

National Waste Management Strategy 2019-2023



National Waste Management Strategy
(2019-2023)

Ministry of Natural Resources and Environment

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Acronyms

AG	Attorney General
CDL	Container Deposit Legislation
CHWM	Chemical and Hazardous Waste Management
EPC	Electric Power Corporation
JICA	Japan International Cooperation Agency
LTA	Land Transport Authority
MAF	Ministry of Agriculture & Fisheries
MCIL	Ministry of Commerce Industry & Labour
MESC	Ministry of Education Sports & Culture
MFAT	Ministry of Foreign Affairs & Trade
MfR	Ministry for Revenue
MJCA	Ministry of Justice & Courts Administration
MNRE	Ministry of Natural Resources and Environment
MOF	Ministry of Finance
MOH	Ministry of Health
MOP	Ministry of Police
MPE	Ministry of Public Enterprises
MPMC	Ministry of the Prime Minister & Cabinet
MWCSD	Ministry of Women Community & Social Development
MWTI	Ministry of Works & Transport & Infrastructure
NHS	National Health Services
NUS	National University of Samoa
NWMS	National Waste Management Strategy
POPs	Persistent Organic Pollutants
PSC	Public Service Commission
SAA	Samoa Airport Authority
SBS	Samoa Bureau of Statistics
SCC	Samoa Chamber of Commerce
SFESA	Samoa Fire Emergency Services Authority
SLC	Samoa Land Corporation
SPA	Samoa Port Authority
SPREP	Secretariat of the Pacific Regional Environment Programme
SROS	Scientific Research Organization of Samoa
SRWMA	Samoa Recycling & Waste Management Association
SSC	Samoa Shipping Corporation
STA	Samoa Tourism Authority
SUNGO	Samoa Umbrella of Non-Governmental Organization
SWA	Samoa Water Authority
SWM	Solid Waste Management
USP	University of South Pacific / Alafua

Foreword



The formulation of the National Waste Management Strategy of Samoa is one of mandates under Waste Management Act 2010 and also triggered by the need to respond to significant changes in the waste sector in the Pacific Region and globally. In particular, the changing consumption pattern in the last ten years saw the proliferation of more wasteful imported products. With current constraints on land space, resources, inadequacy in institutional and human capacity, the increased generation of wastes becomes very challenging.

The sustained proper management of wastes will rely on a roadmap to guide the government and relevant stakeholders in delivering desired outcomes, by way of an endorsed strategy and its implementation. This National Waste Management Strategy will be a milestone for Samoa being the first to be endorsed. Through this Strategy, the Government of Samoa can facilitate approaches that minimizes the volume of wastes generated in the islands and diverting more wastes away from disposal sites with very limited capacity. This Strategy will also explore every possible opportunity to reduce, re-use and recycle waste materials to reduce operational costs and health/environmental impacts. Apart from this, resilience strategies through proper waste management can also contribute to addressing global issues such as resource depletion and climate change.

The Strategy also considers the National obligations in the SDGs Goal 11.6 specifically and the SDS which again in line with the current National Environment Sector Plan (NESP).

I would like to convey my sincere gratitude and appreciation with the continuous assistance and partnership with JICA through the Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries Phase II (J-PRISM II) and the tireless assistance by SPREP in assisting Samoa in the Waste Management and thus the development of this National document to guide the sound and environmentally friendly management of wastes in Samoa.

Just a kind reminder to us all; “Waste Management is Everyone’s’ Responsibility.

Thank you,

A handwritten signature in black ink that reads "Fiame N. Mataafa". The signature is written in a cursive style.

Hon. Fiame Naomi Mataafa

Deputy Prime Minister and Minister for MNRE.

About the document

This document consist 4 parts as follows,

Part 1 Executive Summary

- Part 1 summarizes the key contents of strategy for quick reference.

Part 2 Strategy Context

- Part 2 provides context for the development of the National Waste Management Strategy and summarizes the institutional mechanisms governing the management of wastes in the country as well as the issues and challenges faced in the delivery of waste services. It also highlights current efforts in waste management and resource recovery and presents the drivers for change based on issues besetting the waste management.

Part 3 Strategy

- Part 3 presents the strategic actions which will define the direction Samoa has to take to address the key issues presented in Part 2.

Part 4 Annex

- Part 4 provides detail information regarding contents in this document and references.

Part 1 Executive Summary

1 Introduction

Improvement of waste management is a key environmental issue in Samoa and it is one of the global issues as well. Prior to the formulation of National Waste Management Strategy, “Cleaner Pacific 2025” which is waste management strategy for pacific region, was developed and addressed key waste issues and countermeasures at the regional level with action plan for 2016-2025 (SPREP, 2014). On the other hand, Samoan government addressed waste management in the Strategy for the Development of Samoa (SDS) 2016/17 - 2019/20 under priority area 4 Environment, which also refers relevant Sustainable Development Goals (MOF, 2016). National Environment Sector Plan (NESP) 2017-2021 (MNRE, 2017) also addressed waste management under “Sustainable and Resilient Built Environment”.

Formulation of National Waste Management Strategy (NWMS) is also required under the Waste Management Act 2010 (MNRE, 2010). The act addresses 17 Functions of MNRE and the formulation of the NWMS is one of these functions. This strategy will guide the waste management of Samoa for the period of 2019 to 2023 based on the baseline data collected through several surveys and outcomes of series of discussions amongst stakeholders in broad aspects of waste management in Samoa. The NWMS will be revised in 2023 based on review of progress.

Considering the alignment and context mentioned above, as well as comments collected through consultation in the process of the formulation, National Waste Management Strategy (2019-2023) has been developed as integrated waste management strategy which targets both solid wastes and chemical and hazardous wastes to address priority actions to be taken for the next 5 years from 2019.

2 Scope of the NWMS

The NWMS has been developed by covering solid waste and chemical and hazardous waste. Solid waste which includes general waste generated from households and businesses, while chemical and hazardous waste is a substance or matter which is toxic or poisonous or may cause injury or damage to human health or the environment as well as those items specified under international conventions.

Solid Waste

- General waste generated from households and businesses
(Ex; paper, cardboard, kitchen waste, green waste, aluminum can, steel can, plastic paper, plastic bag, PET bottle, diaper, textile, rubber, glass and bulky waste and etc.)

Chemical and Hazardous Waste

- Substance or matter which are toxic or poisonous which may cause injury or damage to human health or the environment
(Ex; E-waste, waste oil, battery, healthcare waste, Asbestos, POPs and etc.)

Figure 1-1 Definition of waste in the strategy

3 Strategy

3.1 Vision

Clean and Healthy Samoa

3.2 Mission

Collaboration with every citizen through participatory approach and commitment to waste management

3.3 Guiding Principles

- Reduce, Reuse, Recycle, Return
- Polluter pays principle
- Public consultation and participation
- Sound decision making
- Selection of appropriate and affordable technology
- Public-private partnership

3.4 Priority areas

A: Enhance environmental awareness of the public on waste related issues and the countermeasures

B: Strengthen operational planning on SWM

C: Implement regular survey for Basic SWM data collection

D: Study Feasibility of future SWM options

E: Establish efficient monitoring system on SWM operation

F: Strengthen legal framework and enforcement

G: Improve capacity of officials related to SWM

H: Improve Chemical and Hazardous Waste Management

3.5 Top Priority Activities

Based on the consultation process of formulating NWMS, following activities are addressed as top priority activities.

