



Solid Waste Management in the Pacific

The Marshall Islands Country Snapshot

BACKGROUND

The Marshall Islands consists of five single islands, 29 atolls, and many other smaller islets. Around 74% of its population resides in the country's two major urban centers, Majuro and Kwajalein (Ebeye). Majuro, which is the focus on this assessment, is the country's political and economic center. Majuro atoll is highly urbanized with a population of 27,979 living in an area of just 9.71 square kilometers.¹ In 2012, per capita GDP of the Marshall Islands was estimated at \$3,284.²

TECHNICAL ASPECTS

Waste Generation, Collection, and Disposal

The Majuro Atoll Waste Company (MAWC), which is owned by the national government, and the Majuro Atoll Local Government, is responsible for solid waste collection, landfill management, and recycling.

MAWC provides weekly collection services to around 2,500 households, and 82 commercial customers located in the area between the airport and Rita. The company does not provide service in the area between the airport and Laura, where approximately 500 households are responsible for transporting their wastes to Majuro's dumpsite. However, due to the lack of available collection services, many households create backyard pits for disposal of waste, which pose environmental and public health hazards. In addition, some larger businesses within the MAWC collection area haul their solid wastes to the landfill. Until recently, wastes were collected only from 100 public dumpsters placed around the MAWC collection area; however, many of these have become so dilapidated that the bins could no longer be used to safely store wastes. With assistance from the

Government of Japan, since 2010, around 2,300 garbage bins, 360 liters in size, have been provided to households within the MAWC service area.

Effective disposal of solid waste is an enormous challenge on small atolls with limited land, such as Majuro. It is estimated that Majuro generates about 7.2 tons of residential waste per day and 13.2 tons of commercial waste per day. The main dumpsite at Jable-Batkan has exceeded its design capacity. About 56,600 cubic meters of waste is stored at the dumpsite, which is prone to flooding; and does not have leachate control, which contributes to pollution of the surrounding marine environment. In 2011, the Environmental Protection Agency (EPA) ordered the temporary closure of the dumpsite, but it was reopened because there were no alternatives available. Sand is dredged by MAWC to provide daily cover for the landfill to minimize odors and flies. A compactor and excavator are used to undertake wastes compaction and grading.

An improved landfill facility is needed to effectively dispose of solid wastes in Majuro. As a temporary measure until a new facility is developed, a new seawall has been constructed at the existing facility toward the reef to increase its capacity. The site for a new landfill, which is proposed to be constructed on an expansive reef flat, has been identified. Preliminary activities have started; however, an environmental impact assessment is needed before the new facility is approved.

Given the limited options for environmentally appropriate waste disposal facilities in atoll countries, such as the Marshall Islands, the Asian Development Bank (ADB) funded a prefeasibility study to assess the potential for investment in a waste-to-energy (WTE) facility to

¹ The Republic of the Marshall Islands (RMI), Economic Policy, Planning and Statistics Office. 2012. *The RMI 2011 Census of Population and Housing: Summary and Highlights Only*. Majuro.

² ADB. 2013. *Key Indicators for Asia and the Pacific 2013*. Manila.



Photo by K. Serrona

Dumpsite at Jable-Batkan

dispose of Majuro’s waste and produce electricity. The study was finalized in 2010.³ While the proposed investment was found to be technically feasible, it was not financially feasible. Electricity produced from wastes would need to be sold at \$0.40 per kilowatt hour, compared with the cost of producing power from diesel, which at the time of the study, was \$0.30 per kilowatt hour.

In January 2014, a firm presented to the cabinet a WTE proposal, which includes the construction of an 8.5-megawatt WTE generator. It is proposed that the plant is operated under a 15-year build-operate-transfer contract. Power generated from the plant would be purchased by the Marshalls Energy Company. The government would be required to provide land for the facility, and ensure that collection services were undertaken efficiently to deliver solid waste to the waste-to-energy facility.⁴

MAWC has made significant efforts to reduce the stream of wastes entering the landfill to prolong its life. While no recent statistics are available, it is believed that up to 50% of total waste collected is biodegradable organic waste. Through the segregation of green waste, aluminum and plastic containers, glass, and cardboard, MAWC aims

to reduce the stream of wastes entering the landfill by 70%–80%. A composting center, paper fuel plant, aluminum collection center, and a facility to recover metals from electronics, are located at the landfill site. Since wastes are not segregated at the source, MAWC must segregate wastes arriving at the landfill.

Waste Recycling

Various waste minimization initiatives are being implemented in Majuro to reduce the amount of wastes that enter the landfill. These include the promotion of reusable shopping bags, production of paper fuel briquettes, composting, collection of aluminum cans, shredding of used tires, collection of used lead acid batteries, and manual recovery of copper and metals. In fiscal year 2012, the MAWC sales were as follows:

Product	Sales (\$)
Compost	3,276
Paper fuel	114
Mixed metal and aluminum cans	50,040

3 SCS Engineers. 2010. *Prefeasibility Study: Waste-to-Energy Facility, Majuro, the Republic of the Marshall Islands*. Report produced for ADB.

