



Report and Recommendation of the President to the Board of Directors

Project Number: 51077-002
June 2018

Proposed Grant and Technical Assistance Grant and Administration of Grant Republic of Maldives: Greater Malé Environmental Improvement and Waste Management Project

This document is being disclosed to the public prior to its consideration by ADB's Board of Directors in accordance with ADB's Public Communications Policy 2011.

CURRENCY EQUIVALENTS

(as of 1 May 2018)

Currency unit	–	rufiyaa (Rf)
Rf1.00	=	\$0.0644
\$1.00	=	Rf15.5332

ABBREVIATIONS

3R	–	reduce, reuse, and recycle
ADB	–	Asian Development Bank
CDW	–	construction and demolition waste
DRM	–	disaster risk management
ELV	–	end-of-life vehicle
IWMC	–	island waste management center
JFPR	–	Japan Fund for Poverty Reduction
MEE	–	Ministry of Environment and Energy
MOFT	–	Ministry of Finance and Treasury
O&M	–	operation and maintenance
PAM	–	project administration manual
PMU	–	project management unit
SWM	–	solid waste management
TA	–	technical assistance
tpd	–	ton per day
WAMCO	–	Waste Management Corporation Limited

NOTE

In this report, “\$” refers to United States dollars.

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PROJECT AT A GLANCE

1. Basic Data		Project Number: 51077-002	
Project Name	Greater Male Environmental Improvement and Waste Management Project	Department /Division	SARD/SAUW
Country Borrower	Maldives Republic of Maldives	Executing Agency	Ministry of Finance and Treasury
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Water and other urban infrastructure and services	Urban policy, institutional and capacity development		1.97
	Urban solid waste management		31.10
		Total	33.07
3. Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Climate Change impact on the Project	Medium
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns Urban environmental improvement	ADB Financing Adaptation (\$ million)	1.72
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Institutional development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions (KNS)	Organizational development Application and use of new knowledge solutions in key operational areas		
Partnerships (PAR)	International finance institutions (IFI) Official cofinancing		
5. Poverty and SDG Targeting		Location Impact	
Geographic Targeting	No	Urban	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG11, SDG13		
6. Risk Categorization:	Low		
7. Safeguard Categorization	Environment: B Involuntary Resettlement: C Indigenous Peoples: C		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		33.07	
Sovereign Project grant: Asian Development Fund		33.07	
Cofinancing		2.00	
Japan Fund for Poverty Reduction - Project grant (Full ADB Administration)		2.00	
Counterpart		4.93	
Government		4.93	
Total		40.00	
Note: An attached technical assistance will be financed on a grant basis by the Technical Assistance Special Fund (TASF-6) in the amount of \$500,000.			

MALDIVES GREATER MALÉ ENVIRONMENTAL IMPROVEMENT AND WASTE MANAGEMENT PROJECT

72°00'E

74°00'E

6°00'N

6°00'N



0 50 100

Kilometers



National Capital

----- Atoll Administrative Boundary

Boundaries are not necessarily authoritative.

This map was produced by the cartography unit of the Asian Development Bank. The boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of the Asian Development Bank, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries, colors, denominations, or information.

ZONE 1

THILADHUNMATHEE DHEKUNUBURI
(Haa Dhaalu Atoll)

THILADHUNMATHEE UTHURUBURI
(Haa Alifu Atoll)

MILADHUNMADULU UTHURUBURI
(Shaviyani Atoll)

MAALHOSMADULU UTHURUBURI
(Raa Atoll)

MILADHUNMADULU DHEKUNUBURI
(Noonu Atoll)

ZONE 2

MAALHOSMADULU DHEKUNUBURI
(Baa Atoll)

FAADHIPOLHU
(Lhaviyani Atoll)

**ZONE 3
(project area)**

ARIATHOLHU UTHURUBURI
(Alifu Alifu Atoll)

Outer Islands

Vaadho Channel

MALE'ATHOLHU
(Kaafu Atoll)

GREATER MALÉ

ARIATHOLHU DHEKUNUBURI
(Alifu Dhaalu Atoll)

Outer Islands

Outer Islands

Fulidu Channel

FELIDHEATHOLHU
(Vaavu Atoll)

Outer Islands

Ariadhoo Channel

NILANDHEATHOLHU UTHURUBURI
(Faafu Atoll)

Vattaru Channel

ZONE 4

NILANDHEATHOLHU DHEKUNUBURI
(Dhaalu Atoll)

MULAKATHOLHU
(Meemu Atoll)

Kudahuvadho Channel

ZONE 5

KOLHUMADULU
(Thaa Atoll)

HADHDHUNMATHI
(Laamu Atoll)

Veymandoo Channel

One and Half Degree Channel

ZONE 6

HUVADHUATHOLHU UTHURUBURI
(Gaafu Alifu Atoll)

HUVADHUATHOLHU DHEKUNUBURI
(Gaafu Dhaalu Atoll)

