER CONSULTATION

A. Site Visit

18. At Thulusdhoo, site visit was undertaken by the project team along with island council members to the existing dumpsite. At present the waste is taken to a location near an existing disused IWMC and it is burned. The proposed IWMC site is located at the eastern side of the island that has been recently reclaimed.

B. Stakeholder Consultation

19. Consultations were undertaken between the transaction technical assistance consultants, representatives of the Ministry of Environment and Energy and representatives of the Island Council. These consultations enabled the transaction technical assistance consultants and the Ministry of Environment and Energy to understand the existing situation

with respect to waste management at Thulusdhoo, proposals and actions of the Island Council to improve waste management and to gauge the capacity development needs.

20. Consultations with the Island Council indicated that they are not aware of what is involved in establishing (or re-establishing) and running an IWMC and were planning to continue burning waste at the new site. At present, the proposed site is bare, on newly reclaimed land that is yet to be developed with infrastructure such as roads or buildings. Vegetation cover is sparse. Vegetation on the border of the newly reclaimed area consists of shrubs, young trees and heavy vine growth. The newly reclaimed area adjoins the existing beach. The summary of discussions is given in the table below.

Table 1: Summary of Stakeholder Consultation

Date	Location	Participants	Issues Discussed
6 November 2017	Thulusdhoo island	Mr. Anees, Council Chairman and Vice Chairman, Island Council	<ul style="list-style-type: none"> • At present, waste is taken to a location near an existing disused IWMC and burned. The smoke is a nuisance, drawing complaints from the public and in particular from guesthouse operators. • Widespread littering and dumping takes place and is a concern to the public and to the council, both because of the accumulation of rubbish on the beach and release of floating waste which is perceived to affect the appeal of the island for tourism. • The island council are not aware of the role of an IWMC in improved handling and transfer of waste, or of the importance of avoiding the burning of waste. • An existing initiative is to encourage separation of food waste, and to dispose of this in a metal cage in seawater, newly installed and accessed by a jetty. • The council has held a ten day information campaign to encourage separation of waste. • Construction and demolition waste is treated separately from general household waste, and dumped nearby. It is accumulating and also of concern to the public.

21. Further consultations with island communities, particularly those living around the site will be conducted to ensure that their concerns and issues are factored into project design. The updated DDR will include details of such consultations and proposed solutions.

IV. LAND AVAILABILITY AND RESETTLEMENT IMPACTS

22. The scope of the land acquisition and involuntary resettlement is identified based on the site visit reports, consultations and imagery study (Google Earth) of the site locations. It was reported that the council has applied to the Ministry of Housing for the proposed plot of land identified for IWMC.

23. The IWMC will be constructed on a vacant and unused parcel of newly reclaimed land owned by the Ministry of Housing, Government of Maldives. No private land acquisition is therefore envisaged for the implementation of the proposed sub-project component. The total government land available is 33 hectares and the required land area for the proposed IWMC at Thulusdhoo is about 2000 square metres. The proposed site is close to the shore line. No non-titled users are reported at the site. The selected piece of land conforms to the site selection criteria specified in the Project Administration Manual (footnote 9), of no private land acquisition,

no physical displacement, and no livelihood loss or temporary impacts. Hence, the project is not anticipated to entail any involuntary resettlement or land acquisition related impacts.

24. **Table 2** provides an assessment of potential involuntary resettlement impact of the proposed IWMC at Thulusdhoo.

Table 2: Island Waste Management Center at Thulusdhoo: Summary of Involuntary Resettlement Impacts

Location	Component	Land Ownership (Govt./ Private)	Potential Involuntary Resettlement Impact
Thulusdhoo	Island Waste Management Centers	Govt. land (Housing Department)	The facility is proposed on recently reclaimed, vacant and unused government land. No involuntary resettlement or land acquisition related impact is envisaged. The exact location of the facility within the large area of reclaimed land will be known during detailed design. Adherence to the site selection criteria on no land acquisition and involuntary resettlement impacts and minimum 100 m distance from the nearest habitation/school/hospital, will be ensured.

V. SCREENING OF SUBPROJECT

25. The proposed location of IWMC Thulusdhoo was screened using ADB's Involuntary Resettlement Impacts Checklist and the site selection criteria for IWMCs. Even though the exact location and footprint of the proposed facility will be known during detailed design, the screening and due diligence reveals that the entire available newly reclaimed, vacant government site meets the following involuntary resettlement related criteria for site selection – of no private land acquisition, no physical displacement, and no permanent livelihood loss or temporary impacts. The proposed IWMC at Thulusdhoo is therefore Category C for involuntary resettlement impacts.

VI. CONCLUSIONS

A. Summary and Conclusions

26. No involuntary resettlement impacts are anticipated due to the proposed civil works for IWMC Thulusdhoo as per the due diligence review conducted, based on the feasibility study and IEE report, field visits and study of Google Earth imagery. The civil works will be undertaken on land owned by government (Housing Department). The assessed subproject components in this DDR are not anticipated to require acquisition of private land or involuntary resettlement impacts, permanent or temporary. Meaningful consultations with surrounding communities and their involvement in the project from the design stage will be key to its successful implementation.

B. Next Steps

27. This draft DDR needs to be updated during detailed design, and ADB approval obtained prior to start of construction work. The DDR needs to be updated with the following information:

- (i) Application of island council to the Ministry of Housing and their approval letter for the proposed plot of land for IWMC to be appended to this report.
- (ii) Re-assessment and confirmation of IR impacts during detailed design, to reflect the exact location, footprint and any site/design changes.
- (iii) Photographs of the exact location where IWMC is proposed, to be included in the updated DDR.
- (iv) Land records for the proposed IWMC site will be appended to the updated DDR.
- (v) Minutes of meetings and consultations with surrounding communities, with sex-disaggregated data on participants, concerns expressed by community members if any, solutions discussed, with photographs of consultations and signature sheets.

PHOTOGRAPHS



Existing dump site, disused IWMC



Existing IWMC location where the waste is burned

INVOLUNTARY RESETTLEMENT IMPACT SCREENING CHECKLIST

Probable Involuntary Resettlement Effects	Yes	No	Not Known	Remarks
Involuntary Acquisition of Land				
1. Will there be land acquisition?		√		Facility will be built on vacant and unused parcel of newly reclaimed land owned by the Ministry of Housing, Government of Maldives
2. Is the site for land acquisition known?				Not applicable
3. Is the ownership status and current usage of land to be acquired known?				Not applicable
4. Will easement be utilized within an existing Right of Way (ROW)?				Not applicable
5. Will there be loss of shelter and residential land due to land acquisition?				Not applicable
6. Will there be loss of agricultural and other productive assets due to land acquisition?				Not applicable
7. Will there be losses of crops, trees, and fixed assets due to land acquisition?				Not applicable
8. Will there be loss of businesses or enterprises due to land acquisition?				Not applicable
9. Will there be loss of income sources and means of livelihoods due to land acquisition?				Not applicable
Involuntary restrictions on land use or on access to legally designated parks and protected areas				
10. Will people lose access to natural resources, communal facilities and services?		√		

11. If land use is changed, will it have an adverse impact on social and economic activities?		√		
12. Will access to land and resources owned communally or by the state be restricted?		√		
Information on Displaced Persons:				
<p>Any estimate of the likely number of persons that will be displaced by the Project? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, approximately how many? _____</p> <p style="text-align: center;">Not applicable</p>				
<p>Are any of them poor, female-heads of households, or vulnerable to poverty risks? <input type="checkbox"/> No <input type="checkbox"/> Yes</p> <p style="text-align: center;">Not applicable</p>				
<p>Are any displaced persons from indigenous or ethnic minority groups? <input type="checkbox"/> No <input type="checkbox"/> Yes</p> <p style="text-align: center;">Not applicable</p>				

Land Acquisition and Resettlement Due Diligence Report

Document Stage: Draft
Project Number: 51077-002
March 2018

Republic of the Maldives: Greater Malé Environmental Improvement and Waste Management Project

Due Diligence for Output 1 Subprojects: Transfer stations in Malé and Villamalé; Construction and Demolition Waste Processing Plant; End of Life Vehicle Dismantling Workshop, Waste Vessel Harbor at Thilafushi and Administrative Buildings for WAMCO

This Due Diligence Report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, management, or staff, and may be preliminary in nature.

