

SECTOR ASSESSMENT (SUMMARY): WATER AND OTHER URBAN INFRASTRUCTURE AND SERVICES

Sector Road Map

1. Sector Performance, Problems, and Opportunities

1. **Sector performance in Maldives.** With their disbursed nature and limited available land, small island nations such as Maldives present unique challenges for solid waste management (SWM).¹ The Greater Malé capital region, the most populated area in Maldives,² suffers from severe environmental pollution and deteriorating livability because of inadequate collection and haphazard disposal of solid waste. The dumping and burning of garbage at the 30-year-old, 10-hectare dumpsite on Thilafushi Island (6 kilometers from Malé) creates a significant 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. Greater Malé and its 32 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 With rapid urbanization and tourism development in the region, the amount of waste is projected to grow 19% to 924 tpd by 2022 (footnote 3). This will increase pressure on an already stressed waste management system, posing a significant threat to Maldives' economic cornerstones: tourism and fisheries, both of which rely on the country's pristine environment.⁴ Poor communities on the outer islands suffer from accumulated garbage with limited awareness and capacity to manage solid waste effectively.

2. **Greater Malé development strategy.** As part of its national strategy to achieve efficient public spending on economic and social services, the Government of Maldives aims to have 70% of its total population reside in Greater Malé.⁵ The plan seeks to create spatial agglomeration and 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.⁶ The near doubling of Malé's population will significantly increase pressure on already stressed SWM services.

¹ Maldives' land area is less than 300 square kilometers. Average elevation is about 1.2 meters. The country's territory stretches more than 750 kilometers.

² The project area is classified as zone 3 in the National Solid Waste Management Policy. The policy divides Maldives into seven regional waste management zones (as shown in the map in the main text of the report and recommendation of the President), each with a regional waste management facility.

³ Breakdown of solid waste by type: construction and demolition = 530 tpd (68%), household = 149 tpd (19%), resort = 48 tpd (6%), commercial = 27 tpd (3%), airport = 9.3 tpd (1.2%), industrial = 6 tpd (0.8%), market = 2.5 tpd (0.3%), hazardous = 1.5 (0.2%), and end-of-life vehicles = 0.65 tpd (0.1%). Municipal waste composition: organic (53%), paper and cardboard (12%), plastic (11%), hazardous (medical) waste (8%), metal (3%), glass (3%), and others (11%). Source: Government of Maldives, Ministry of Environment and Energy. 2017. Draft 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.

⁴ A quarter of the country's employment is in tourism and fisheries (2014 Census). Tourism is the most rapidly expanding industry and contributes the most to Maldives' gross domestic product.

⁵ The government did not specify a timeframe for achieving this target but estimated it would take 15–20 years.

⁶ To prepare for the increase in population, the government is embarking on major infrastructure projects including three mega transport and residential housing projects totaling \$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 the 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).

3. **Institutional arrangements for solid waste management.** The Waste Management and Pollution Control Department in the Ministry of Environment and Energy is mandated to ensure safe waste disposal and cost-effective and environmentally responsible waste management and pollution controls on all inhabited islands in line with the government's manifesto.⁷ The department is also in charge of drafting national strategies and action plans to implement national policies. Created in 2015, the Waste Management Corporation Limited (WAMCO) is the state-owned operator charged with providing sustainable SWM collection and transfer in the Greater Malé capital region. WAMCO's core business is the collection and transport of waste and management of regional waste management facilities throughout the country.⁸ Under the government's decentralization program,⁹ island councils are mandated to support planning functions including SWM services.

4. **Waste collection and transfer in the project area.** The dense population and narrow streets in Malé present unique challenges for waste collection. WAMCO collects waste but has limited staffing and technical and managerial experience in modern and efficient collection systems.¹⁰ About 89% of Malé, 89% of Vilimalé, and 84% of Hulhumalé are covered by highly inefficient waste collection, resulting in waste piling on streets. Household waste is collected during evening peak traffic hours, causing significant congestion. Collection crews hand carry most waste up and down stairs within high-rise buildings. WAMCO does not have standardized collection routes, collection points, or bins. Its collection equipment includes a small fleet of aging trucks that are unable to access smaller streets. While WAMCO is trying to improve collection, the company receives about 150 complaints per day on its hotline, mostly related to non-collection.¹¹ It does not have any planned collection for the 500 tpd of construction and demolition waste; hazardous wastes are commonly commingled and disposed of with municipal solid waste. WAMCO also does not have any formal transfer stations. Waste is transported in open, non-containerized vessels, resulting in significant spillage into the ocean. About 20 tpd of waste is dumped on beaches or in the ocean on outer islands, and backyard burning is common.¹² The lack of technical and professional skills in waste management constrains the industry's performance.