0°00'N

Equatorial Channel

0°00'N

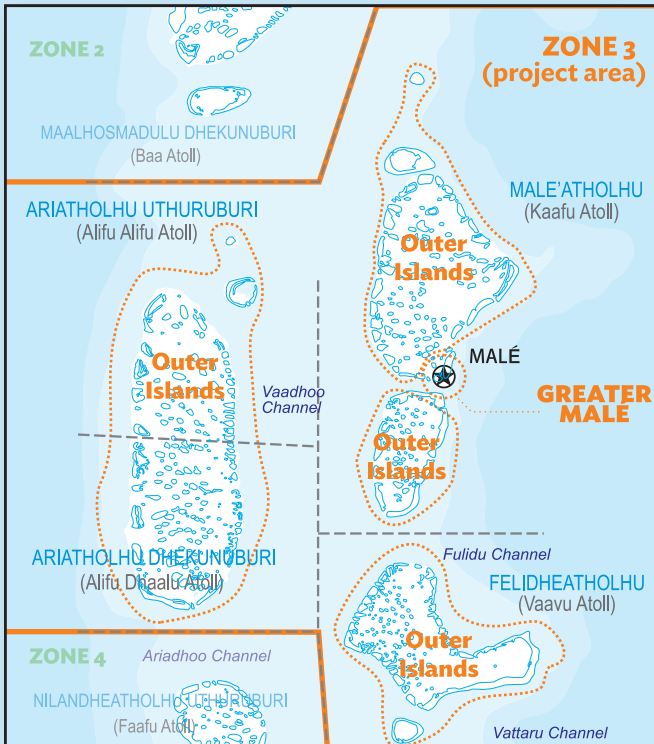
ZONE 7

ADDUATHOLHU
(Seenu Atoll)

FUVAHMULAH
(Gnaviyani Atoll)

72°00'E

74°00'E



I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed grant to the Republic of Maldives for the Greater Malé Environmental Improvement and Waste Management Project.¹ The report also describes (i) a proposed technical assistance (TA) for Strengthening Capacity for Sustainable Solid Waste Management in the Greater Malé Region and (ii) the proposed administration of a grant to be provided by the Japan Fund for Poverty Reduction (JFPR), and if the Board approves the proposed grant, I, acting under the authority delegated to me by the Board, approve the TA and the administration of the JFPR grant.

2. 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 on reduce, reuse, and recycle (3R) behaviors. Physical and nonphysical 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.²

II. THE PROJECT

A. Rationale

3. The Greater Malé capital region and its outer islands suffer from severe environmental pollution and deteriorating livability because of the inadequate collection and haphazard disposal of solid waste. The project area encompasses the 35 inhabited islands of the Alifu Alifu Atolli, Alifu Dhaalu Atoll, Kaafu Atoll, and Vaavu Atoll, including the capital city of Malé, with a total population of 216,000 (51% of Maldives). Open dumping and burning of garbage at the 30-year-old, 10-hectare dumpsite on Thilafushi Island (6 kilometers from Malé) creates an environmental and public health hazard. Plumes of smoke visible from 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 inhabited outer islands lack an organized and sustainable waste management system for the 774 tons per day (tpd) of mixed solid waste they generate.³ Because of rapid urbanization and tourism development in the region, waste generation is expected to grow to 924 tpd by 2022 (footnote 3). The 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 Maldives' economy.⁴ Poor communities on the outer islands suffer from accumulated garbage as they have limited awareness and capacity to manage solid waste effectively.

4. **Existing waste collection, transfer, and disposal system.** High population density and narrow streets present unique challenges for waste collection in Malé. Created in 2015, Waste

¹ ADB. 2017. *Country Operations Business Plan: Maldives, 2018–2020*. Manila.

² ADB. 2017. *Concept Paper: Proposed Grant and Administration of Grant to the Republic of Maldives for the Greater Malé Environmental Improvement and Waste Management Project*. Appendix 3 (Project Preparatory Technical Assistance). Manila.

³ Sector Assessment (Summary): Water Supply and Other Municipal Infrastructure Services (accessible from the list of linked documents in Appendix 2).

⁴ A quarter of the country's employment is in tourism and fisheries. Tourism accounts for 30% of gross domestic product and is expected to expand in the project area. Government of Maldives, National Bureau of Statistics – Ministry of Finance & Treasury. 2015. *Maldives Population & Housing Census 2014 - Statistical Release 4: Employment*. Malé.

Management Corporation Limited (WAMCO) is the state-owned operator charged with collecting and transporting waste, as well as managing the regional waste management facilities throughout the country. Waste collection in the outer islands is the responsibility of island councils not WAMCO. WAMCO has limited professional experience in modern and efficient waste collection systems, and this lack of technical and managerial skills undermines their performance (footnote 3). While WAMCO is trying to improve collection, the company receives nearly 150 complaints per day (as of September 2017) for non-collection of waste. Its collection equipment includes a fleet of aging vehicles unable to access narrow streets. WAMCO does not have 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.⁵ Since 2008, fires have been deliberately set at the dumpsite to reduce growing mounds. The equipment and logistics at the site are inadequate to manage incoming waste efficiently and maximize the use of limited space. Construction and demolition waste and end-of-life vehicles (ELVs) are not collected and processed separately. Household surveys in the project area show high demand for 3R awareness and education programs. About half of household respondents to a socioeconomic survey, conducted as part of the project preparatory TA, highlighted the need for more 3R awareness and the importance of education.