Solid Waste Management

- Promote 3R (Reduce campaign / On site compost / Off site compost / Aluminium can collection)
- Implement clean school program in regards to proper waste treatment and 3R for primary level
- Implement landfill survey (Capacity, daily report, water quality test for both in Tafaigata, Savaii)
- Develop landfill operation plan for Tafaigata Landfill and Vaiaata Landfill
- Implement feasibility study on financial option (User Pay System / CDL)
- Establish rubbish collection monitoring system
- Enforce regulation on plastic ban

Chemical and Hazardous Waste Management

- Strengthening of National Governance of Chemicals
- Increased awareness of chemical hazards
- Enhanced and Improved Chemical Legislation
- Sustainable Management of Chemicals during their Lifecycle

3.6 Monitoring Framework (Indicators)

The following tables show indicators' baseline as of 2017 and those target goals for 2023 which are planned to be achieved through implementation of action plan in the NWMS. The progress and achievement of the NWMS are measured not only by monitoring implementation of activities in the action plan but also the changes in the value of indicators during 5 years by 2023.

3.6.1 Solid Waste Management Indicators

No.	Indicator	Baseline as of 2017	Forecast in 2023 (Without strategic actions)	Target by 2023 (With strategic actions)
1	Household waste discharged amount (g/person/day)	387	394	367
2	Organic waste in discharged waste from household (g/person/day)	165	168	140
3	Recycling ratio of aluminum cans from household in Upolu (%)	44	44	61
4	Collection coverage for household in Upolu by amount (%)	38	39	61
5	Collection coverage for Upolu by track (%)	61	61	80
6	Ratio of unmanaged waste in Upolu (%)	58	58	47
7	Ratio of SWM revenue in cost (%)	3	3	5
8	Newly available or updated performance Indicator during 2018-2023	0	0	8
9	Number of legal framework developed or enhance enforcement during 2018-2023	0	0	5
10	Number of accident at landfill	2	2	0
11	Number of complaints for waste collection service	100	100	50
12	Ratio of plastics in discharged waste from household (%)	16	16	8
13	Number of Schools involved in clean school program	0	0	10

3.6.2 Chemical and Hazardous Waste Management Indicators

No.	Indicator	Baseline as of 2017	Forecast in 2023 (Without strategic actions)	Target by 2023 (With strategic actions)
1	Number of New Inventories Identified	0	0	2
2	Number of awareness programs conducted for CHWM	6	10	20
3	Number of regulating tools developed	0	0	2
4	Number of minimization programs conducted	0	0	4

Part 2 Strategy Context

1 General Background

1.1 Geographic features and location

The Independent State of Samoa is situated in the south of equator, approximately 1,800 miles away from New Zealand and 80 miles away from American Samoa. The Independent State of Samoa consists of two main islands, Savaii and Upolu, with eight smaller islands Apolima, Manono, Fanuatapu, Namu'a, Nu'utele, Nu'ulua, Nu'uolopa, and Nu'usafe'e. The total land area is 2830 square km. (SBS, 2018).

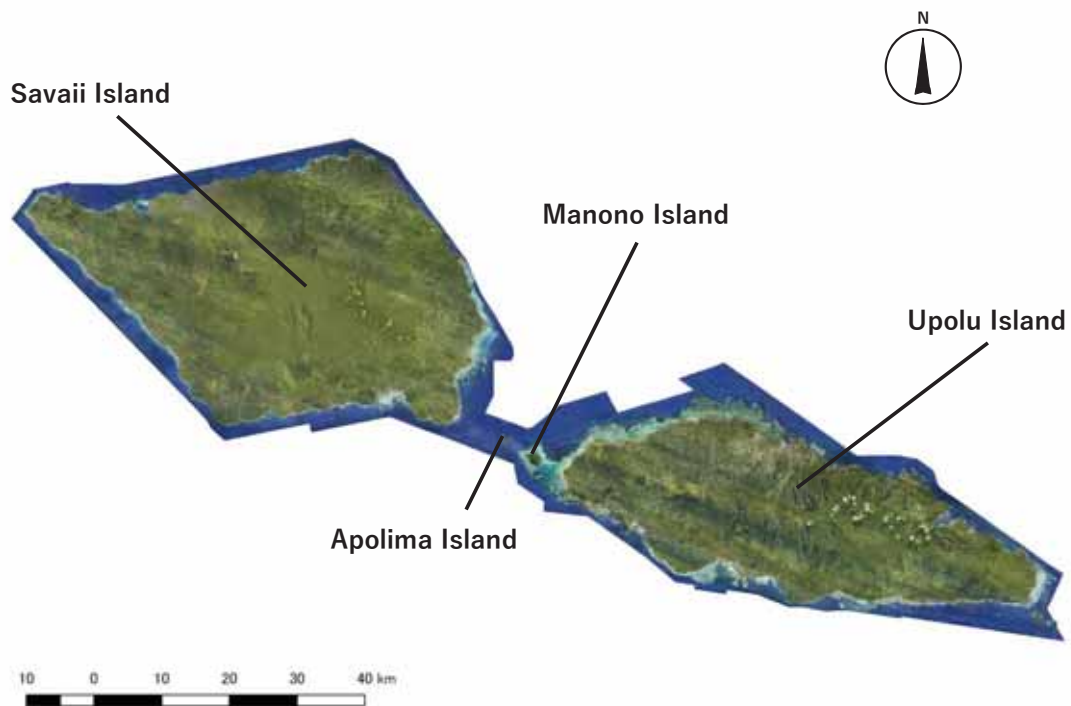


Figure 2-1 Map of Samoa

Samoa is rich in nature resources and 60 percent of area is forested as of 2009 (FAO, 2009). Both of main islands have relatively mountainous landscape with symbolic mountains, the Mount Fito (1,110m) in Upolu Island and the Mount Silisili (1,848m) in Savaii Island. While most of the settlements are concentrated along the narrow flat land along coastal line for both of main islands. Road network is developed on both islands connecting all villages.

Samoa has a tropical climate with distinction dry season (May-Oct) and wet season (June-Sep). The average temperature is 26-27 degree Celsius throughout the year (MNRE, 2016). Occasionally, tropical cyclone strikes the nation and causes serious impacts on SWM.

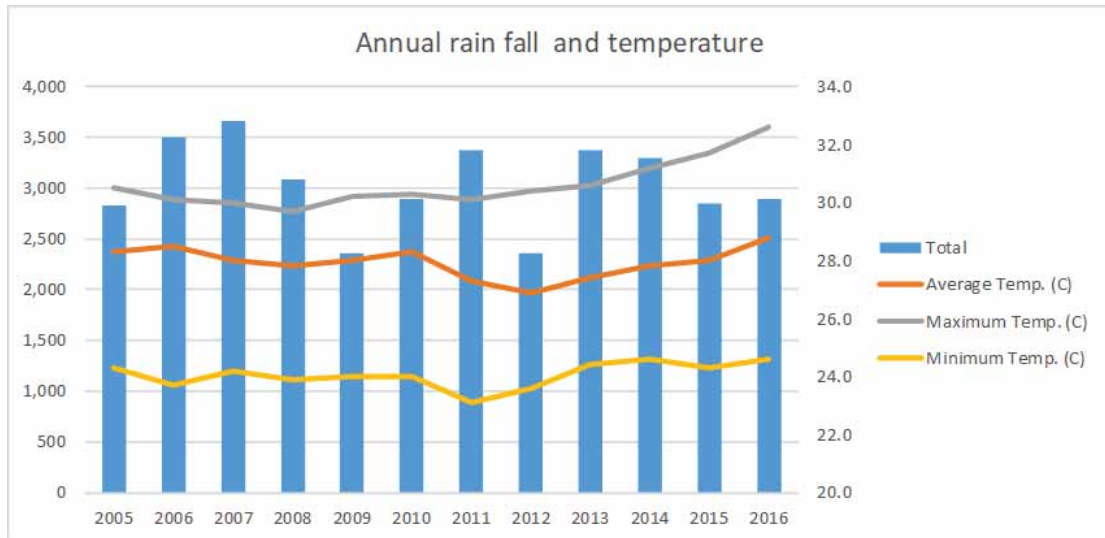


Figure 2-2 Rainfall and temperature

1.2 Population

According to the national census (SBS, 2017), the population as of 2016 is 151,364 in Upolu, 884 in Manono, 96 in Apolima and 43,499 in Savaii with a total population of 195,843. The total population in 2023 is estimated to be 207,075 with the annual population growth rate of 1,605 persons/year.

