



# Solid Waste Management in the Pacific Financial Arrangements

## INTRODUCTION

The quality and coverage of solid waste management (SWM) services are determined to a large extent by the amount of funding available for the collection, transport, disposal, and recycling of wastes.

Effective SWM requires adequate funds to cover a range of activities involving designing and building recycling centers, landfills, and other facilities; buying collection vehicles, compactors, and other equipment; operating SWM services, including paying for fuel and staff salaries; training staff; and assessing needs, monitoring services, and other planning and administration tasks. The budgetary requirements for SWM are substantial, and have been estimated to account for 20%–50% of municipal expenditures.<sup>1</sup>

In the Pacific, volumes of solid waste have been growing in line with rising living standards, but available financing has not kept pace with needs.

## CHALLENGES

While SWM services have improved, several challenges remain:

1. Most improvements have been supported by external funding, which is unreliable and unsustainable in the long run.
2. The other major source of funding from government subsidies is contrary to international best practice.

3. In the smaller Pacific island countries, urban populations may be too low for waste accumulation rates to make recycling commercially viable.
4. With the exception of scrap metals, high transport costs make recycling even less viable.
5. Few island countries in the Pacific use full cost accounting methods to assess the costs of solid waste management activities including collection, transportation, disposal, and recycling. Without detailed information on each of these services, it is difficult to estimate the level of resources required to cover the full costs of SWM operations.

## WEIGHING THE COSTS OF IN ACTION

The cost of effective SWM must be weighed against the adverse impact of inadequate SWM in terms of poor health, environmental degradation, and revenue loss from decreased tourism. Many Pacific island countries are heavily reliant on tourism. For example, tourism accounts for 65% of the Cook Islands' gross domestic product (GDP), and 50% of Palau's GDP.<sup>2</sup> The clean and natural environment is an important reason why tourists choose to travel to the Pacific islands, and inadequate management of solid wastes could adversely affect this important industry.

Effective and efficient use of limited funds available for SWM is thus vital. Waste avoidance is the best means of achieving cost savings through reduced collection, transport, and disposal costs. Addressing institutional inefficiencies, such as overlapping functions and responsibilities among government institutions, can also result in cost savings.

<sup>1</sup> S. Cointreau. 2005. Conceptual Note on Financing Solid Waste.

<sup>2</sup> ADB estimates; International Monetary Fund (IMF). 2012. *Republic of Palau: 2012 Article IV Consultation—Staff Report*. Washington, DC.

## IMPROVING FINANCIAL SUSTAINABILITY

SWM activities are generally financed by one or more of the following sources:

- intergovernmental transfers or subsidies;
- external development assistance;
- local taxes, e.g., property tax;
- user charges; and
- environmental fees.

Other means of financing SWM investments include commercial debt and private sector financing. However, these are less suitable for Pacific island countries because of weak institutional capacity, lack of transparency in accounting systems, and limited revenue streams.

There is widespread dependence on government subsidies and external development assistance in the Pacific. However, best practice dictates that whenever possible, “user pays” principle should apply so that those who generate solid waste are charged directly for the SWM services that they use.

### National Government Subsidies

Many SWM authorities in the Pacific are partially or wholly reliant on fund transfers from the central government to support their services. However, these subsidies are generally insufficient to finance adequate services. In many countries, this is due to limited revenue base, which means that many sectors compete for limited budgetary resources. SWM is given lower priority in the use of the national budget compared with other services, such as health and education.

There are a number of disadvantages of relying on subsidies to fund recurrent SWM costs. Funding allocations may not be reliable, and may vary from year to year depending on the size of national government budgets and spending priorities. It is difficult to plan and manage SWM operations when the relevant authorities cannot project whether there will be sufficient funds to cover required expenditures from year to year.

The chain of accountability is also weakened when central governments fund SWM services indirectly with revenues raised through income tax payments, compared with direct user charges or indirect local taxes. When SWM providers are not directly reliant on service users for funding, it is more difficult for households and businesses to hold providers accountable for the quality of service that they receive. The link between allocation of funds and actual service delivery is less transparent with government transfers, making it more difficult to ensure that SWM authorities provide value for money. There is also limited

use of performance-based budgeting or monitoring in Pacific island countries to ensure that transfers are used efficiently and effectively, reducing the incentive to improve service quality and coverage.