5. **Climate change and disaster risks.** At 1.5 meters above mean sea level, Maldives is vulnerable to sea level rise. Natural hazards such as extreme rainfall and severe storms are projected to increase because of climate change, posing a risk to infrastructure and operations. The Indian Ocean tsunami in December 2004 dispersed about 290,000 cubic meters of waste from open dumpsites on land, including municipal and hazardous waste such as asbestos, medical waste, and oil.⁶ Therefore, the project design needs to include measures to protect systems from natural hazards and climate change.⁷

6. **Policy, regulatory, and institutional framework for waste management.** The President's 2013 manifesto calls for improvement in waste management in the Greater Malé area.⁸ The National Solid Waste Management Policy outlines the principles to improve environmental quality. A proposed solid waste management act would set the legal and institutional framework for the industry. The project is fully aligned with the national policy and regulations. The Waste Management and Pollution Control Department in the Ministry of Environment and Energy (MEE) is mandated to ensure safe waste disposal on all inhabited islands. The MEE works closely with development partners to develop its regional waste management systems,⁹ and selected the Asian Development Bank (ADB) to cover the project area because of the bank's industry experience and the project's link to ADB's TA for formulating a development strategy for Greater Malé.¹⁰

⁵ Government of Maldives, Ministry of Environment and Energy. 2016. *State of the Environment, 2016*. Malé.

⁶ Joint United Nations Environment Programme and United Nations Office for the Coordination of Humanitarian Affairs Environment Unit. 2005. *Indian Ocean Earthquake Tsunami of 26 December 2004: UNDAC Rapid Environmental Assessment, Republic of Maldives*. Geneva.

⁷ Climate Change Assessment (accessible from the list of linked documents in Appendix 2).

⁸ Progressive Party of Maldives. Manifesto of the Progressive Party of Maldives, 2013–2017. Unpublished (unofficial English translation).

⁹ The government regularly organizes meetings with its development partners to exchange lessons and coordinate financing activities. Other development partners active in the waste management sector in Maldives are the World Bank and the United Nations Development Programme.

¹⁰ ADB. 2017. *Final Report: Strategy for Development of the Greater Malé Region*. Manila (prepared under ADB. 2012. *Technical Assistance to the Republic of Maldives for Strengthening Capacity for Operations Management*. Manila).

7. **Greater Malé development strategy.** As part of its national strategy to achieve efficient public spending on economic and social services, the government aims for 70% of its total population to live in Greater Malé.¹¹ The plan seeks to create spatial agglomeration and economic opportunities for faster growth and poverty reduction. Most of the population increase is expected to be absorbed in the newly developed island of Hulhumalé. Waste management systems are not currently equipped to handle this projected growth.

8. **Value added by ADB assistance.** The following lessons and value additions were incorporated in the project design:¹² (i) use a phased approach to match implementation capacity—a follow-on ADB project to develop a waste-to-energy plant as a long-term treatment solution consistent with the comprehensive waste management strategy¹³ for the project area is planned for approval in 2019 or 2020;¹⁴ (ii) develop high project readiness; (iii) include technical capacity building for procurement, contract management, safeguards, and operation and maintenance (O&M); (iv) ensure strong community consultation and capacity building targeting women;¹⁵ and (v) incorporate disaster risk reduction and climate change-resilient measures in project designs.

B. Impact and Outcome

9. The project is aligned with the following impact: a healthy living environment created in the Greater Malé capital region and its outer islands (footnote 8). The project will have the following outcome: climate- and disaster-resilient SWM services improved.¹⁶

C. Outputs

10. The project will have three outputs.

11. **Output 1: Waste collection, transfer, and disposal systems improved and made climate and disaster resilient.** This output 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, such as trucks, bins, and containers, provided for Malé, Hulhumalé, and Villimalé; (iii) transfer stations in Malé and Villimalé constructed, and transfer station in Hulhumalé designed as land is not yet confirmed; (iv) construction and demolition waste processing plant and ELV dismantling workshop constructed; (v) waste vessel harbor at Thilafushi rehabilitated; (vi) three vessels for waste transport from the outer islands to Thilafushi provided; (vii) heavy equipment, such as bulldozers, excavators, and roll trucks, provided for controlled dumpsite management at Thilafushi; and (viii) two administrative buildings for WAMCO at the Malé transfer station and the Thilafushi waste vessel harbor constructed. All facilities will adopt climate-change and disaster-resilient design features including enhanced engineering designs such as strengthened seawalls, raised floor elevations, and enhanced drainage systems; and soft interventions, such as disaster and emergency planning and awareness building.

¹¹ The government did not specify a period for achieving this target but estimated it would take 15–20 years.

¹² Independent Evaluation Department. 2011. *Country Assistance Program Evaluation: The Maldives*. Manila.

¹³ Government of Maldives, Ministry of Environment and Energy. 2018. *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*. Malé.