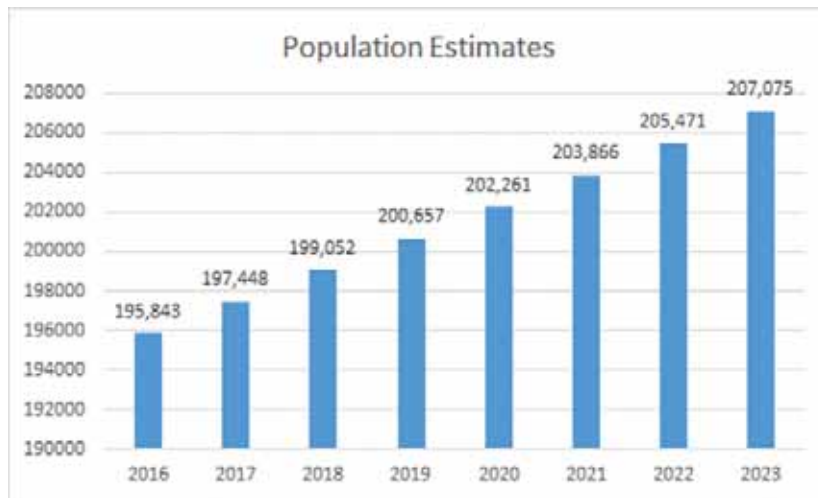


Figure 2-3 Population estimates of Samoa

1.3 Social organization

The nation is divided into 48 districts with total of 338 villages. At the village level, the governance is through a traditional body of village councils. The village council consists of matais representative of each family in the village. The Matai plays an important role in broad aspect of local community affairs by making important decisions for the village and formulation of village rules and laws. Village mayors are the Government arm as a representative of the Government in the village under the administration of the MWCSO.

Further, each village appoints a representative called sui o le nuu from the matai which works for interactive communication between the government and the village.

Samoa government usually consults these representatives and ascertains the cooperation from the community for implementing the Strategies, Policies, etc. The following table shows the number of districts and villages in Samoa (SBS, 2017).

Table 2-1 Number of districts and villages in Samoa

Island	Number of district	Number of village
Upolu	29	229
Savaii	19	102
Manono	(Under Aiga i le Tai district in	6
Apolima	Upolu)	1
Total	48	338

2 Understanding Solid Waste Management System

This section highlights baseline information on SWM and also provides legal framework which governs the overall management of solid waste on the national level.

2.1 Waste generation amount and composition

Waste amount and composition is one of the fundamental indicators of SWM which enables to estimate the amount of waste generated in the country and thus highlight the dominant waste category occupies by ratio in total. Two different concepts of “waste amount” were adopted to consider waste amount and composition. One is “Waste generation amount” and the other is “Waste discharged amount”. “Waste generation amount” refers to all kinds of waste generated at generation source. “Waste discharged amount” only includes waste categories which are discharged on the platform (Waste collection point). There is also a concept of “Potential Waste” which could be waste but are not generated actually by practicing Reduce, Reuse, Refuse and Repair policy at waste generation source but it is quite difficult to measure the potential waste amount, hence this concept was excluded from the analysis. Above mentioned concept of “waste amount” is summarized in the figure below.

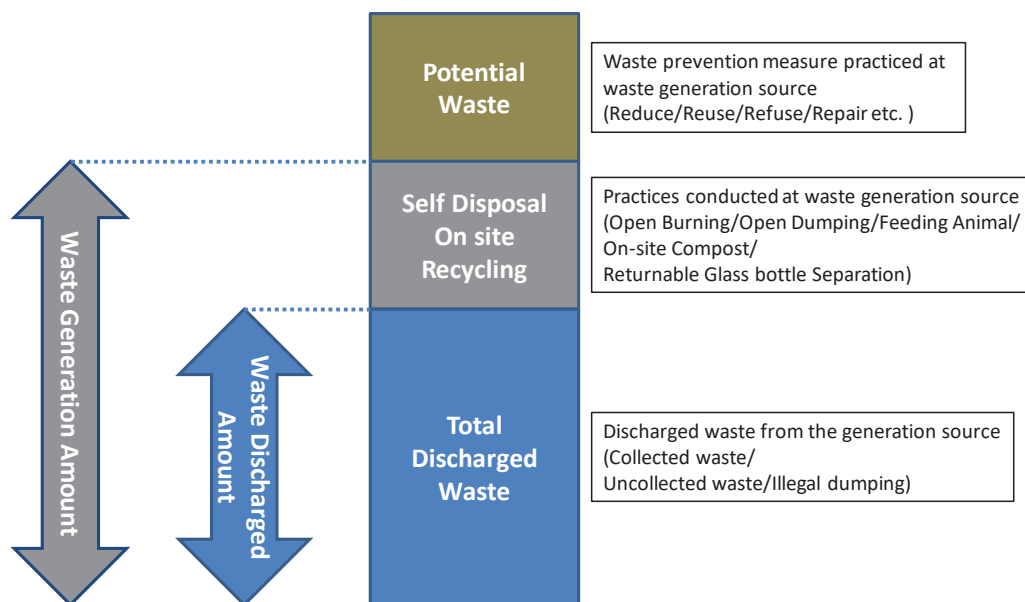


Figure 2-4 Concept of waste amount

The Waste Generation Amount and Waste discharged amount and those compositions were surveyed with Waste Audit conducted in Nov 2017. The audit was conducted by collecting waste samples from selected 40 households with 365 persons in 5 villages for 1 week. As a result of the survey, the waste generation amount was identified as 1,060 g/person/day and discharged amount was 387g/person/day. Major waste categories in discharged waste were organic waste (Green waste + Food scrap) (43%) followed by Plastics (16%), paper and cardboard (13%) and Diaper (12%).