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CURRENCY EQUIVALENTS

(as of 15 March 2018)

Currency unit	=	Rufiyaa (Rf)
Rf1.00	=	\$0.065 USD
\$1.00	=	Rf15.449

ABBREVIATIONS

ADB	-	Asian Development Bank
C&D	-	construction and demolition
DDR	-	due diligence report
ELV	-	end-of-life
IWMC	-	Island Waste Management Centre
MEE	-	Ministry of Environment and Energy
O&M	-	operation and maintenance
PAM	-	program administration manual
SWM	-	solid waste management
tpd	-	tons per day
WAMCO	-	Waste Management Corporation Limited

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I. INTRODUCTION

A. Project Background

1. The Republic of Maldives has a total population of around 341,256 with 35 percent of the total population living in the capital city of Malé. The Government of Maldives is committed to improve the environmental conditions of the country and strengthen its solid waste management (SWM), and requested support from the Asian Development Bank (ADB) to implement the Greater Malé Environmental Improvement and Waste Management Project. The Project aims to improve the critical situation of Thilafushi dumpsite and strengthen SWM in Zone 3¹, which covers Greater Malé (Malé, Villingili and Hulhumalé including inhabited islands in Kaafu, AlifuAlifu, AlifuDhaalu and Vaavu atolls.

2. Zone 3 is distributed over 32 islands and is the most important region in terms of economic and social development in the Maldives. Solid waste remains the most visible environmental threat. With increasing population, developing industries and activities, waste management became a major challenge in the protection of the environment. Solid waste generation from domestic, institutional, commercial and industrial activities is 75,000 tons per year and projected to reach 115,000 tons per year by 2022. Malé's overburdened dumpsite on Thilafushi island is creating significant environmental and public health hazards with negative impacts on residents and surrounding resorts. So the Government and ADB agreed to prioritize and provide immediate actions to address the solid waste management on Thilafushi.

B. Project Description

3. The Project will establish a sustainable regional SWM system in Greater Malé by (i) improving collection, transfer, disposal, treatment (using advanced waste to energy technology), recycling, and dumpsite rehabilitation; (ii) strengthening institutional capacities for solid waste services delivery and environmental monitoring; and (iii) improving public awareness and behaviors in reduce-reuse-recycle (3R). The Project will be designed to reduce disaster risk and improve climate change resilience while creating a cleaner environment and reducing greenhouse gas emissions.

4. The project area encompasses the inhabited islands in the North Ari Atoll (Alifu Alifu Atoll), South Atoll (Alifu Dhaalu Atoll), Malé Atoll (Kaafu Atoll) and Vaavu Atoll which are classified as Zone 3 in the national waste management system. The Greater Malé region consisting of seven islands (Thilafushi, Gulhifalhu, Villingili, Malé, Funadhoo, Hulhulé and Hulhumalé) is the most populated. The total population of the project area is 216,000 (nearly 51% of country) comprising the capital city Malé, 35 inhabited islands, 76 resorts (42 proposed), along with institutions and industry, and the country's largest international airport. Total population in the project area is expected to grow on average by 5.4% annually to reach 422,000 in 2030.

5. The Greater Malé capital region suffers from severe environmental pollution and deteriorating liveability from inadequate collection and haphazard disposal of solid waste. Open dumping and burning of garbage at the 30-year old 10-hectare dumpsite² on Thilafushi Island presents a daily nuisance to Malé's residents and tourists, with plumes of smoke visible from

¹ The Ministry of Environment divided the country into 7 zones for waste management. The project area is Zone 3 and the most populated.

² There are no leachate control systems at the dumpsite.

Malé's international airport and surrounding resorts. The region lacks an organized and sustainable waste management system for the 774 tons of mixed solid waste generated per day (tpd).³ With rapid urbanization and tourism development this amount is expected to grow to 924 tpd by 2022.⁴ Moreover, poor communities in the region's outer islands suffer from piling garbage heaps as a result of limited awareness and weak capacity for waste management. Considering Maldives reputation as a pristine high-end tourist destination and its heavy demand on sustainable fisheries for food and export,⁵ the pollution caused from improper waste management poses significant threats to the economy and day-to-day living in the capital region.

6. **Greater Malé development strategy.** As part of its national strategy to achieve efficient public spending on economic and social services, the Government of Maldives targeted 70% of its total population to reside in Greater Malé.⁶ The plan seeks to create spatial agglomeration and generate economic opportunities for faster growth and poverty reduction. Tourism accounts for 30% of gross domestic product and is expected to expand, particularly in the project area.⁷ The near doubling of Malé's population will significantly increase pressure on the already stressed solid waste services.

7. **Impact and Outcome.** The impact of the project will be a healthy living environment created in Greater Malé Region.⁸ The outcome will be climate and disaster resilient solid waste management services improved.

8. **Outputs.** Phase 1 will have three outputs.

9. **Output 1:** Waste collection, transfer, and disposal systems improved and made climate and disaster resilient. This will include (i) waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhumalé and Villimalé delivered and efficient collection system designed in consultation with local community (equal representation from women); (ii) 2 transfer stations in Malé and Villamalé constructed, and 1 transfer station in Hulhumalé designed; (iii) one construction and demolition (C&D) processing plant; (iv) one end-of-life vehicle (ELV) dismantling workshop; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) heavy equipment (bulldozers, excavators, roll trucks, etc.) for controlled dumpsite management at Thilafushi delivered; and (vii) construction of two administrative buildings for Waste Management Corporation Limited (WAMCO) at Malé transfer station and Thilafushi waste vessel harbor. All facilities designed will consider climate change and disaster risk.

10. **Output 2:** Community-based outer island waste management systems targeting poor and women enhanced. This will include (i) 32 community-based island waste management

³ Breakdown of solid waste by type: household = 149 tpd (19%), commercial = 27 tpd (3%), resort = 48 tpd (6%), C&D = 530 tpd (68%), market = 2.5 tpd (0.3%), airport = 9.3 tpd (0.3%), hazardous = 1.5 (0.2%), end of life vehicles = 0.65 tpd (0.1%), industrial = 6 tpd (0.8%). *Source: Project Feasibility Study final report (2017).*

⁴ Waste composition: organic (53%), paper and cardboard (12%), plastic (11%), hazardous (medical) waste (8%), metal (3%), glass (3%), and others (11%). *Source: Project Feasibility Study final report (2017).*

⁵ Tourism and fisheries account for a quarter of total employment in the country (2014 Census). Tourism being the most rapidly expanding industry and being the highest contributing sector to the Maldivian gross domestic product.

⁶ The government did not specify a timeframe for achieving this target but estimated over next 15-20 years.

⁷ To prepare for the increase in population, the government is embarking on major infrastructure projects including three mega transport and residential housing projects amounting to \$1.5 billion. The projects include the International Airport Expansion Project, the Malé-Hulhumalé Bridge Project, and the Hulhumalé Phase 2 development with 15,000 housing units. Other plans include redevelopment of Malé, and the development of Hulhumalé into a mixed-use modern city and special economic zone. ADB is supporting the government in preparing an integrated Greater Malé Region Development Concept Plan. ADB. 2012. *Strengthening Capacity for Operations Management*. Manila (TA 8070-MLD).

⁸ Progressive Party of the Maldives. Manifesto of the Progressive Party of Maldives, 2013–2017. Unpublished (Unofficial English Translation).

centers developed with waste processing equipment (balers, glass crushers, wood chippers, metal presses, etc.) in consultation with community targeting the poor and women, and (ii) awareness and skills strengthened in waste collection, segregation, composting, recycling, and operation and maintenance targeting the poor and women. This component will be partially funded by a grant from a Trust Fund focusing on poverty reduction.