¹⁴ The ADB Country Operations Business Plan (2018-2020) for Maldives includes \$24.92 million grant in 2019-2020 for Phase 2.

¹⁵ ADB. 2014. *Completion Report: Regional Development Project, Phase II—Environmental Infrastructure and Management in Maldives*. Manila.

¹⁶ The design and monitoring framework is in Appendix 1.

12. Output 2: Community-based outer island waste management systems targeting poor and women enhanced. This output will provide comprehensive support to strengthen sustainable SWM in the 32 poor outer island communities of the project area. It will include (i) at least 22 island waste management centers (IWMCs), of which 11 will be supported by JFPR grant, developed or upgraded with processing equipment (balers, glass crushers, metal presses) in consultation with the community, targeting women and incorporating climate and disaster-risk measures;¹⁷ (ii) collection equipment for the 32 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 undertaken; and (iv) community awareness and behavior change campaigns in 3R targeting women in all 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. The criteria, which are intended to ensure sustainability, are outlined in the project administration manual (PAM).¹⁸ Subprojects with resettlement impacts will not be included. Output 2 will be partially funded by a JFPR grant, which will support (i) the construction of IWMCs on at least 11 eligible islands, (ii) the provision of skills and capacity building to women on eligible islands, and (iii) the delivery of 3R awareness campaigns on all the 32 outer islands. The PAM outlines additional selection criteria for JFPR supported islands.

13. Output 3: Institutional capacity and public awareness in sustainable waste management strengthened. This will include (i) capacity building support in sustainable SWM service delivery and disaster risk management provided to eligible WAMCO staff (at least 70% eligible women staff); (ii) public awareness and behavior change campaigns in 3R delivered, targeting the poor and women in Greater Malé; and (iii) project management, design, and supervision consultant support provided. Capacity building activities in disaster risk management will include the preparation of an SWM disaster action plan outlining prevention, preparedness, response, and recovery tasks. Disaster risk management awareness activities will involve first responders, such as police and firefighters, in Thilafushi. A public awareness and community capacity building consultant recruited by the PMU will implement public awareness and behavior change activities in outer islands (under outputs 2) and Greater Malé (under output 3).

D. Summary Cost Estimates and Financing Plan

14. The project is estimated to cost \$40 million (Table 1). Detailed cost estimates by expenditure category and by financier are in the PAM (footnote 18).

Table 1: Summary Cost Estimates
(\$ million)

Item	Amount^a
A. Base Cost^b	
1. Waste collection, transfer, and disposal systems improved and made climate and disaster resilient	26.92
2. Community-based outer island waste management systems targeting poor and women enhanced	6.17
3. Institutional capacity and public awareness in sustainable waste management strengthened	3.23
Subtotal (A)	36.32
B. Contingencies^c	3.68
Total (A+B)	40.00

^a Includes taxes and duties of \$2.1 million to be financed from government resources by cash contribution. Such amount does not represent an excessive share of the project cost.

^b In early 2018 prices, using an exchange rate of \$1 = Rf15.4.

¹⁷ Some of the 32 outer islands have waste management facilities but some are not operational because of inadequate design and insufficient equipment, which would be upgraded under the project.

¹⁸ Project Administration Manual (accessible from the list of linked documents in Appendix 2).

^c Physical contingencies are computed at 5.5% for civil works and equipment. Price contingencies are computed at 1.5%–1.6% on foreign exchange costs and 2.8%–3.0% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.
Source: Asian Development Bank estimates.

15. The government has requested a grant not exceeding \$33.07 million from ADB’s Special Funds resources (Asian Development Fund), of which \$1.58 million will be financed by the disaster risk reduction financing mechanism under the 12th replenishment of the Asian Development Fund, to help finance the project.

16. The summary financing plan is in Table 2. ADB will finance the expenditures for works, equipment, consulting services, capacity building, incremental recurrent costs, and contingencies. The government will provide \$4.93 million to finance (i) taxes and duties; and (ii) part of the expenditures for works, equipment, incremental recurrent costs, and contingencies. It will provide the grant proceeds and counterpart funds to the implementing agency as a grant. The government has assured ADB that it will meet any financing shortfall to ensure that project outputs are fully achieved. JFPR will provide grant cofinancing equivalent to \$2 million, to be administered by ADB.

Table 2: Summary Financing Plan

Source	Amount (\$ million)	Share of Total (%)
Asian Development Bank		
Special Funds resources (Asian Development Fund grant) ^a	33.07	82.7
Japan Fund for Poverty Reduction (grant) ^b	2.00	5.0
Government	4.93	12.3
Total	40.00	100.0

^a The Asian Development Fund 12 disaster risk reduction financing mechanism will finance \$1.58 million equivalent of the grant.

^b Administered by the Asian Development Bank. No administration fees and other charges will be deducted under the cofinancing agreement.

Source: Asian Development Bank

17. Climate adaptation is estimated to cost \$1.72 million. ADB will finance 100% of adaptation costs. Details are in the PAM (footnote 18).