Table 2-2 Waste Generation Amount and Waste Discharged Amount

Waste Generation Amount (g/person/day)	1,060
Waste Discharged Amount (g/person/day)	387

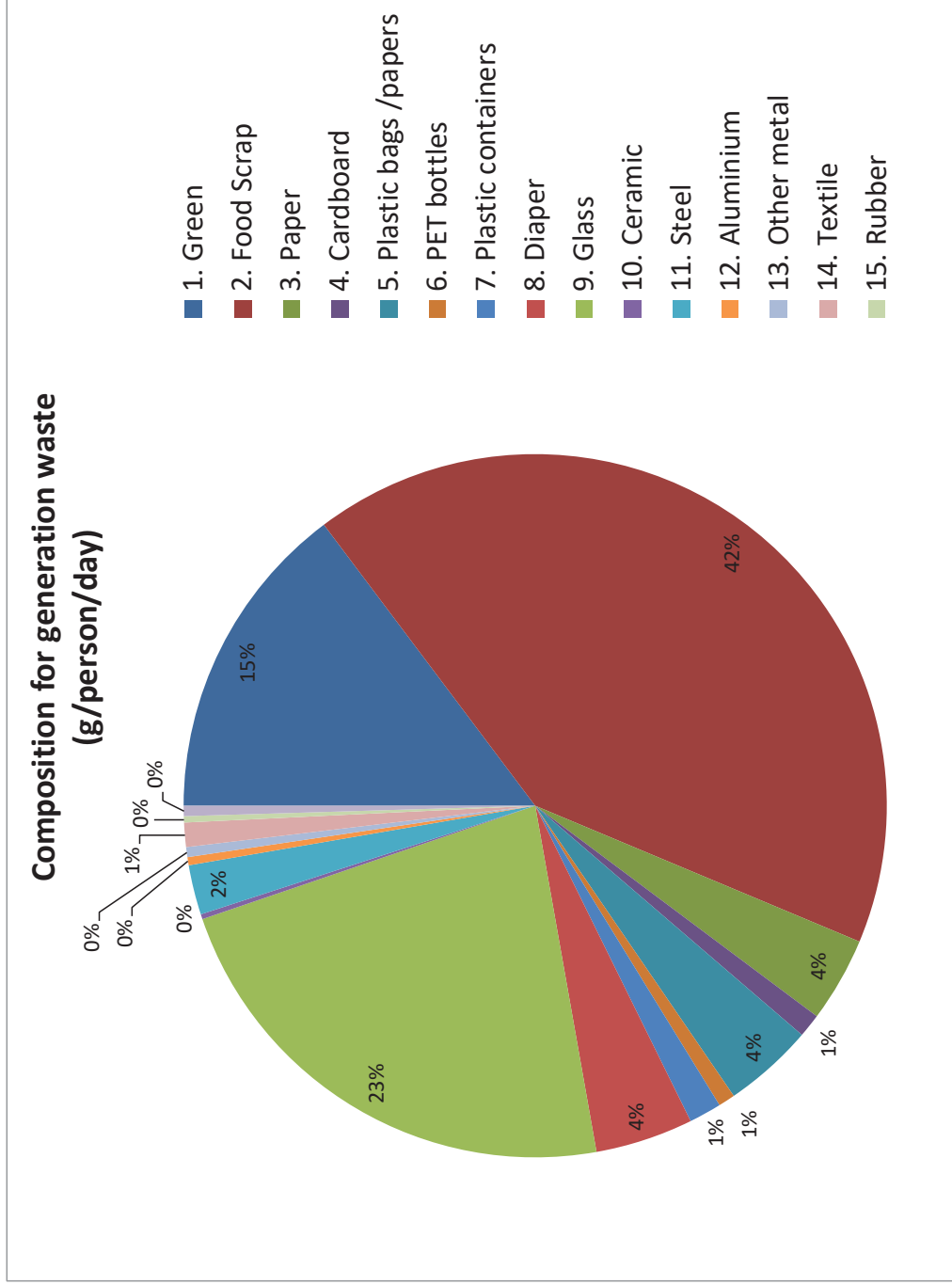


Figure 2-5 Composition for generation waste

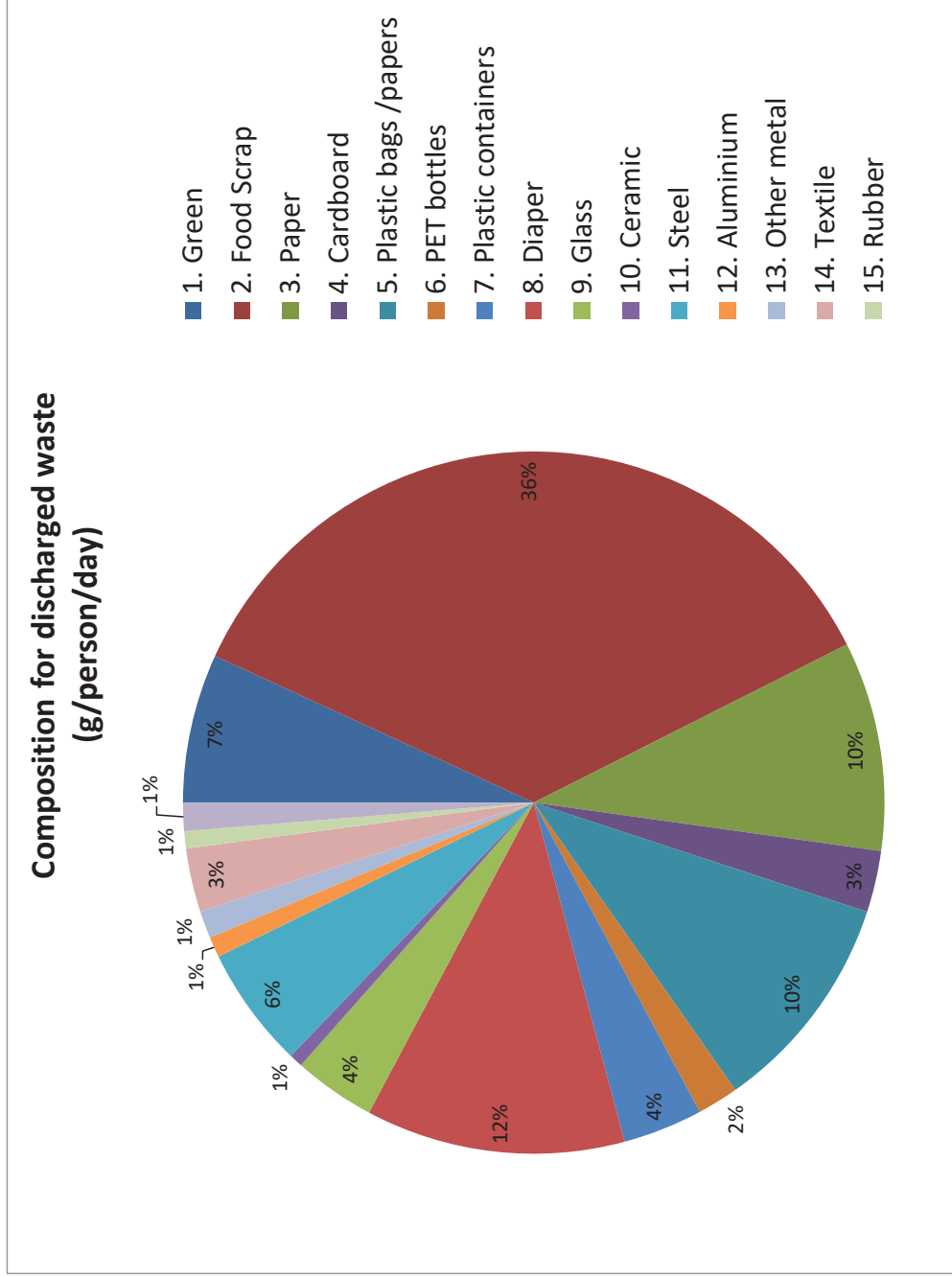


Figure 2-6 Composition for discharged waste

Comparing the result with waste audit results in 2011 (MNRE, 2011), there is a slight increase in waste discharge amount (7g/person/day). If we consider entire of Samoa, waste discharge amount is estimated as 71.4 ton/day as of 2011 with the population of 187,820, while it is estimated as 76.4 ton/day with the population of 197,448 as of 2017 which indicates 5 tons of increase in daily waste discharge amount nationwide. As for waste composition, organic waste (Green waste, food scrap) is still the most dominant category in household waste. The composition was changed slightly by increase of paper, cardboard, plastics and textiles.