### External Development Assistance

Many Pacific island countries are heavily reliant on external development assistance to fund investments in SWM, particularly large capital investments in disposal facilities and equipment. Given limited revenue base, and competing development priorities, external assistance can play an important role in financing the SWM sector.

Like government subsidies, external funding is generally more suitable for funding capital investments rather than recurrent expenditures. Development assistance is generally project-based, which means that it is only provided for a limited duration and cannot be relied upon to cover ongoing costs incurred over the medium to long term.

However, while aid effectiveness principles promote the use of country systems and planning processes, external assistance may not always be in line with national SWM strategies and priorities, and countries may have less control over the way funds are spent. Financing may be tied to technologies and standards that are not always appropriate to the local context; and developing member countries in the Pacific may not either have the financial capacity to fund ongoing expenditures, or the required operation and maintenance capacity. For example, compactor trucks are commonly used in developed countries for the collection of solid waste. In developing countries, where wastes are largely high-density organic, the use of compactor trucks is less appropriate; and compaction trucks are also very expensive to maintain and require skilled technicians.

At the same time, limited availability of land, may heavy reliance on tourism, and environmental fragility may call for more costly but more environment-friendly SWM beyond the financial capacity of developing countries in the Pacific. For example, where limited funding is available, a country may opt to dispose of solid waste using open dumps rather than more expensive landfills. However, leachate pollution from open dumping can result in the contamination of soil and groundwater; and sensitive coastal environments, such as mangrove swamps.

External development assistance can support investments to improve environmental management. For example, carbon financing can provide funds to make investments in SWM viable, such as investments in upgrading solid waste disposal facilities to reduce methane gas emissions.

### Box 1: SWM Charges as Part of Local Taxes

#### PORT VILA, VANUATU

Port Vila Municipality Council (PVMC) charges a waste collection fee to cover the cost of collection services. While waste collection is scheduled twice a week, actual collection schedules are not always maintained. An itemized invoice for property taxes and solid waste collection is sent every 6 months to registered household, government, and commercial properties within Port Vila Municipality (PVM). The standard rate for waste collection is 7,500 vatu (\$81.63) every 6 months (corresponding to a fee of \$13.61 per month). The rate is the same for all household, government, and commercial properties regardless of the amount of waste collected, except that hotels are usually billed as multiple units.

The key concerns are the following:

**Invoicing small percentage of properties.** Only a small percentage of registered properties in PVM are invoiced. There are about 3,000 households and 1,000 government and commercial properties on PVMC's register—of which, about 60% (2,400 properties) are said to pay their invoices. However, census data indicate that there are around 10,300 households in PVM. It is further estimated that there are at least 1,000 additional unregistered commercial and government properties. As a result, only a small proportion of households in PVM are paying the waste collection fee. This gross underfunding of solid waste management has contributed to the poor reliability of collections services.

**Low collection efficiency and resulting arrears.** For approximately 4,000 registered properties, 40% of leaseholders that receive invoices carry arrears for uncollected property taxes and waste collection fees for as far back as 10–12 years ago. Arrears are estimated to be around 400 million vatu (\$4.4 million). To-date, PVMC has made little effort to collect arrears in either property taxes or waste collection fees. However, there are plans to hire private collection agent to improve invoice payment rates.

**No distinction between payers and nonpayers.** PVMC's waste collection service does not make a distinction between properties that have paid their collection fees and those that have not—trucks pick up all rubbish that is set out for collection. As a result, leaseholders (i) have little incentive to pay their collection fees, and (ii) justify their failure to pay both the waste collection fees and property taxes for reason of poor collection service.

Some initiatives to the problem of arrears in waste collection fees were tried, but have been unsuccessful. First, PVMC attempted spray painting "X" on properties that had paid their waste collection fees, and collected waste only from those properties. According to staff, this solution was abandoned since their neighbors put garbage for collection in front of properties that had X marks only. Second, only solid waste in yellow bags were to be collected. This system was piloted for 3 months, after which it was abandoned because of complaints that the fees for the plastic bags were too high, and that the cost of the bags duplicated fees that still appeared on property tax invoices. Many leaseholders refused to buy the plastic bags. ■

#### Local Taxes

Local taxes, such as property taxes, are the most commonly used source of SWM financing by local authorities, including municipal councils, around the world. Taxes may be in the form of a flat SWM charge that is billed together with the property taxes. For example, the Port Vila Municipal Council levies SWM charges that are billed together with property taxes. Alternatively, property taxes based on the value of a property can be collected to fund all municipal expenses including those associated with SWM. Some municipalities, such as the Suva City Council, use both a flat SWM charge and property taxes to fund SWM activities. A specific SWM charge has the advantage of greater transparency since

property owners are able to determine exactly the amount they pay for the SWM services that they receive.