E. Implementation Arrangements

18. The Ministry of Finance and Treasury (MOFT) will be the executing agency and the MEE will be the implementing agency. The MEE will establish a PMU in its Waste Management and Pollution Control Department comprising eight officials from the MEE and WAMCO. The project steering committee will provide overall policy and strategic guidance to the project. A project technical committee will coordinate design and implementation issues. The PMU will recruit (i) consulting firms to support project management, engineering, supervision, capacity building, and community awareness; and (ii) an individual expert to support disaster risk management activities. The PAM has an outline of the terms of reference for consultants (footnote 18). The implementation arrangements are summarized in Table 3 and described in detail in the PAM (footnote 18).

Table 3: Implementation Arrangements

Aspects	Arrangements
Implementation period	June 2018–June 2023
Estimated completion date	30 June 2023
Estimated grant closing date	31 December 2023

Aspects	Arrangements		
Management			
(i) Oversight body	<p><u>Program Steering Committee</u> Chair: Ministry of Environment and Energy (MEE) minister Members: Waste Management Company Limited (WAMCO), Ministry of Finance and Treasury (MOFT), Ministry of Tourism, Ministry of Health, Ministry of Gender and Family, Local Government Authority, Environmental Protection Agency</p> <p><u>Technical Committee</u> Chair: MEE project director Members: MEE, Ministry of Tourism, Ministry of Health, Ministry of Gender and Family, Local Government Authority, Ministry of Housing and Infrastructure Malé City Council, Environmental Protection Agency, WAMCO, Thilafushi Corporation Limited, and two representatives from environmental nongovernment organizations</p>		
(ii) Executing agency	MOFT		
(iii) Implementing agency	MEE		
(iv) Implementation unit	Project management unit at the MEE's Waste Management and Pollution Control Department (eight staff)		
Procurement	International competitive bidding	9 contracts	\$32.60 million
	National competitive bidding	1 contract	\$2.60 million
Consulting services	Quality- and cost-based selection 90:10	102 person-months	\$1.50 million
	Quality-based selection	79 person-months	\$0.91 million
	Individual consultant selection	3 person-months	\$0.09 million
Retroactive financing and/or advance contracting	Advance contracting is requested for civil works, equipment, and consultant packages. Retroactive financing will be up to 20% of the Asian Development Bank (ADB) grant amount for eligible expenditures incurred before grant effectiveness. However, such expenditures cannot be incurred more than 12 months before signing of the grant agreement.		
Disbursement	The grant proceeds will be disbursed following ADB's <i>Loan Disbursement Handbook</i> (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB.		

Source: Asian Development Bank.

III. ATTACHED TECHNICAL ASSISTANCE

19. The transaction TA for Strengthening Capacity for Sustainable Solid Waste Management in the Greater Malé Region will (i) strengthen WAMCO's capacity for sustainable SWM services, including controlled dumpsite management, efficient waste collection and transfer system planning, and strategic and business planning; (ii) provide implementation support to the PMU on ADB procurement and safeguards requirements, and performance monitoring; and (iii) conduct a recycling market study to inform WAMCO's business planning and operations.¹⁹ The TA is estimated to cost \$525,000, of which \$500,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF 6). The government will provide counterpart support in the form of staff, office space, and other in-kind contributions.

IV. DUE DILIGENCE

A. Technical

20. Technical due diligence confirmed the designs are robust and sustainable. It included a comprehensive review of the project feasibility study, engineering designs, cost estimates, and site investigations. Technical aspects of the project were appraised based on (i) rationale and

¹⁹ Attached Technical Assistance Report (accessible from the list of linked documents in Appendix 2).

relevance, benefits, proposed designs, ease of implementation, and operations; (ii) technical alternatives and their viability along with least-cost analysis - MEE evaluated a range of alternatives, including various collection concepts and technologies (e.g., vehicle and bin types, container designs, and treatment and disposal approaches) to ensure continuity and feasibility across the system; (iii) life cycle costs, including capital and operating costs; and achievable cost savings, including climate- and disaster-resilient measures (footnote 7); (iv) maximum beneficiary area coverage, including the poor; (v) minimum adverse environmental and social impacts; and (vi) optimized time lines for implementation through high project readiness. The project design adequately addresses the key waste management issues facing the project area.

B. Economic and Financial

21. **Economic analysis.** The economic rationale for government intervention is sound as the project aims to provide sustainable SWM services in the Greater Malé capital region and its outer inhabited islands. The project's estimated economic internal rate of return is 17.5%, higher than the economic opportunity cost of capital estimated at 9.0%, indicating significant economic returns. The sensitivity analysis also revealed satisfactory results, except under the scenario of all downside risks occurring together, i.e., (i) a 20% capital cost overrun, (ii) a 20% overrun in O&M costs, (iii) a 20% decline in estimated benefits, and (iv) a 1-year delay in implementation.²⁰

22. **Financial analysis.** The transaction TA (footnote 2) conducted a financial analysis for the project to determine whether it is sustainable and the extent to which it will generate revenues to cover O&M costs. The results showed the project would generate sufficient revenues to cover full O&M costs provided WAMCO implements regular tariff revisions. The financial performance of WAMCO shows it has substantially depended on government grants. Thus, the financial projections of WAMCO and the island councils demonstrate the revenue account will remain in surplus by (i) rationalizing tariffs, (ii) improving collection efficiency, and (iii) continuing government support.