11. Output 2 will follow a sector approach where each island will be required to meet minimum eligibility and selection criteria to receive support under the project. The criteria is outlined in the Project Administration Manual.⁹

12. **Output 3:** Institutional capacity and public awareness in sustainable waste management strengthened. This will include (i) institutional capacity support provided to WAMCO in waste collection, controlled dumpsite management, and strategic planning including participation of relevant women employees, (ii) recycling market study (plastics, C&D) conducted, (iii) capacity building and awareness raising on disaster risk management activities for WAMCO and first responders (police, fire fighters) on Thilafushi conducted targeting women, (iv) SWM risk action plan prepared outlining response, recovery and prevention tasks with consideration of specific risks for women, and (v) project management, design, and supervision consultant support provided.

C. Scope of this Report

13. This draft land acquisition and resettlement due diligence report is prepared for subproject components proposed under Phase I and Output 1 for the Greater Malé Environmental Improvement and Waste Management Project in Maldives. The scope of this report is limited to phase I and output 1 components involving civil work, for which all sites have been identified/finalized. This draft due diligence report (DDR) is prepared based on the preliminary information available from several documents (Feasibility Reports, Environmental Assessment and Review Frameworks, Project Administration Manual, etc.) and field visits. This draft DDR for Output 1 components will be updated and reconfirmed for final involuntary resettlement impacts during detailed design. Separate, package-wise updated social safeguards reports will be prepared for the Output I components based on detailed design and submitted to ADB for approval. The final documents will be reviewed and disclosed on implementing agency and ADB websites. No civil works contract package should be awarded or construction started before the approval of final social safeguards document for the said package by ADB. The implementing agency is responsible to hand over the project land/site to the contractor free of encumbrance.

14. A due diligence report is prepared for the proposed island waste management centre (IWMC) at Thulusdhoo, proposed under Output 2. Sites for the remaining island waste management centres proposed under Output 2 are yet to be finalized. The Environmental Assessment and Review Framework for the Greater Malé Environmental Improvement and Waste Management Project specifies the site selection criteria for selection of project sites. It must be noted that site selection criteria specify that no sites involving private land acquisition, physical displacement, livelihood loss, or temporary impacts can be selected. Separate, package-wise due diligence reports will be prepared for the Output 2 civil works components for which sites are under identification.

⁹ Project Administration Manual (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

II. SUBPROJECT DESCRIPTION

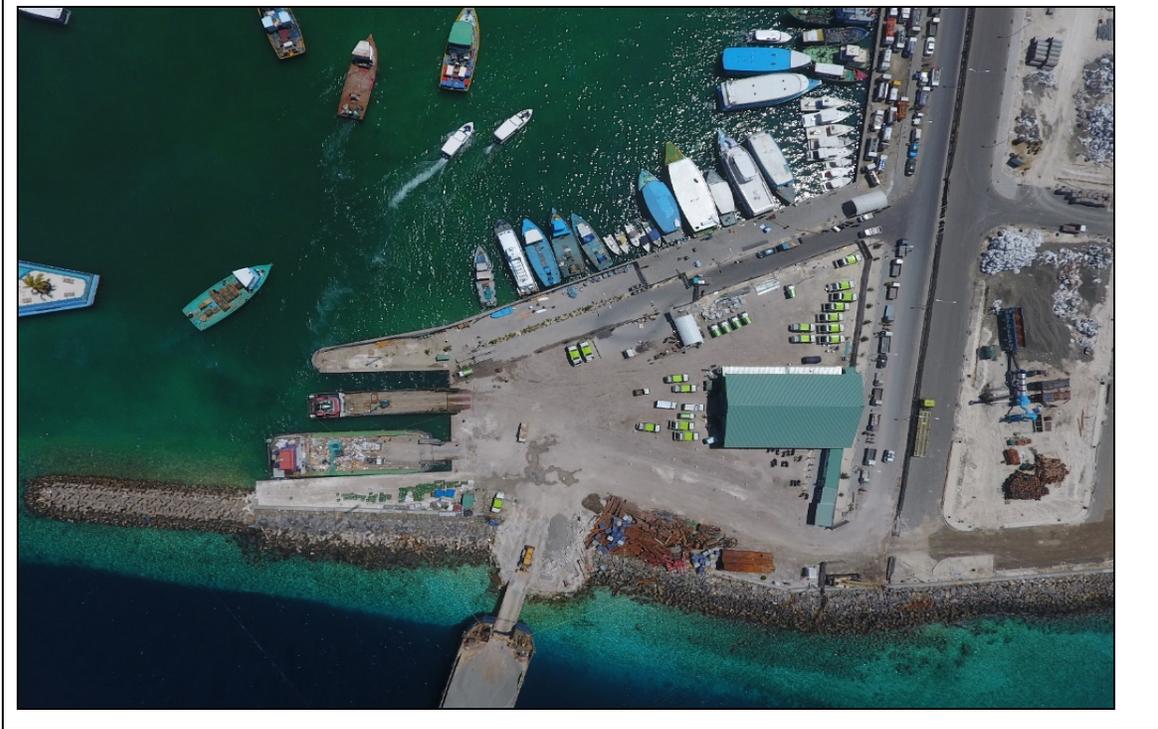
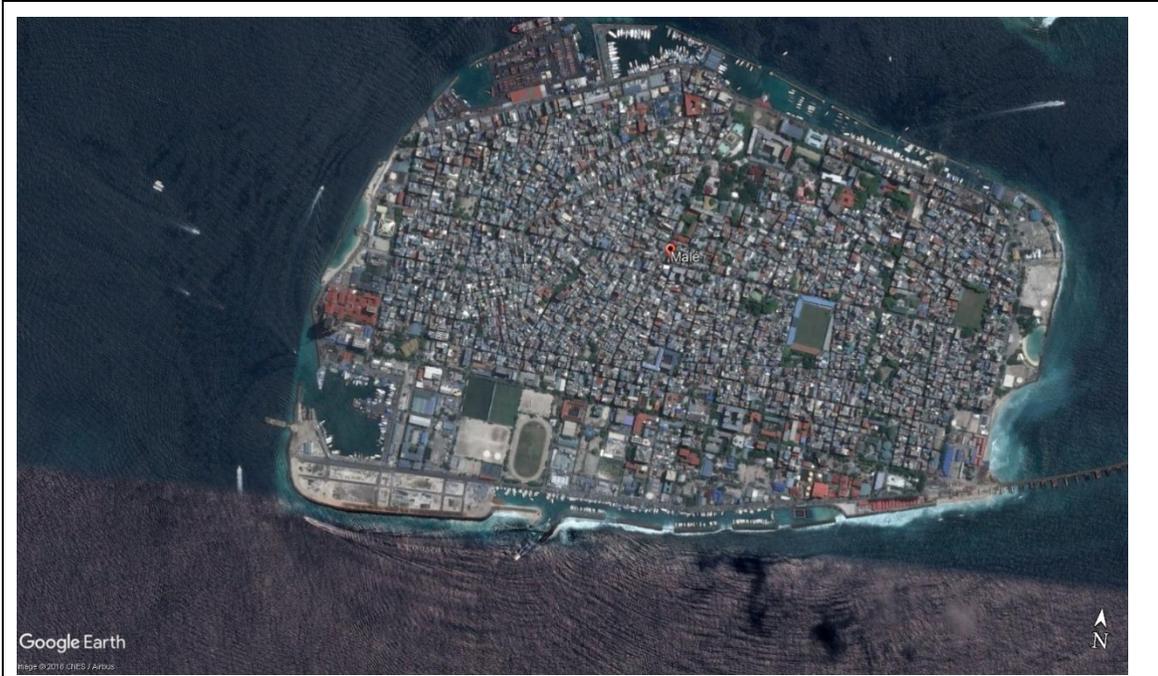
15. This draft DDR covers the following proposed subproject components under Phase I Output 1, where civil works are involved: (i) two transfer stations in Malé and Villamalé constructed; (ii) 1 C&D processing plant; (iii) one ELV dismantling workshop; (iv) waste vessel harbor at Thilafushi rehabilitated; and (v) construction of 2 administrative buildings for WAMCO at Malé transfer station and Thilafushi waste vessel harbor.