2.2 Waste collection

2.2.1 Waste collection system

MNRE provides waste collection service for all households and small businesses located in collection zone by its contractors.

Majority of the households and small businesses located in the collection zones have “Plat form” which are raised waste collection (or discharge) point made of concrete block or other locally available materials and are visually placed along the roadside.

On the other hand, there are households which don’t have access to the waste collection services although they are located within the collection zone. Actual situation of collection points and collection service provided by contractors in both Upolu Island and Savaii Island were surveyed through the time and motion survey conducted in 2017.

Table 2-4 below summarizes collection points confirmed in time and motion survey in Upolu Island.

Among 6,260 collection points, waste of 5,287 collection points (84.5 percent) were collected while 34 (0.5 percent) were mistakenly not collected. The other 939 collection points (15.0 percent) were without waste even though the day was the collection day.

Except for the above mentioned collection points, there were 258 cases confirmed that even there were not collection points but waste was collected directly from resident.

Basically, the collection vehicle stops by each of collection points and collect the waste discharged on the collection points. As for those houses without collection points, the waste only collected when the residents of those houses are waiting in front of the road with the waste when the collection vehicle arrives, otherwise their wastes are not collected and which might potentially cause open dumping.

Table 2-3 Collection Point in Upolu Island

Category	No.	Proportion (%)
Collected CP	5,287	84.5
Uncollected CP	34	0.5
Empty CP	939	15.0
Total No of CP	6260	100.0
Waste collected without CP	258	

There are 14 zones in the Upolu and 4 zones in the Savaii. The coverage of collection service for each zone was identified based on the actual track taken at the time and motion survey. As a result, approximately 60 percent of the length of designated road was collected while the other 40 percent of the road was not collected.

The overall result of time & motion survey indicates that contractors are mostly collecting waste in the area where they normally take, while not covering all the designated areas.

In order to examine the cause of the low collection coverage, implementation of regular monitoring on contractor's performance and user's discharge manner as well as development of user database to identify the location of problematic points are required.

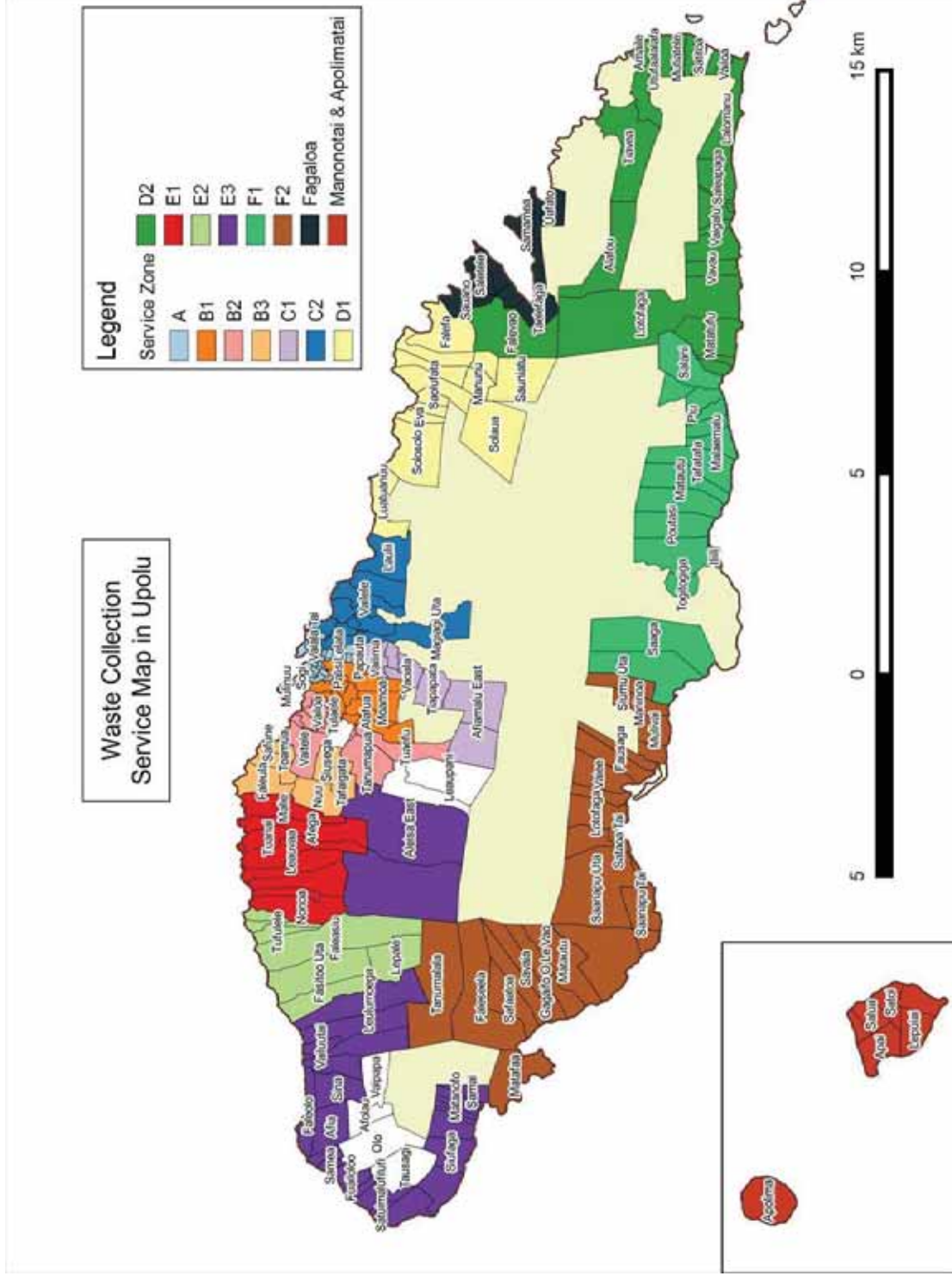


Figure 2-7 Waste collection service map in Upolu (including Manono and Apolima)