C. Governance

23. **Financial management.** The financial management assessment concludes the MEE can conduct adequate financial management of the project. The MEE has experience in handling large projects funded internally and externally (footnote 3). In addition, the MEE has an established legal, institutional, and monitoring framework available for budgeting, accounting, and auditing. Thus, the overall financial management risk for the project is *moderate*. The project design includes the following risk mitigation measures: (i) commitment of the MOFT and the MEE to ensure the timely setup of the PMU with qualified staff, and (ii) commitment from the MOFT and the MEE for timely allocation and disbursement of the government's counterpart funds. The program will provide further support to improve the financial management capacity of the MEE and the PMU.

24. **Procurement.** Procurement of civil works and goods will follow ADB's Procurement Guidelines (2015, as amended from time to time). The recruitment of consultants will follow ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). A procurement capacity assessment concluded the overall procurement risk for the project is *moderate*. The MEE has extensive experience in development partner-supported procurement of goods and works. A procurement expert recruited under the attached TA will provide additional implementation support for the MEE. ADB's Anticorruption Policy (1998, as amended to date) was explained to

²⁰ Economic Analysis and Financial Analysis (accessible from the list of linked documents in Appendix 2).

and discussed with the government and the MOFT. The specific policy requirements and supplementary measures are described in the PAM (footnote18).

D. Poverty, Social, and Gender

25. Overall poverty in Maldives is estimated at 15% (2010), but poverty levels in Malé increased from 4% in 2003 to 12% in 2010 due to migration of unskilled workers from the outer atolls.²¹ The project includes improved waste management for poor outer island communities, including skills training and awareness and behaviour change campaigns. The project will result in a cleaner environment that will have a positive impact on fishing and tourism-based livelihoods, which many of the poor depend on.

26. **Gender.** The project is classified *effective gender mainstreaming*. The gender benefits of the project include (i) participation of women in community-based waste management activities in poor outer island communities, (ii) capacity building on gender for project stakeholders, (iii) promotion of equitable access to project-related jobs, and (iv) equal opportunity employment across positions in WAMCO. The MEE endorsed a gender action plan with clear targets, responsibilities, and resource allocations for the participation of women.²² The PMU will implement the gender action plan with support from public awareness and community capacity building consultants recruited under the project, and the JFPR grant coordinator. The information, education, and communication specialist in the PMU will serve as the gender focal point to support timely and effective implementation of the gender action plan (footnote 22).

E. Safeguards

27. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows.²³

28. **Environment (category B).** The MEE prepared three draft initial environmental examinations²⁴ with environmental management plans for subprojects requiring civil works: (i) transfer stations in Malé and Villimalé; (ii) construction and demolition waste processing plant, ELV dismantling workshop, and waste vessel harbor rehabilitation; and (iii) a sample IWMC. All project locations are outside sensitive areas and impacts will be avoided or mitigated through measures identified in the environmental management plans. The MEE conducted public consultations that will continue throughout implementation. The MEE prepared an environmental assessment and review framework for output 2, including site selection and design criteria. No *category A* projects are allowed.²⁵ The environmental assessment and review framework and the initial environmental examinations were disclosed on the websites of ADB and the MEE and will be available in the local language. The PMU will handle safeguards-related grievances following the project-specific grievance redress mechanism for the project. While the MEE developed safeguards capacity from other development partner-supported projects, the PMU will receive

²¹ Government of Maldives, Ministry of Finance and Treasury, Department of National Planning. 2010. *Household Income & Expenditure Survey Findings 2009/2010*. Malé. Poverty is based on the percentage of the population living below the national poverty line of Rf22 per day.

²² Gender Action Plan (accessible from the list of linked documents in Appendix 2).

²³ ADB. Safeguard Categories. <https://www.adb.org/site/safeguards/safeguard-categories>.

²⁴ Initial Environmental Examination: Transfer Station Improvements Subproject for Malé and Villingilli; Initial Environmental Examination: Improvement of Waste Handling and Processing Facilities for Thilafushi Island; and Initial Environmental Examination: Island Waste Management Center in Thulusdoo Island (accessible from the list of linked documents in Appendix 2).

²⁵ Environmental Assessment and Review Framework (accessible from the list of linked documents in Appendix 2).

consultant support to ensure compliance. Environmental reporting to ADB will be done semiannually.

29. **Involuntary resettlement (category C).** The MEE prepared a due diligence report, which found no permanent or temporary resettlement impacts occurring from the project as all works are proposed within available government lands. For output 2, the selection criteria outlined in the PAM (footnote 18) require no resettlement impacts as an eligibility criterion for project support; a resettlement framework has been prepared to guide appraisal and implementation.²⁶ The MEE has sufficient capacity to monitor safeguards compliance from its experience in similar development partner-funded projects. Dedicated PMU safeguards staff and consultants will support the MEE.

30. **Indigenous peoples (category C).** There are no indigenous people communities present at or around the subproject sites.