16. The remaining Output 1 components do not involve civil works and hence no land acquisition and involuntary resettlement due diligence is required: (i) design of one transfer station in Hulhulmalé; (ii) procurement of waste collection and transport equipment (trucks, bins, containers) for Malé, Hulhulmalé and Villimalé; (iii) design of efficient waste collection system in consultation with local community (equal representation from women); and (iv) procurement of heavy equipment (bulldozers, excavators, roll trucks, etc.) for controlled dumpsite management at Thilafushi.

17. Google Earth images for the proposed sites for (i) transfer station and administrative building at Malé; (ii) transfer station at Vilingili; (iii) transfer station at Hulhulmalé; and (iv) site for proposed works (C&D) processing plant, ELV dismantling workshop, harbor rehabilitation and administrative building) at Thilafushi harbor, are presented below.

Figure 1: Google Earth Image of Malé Transfer Station and Administrative Building Site

Site 1 : Malé Transfer Station Industrial Village	
Area	6.415 m ²
	Newly reclaimed area in Malé called industrial village
Actual situation	<ul style="list-style-type: none"> Temporary fence 1 big storage hall Some containers for site administration A shed for storage of materials Parking of collection vehicle and tricycle





Malé Transfer Station Site



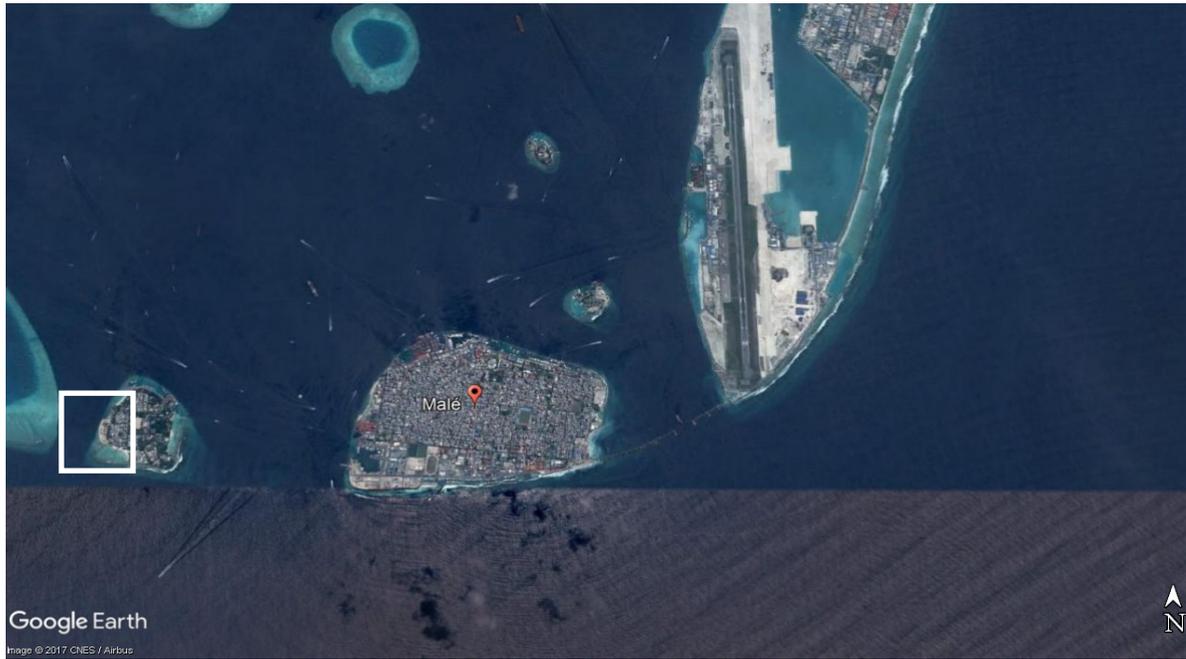
Vessel at transfer site in Malé

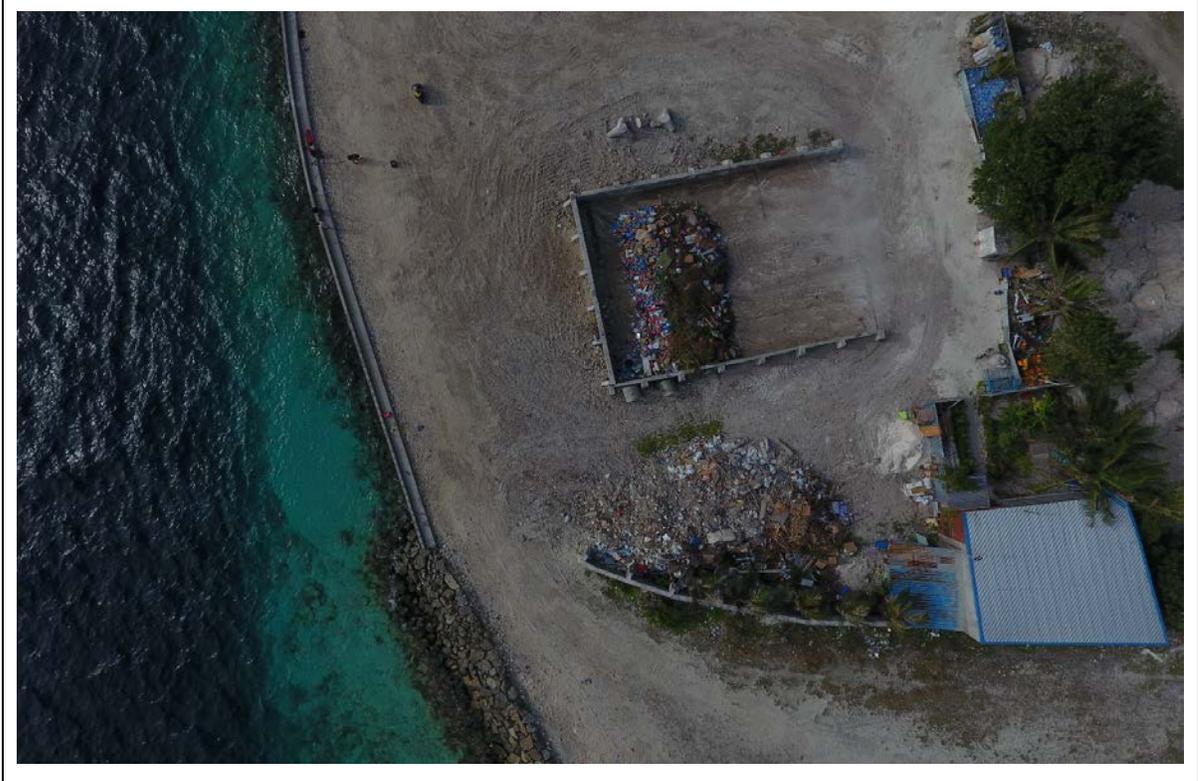


Industrial and C&D Waste Transport at Malé

Figure 2: Google Earth Image of Vilingili Transfer Station site

Site 3 : Vilingili TS	
Area	2.000 m ²
Actual situation	ISWMC







Vilingili Transfer Station site



Figure 3: Google Earth Image of Thilafushi Harbour site

Site 4 :Tilafushi/harbor	
Area	4.000 m ²
Actual situation	Under "improvement 5 small-scale incinerator Container + administration Waste acceptance area





Thilafushi Harbour



Thilafushi Dumpsite

III. STAKEHOLDER CONSULTATION

18. All major stakeholders within the government (most notably the Ministry of Finance and Treasury, the Ministry of Environment and Energy, Environment Protection Agency, Waste Management Corporation Limited, STELCO), the private sector (resorts and other businesses), development partners (World Bank, UNDP, UNICEF) and civil society (particularly civil society organizations such as Parley and Maldivian Red Crescent) were consulted, and their views and suggestions have informed the project design. Representatives of government ministries in Malé were met repeatedly to verify and validate findings and observations by the project design team. In the atolls, project plans were discussed with the local councils and Women Development Committees, and their views were taken into account.