5. **Waste disposal in the project area.** WAMCO transports collected waste on two barges to the industrial island of Thilafushi, 6 kilometers from Malé.¹³ The dumpsite, managed by WAMCO, has no leachate control systems. Since 2008, fires have been set to reduce growing mounds of garbage, producing plumes of smoke and severe air pollution for on-site workers, Malé residents, and surrounding resorts. The burning generates frequent complaints. On-site equipment and site logistics are not sufficient or optimal to efficiently manage the growing volume of incoming waste. The scarcity of land on Thilafushi requires the government to reclaim 15 hectares of additional land in the adjacent lagoon (1.5 meters depth) next to the dumpsite for the proposed regional waste management facility.¹⁴

⁷ Progressive Party of Maldives. Manifesto of the Progressive Party of Maldives, 2013–2017. Unpublished (unofficial English translation).

⁸ The island councils, not WAMCO, operate collection in the outer islands.

⁹ In 2010, the government formulated a national decentralization program under which island councils were to be entrusted with the responsibility for water supply, sanitation and sewerage, environmental management, and land management.

¹⁰ Established in 2015, WAMCO started operations in January 2016.

¹¹ This was the number of grievances as of September 2017 but they are gradually declining. WAMCO is in initial stages of dividing Malé into waste collection zones to establish a more organized system.

¹² Government of Maldives, Ministry of Environment and Energy. 2016. *State of the Environment*. Malé.

¹³ Thilafushi Island is an artificially reclaimed island created in the early 1990s from a combination of garbage and sand. It is zoned for industrial use. Thilafushi Island does not have any inhabitants.

¹⁴ To be financed in phase 2.

6. **Climate change and disaster risks.** As one of the lowest-lying countries in the world (1.5 meters above mean sea level), Maldives is vulnerable to sea level rise and extreme weather linked to climate change, including increased precipitation and storm severity. The eastern side of Maldives, including Greater Malé, is more exposed to natural hazards (tsunamis, storm surges, floods, and strong winds) than the western side. The Indian Ocean tsunami in December 2004 dispersed about 290,000 cubic meters of waste from open dumpsites on land, including municipal and hazardous wastes (asbestos, medical, oil).¹⁵ The following measures have been built into the project design to protect systems from natural hazards and climate change: (i) strengthening seawalls at project locations; (ii) elevating mechanical and electrical equipment at proposed WAMCO administrative buildings; (iii) flood-proofing transfer stations; (iv) increasing rain and storm water runoff capacity on Thilafushi; (v) building capacity and raising awareness on disaster risk management for WAMCO and first responders (police, fire fighters) on Thilafushi; and (vi) preparing a SWM risk management action plan outlining response, recovery, and prevention tasks.

7. **Investment opportunities.** With the launch of the *Saafu Raajje* (Clean Maldives) initiative in 2015, the government began significant infrastructure, capacity building, and awareness raising activities on SWM across all seven administrative zones. About \$30.65 million, mainly provided through grants from the World Bank's International Development Association, was invested to improve SWM in zones 2, 4, and 5. The government is planning to invest about \$140 million to improve SWM in zone 3, including (i) improving waste collection, transfer, disposal, treatment (using advanced waste-to-energy technology), and recycling; (ii) rehabilitating the existing dumpsite; (iii) strengthening institutional capacities for solid waste services delivery and environmental monitoring; and (iv) improving public awareness and behaviors in reduce–reuse–recycle.