Compared with national government funding, financed through income taxes, local taxes promote greater accountability. Users can weigh the quality of service they receive against the amount they pay for it.

However, raising local taxes can be administratively complex and requires capacity. Local authorities must have a system for appraising property values as basis for determining the appropriate local taxation rates, and billing and collection systems in place.

### Box 2: Kiribati Pay per Bag Initiatives

#### KIRIBATI GREEN BAG INITIATIVE

The “green bag” collection concept was introduced in 2004 by International Waters of the Pacific Small Island Developing States, Kiribati (IWPK). Early results were very encouraging but, for reasons not connected to the system design, the green bag scheme was soon discontinued. Under the New Zealand-supported Urban Development Project, the scheme was re-introduced in 2012, building on the public’s familiarity with the green bag from the earlier project.

The green bag scheme aims to put in place a prepaid household garbage collection system. The green bag, containing the garbage, is placed in the street for collection. The bag’s purchase price covers the cost of collection. The scheme is a simple, low cost, low tech initiative. Under this scheme, households buy green bags at \$0.20 (around \$0.18) a bag to dispose of their nonorganic waste. Private contractors collect the green bags from households, with the revenue from the sale of the bags paying for the cost of hiring the contractors. However, a concern is that the town councils are still charged with the collection of all other wastes. Thus, two parties are now collecting waste, which is very inefficient.

This first phase of the scheme is largely a “price discovery” process to determine the real cost of waste collection in South Tarawa, the capital of Kiribati, where the project is being implemented. The current schedule provides for a visit by a compacting collection truck to all accessible households in South Tarawa weekly. The truck only picks up household wastes that are put out in green bags. A significant aspect of this scheme is that those households that have more waste pay more to have it collected; thus, the approach is highly efficient and fair. Unfortunately, only a few households participate, and only those that buy the bags benefit from the service. It is envisaged that the scheme will be fully managed by a private operator in the future.

To achieve full cost recovery, it is estimated that the cost of a green bag will need to increase to A\$0.40 (around \$0.36). ■

Raising revenues from local taxes may not be possible in Pacific urban settings where large tracts of customary land fall within municipal boundaries, or where there exist large informal settlements. In cities, like Port Moresby in Papua New Guinea, where a significant proportion of the population lives in unplanned settlements, many of the residents do not have registered properties and are not provided with municipal services. The case of Port Vila (Box 1) highlights some key challenges in implementing a local SWM tax system. Another challenge is that while costs of SWM service provision may increase annually, local tax rates tend to rise less often, which may result in insufficient revenues. Charges do not usually reflect the full cost of SWM service delivery, and are not regularly revised to factor in inflation. Further, local taxes are not linked to solid waste generation rates, providing little incentive for households to reduce solid waste.

A study of 15 cities in Pacific developing member countries shows that only six of them have introduced household levies or fees to cover the costs of waste collection

and disposal.<sup>3</sup> In some cases, the enabling by-laws, which would allow local authorities to charge fees, are not in place (footnote 2). In Timor-Leste, for example, there is no legal provision by which a local authority can charge user fee for SWM services.

Even where user charges are levied, low rates and poor collection efficiency, ranging from 20% to 50%, affect revenues, and limit financial sustainability. As a result, the majority of local authorities in the region have substantial arrears. Collection efficiency for user charges was found to be higher in cities where penalties are imposed for nonpayment, such as in Lae, Papua New Guinea; or in cases where SWM charges are billed together with water, as is being tried out in Nuku’alofa, Tonga.