19. Consultations have been held with several civil society organisations (CSOs) during project preparation. Learnings based on past work undertaken by some CSOs such as Maldivian Crescent and Parley have been considered during project preparation. The CSOs will continue to be engaged with as part of IEC activities to create greater outreach on SWM issues among the project beneficiaries. A consultancy package for public awareness and capacity building consultants (PACB) is proposed, and the PACB will support the PMU in continuing engagement and consultations with stakeholders. Appendix 1 provides a summary of stakeholder consultations held. Consultations held with stakeholders and communities around project sites are documented in Appendix 2.

IV. LAND AVAILABILITY AND RESETTLEMENT IMPACTS

20. The scope of the land acquisition and involuntary resettlement is identified based on the preliminary information received from several documents (Feasibility Reports, Environmental Assessment and Review Frameworks, Project Administration Manual, etc.), imagery study (Google Earth) of the site locations, certification of land ownership for Phase I Output 1 subproject components by the government, and field visits to identified sites by the project team.

21. **Transfer Stations (2 no.)** Two transfer stations are proposed under Output 1 of the project - one in Malé (which will be a major transfer station with an administrative building) and the other in Vilingili (this will be a smaller transfer station). Both are proposed on government lands already under use for solid waste management (SWM). An existing ISWM centre in Vilingili has been allotted for construction of transfer station. The proposed site in Malé is also being used to transfer waste. Both of these sites are owned by the government. It needs mentioning that for Hulhulmalé transfer station, in Phase I, only detailed design will be prepared, with implementation in Phase II. The DDR for Hulhulmalé transfer station will be prepared based on detailed design.

22. **Harbour rehabilitation, C&D Processing Plant, ELV Plant at Thilafushi.** The following facilities are proposed at Thilafushi under Phase I Output 1: (i) construction of 1 C&D processing plant, (ii) construction of 1 end of life vehicle (ELV) dismantling workshop, (iii) rehabilitation of waste vessel harbor at Thilafushi, and (iv) construction of administrative building for WAMCO at Thilafushi waste vessel harbor. Government land at Thilafushi is allotted for the construction of these facilities.

23. No private land acquisition is therefore envisaged for the implementation of the proposed Output 1 components of the project. **Table 5** provides land ownership details and potential involuntary resettlement impacts anticipated during implementation of the components under the project.

Table 5: Output 1 Component-wise Summary of IR Impacts

Location	Component	Land Ownership (Govt./ Private)	Potential IR Impact
Malé	Transfer Station Administrative building	Govt. land	The islands of Malé and Villingilli are densely populated, however project sites are situated in primarily industrial areas and on land already allocated for waste management. Malé site is situated in primarily industrial zone; Villingilli site is separated from nearest habitation by >400m including tree belt. No IR impact is anticipated.
Vilingili	Transfer Station	Govt. land	
Thilafushi	(i) construction of 1 construction and demolition processing plant (ii) construction of 1 end of life vehicle dismantling workshop (iii) rehabilitation of waste vessel harbor at Thilafushi (iv) construction of administrative building for Waste Management Corporation Limited at Thilafushi waste vessel harbor.	Govt. land	The island is situated within a large atoll (Kaafu Atoll) surrounded by adjoining lagoon waters. The island where the works are situated – Thilafushi – is exclusively used for waste management and industry. Land is government owned; no involuntary resettlement impact anticipated.

V. SCREENING OF SUBPROJECT

24. The proposed locations of Output 1 were screened using ADB's Involuntary Resettlement Impacts Checklist and the site selection criteria for the project. Screening and due diligence reveals that all locations identified are on government-owned land already used for waste management situated at primarily industrial areas; therefore, they meet the involuntary resettlement criteria for site selection - of no private land acquisition, no physical displacement, and no permanent livelihood loss or temporary impacts. Thus, Output 1 is Category C for involuntary resettlement impacts.

VI. CONCLUSIONS

A. Summary and Conclusion

25. No involuntary resettlement impacts are anticipated due to implementation of the proposed components of Phase I Output 1 components as per the due diligence review conducted, based on the feasibility study and technical reports, site visits by project team, study of Google Earth imagery and certification of land ownership by government. The civil works will be undertaken on land owned by government. The assessed subproject components of the project in this DDR are not anticipated to require acquisition of private land.

B. Next Steps

26. This draft DDR to be updated during detailed design, and ADB approval obtained prior to start of construction work. The Due Diligence Report needs to be updated with the following information:

- (i) Minutes of stakeholder meetings and community consultations conducted at and around subproject sites (with adjacent landowners/users and surrounding communities, industries etc.) under Output 1 to be prepared and appended to the DDR.
- (ii) Re-assessment and confirmation of IR impacts during detailed design, to reflect any site/design changes.
- (iii) Land records will be appended to the updated DDR, prior to start of construction work.

27. Separate due diligence reports will be prepared for Output 2 (IWMC) packages.

INVOLUNTARY RESETTLEMENT IMPACT SCREENING CHECKLIST

Probable Involuntary Resettlement Effects	Yes	No	Not Known	Remarks
Involuntary Acquisition of Land				
1. Will there be land acquisition?		√		Only government-owned land will be utilized
2. Is the site for land acquisition known?				Not applicable
3. Is the ownership status and current usage of land to be acquired known?				Not applicable
4. Will easement be utilized within an existing Right of Way (ROW)?				Not applicable
5. Will there be loss of shelter and residential land due to land acquisition?				Not applicable
6. Will there be loss of agricultural and other productive assets due to land acquisition?				Not applicable
7. Will there be losses of crops, trees, and fixed assets due to land acquisition?				Not applicable
8. Will there be loss of businesses or enterprises due to land acquisition?				Not applicable

9. Will there be loss of income sources and means of livelihoods due to land acquisition?				Not applicable
Involuntary restrictions on land use or on access to legally designated parks and protected areas				
10. Will people lose access to natural resources, communal facilities and services?		√		
11. If land use is changed, will it have an adverse impact on social and economic activities?		√		
12. Will access to land and resources owned communally or by the state be restricted?		√		
Information on Displaced Persons:				
<p>Any estimate of the likely number of persons that will be displaced by the Project? <input type="checkbox"/> No <input type="checkbox"/> Yes If yes, approximately how many? _____ Not applicable</p>				
<p>Are any of them poor, female-heads of households, or vulnerable to poverty risks? <input type="checkbox"/> No <input type="checkbox"/> Yes Not applicable</p>				
<p>Are any displaced persons from indigenous or ethnic minority groups? <input type="checkbox"/> No <input type="checkbox"/> Yes Not applicable</p>				

SUMMARY OF STAKEHOLDER CONSULTATIONS

S. No.	Date / Place	Organizations met	Number of participants	Concerns/Issues discussed
1.	10 July 2017; Malé	UNDP, International Federation of Red Cross, Maldivian Red Crescent, <i>Saafu Raajje</i> Initiative, WAMCO, MEE	Male: 5 Female: 2 Total: 7	<p>Work being undertaken by UNDP, UNICEF, MRC and other agencies on SWM, Disaster Management & Climate Resilience on the islands</p> <p>Good examples of SWM such as Ukulhas and Faresmaathoda islands</p> <p>Social outreach work being undertaken as part of these initiatives</p> <p>Role of NGOs and community-based organizations in supporting SWM initiatives but lack of capacity among them</p> <p>Two-pronged approach for SWM:</p> <p>Urban: Efficient, effective collection; safe transportation; 3R communication; segregation into construction & demolition waste, plastic bottles, rest.</p> <p>Rural: community-based; composting; recycling; transfer left-overs to regional waste management center; focus on gender concerns.</p>
2.	10 July 2017; Malé	World Bank SWM Project Team, MEE	Male: 2 Total: 2	<p>Role of community consultations in the design of island waste management facilities</p> <p>Role played by women in managing solid waste on the islands</p>
3.	05 November 2017; Fenfushi Island	Island Council, Women Development Council	Male: 6 Female: 2 Total: 8	<p>Public consultation campaign carried out to encourage waste segregation at source</p> <p>Key role of women in managing solid waste</p> <p>Potential key role to be played by Women Development Council in training women</p> <p>Impact of waste on local health and environment; groundwater contaminated leading to higher use of bottled water, thus increasing solid waste quantity</p> <p>How to make the SWM operations on the island financially and environmentally sustainable; how to market compost being produced</p>
4.	06 November	Island Council,	Male: 2	Food waste dumped into the sea in a cage enabling fish & other creatures to