4 Pacnews. 2014. Marshall Islands waste-to-energy proposal presented to cabinet. 10 January 2014. <http://www.pina.com.fj/index.php?p=pacnews&m=read&o=36122589852cf0b63a0e4d75509b22>

Medical Waste

Medical waste management poses a serious challenge in the Marshall Islands, with inappropriate treatment, inadequate facilities, and lack of training. In Majuro, the EPA ordered the main hospital to transfer the incinerator off the hospital compound due to foul emissions. The new location, which is close to the international airport, is also problematic, experiencing equipment breakdowns and producing a bad smell. In addition, transporting medical waste is problematic because there is no appropriately designed collection truck, and workers do not have adequate protective gear. A privately contracted company runs the collection and incineration of medical waste.

MAWC is the main authority for SWM in Majuro. It was established in 2007 with technical assistance support from ADB. The Ministry of Public Works is responsible for managing the MAWC contract. MAWC operations are overseen by its five board of directors, consisting of members from the Ministry of Public Works, Majuro Atoll Local Government, Marshall Islands Chamber of Commerce, Marshall Islands Visitors Authority, and Marshall Islands Conservation Society. The objective was to centralize waste management under a single authority to improve accountability and quality of service delivery. The semi-corporate entity of MAWC provides for flexibility in exercising its function as a public service provider, and in implementing waste-related legislations.

A national SWM committee was established in 2006 by the cabinet with the aim of developing a national SWM strategic plan. However, the plan has yet to be developed.

INSTITUTIONAL ASPECTS

The Environmental Protection Act 1984, and associated solid waste management (SWM) regulations approved in 1989, provides the legal and policy framework for the management of solid waste in the Marshall Islands. The EPA is responsible for setting and monitoring minimum standards for the design, construction, installation, operation, and management of solid waste storage, collection, and disposal facilities in the country. In addition to enforcing relevant regulations, the EPA is also engaged in several solid waste public awareness activities. The Public Health, Safety and Welfare Act also empowers the Ministry of Health to ensure that SWM practices do not pose risks to public health.

FINANCIAL ASPECTS

Under the Compact of Free Association with the United States, the Marshall Islands receives financial assistance. The Marshall Islands' Compact Trust Fund has a value of around \$165 million, which is used to finance a sizable proportion of the country's government budget of around \$95 million per year.



Recycling station

Photo by K. Serrona

MAWC receives an annual operating subsidy of \$325,000 annually from the national government. It also receives periodic grants for capital investments, such as new equipment. However, revenues are generally not sufficient to support the provision of effective waste collection and disposal services in Majuro.

MAWC derives operating revenues from commercial waste collection services and the sale of recyclable materials. It is reported that the default rate among commercial customers is around 10%–15%, while many businesses transport their wastes to the landfill, and do not use the MAWC collection services. In 2011, its operating revenues were \$96,237 compared with revenues of \$193,709 in 2010, as a result of the temporary closure of the landfill. Currently, residential customers do not pay for waste collection services. Similarly, tipping fees are not charged for the disposal of solid waste at the landfill. The majority of MAWC's expenses are for payroll costs, which account for 44% of total operating expenses.

A “green fee” was recently introduced, and is levied as departure tax of \$20. The revenues from the tax are reportedly used to support the improvement of SWM.

PUBLIC AWARENESS

The Marshall Islands Visitors Authority helps MAWC raise public awareness on improved SWM practices by distributing educational materials, making radio announcements, and organizing cleanups in different areas of Majuro. However, such programs have had limited impact. There is a need for improved community engagement, particularly the involvement of traditional leaders and landowners in tackling Majuro's solid waste challenges. Landowners carry significant influence with their tenants, and are in a strong position to discourage illegal dumping and burning of waste. The Marshall Islands Conservation Society also supports a range of public awareness activities in Majuro.

CONCLUSIONS AND RECOMMENDATIONS

For many decades, the Marshall Islands has struggled to effectively tackle its severe SWM issues despite significant external support provided by development partners. In particular, as a low-lying atoll with limited available land, Majuro faces the formidable challenge of developing appropriate measures for the disposal of its solid wastes, in a manner that does not contribute to the degradation of the surrounding environment.

WTE technologies may offer a viable solution to Majuro's waste disposal challenges, especially if operated under public-private partnership arrangements, where a private operator could provide needed financing and technical skills to operate the plant. The financial feasibility of any future WTE investment should take into account the current diesel-based electricity production costs, as well as costs avoided from having to develop a new solid waste disposal facility in Majuro. In addition, potential environmental impacts, such as ash and air emissions, have to be carefully considered.

Furthermore, improved waste collection services are needed to expand coverage to all households in Majuro. This could be supported with the introduction of a “user pays” system for households to improve cost recovery in service delivery. Also, to ensure that sufficient funds are available to support dumpsite operations, the introduction of a tipping fee should be considered. This would also encourage consumers to minimize and segregate their wastes before it enters the landfill. As the Marshall Islands looks to reduce its dependence on assistance provided by the United States under the Compact of Free Association, which will expire in 2023, it is important for MAWC to move away from its heavy reliance on subsidies.

MAWC could also consider the introduction of a container deposit scheme for aluminum and plastic beverage containers, similar to programs that are successfully operating in other parts of the North Pacific, such as Palau and Kosrae. While MAWC already segregates containers of this type from the waste stream for recycling, this requires significant personnel and contributes to increased operating costs. A container deposit scheme, which levies a tax on imported beverage containers, and allows consumers to redeem a portion of the deposit upon return of containers to designated collection points, has the potential to be self-financing. ■

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