#### Environmental Fees

Environmental or “green” fees are another means of financing SWM, particularly in countries that receive a high number of tourists, who directly enjoy the benefits of a clean, waste-free environment. Several Pacific island countries,

<sup>3</sup> The 15 urban areas surveyed were: Apia, Dili, Funafuti, Gizo, Honiara, Koror, Kosrae, Majuro, Nuku’alofa, Pohnpei, Port Moresby, Port Vila, Rarotonga, South Tarawa, Suva, and Yaren.

such as the Cook Islands, the Marshall Islands, and Palau, levy green fees as part of airport departure taxes. In the Marshall Islands, the recently introduced fee is intended specifically to finance SWM activities.

Those who pay green fees are direct beneficiaries of a clean environment. However, the fee is not in line with the “polluter pays” principle, since those who generate solid waste are not taxed. Therefore, fees are inadequate to encourage behavioral change among users, unless revenues are invested in public awareness activities that promote solid waste minimization.

Another challenge is that the responsible authorities may not have full control over revenues generated from green fees, such as when revenues are paid directly into the government’s general funds. For example, a portion of the airport departure tax in the Cook Islands is earmarked for SWM. However, funds remitted to the general fund are difficult to track and use specifically for SWM.

### User Charges

User charges are volume-based fees paid by households, businesses, and industries in exchange for the provision of SWM services. User charges support the “polluter pays” principle based on “pay as you throw,” which ensures that those who generate waste bear the full cost of its collection, treatment, and disposal. This encourages waste minimization, since user charges are directly linked to the volume of waste generated. The user charges include collection and tipping fees. A tipping fee is the charge levied on the quantity of waste received at a collection or processing facility, such as a landfill.

Collection charges, such as the “pay by bag” scheme, are popular in countries, such as Japan and New Zealand; and have been introduced in Pacific island countries, like

in Kiribati (Box 2). This system was also attempted in Port Vila, Vanuatu, but cancelled after a trial period. Under this system, users must buy garbage bags for a fee that is intended to cover SWM collection and disposal costs.

Tipping fees are levied on commercial and industrial customers in a number of Pacific towns including Rarotonga (Cook Islands), Suva (Fiji), Port Moresby (Papua New Guinea), Apia (Samoa), and Port Vila (Vanuatu) to cover the costs of solid waste disposal.

However, in practice, it is not always possible to fully recover costs through a user fee system for SWM. Where affordability is an issue, such as in low-income settlement areas, subsidies for basic service delivery may be justified on environmental and public health grounds. It may not be possible to introduce full cost recovery charges where willingness to pay is low and enforcement is weak. Residents may instead opt to illegally dump or burn their rubbish rather than pay fees. Also, households may be willing to pay the full costs of solid waste collection. On the other hand, they may be less willing to pay the costs of disposal, where broader health and environmental benefits are not felt directly by the households.

In deposit refund schemes, the consumer pays a part of the cost of recycling. Container deposit schemes are popular means of covering the costs associated with the collection and recycling of plastic bottles, aluminum cans, and lead acid batteries in Kiribati, Kosrae in the Federated States of Micronesia, and Palau (Box 3). In Kiribati, an import fee of A\$0.05 is levied on bottles and cans, and A\$0.04 can be redeemed by individuals when they return these items to a licensed operator. The remaining A\$0.01 goes to the operator as handling fee. Private, licensed operators recoup their costs and make a small profit by exporting the crushed containers for recycling.

### Box 3: Container Deposit Legislation

Palau has successfully implemented a beverage container recycling program. The collection rate is nearly 98% and removes 8% of all aluminum cans from the waste stream, leading to savings of \$12,000 from the operation of the M-dock landfill. The impetus for Koror state’s recycling program was the passage of the Recycling Act of 2006, which established a beverage container deposit fee for containers 946 milliliters or less. The program imposes a fee of \$0.10 for each imported beverage container, of which \$0.05 go to the customer for each can that is redeemed, \$0.025 to the Koror state government, and another \$0.025 to the national government for administrative costs. As the tax collection is fully in place, the recycling program is financed through a dedicated recycling fund. The system of refund to the customers started in October 2011. The recycling fund is now sufficient to make the recycling program self-sustaining. The containers are shipped to Taipei, China for recycling. ■