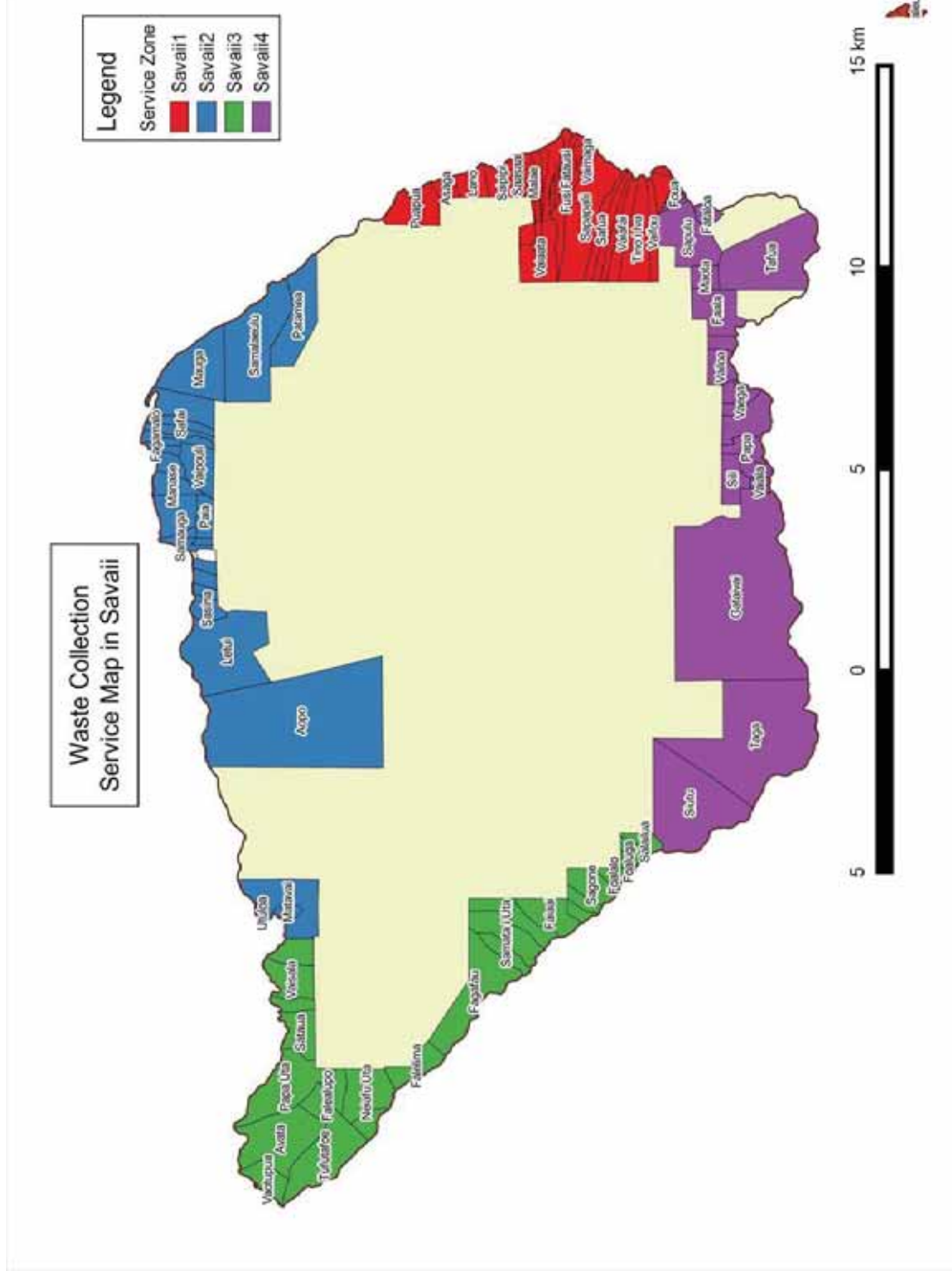


Figure 2-8 Waste Collection Service Map in Savaii

Table 2-4 Collection route and actual track at the T&M Survey

ID	Zone	Route (m)	Actual track (m)	Coverage (%)
1	A	27,208	21,392	79
2	B1	41,996	29,539	70
3	B2	55,998	28,583	51
4	B3	67,271	26,625	40
5	C1	37,862	24,403	64
6	C2	63,848	52,223	82
7	D1	40,491	18,331	45
8	D2	117,533	72,999	62
9	E1	54,215	20,349	38
10	E2	49,737	19,456	39
11	E3	91,087	55,577	61
12	F1	56,693	48,870	86
13	F2	81,961	56,044	68
14	Fagaloa	20,833	20,833	100
15	M/A	N/A	N/A	N/A
16	Savaii1	61,517	34,991	57
17	Savaii2	101,075	74,089	73
18	Savaii3	76,626	56,349	74
19	Savaii4	106,323	69,999	66

2.3 Final disposal

2.3.1 Location and area of landfill

In Samoa, there are 2 approved landfills namely, Tafaigata Landfill and Vaiaata Landfill. There are 15.4 acres for Tafaigata and 9.8 acres for Vaiaata Landfill including related functions or facilities of landfills. However, there is no system in place to monitor the remaining capacity and operation.

Table 2-5 Outline of approved landfill in Samoa

	Tafaigata Landfill	Vaiaata Landfill
Location	Tafaigata, Upolu Island	Vaiaata, Savaii Island
Area of Landfill	15.4 acres	9.8 acres

2.3.2 Functions of landfills

There are known and systematic functions of landfills. There is a waste separation and collection system already in place at Tagfaigata Landfill. Basically recyclables at the landfill area are separately collected by registered waste pickers and recyclers based within the landfill site and recyclers buy those recyclables from the waste pickers. There is composting yard within the landfill area at Tafaigata Landfill but currently not fully functioning due to lack of staffs with relevant skills.

Table 2-6 Functions of landfill

	Tafaigata Landfill	Vaiaata Landfill
Separation and collection	Recyclables such as Aluminum can, Aluminum, White goods are separated by waste pickers and recycling company	N/A
Compost	N/A (There is compost yard but currently not operated)	N/A
Disposal	General waste from household and businesses is accepted.	General waste from household and businesses is accepted.
Incinerator for healthcare waste	Healthcare waste is incinerated.	Healthcare waste is incinerated.
Leachate Pond	Quality of the leachate is monitored in 2018.	Quality of the leachate is not monitored.

2.3.3 Incoming waste

Wastes collected by the contractors as well as waste directly transported by public institutions, businesses and individuals are accepted at the landfills. According to incoming waste record taken at Tafaigata Landfill during 1 week in Jan 2018, 45 tons was recorded from incoming wastes on a daily average. Majority of incoming vehicles are from contractors.

Table 2-7 Incoming waste record at Tafaigata Landfill

Date	Day	No. of incoming vehicle with waste (No.)	Total weight (kg)
2018/1/29	Mon	46	66,791
2018/1/30	Tue	44	89,045
2018/1/31	Wed	36	31,745
2018/2/1	Thu	33	37,121
2018/2/2	Fri	54	56,771
2018/2/3	Sat	39	33,693
2018/2/4	Sun(Closed)	0	0
Total		252	315,166
Daily average (Excludes Sunday)		42	52,528
Daily average (Includes Sunday)		36	45,023

2.4 Revenue and expenditure on SWM

In Samoa, SWM is under MNRE's responsibility and the revenue for implementing SWM is covered by tax, grants and other revenue of Samoan government. While, tipping fees at the Tafaigata Landfill is the only source of revenue for the government from SWM. When it comes to the balance between revenue and expenditure specifically for SWM, revenue is far less than expenditure. In this regards, implementation of SWM in Samoa is highly depended on the availability of other sources of revenue. Recently, expenditure for SWM service tends to increase significantly. Considering the above mentioned situation, there is an ongoing discussion within the government to increase the revenue collection through a "pay user system" which basically collects waste fee from users of waste collection services.

Revenue and expenditure on SWM in MNRE is summarized in table below.