S. No.	Date / Place	Organizations met	Number of participants	Concerns/Issues discussed
	2017; Thulushdoo Island	Women Development Council	Female: 1 Total: 4	eat the same All waste, except C&D waste, is burned Potential key role to be played by Women Development Council in training women Impact of waste on local health and environment How to make the SWM operations on the island financially and environmentally sustainable Land issues around new Island Waste Management Centre Use of large recyclable plastic containers by households for drinking water that are refilled at the local Coca-Cola factory
5.	06 November 2017; Sun Island Resort	Resort Management	Male: 4 Total: 4	Staff of more than 30 responsible for waste management Plastic bottles transported to Male' and handed over to Parley NGO for recycling Compost production higher than the demand Plans to set up a desalination and water bottling plant
6.	07 November 2017: Kurumba Resort	Resort Management, Sanitation workers	Male: 4 Total: 4	Good composting facility Incinerator used sparingly as resulting smoke causes inconvenience to guests Most waste shipped to Thilafushi island
7.	08 November 2017: Centara Ras Fushi Resort	Resort Management	Male: 3 Female: 1 Total: 4	Complained of the steady nuisance from Thilafushi due to smoke, smell and flies Concern about the utility of Green Tax as situation at Thilafushi has not improved Operates desalination and further demineralisation plant to produce high quality drinking water which is served in recyclable glass bottles

S. No.	Date / Place	Organizations met	Number of participants	Concerns/Issues discussed
				All waste shipped to Thilafushi
8.	12 November 2017: Malé	Chairwoman, PARLEY (NGO)	Female: 1 Total: 1	<p>Need to recycle plastic bottles as quantity of such waste is growing at an alarming rate</p> <p>Need to introduce good practices such as use of recyclable glass bottles or plastic containers for drinking water</p> <p>Parley is unable to meet its target of recycling plastic bottles as little waste segregation in Greater Malé region</p> <p>Parley working with a couple of resorts to have them help the nearby islands manage and transport solid waste</p>

MINUTES OF MEETINGS AND CONSULTATIONS WITH STAKEHOLDERS AND COMMUNITIES AROUND PROJECT SITES

Malé Waste Transfer Facility
Water Solutions Pvt Ltd
February 2018

Introduction

Stakeholder consultations had been carried regarding the proposed waste transfer station in Malé. The stakeholders who have a role in the planning, designing, construction and operation of the waste transfer station in Malé had been consulted through meetings and surveys that been carried out by the consultant team.

Outcomes from consultations with Ministry of Environment and Energy (MEE)

The Ministry of Environment and Energy had been consulted regarding this project on various occasion since January 2016.

- (i) A proper waste management and transfer facility is urgently needed for the City of Malé to remove the waste collected from Malé to transport to Thilafushi. The Ministry is working hard to initiate the project to develop a waste transfer station in Malé.
- (ii) Ministry of Housing and Infrastructure allocated the site for the proposed waste transfer facility from the newly developed Industrial Village of Malé. MEE noted that the allocated site from Industrial Village for the waste transfer facility is not adequate. However the Minister noted that the land in Malé is a premium commodity and hence need to best use the available land. The Minister requested to “think out of the box” and design the waste transfer facility vertically to address the land shortage issue. A terrace floor has been included in the waste transfer building to allow the parking of the small waste collection trucks. Parking of the waste collection trucks and vehicles has been considered in the design of the facility as there is no available land parking of the WAMCO’s vehicles
- (iii) MEE requested the waste transfer area need to be protected from rain and the facility need to be protected waves as the site is located on the periphery of the building.
- (iv) The MEE requested to have the administrative building multistory to allow office space for MEE, EPA and WAMCO.
- (v) The Ministry informed that the western strip of the land that has been allocated for the waste transfer facility is presently used by the contractor constructing the bridge between Malé and Hulhulhe. The Ministry is unsure when the bridge contractors using the Western edge of the site will stop their operations and hand back that strip of land back to MEE
- (vi) MEE noted that the existing site for waste management is very small area and would be challenging during the construction phase of the waste transfer facility as the site need to be used for the transferring of waste even during the construction phase of the project.
- (vii) MEE is concerned regarding the issue of higher traffic on the main road when the Malé-Villigili bridge is completed, and how this may impact the ease of access to the facility for waste collection trucks and individuals wishing to dispose of their waste
- (viii) MEE wanted to maximum use the allocated land for the waste transfer facility in Malé and also use the allocated area for the parking of the waste collection vehicles.

- (ix) MEE noted that waste collection tricycles will not be part of the waste collection fleet of Malé. The tricycles had been moved to Villingili and it will be used for the waste collection in Villingili.
- (x) MEE noted that the landing crafts will not be able to operate on a limited number of days of a year when the wind is on north westerly direction. During this period, the landing crafts need to be placed on eastern quay wall of the area. A crane need to be

Outcomes from the consultations with Ministry of Housing and Infrastructure

Ministry of Housing and Infrastructure was consulted on 19th April 2017 at their Ministry.

- (i) The site to develop waste transfer facility has been allocated from the newly developed Industrial Village on south western side of Male'.
- (ii) The Ministry informed that the western strip of the land that has been allocated for the waste transfer facility is currently used by the contractor constructing the bridge between Malé and Hulhulhe. This site would be used by the contractor till the end of the construction of the bridge.
- (iii) The Ministry noted that the multistory building at the site need to be design in accordance with the building regulation issued by the Ministry. They noted that no windows would be located on a side that can have a clear view of the Ministry of Defense building.
- (iv) The Ministry noted that the government have plans to build a bridge to west connecting Male' to Villingili. In the future, the allocated land for the waste transfer facility would high traffic, when the bridge is completed. However they noted, currently there is no project to start a bridge between Male' and Villingili.

Outcomes from the consultations with Health Protection Agency HPA

Health Protection Agency (HPA) was consulted on 19th April 2017 at their agency.

- (v) HPA highlighted the importance of using proper personal protective items for all laborers working during the construction and operation phases of the facility, and the responsibility that the proponent, contractor and operators need to take to ensure that all workers are provided with the proper safety equipment.
- (vi) During the construction period, it will be vital to prevent mosquito breeding on site. For this to be done, all materials that may collect water and allow it to stagnate should be cleared of water regularly or removed.
- (vii) HPA representatives highlighted the importance of the safety of people who use the main road in the industrial village during the construction period. If the construction can produce and hazardous particles or cause any health hazard, the area will need to be closed off to prevent any injury to people.
- (viii) There is a need for a storage or transfer mechanism for hospital waste in the facility.

Consultation with Environmental Protection Agency (EPA)

Environmental Protection Agency had been consulted on various occasion regarding this project. They were consulted on 19th April 2017 at their office.

- (xi) EPA noted that the waste management site need to be have a boundary wall to ensure security and unauthorized access to the area. EPA noted the site need to be completely fenced as this is a requirement of the Waste Management Regulations

- (xii) EPA highlighted that proposed project is the development of a waste transfer facility at Male' Industrial Site. Since odour is an important element in waste transfer facility, EPA noted that the proposed administrative building as part of the waste transfer facility development might be impacted due to the odour during the handling of waste at the waste transfer area. EPA cautioned that regarding the issue of the smell of waste and how it could affect the administrative building on site
- (xiii) EPA noted that the waste transfer facility and its operation need to have an contingency for the event of an system failure or overflow of waste to the site.
- (xiv) EPA highlighted that the importance of developing the Waste Transfer Facility in Male' giving consideration to the Thilafushi Regional Waste Management Facility that would be established in Thilfaushi to carter the waste management issue for the Greater Male' area

Outcomes from the consultations with WAMCO

WAMCO had been consulted on various occasion regarding this project. They were consulted on 19th April 2017, 29th September 2017, 4th October 2017, and 4th February 2018 at their office and MEE.