### Summary Financial Arrangements for Solid Waste Management in Pacific Developing Member Countries

Name of Country	Urban Area	Sector Financing (Budgetary Process)	Current System of Solid Waste Management Charges for General Municipal Solid Waste
Cook Islands	Rarotonga	Revenue to support solid waste management (SWM) operations comes from tipping fees at the landfill for nongovernment vehicles, as well as from government budget allocations and aid contributions.	<p>There is no “user pays” system for waste collection.</p> <p>Commercial waste haulers and self haulers pay a landfill tipping fee based on the size of the vehicle. The fee is equivalent to around 67 New Zealand dollars (NZ\$) (around \$55) per ton of waste for a pickup truck.</p> <p>NZ\$5.00 of each airport departure tax is supposed to go to environmental protection and conservation, and NZ\$3.50 of that amount for SWM, but the funds go into the general fund.</p>
Fiji	Suva	Municipal councils have the power to levy rates to fund operating and capital costs. Government helps local bodies with technical services, town planning, grants, and loans.	<p>In Suva, the general rates are 0.025 per F\$1.00 (around \$0.54) and special rates are 0.015 per F\$1.00 (\$0.54) multiplied by the improved value of a property. Households and businesses are also charged a collection fee of F\$28.15 (around \$15) per year per garbage bin. In addition, there are commercial waste haulers who charge users based on mutually agreed terms and conditions.</p> <p>The regional landfill at Naboro operated by a private company collects weight-based charges of F\$26 per ton for municipal solid waste (MSW) and green waste; and F\$46 per ton for special waste, which includes expired drugs, asbestos, fish waste, and government documents.</p>
Kiribati	South Tarawa	<p>Budget estimates are compiled every year by the National Economic Planning Office of the Ministry of Finance and Economic Development.</p> <p>The central government provides funding while local authorities take responsibility for day-to-day management.</p> <p>There is significant donor funding, especially for landfill activities.</p>	Councils levy service charges for solid wastes ranging from A\$29 (around \$26) per year for households to A\$650 (Around 592) per year for commercial extensions. Under the green bag system, the purchase price of garbage bags is A\$0.20 (\$0.18) per bag. Recovery of these charges is very low—only about 25% of the billed properties pay the charges.
Marshall Islands	Majuro	There are two sources of finance: local revenues and funds from the United States (US) government. In addition, there are general fund allowances for Ebeye. In total, about 60% of Ebeye’s finances is sourced from the US while the rest come from the national government. Certain SWM activities also fall under the responsibility of the Marshall Island Visitors Bureau.	There is no user fee for households. Majuro imposes user fees for commercial establishments only.
Federated States of Micronesia	Kosrae	The financial system of the Federated States of Micronesia relies on the funds from the Compact of Free Association (CFA) with the US and government budget. In Kosrae, about 80% funds come from US aid, and only 20% are locally sourced, such as taxes from imports and exports. Funds for solid waste management come mainly from the CFA.	User fees are selectively imposed in Kosrae. Household fees from \$12 to \$13 per month.
	Pohnpei		Private waste collection service in Pohnpei collects fees, from only 30 households. The charges vary from \$40 to \$70 per month depending on the size of the bin and the frequency of collection.

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Name of Country	Urban Area	Sector Financing (Budgetary Process)	Current System of Solid Waste Management Charges for General Municipal Solid Waste
Nauru	Yaren	<p>The budget is released prior to the beginning of the financial year, which runs from 1 July to 30 June.</p> <p>Separate accounts for government revenues and expenditures, and donor-funded programs, are in place.</p> <p>In 2012–2013, the government introduced the Annual Operational Plan as an integral part of the budget process. This captures financial and descriptive update on the progress and status of ongoing activities and future projects.</p>	Some revenues from selling of wheelie bins, hiring of skip bins, tree felling, and disposal of scrap metals are generated. Households are provided with collection services free of charge.
Palau	Koror	Palau depends heavily on tourism revenues and funding assistance from the US government. Budget for solid waste in Palau comes partly from CFA funds and revenues from the tax collection of beverage containers.	There is no user fee imposed on residents and businesses for disposing of waste into the M-dock landfill.
Papua New Guinea	Port Moresby	The National Capital District Commission funds the city's municipal SWM services as part of its annual budget through internal revenue sources, such as land tax, licensing fees, and SWM tariffs. The national government does not provide funding for the city's SWM sector.	<p>SWM tariffs are established for residential areas at a rate of K33.00 (around \$12) per month for an 80-liter volume waste storage bin, paid quarterly. Tariff collection efficiencies are reportedly low. Only residents on titled properties pay SWM tariffs in conjunction with their annual land rates.</p> <p>A tipping fee is established at the Baruni dumpsite at K52.00 (around \$19) per truck, although the collection efficiency of the fees is reported as low.</p>
Samoa	Apia	Funding is provided directly from the central government budget, and household tariffs are neither implemented nor planned.	<p>There is no “user pays” system for waste collection for the households.</p> <p>Commercial and institutionally generated municipal solid waste (MSW) is collected and transferred by private sector operators under individually negotiated arrangements between generators and haulers. All commercial and institutional MSW entering the Tafaigata landfill is subject to tipping fees.</p>
Solomon Islands	Honiara	<p>There is little or no budget at the national, provincial, or city level earmarked specifically for SWM. But whatever small amount is budgeted for SWM can be diverted to other purposes.</p> <p>Operating budgets are small and can change dramatically and unpredictably from year to year, and are exhausted by midyear. There are no funds designated for maintenance or repair of the compactor trucks in Honiara.</p> <p>The Honiara City Council (HCC) also operates a commercial collection service that competes with private-sector operators, and it uses the revenue to help defray costs.</p>	<p>HCC does not receive direct payments from users for solid waste collection</p> <p>Fees are charged to commercial enterprises and market vendors.</p>