Table 2-8 Revenue and expenditure on SWM in MNRE

	Revenue
Tipping fee at Tafaigata Landfill	\$102,959.00
	Expenditure
Waste Collection	\$2,360,104.37
Litter maintenance	\$433,637.64
Landfill maintenance	\$443,805.00
Lawn maintenance	\$25,450.00
Total	\$3,262,997.01

2.5 Statistic information availability on SWM

Some of the statistic information on SWM were updated through baseline survey conducted in 2017. Based on the result of the survey, baseline of some key SWM indicators were identified as of 2017 and which are the basis of future planning and target goals of the NWMS. On the other hand, there are still SWM indicators which are not available and to be identified in the future. In addition to that, current available SWM indicators also need to be updated on a regular basis subject to monitoring of any changes occurred during a certain period.

2.6 3R activities

Most of the 3R activities are related to the view of values, lifestyles and culture of people. Generally, the concept of 3R is Reduce, Reuse and Recycle.

2.6.1 Reduce

Reduce is a practice of not generating waste as much as possible, which is prior to recycle but it is difficult to quantify the baseline with statistics. Several practices related to reduce were confirmed in the community by sharing the food for reducing food waste. Avoiding of disposal of certain items also contributes to reduction of wastes. The Reduce concept also contributes to minimize the expenditures and can be promoted with optimization of household economy.

2.6.2 Reuse

Reuse is a practice of using the same material repeatedly as much as possible which is also prior to recycle and again, it is difficult to quantify the baseline with statistics. Basically, glass bottles of local beverages in Samoa are being reused but not recycled through a refund system.

2.6.3 Recycle (and return)

Recycle is a practice to produce new products or materials from the ones that are out of use. It is the last option and is specifically for certain materials such as aluminum cans, etc.

When it comes to recycle, many people think about recycling of industrial products with high technology. However, the concept of recycle also refers composting which has been practiced since long ago traditionally.

2.6.4 Recycle of industrial product included in wastes in Samoa

Since Samoa is highly depended on import for domestic consumption, most of the wastes are generated from products imported from overseas particularly from packaging. In many cases, packages of those products or products themselves are recycled in the country where the products are manufactured, while those are just landfilled together with other wastes in Samoa due to absence of a proper recycling system. The only exception, is for recyclables with relatively high value in the world market which can produce some profit by collecting in Samoa and exporting to the country where those materials can be re-processed and recycled. Among the waste streams of households and small businesses, aluminum cans are the only material that are collected in Samoa and exported to New Zealand, Australia and etc.

2.6.5 Composting in Samoa

Composting can be divided into two categories by the location of composting. On-site compost is a way of composting practiced at waste generation source usually at household level. While Off-site composting is a way of composting practiced at designated place developed for composting and organic wastes collected from several waste generation sources. Off-site compost is adopted usually for composting green waste generated from businesses.

There are composting practiced in Samoa but there are no statistical data readily available.

On-site composting at household level was confirmed during the waste audit. People generally apply green waste to the roots of plant in their home gardens as nourishment and it is called mulching. Since green waste and food scrap are the main components of the discharged waste from household, promotion of composting can be an option to reduce the waste generation amount.

2.7 Waste Stream in Upolu and Savaii

Based on the data collected through baseline survey, waste stream for Upolu and Savaii were developed as shown below. Waste stream for Savaii is developed based on the data in Upolu.