F. Summary of Risk Assessment and Risk Management Plan

31. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.²⁷

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigation Measures
Political instability in the country could disrupt delivery of improved SWM services.	The attached TA and project will provide additional capacity building support to WAMCO and island councils to ensure timely delivery of sustainable SWM services.
The technical capacity of WAMCO and island councils for O&M is weak.	Capacity building in O&M for WAMCO and island councils is included in the terms of reference for consultants under the project. The attached technical assistance will also provide additional technical support to WAMCO for improved operations.
Extreme weather conditions and price surges of materials beyond projections and contingencies result in cost overruns and delays in project completion.	The longer implementation period will accommodate project delays, including those caused by heavy monsoon. The project costs incorporate sufficient contingencies to cover cost overruns.

O&M = operation and maintenance, SWM = solid waste management, TA = technical assistance, WAMCO = Waste Management Corporation Limited.

^a Government of Maldives, Ministry of Environment, Energy and Water, Environment Research Centre. 2008. *National Solid Waste Management Policy for the Republic of Maldives*. Malé.

Source: Asian Development Bank.

V. ASSURANCES

32. The government and the MOFT have assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and grant documents.

33. The government and the MOFT have agreed with ADB on certain covenants for the project, which are set forth in the draft grant agreements.

²⁶ Resettlement Framework; Due Diligence Report: Thulusdhoo Island Waste Management Improvements Subproject; and Due Diligence Report: Output 1 Subprojects (accessible from the list of linked documents in Appendix 2).

²⁷ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

VI. RECOMMENDATION

34. I am satisfied that the proposed grant would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the grant not exceeding \$33,070,000 to the Republic of Maldives, from ADB's Special Funds resources (Asian Development Fund), for the Greater Malé Environmental Improvement and Waste Management Project, on terms and conditions that are substantially in accordance with those set forth in the draft grant agreement presented to the Board.

Takehiko Nakao
President

6 June 2018

DESIGN AND MONITORING FRAMEWORK

Impact the Project Is Aligned with			
A healthy living environment created in the Greater Malé capital region and its outer islands (Manifesto of the Progressive Party of Maldives) ^a			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
<p>Outcome</p> <p>Climate- and disaster-resilient SWM services improved</p>	<p>By 2024</p> <p>a. At least 90% of all types of solid waste generated in the project area is collected and transferred to Thilafushi or IWMC (2018 baseline: 86% for household, commercial, and resort waste; 62% for CDW)</p> <p>b. Number of daily complaints for non-collection received by WAMCO reduced by 80% (2017 baseline: 150)</p> <p>c. Controlled dumping at Thilafushi dumpsite implemented without waste burning (2018 baseline: unmanaged dumping, smoke)</p> <p>d. DRM operational plan approved and adopted by WAMCO management (2018 baseline: 0)</p>	<p>a–d. WAMCO’s annual reports and PMU reports</p>	<p>Political instability in the country could disrupt delivery of improved SWM services</p>
<p>Outputs</p> <p>1. Waste collection, transfer, and disposal systems improved and made climate and disaster resilient</p>	<p>By 2023</p> <p>1a. New waste collection and transfer strategy developed (2018 baseline: ad hoc, inefficient)</p> <p>1b. 10,000 bins of various sizes distributed for waste collection in Greater Malé (2018 baseline: 0)</p> <p>1c. 21 additional refuse collection vehicles commissioned for waste collection in Malé and Hulhumalé (2018 baseline: 12 5-cubic-meter vehicles and 6 4-cubic-meter vehicles)</p> <p>1d. 3 vessels commissioned for waste transport from islands to Thilafushi (2018 baseline: 0)</p> <p>1e. New Malé and Villimalé transfer stations constructed with climate- and disaster-resilient design features^b (2018 baseline: 0)</p> <p>1f. 11 heavy machinery and 20 containers commissioned for Thilafushi dumpsite management (2018 baseline: 0)</p>	<p>1a–g. PMU quarterly reports and WAMCO’s annual report</p>	<p>Extreme weather conditions and price surges of materials beyond projections and contingencies result in cost overruns and delays in project completion</p>