- (i) WAMCO noted that they have a large fleet of waste collection trucks and these vehicles need to be parked at the waste transfer facility. The facility should be have basic servicing facility as to wash the vehicles after it returns from waste collection rounds
- (ii) WAMCO noted Construction & Demolition waste is a large waste stream that they had to handle at the waste management site. Currently this is loaded onto landing craft directly from vehicles. WAMCO noted not all construction and demolition waste can be dump into a container. Compaction would be need to increase the efficiency of the waste transferred at the facility.
- (iii) It will be important for the containers to be able to be stacked on site supposing that there are problems with the landing crafts, or if bad weather doesn't permit transport to Thilafushi.
- (iv) WAMCO highlighted the importance of finding a solution to the traffic issue that may come from the Male'-Villigili bridge development in the future.
- (v) The waste transfer area need to be covered to reduce the interruption of the operation at the site during rain and high wind. The area is located on the south western side and the area would have high wind during south west monsoon.

Outcomes from consultations with the Maldives Ports Limited

The operations office of the Maldives Ports Limited at the Malé South West Harbour was consulted on 13th February 2018.

- (vi) Maldives Ports Limited operates the Male' South West Harbour. The harbour handles the cargo which arrives to Male' from the atolls and Greater Male' region. The harbour receives large amount of cargo and construction materials from warehouses and business at Thilafushi.
- (vii) Development and operation of the waste transfer facility at the proposed site will not have impact on the operation of the Male' South West Harbour.
- (viii) Male' South West Harbour could be an alternative option to load certain waste streams onto landing craft during the construction of the waste transfer facility.

Outcomes from consultations with the Ministry of Defense and National Security

Ministry of Defense and National Security was consulted as part of the project. The Ministry of Defense and National Security provided their views on 8th November 2018 regarding the proposed project.

- (ix) The Ministry of Defense and National Security has expressed their views on the development and has no issues of developing a waste transfer station at the Industrial Village except that administration building proposed at the site. The Ministry has requested that the windows and doors facing the Kalhuthukalaa Koshi, which is a Maldives National Defense Force (MNDF)'s facility, from 7th floor to have forested glass as to a security measure
- (x) The Ministry of Defense and National Security also requested to have a 6 feet terrace wall on the eastern side of the building terrace.

Outcomes from consultations with the Parley Maldives

Parley Maldives is the local chapter of an International NGO, Parley addressing global waste issues. They are mostly engaged in recycling pet bottles and managing them. As such, the local representatives were met on 18th July 2017 to discuss about this project and the following are the summary outcomes.

- (i) Currently Parley collects PET bottles with the help of WAMCO door to door waste collection carried out in Male'. Parley is working with the schools in Male' to collect recyclable materials generated from the school and the homes of students and teachers.
- (ii) Parley has been actively involved in reducing and recycling the plastic bottles in Thilafushi. In 16 months, they have exported 34 containers, 40 feet each.
- (iii) Each container costs US\$ 5000 for logistics and export charges.
- (iv) Establishment of the waste transfer facility would help to improve the collection of the recyclable materials. Parley insist the waste need to segregated and collected.

Outcomes from the survey of the public living in the vicinity of the proposed project site.

Field visits were made on 13th February 2018 to consult the local public who were in the proximity of the Waste Transfer Station. The public consultations were conducted through individual interviews after giving an introduction of the project; the following is a brief of the introduction to the project. Although the TS is not located in the residential area, the houses, business and commercial establishments near the proposed were in the area. The local stakeholders include the regular users of the South West Commercial Harbour located near the industrial village, the Male' South West Harbor (MSWH), Maldives Transport and Contracting Company (MTCC) who runs the Villingili Ferry terminal.

The interviewees were briefed on the regional waste management project of zone 3 and the necessity of a transfer station in each island. As part of the consultation, public was informed of the impacts and difficulties that may occur from the TS during the construction and operational stage and the consultants are therefore seeking community's views and concerns on various aspects of the project concept designs shared with them. Several concerns were raised with regard to various aspects of the TS location, design, and operation. The participants of the

consultations included 75% male of the 12 persons interviewed. They were of different age groups, from student to the elderly.

Findings of stakeholder consultations

There was a general consensus among all survey participants that the location of the waste transfer facility in Male', is located far away from the residential area. The location would not have any direct impact on the community, and business due to smell, dust or noise were to reach this area. Male' South West Harbor is located closer to the waste transfer area and stakeholders who work in the commercial harbour area noted that odour from the waste transfer area could be an issue during the days when the wind is blowing over the waste transfer site.

Some participants noted that currently Industrial Village has the operation of the waste site. When fuel sheds, warehouse and industries are moved to the Industrial Village, traffic would become an issue.

All 3 fuel sheds proposed to be moved to the industrial site in 6 months from December 2017. Traffic, construction noise, smell and dust may cause difficulty when the shed are relocated. Current too far away to experience difficulty from TS.

Establishment and operation of the waste management site at the new locations by WAMCO had improved the waste handling operations. Most of the participants noted that WAMCO frequently takeaway the collected waste which are accumulated on the landing craft to Thilafushi. Some participants noted that they should be allowed to take their waste and throw it to the collection bin when new facility is developed. Most of the participants noted, WAMCO's operation had created a lot of good job opportunities and large number of women are being employed in the waste collection operations.

In general the stakeholders, including public are happy about the current location of the waste transfer site. Especially the people from the community consulted shared their views on moving two waste dumpsites inside Male' to the current single location at the Industrial Village was a wise and good decision by the Government. As the previous two sites sitting inside Male' had been a public nuisance because of set of fire at both sites from time to time especially for school kids as they were located at close proximity to the schools. In fact, the current location has been decided due to the continuous complain from the public on the said two sites.

However participants noted, although, the current location is far away from the community that no burning of waste should be done in Male' and if it is allowed it would create a lot of issues and risk of fire would become a high.

List of stakeholders consulted

No.	Name	Gender	Age group	Address/ Designation
1	Shiyama Ibrahim	F	Elderly	M. Fesco
2	Ahmed Nazooh Nazim	M	Youth	FSM Easyfill, Sales and Marketing
3	Mariyam Nazha	F	Middle age	V. Kokamanzil, Regular travel from Villingili ferry terminal
4	Ibrahim Ashraf	M	Middle aged	MNDF
5	Naajee	M	Youth	Banyan Tree Crew, T Jetty user
6	Shirumeena	F	Middle aged	Mamma Gaadiya
7	Abdullah Shimau	M	Elderly	MTCC, Manager
8	Hishaam Hoodh	M	Youth	Villa college (Student)
9	Ibrahim Rasheed	M	Elderly	Teacher
10	Nafiz	M	Youth	Ali Mathaa Boat Captain, T Jetty User
11	Mohamed Thuthu Didi	M	Elderly	Villa Boat Captain, T jetty user
12	Zadhy Ibrahim	M	Elderly	Male' South West Harbor, Assistant Manager
13	Hussain Ibrahim	M		Assistant Environment Officer, EPA
14	Aminath Mohamed	F		Assistant Project Officer, EPA
15	Ali Mishal	M		Engineer, EPA
16	Aminath Shaufa	F		Director, Public Health, HPA
17	Moosa Haneef	M		Senior Public Health Programem Officer, HPA
18	Ahmed Shafiu	M		Facilities Manager, WAMCO
19	Ismail Ubaidh	M		Facilities Manager, Male', WAMCO
20	Nafha Aujaz	F		Environment Analyst, MHI
21	Anoosha Hashim	F		Assistant Project Officer, MHI
22	Thoriq Ibrahim	M		Minister of Environment and Energy, MEE
23	Ali Amir	M		Deputy Minister, MEE
24	Ahmed Murthaza	M		Director General, MEE
25	Easa Hamdhan Rasheed	M		FO, MEE
26	Mohamed Hamdhan	M		Assistant Project Coordinator, MEE
27	Zadhy Ibrahim	M	Elderly	Male' South West Harbor, Assistant Manager
28	Mohamed Zuhair	M		Minister of State, Ministry of Defense and National Security
29	Ms. Shahina Ali	F		Executive Director, Parley Maldives

Stakeholder Consultations at Villingili Waste Transfer Facility

Water Solutions Pvt Ltd

February 2018

Stakeholder consultations had been carried regarding the proposed waste transfer station in Villingili. The stakeholders who have a role in the planning, designing, construction and operation of the waste transfer station in Villingili' had been consulted through meetings and surveys that been carried out by the consultant team.