2. Government's Sector Strategy

8. **National solid waste management policy and regulation.** The Maldives' strategy on solid waste is based on two legislative pillars: the National Solid Waste Management Policy (2015)¹⁶ and the Solid Waste Regulation (2013). These set out key strategic, governance, and legislative principles to meet worldwide statutory objectives for waste management, including (i) a waste hierarchy¹⁷ approach to SWM, prioritizing waste minimization and resource recovery; (ii) proximity and self-sufficiency, requiring waste to be dealt with as close as possible to where it is produced; (iii) "polluters pay" principle, reflecting the environmental and health costs of waste generation, treatment, and disposal in the price of products and SWM fees; and (iv) best practicable environmental option as a major tool for decision making. The Majlis (Maldivian Parliament) is considering a new SWM bill, which, if approved, will improve the current regulation

¹⁵ United Nations Environment Programme and Office of Coordination for Humanitarian Affairs. 2005. *Indian Ocean Earthquake-Tsunami of 26 December 2004: UNDAC Rapid Environmental Assessment Republic of Maldives*. Switzerland. UNDAC is United Nations Disaster Assessment and Coordination.

¹⁶ The policy (i) defines the responsibilities for SWM, assigning the regulatory role to the Ministry of Environment and Energy and the monitoring role to the Environmental Protection Agency; (ii) divides the Maldives territory into seven administrative zones, mandating a regional waste management facility in each of them; (iii) stresses reduce–reuse–recycle, and raising citizen awareness; (iv) mandates the development of island waste management plan and systems, including equipment and facilities (Island Waste Management Centers), in all inhabited islands; (v) specifies mechanisms for SWM fee collection; and (vi) mandates residual waste from islands to be transferred to respective RWMFs.

¹⁷ Waste hierarchy is (i) waste prevention and minimization; (ii) reuse; (iii) recycling; (iv) recovery and/or other treatment; and (v) disposal (e.g., landfilling) as least preferred option.

and cover management of all waste in the country.

3. ADB Sector Experience and Assistance Program

9. The Asian Development Bank (ADB) provided \$14 million to the urban sector from 1999 to 2017 for two projects.¹⁸ The projects supported a balance of institutional, infrastructure, and environmental improvements (on islands outside the proposed project area) and included small investments in SWM (equipment, awareness building). The proposed project is the first dedicated, large-scale ADB assistance in SWM in the country. The Maldives' country operations business plan, 2018–2020 includes \$49.77 million in grants for the project in two Asian Development Fund cycles: a \$24.85 million grant in 2018 and a \$24.92 million grant in 2019–2020. To access the full Asian Development Fund grant allocation, the grants will be approved in two phases: phase 1 (\$33.07 million)¹⁹ in 2018 and phase 2 (\$24.92 million) in 2019 or 2020. This report and recommendation of the President applies to phase 1. Phase 2 will develop a waste-to-energy treatment plant and will be processed separately.

10. Proposed transaction technical assistance titled Strengthening Capacity for Sustainable Solid Waste Management in the Greater Malé Region is attached to the project. It 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 project management unit (PMU) on ADB's procurement and safeguards requirements, as well as performance monitoring; and (iii) conduct a recycling market study to inform WAMCO's business planning and operations.²⁰

11. **Lessons.** The following lessons and good practices are incorporated into the project design: (i) include operation and maintenance (O&M) in contracts and technical capacity building for O&M; (ii) develop high project readiness to avoid downstream delays; (iii) use phased approaches and provide adequate support for preparation;²¹ (iv) establish a dedicated full-time PMU with adequate staff; (v) provide implementation support and capacity building to PMU staff in project implementation, particularly in procurement, contract management, and safeguards;²² (vi) complement infrastructure investments with strong capacity building in technical and strategic planning; (vii) plan training activities targeting women around women's development committee availability, and conduct these simultaneously with the provision of infrastructure and equipment to ensure benefits and outputs are fully realized at the end of the training;²³ (viii) incorporate disaster risk reduction and climate change resilience measures into project designs; and (ix) include strong community consultation and training, e.g., O&M targeting the poor and women to promote SWM projects sustainability.

¹⁸ ADB. 1999. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Maldives for the Regional Development Project*. Manila. (\$8.0 million); ADB. 2005. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Maldives for the Regional Development Project Phase II—Environmental Infrastructure and Management*. Manila. (\$6 million).