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Name of Country	Urban Area	Sector Financing (Budgetary Process)	Current System of Solid Waste Management Charges for General Municipal Solid Waste
Timor-Leste	Dili	<p>The Ministry of Finance is the central body of the government responsible for annual planning and monitoring, budget, and finance.</p> <p>For district administrations, this process is carried out by the Ministry of State Administration based on inputs from the National Director, Local Administration. All expenses for remuneration, capital, and operating expenses for SWM services are budgeted.</p> <p>The district administration is responsible for a wide range of services on a day-to-day basis, while the national government provides funding.</p>	<p>There is no “user pays” system for waste collection in Dili.</p> <p>Commercial waste haulers charge users based on mutually agreed terms and conditions.</p>
Tonga	Tongatapu	<p>Funding for the SWM sector on Tongatapu is through consumer tariffs paid directly to the Waste Authority Limited (WAL). In addition, until recently, WAL received a direct government subsidy for its operations of 0.5 million pa'nga (T\$) annually.</p>	<p>The existing household tariff is T\$10.00 (approximately \$5.75) per month. There are three tariff tiers for commercial waste: small generators (T\$17.00 per month), medium sized generators (T\$25.00 per month), and large generators, such as markets and hospitals (T\$128.00 per month).</p> <p>There are also landfill tipping fees for waste and septic sludge.</p>
Tuvalu	Funafuti	<p>The government makes allocations for waste management under the national budget to support operations, including other SWM activities, of the Solid Waste Agency of Tuvalu.</p>	<p>The Funafuti, Kaupule charges an annual fee of A\$40 (around \$36) for households, and between A\$110–A\$410 (\$99–\$369) for commercial enterprises to cover the costs of providing solid waste collection services. The Waste Operations Services Act 2009 provides for the option to impose Waste Management Levy on imported goods, and to collect a separate consumer tax earmarked for waste services.</p>
Vanuatu	Port Vila	<p>The national budget does not allocate funds for waste management. All funding for the Port Vila Municipality (PVM) comes from the PVM Council. The immediate sources of funds are tipping fees collected at Bouffa, and waste collection fees that the council invoices twice yearly to lessees together with the property taxes.</p>	<p>A waste collection fee of Vt7,500 (\$81.63) every 6 months is charged to a small percentage of properties in PVM.</p> <p>Council collection trucks do not pay gate fees at Bouffa dumpsite. For commercial and self-haul trucks, gate fees average \$30 per ton.</p>

Sources: Leney, A. 2012. Status of New Zealand/Kiribati SWM activities and Outlook for ADB Regional Waste Project. July; New Zealand Urban Development Project. 2011. Implementing a Pre-Paid Garbage Bag Collection System for South Tarawa. Activity Design Document, New Zealand International Development Group, South Tarawa Urban Development Programme, Solid Waste Management Sector. October; Pacific Infrastructure Advisory Center (PIAC). 2012. South Tarawa Program for Improved Water, Sanitation and Solid Waste Management. Report on Monitoring Mission, Pacific Region Infrastructure Facility, PIAC. May.

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