Outcomes from consultations with Ministry of Environment and Energy (MEE)

The Ministry of Environment and Energy had been consulted regarding this project on various occasion since October 2017. Initial concepts for the Villingili waste transfer station was shared and discussed with the Ministry on 6th February 2018 at the Ministry of Environment and Energy.

- The Ministry noted that the tricycles which was part of Male' waste collection had been shifted to Villingili and waste collection at Villingili will be carried out using the tricycles and small waste compacting trucks.
- The waste transfer facility developed at Villingili should be able to accommodate the waste collectors working for the waste collection operation at the island.
- MEE wanted to maximum use the allocated land for the waste transfer facility in Villingili. The waste transfer center should have parking space to park the tricycles and waste collection vehicles.
- The waste transfer center should have to two gates. One gates should have an access to the quay area
- The waste management center should have a storm water management system to prevent the area getting flooded during heavy rain
- The area should be protected from swell and high wave action related flooding.

Outcomes from the consultations with WAMCO

WAMCO had been consulted on various occasion regarding waste management project for the greater Male' area. Villingili waste management center is part of the waste management system that is being developed for the greater Male' region

- Waste is collected from the households, business and commercial establishment in Villingili
- Waste collected from the households are
- The waste collection area need to be covered from rain
- A proper waste management and transfer facility is urgently needed for the City of Malé to remove the waste collected from Male' to transport to Thilafushi. The Ministry is working hard to initiate the project to develop a waste transfer station in Malé.

Meeting with Public

Field visits were made on 13th February 2018 to consult the local public who are in the proximity of the Waste Transfer Station (TS). Although the transfer station is secluded, it is in close proximity to the residential area. The transfer station area has a perimeter wall and trees that would act as a buffer.

The public consultations were conducted through individual interviews after giving an introduction of the project. The interviewees were briefed on the regional waste management project for zone 3 and the necessity of a transfer station in each island. As part of the consultation, public was informed of the impacts and difficulties that may occur from the TS during the construction and operational stage and the consultants are therefore seeking community's views and concerns on various aspects of the project concept designs shared with them. Several concerns were raised with regard to various aspects of the TS location, design, and operation. The participants of the consultations included 75% of women of the total consulted of different age groups that were interviewed.

Findings of stakeholder consultations

There was a general consensus among all participants that there is bad smell to houses that are two to three blocks away from the waste management site and it is especially pungent on days that waste is transferred to Thilafushi. Some participants noted that they had observed that the smell that used to get from the waste site has improved. They believe the improvement is due to the frequent removal of waste that is accumulated at the waste site to Thilafushi after WAMCO started their operation at the island.

Participants noted that improving the condition of the waste transfer area at Villingili is needed. The proposed project would help improve the management of waste at the island. Some participant noted that during the construction of the waste transfer area on the island would have a noise and dust issue for the residents living close to the area.

Despite the difficulties that may arise due to the waste transfer facilities, most of them believe that an upgrade to the waste transfer facilities is required in Villingili; especially proper operation and management which would limit the smell. In general the stakeholders, including public are happy about the current location of the waste transfer site.

List of stakeholders consulted

No	Name	Gender	Age group	Address/ Designation
1	Ali Amir	M		Deputy Minister, MEE
2	Ahmed Murthaza	M		Director General, MEE
3	Easa Hamdhan Rasheed	M		FO, MEE
4	Mohamed Hamdhan	M		Assistant Project Coordinator, MEE
5	Hawwa Ali	F	Elderly	V.Hulheli
6	Rasheedh	M	Elderly	V.Xiphius
7	Azeema	F	Youth	V.Symophylia
8	Aiminath	F	Middle Aged	V.Hanhaara
9	Waheedha	F	Elderly	
10	Raneen	F	Youth	Diver's Lodge Maldives
11	Nasha	F	Youth	V. Basmala
12	Aisha	F	Middle Aged	
13	Ismail	M	Elderly	V.Elam, from a construction site
14	Ameena Ahmed	F	Elderly	V. Lhasandhu
15	Sofiyya Moosa	F		V.Furathama Hiya
16	Firaashaa	F		V.Furaveli
17	Neesha	F		V. Naaraa Iru, Shop keeper
18	Ibrahim Mueen	M		V. Beach Coral, Fisherman
19	Shimla	F		V.Vilishi
20	Ali siraj	M	Youth	V. Happy sle
21	Thoriq Ibrahim	M		Minister of Environment and Energy, MEE
22	Ali Amir	M		Deputy Minister, MEE
23	Ahmed Murthaza	M		Director General, MEE
24	Easa Hamdhan Rasheed	M		FO, MEE
25	Mohamed Hamdhan	M		Assistant Project Coordinator, MEE
26	Ahmed Shafiu	M		Facilities Manager, WAMCO
27	Ismail Ubaidh	M		Facilities Manager, Male', WAMCO
28	Ms. Shahina Ali	F		Executive Director, Parley Maldives



Ministry of Environment and Energy
Male, Republic of Maldives.

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S. NO.	PROPOSED FACILITY	LOCATION OF SITE	PLOT NO. (AS PER OFFICIAL LAND RECORDS)	AREA (SPECIFY UNIT)	PRESENT OWNERSHIP	YEAR OF ACQUISITION / POSSESSION / TRANSFER	ALL COMPENSATION PAID (YES/NO, NOT APPLICABLE)	STATUS OF LAND RECORDS (AVAILABLE / NOT AVAILABLE)	REMARKS
1.	Male transfer station and admin building	K.Male', Kaafu Atoll, Maldives	MNV Plot No.13	5791 sqm	Government	2016	NOT APPLICABLE	NOT APPLICABLE	
2.	Villamale transfer station	K.Villingili, Kaafu Atoll, Maldives	Block No. 55	2705.5 sqm	Government	Not known*	NOT APPLICABLE	NOT APPLICABLE	*The TS is the same location as the old dump site which has been used for this purpose from a very long time.
3.	Hulhumale transfer station	Hulhumale' Kaafu Atoll, Maldives	To be confirmed	To be confirmed	Government	To be confirmed	NOT APPLICABLE	NOT APPLICABLE	"Hulhumale' Land to be finalized
4.	Harbor, admin building	K.Thiartushi, Kaafu Atoll, Maldives					NOT APPLICABLE	NOT APPLICABLE	
5.	C&D plant, ELV plant, recycling yard	K.Thiartushi, Kaafu Atoll, Maldives	Plot: SG-14 Plot: S7-01 Plot: S7-02	25 hectare (10ha existing + 15ha new)	Government	2017	NOT APPLICABLE	NOT APPLICABLE	
6.	Thiartushi dumpsite	K.Thiartushi, Kaafu Atoll, Maldives					NOT APPLICABLE	NOT APPLICABLE	
7.	Thiartushi RWMF	K.Thiartushi, Kaafu Atoll, Maldives					NOT APPLICABLE	NOT APPLICABLE	
8.	32 IWMCs	4 Atolls (Kaafu, Aifu Aifu, Aifu Dhaalu, Vaavu)	4 Atolls (Kaafu, Aifu Aifu, Aifu Dhaalu, Vaavu)		Government	Not Applicable	NOT APPLICABLE	NOT APPLICABLE	*The locations in each island will be finalized in consultation with the EPA/Island Councils and Ministry of Housing
9.									