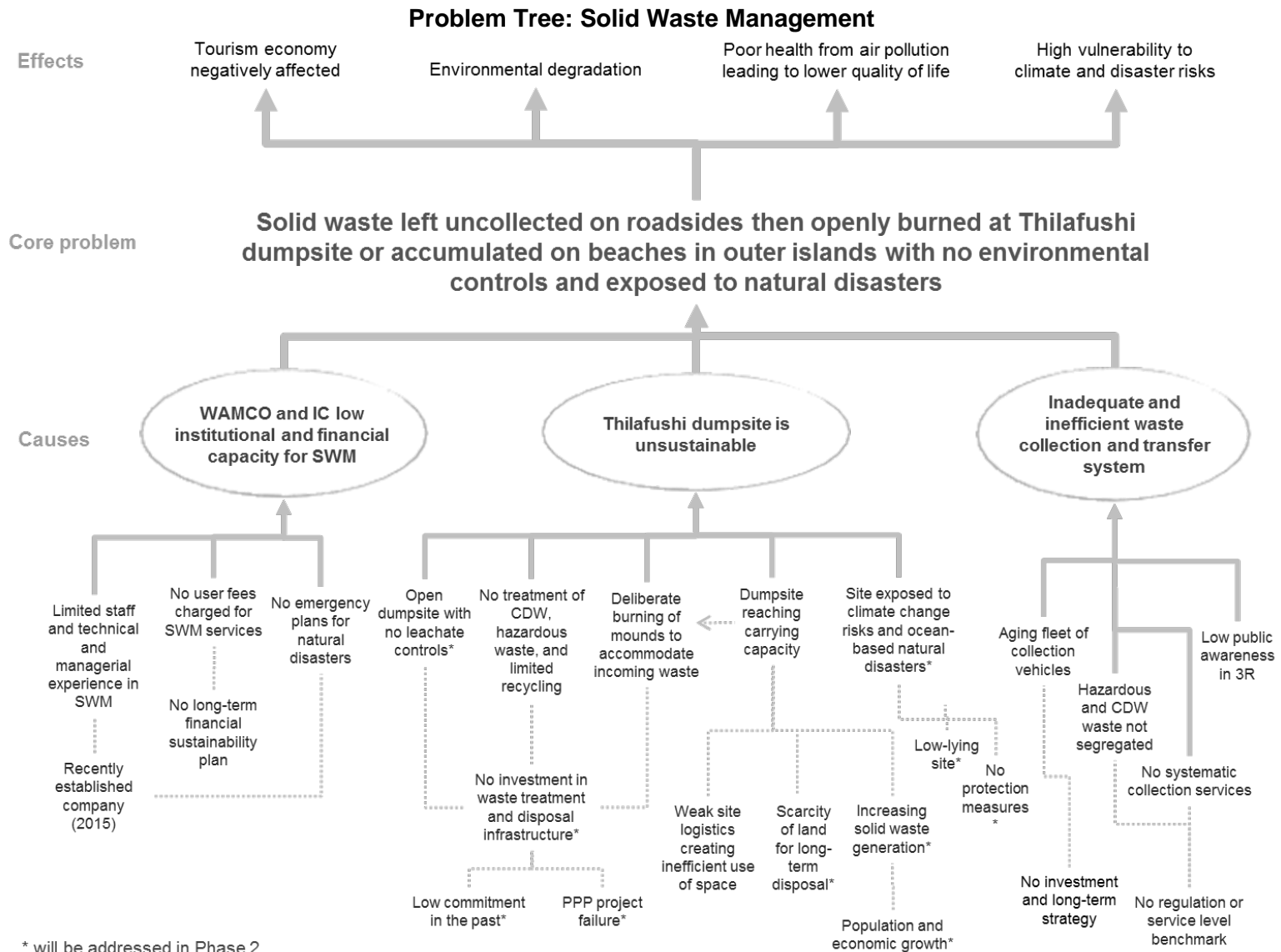
¹⁹ Vice President Operation Group 1 approved additional ADF grant funds of \$8.22 million from Operations Group 1 pool of concessional resources cancellations and savings.

²⁰ Attached Technical Assistance Report (accessible from the list of linked documents in Appendix 2).

²¹ Independent Evaluation Department. 2011. *Country Assistance Program Evaluation: The Maldives*. Manila: ADB.

²² ADB. 2012. *Learning Curves: Country Assistance Program Evaluation for the Maldives*. Manila.

²³ ADB. 2014. *Completion Report: Regional Development Project, Phase II—Environmental Infrastructure and Management in the Maldives*. Manila.



3R = reduce, reuse and recycle, CDW = construction and demolition waste, IC = island councils, PPP = public-private partnership, SWM = solid waste management