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
2. Community-based outer island waste management systems targeting poor and women enhanced	<p>1g. CDW and ELV processing plants established in Thilafushi (2018 baseline: 0)</p> <p>By 2023</p> <p>2a. At least 22 IWMCs developed or upgraded^c in the outer islands (2018 baseline: 0)</p> <p>2b. 18,000 bins of various sizes distributed for improved waste collection in the outer islands (2018 baseline: 0)</p> <p>2c. 4 refuse compaction vehicles and 25 dump trucks commissioned for waste collection in outer islands (2018 baseline: 0)</p> <p>2d. At least 150 outer island inhabitants, of whom at least 30% are women, reported enhanced skills in community-based SWM, including IWMC operations and DRM and participatory action planning (2018 baseline: 0)</p> <p>2e. At least 500 people in outer islands, of whom at least 50% women, reported improved awareness on sustainable SWM and 3R benefits (2018 baseline: 0)</p>	2a–e. PMU quarterly reports, PACCB reports, and survey results	
3. Institutional capacity and public awareness in sustainable waste management strengthened	<p>By 2023</p> <p>3a. 100 eligible^d WAMCO staff, including at least 70% eligible women staff, reported improved skills in sustainable SWM service delivery and DRM (2018 baseline: 0)</p> <p>3b. 100% of WAMCO workers in Thilafushi reported knowledge on public health, human-induced, and natural hazards, including awareness of climate change impacts (2018 baseline: 0)</p> <p>3c. WAMCO's gender-inclusive strategy developed and adopted (2018 baseline: not applicable)</p> <p>3d. WAMCO's DRM plan developed (2018 baseline: 0)</p> <p>3e. At least 1,000 people in Greater Malé, of whom at least 50% are women, reported improved</p>	3a-e. PMU quarterly reports, PACCB reports and survey results	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	awareness on sustainable SWM and 3R benefits (2018 baseline: 0)		
<p>Key Activities with Milestones</p> <p>1. Waste collection, transfer, and disposal systems improved and made climate and disaster resilient</p> <p>1.1 Procure dumpsite equipment and implement immediate management measures in Thilafushi Island (Q1 2020)</p> <p>1.2 Finalize design and procure collection and transfer equipment, such as trucks, bins, and containers (Q3 2021)</p> <p>1.3 Finalize design and procure equipment for transfer and transport of waste, such as vehicles, containers, and cranes (Q3 2021)</p> <p>1.4 Rehabilitate harbor and build CDW plant, ELV workshop, and administration building in Thilafushi (Q3 2022)</p> <p>1.5 Finalize design and procure outer islands transfer vessels (Q2 2021)</p> <p>1.6 Construct and make operational transfer stations in Malé and Villimalé, and complete the design of the Hulhumalé station (Q3 2022)</p> <p>2. Community-based outer island waste management systems targeting poor and women enhanced</p> <p>2.1 Screen eligibility of the outer islands, conduct community consultations, and finalize detailed design (Q2 2019)</p> <p>2.2 Procure equipment and build IWMCs in the eligible outer islands (Q2 2023)</p> <p>2.3 Conduct capacity building activities in community-based SWM, including IWMC operations and DRM in the outer islands (Q2 2023)</p> <p>3. Institutional capacity and public awareness in sustainable waste management strengthened</p> <p>3.1 Advertise terms of reference and mobilize PACCB and DRR consultants (Q1 2019)</p> <p>3.2 Conduct WAMCO training and capacity building (Q1 2023)</p> <p>3.3 Conduct awareness raising campaigns on sustainable waste management and 3R (Q2 2023)</p> <p>3.4 Conduct recycling market study (Q4 2020)</p>			
<p>Project Management Activities</p> <p>Set up the PMU (Q2 2018)</p> <p>Engage and mobilize project management and design supervision consultants (Q3 2018)</p> <p>Conduct regular monitoring, reporting, and evaluation (2018–2023)</p>			
<p>Inputs</p> <p>Asian Development Bank</p> <p style="padding-left: 20px;">Asian Development Fund: \$33.07 million (grant)</p> <p style="padding-left: 20px;">Technical Assistance Special Fund (TASF 6): \$0.50 million (grant)</p> <p>Government: \$4.93 million</p> <p>Japan Fund for Poverty Reduction: \$2.00 million (grant)</p>			
<p>Assumptions for Partner Financing</p> <p>Not Applicable</p>			

3R = reduce, reuse, and recycle; CDW = construction and demolition waste; DRM = disaster risk management; DRR = disaster risk reduction; ELV = end-of-life vehicle; IWMC = island waste management center; PACCB = public awareness and community capacity building; PMU = project management unit; Q = quarter; SWM = solid waste management; WAMCO = Waste Management Corporation Limited.

^a Progressive Party of the Maldives. Manifesto of the Progressive Party of Maldives, 2013–2017. Unpublished (unofficial English translation).

^b Examples are strengthened roofs, foundations, walls, and drainage; and raised elevation.

^c Upgrading also covers standard equipment, such as balers, crushers, and chippers. The project management, design, and supervision consultants will select the final design and equipment for each IWMC based on island needs.

^d Eligibility is determined by the type of training. For example, technical training targets operational staff.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/RRPs/?id=51077-002-2>

1. Grant Agreement: Special Operations
2. Grant Agreement: Externally Financed
3. Sector Assessment (Summary): Water and Other Urban Infrastructure and Services
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Risk Assessment and Risk Management Plan
12. Attached Technical Assistance Report
13. Japan Fund for Poverty Reduction Grant: Improving Community-Based Solid Waste Management in Small Outer Islands of Zone 3
14. Climate Change Assessment
15. Gender Action Plan
16. Initial Environmental Examination: Transfer Station Improvements Subproject for Malé and Villingilli
17. Initial Environmental Examination: Improvement of Waste Handling and Processing Facilities for Thilafushi Island
18. Initial Environmental Examination: Island Waste Management Center in Thulusdoo Island
19. Environmental Assessment and Review Framework
20. Resettlement Framework

Supplementary Documents

21. Due Diligence Report: Thulusdhoo Island Waste Management Improvements Subproject
22. Due Diligence Report 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
23. Financial Management Assessment