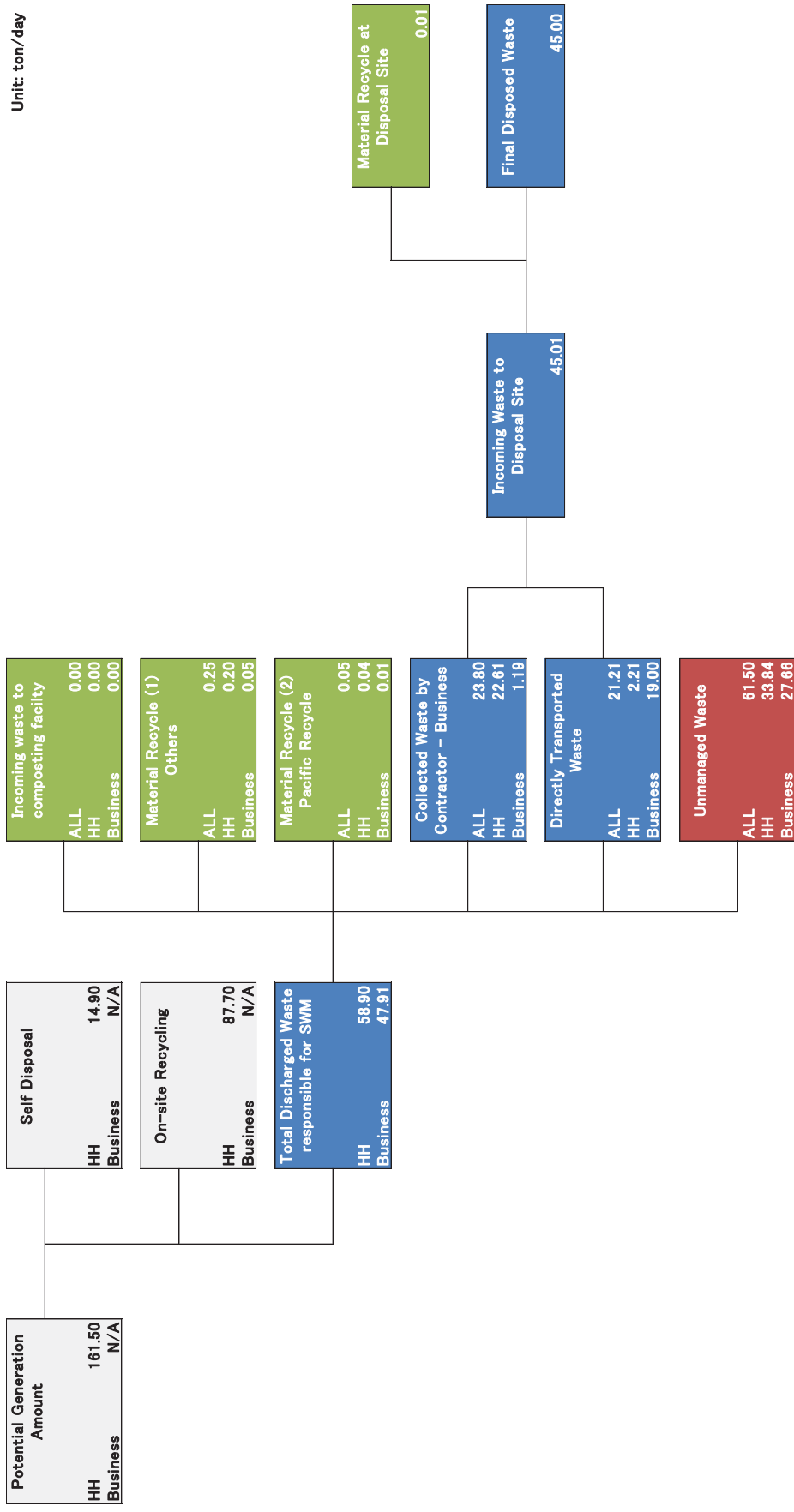


Figure 2-9 Waste Stream in Upolu

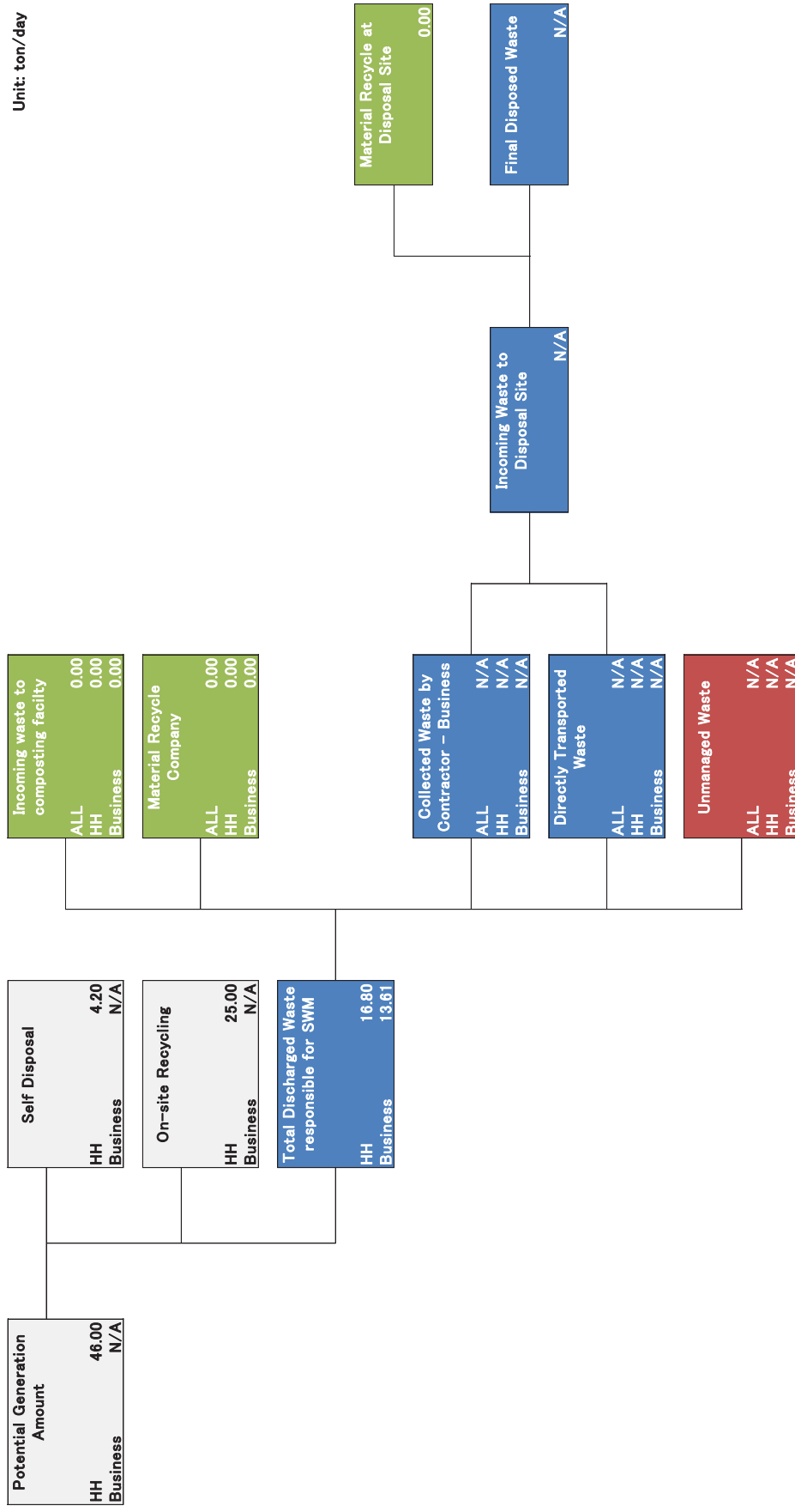


Figure 2-10 Waste Stream in Savaii

2.8 Legal and institutional framework

The section summarizes existing legal framework and describes the current functions of MNRE as specified in the Waste Management Act 2010.

2.8.1 Lands, Surveys and Environment Act 1989

This act was developed in 1989 under the Department of Land, Surveys and Environment. In relation to waste, the Division 8 “Litter Control” prescribed the provisions for litter control measures. It lumps up dumping and depositing of wastes as littering in public places and private lands. The division 8 also imposes penalties on breaching provisions of the Act in general.

2.8.2 Waste Management Act 2010

This act is the most fundamental legal framework on waste management in Samoa. It defines the roles and responsibilities of MNRE and relevant stakeholders by waste category in the general context of waste management. There are 17 MNRE’s mandated functions. MNRE is willing to fulfill those functions as the main responsible ministry for waste management. However, the insufficient capacity of MNRE limits its ability to fulfill its obligations. The current status of MNRE’s performance for each of the functions is summarized in the Table 2-2.

2.8.3 Waste (Plastic Bag) Management Regulations 2018

This Regulations repeals the Plastic Bag Prohibition on Importation Regulation 2006. The primary objective of the Regulations is to ban certain plastic materials in particularly shopping bags, packing bags and straws. It is evident that more than 12.7 Mt of plastics entered the oceans globally. The adverse impact in the marine resources from plastics has turn the tide for countries to implement actions to prohibit the use of certain plastic materials.

The Regulations highlighted that a person who in possession of plastic, Styrofoam plastic or straw for the purpose of:

- a. Manufacturing; or
- b. Exportation; or
- c. Selling and distribution in Samoa

Is prohibited.

Table 2-9 MNRE Function and current status

	Description	Main Objective	Action	Current condition	Necessary action
(a)	The formulation and implementation of a National Waste Management Strategy and other related strategies, and the periodic review and amendment of such strategies;	<ul style="list-style-type: none"> National Waste Management Strategy Other Related Strategies 	(a) -1 Formulation (a) -2 Implementation (a) -3 Periodic Review (a) -4 Amendment	(a)-1 National Solid Waste Management Strategy has been Formulated (a)-2 To be implemented (a)-3 To be reviewed (a)-4 To be amended	Formulate the National Solid Waste Management Strategy.
(b)	Making arrangements for the provision of commercial, industrial and residential waste collection services;	<ul style="list-style-type: none"> Provision of commercial, industrial and residential waste collection service 	(b) -1 Making Arrangements	(b)-1 Waste collection service is arranged for small businesses and households located in the collection zone designed by MNRE. However, there are frequent complains. There are businesses and households which don't have access to the waste collection service but the actual number is not identified. Part of commercial and residential waste is directly transported to landfill by those generated waste. Collection of industrial waste is out of scope of the service provided by the contractors under MNRE. Recyclable is collected by recycling companies. Hazardous waste is monitored depends on the report received.	Improve the monitoring on collection service. Conduct survey to develop service user database. Continue weighbridge record. Collect statistic information on recyclables, hazardous waste.
(c)	Ensuring that adequate provision is made for waste management facilities in Samoa, including the identification, development and management of landfill areas in accordance with this law and other laws relating to development controls;	<ul style="list-style-type: none"> Waste Management Facilities 	(c) -1 Ensuring adequate provision	Landfill site is existed in both Upolu and Savaii. Both of the landfills are adopting semi-aerobic landfill system so called Fukuoka Method. There is no operation plan for the landfills.	Develop landfill operation plan for Tafaigata and Vaiaata Landfills.

	Description	Main Objective	Action	Current condition	Necessary action
(d)	Requiring the sound management of landfill areas and approved dumping and waste storage sites that incorporate comprehensive environmental management systems, including leachate containment and management measures;	<ul style="list-style-type: none"> Landfill areas Approved dumping Waste storage sites 	(d) -1 Requiring the sound management	<p>(d)-1 Tafaigata Landfill and Vaiaata Landfill are approved as landfill area.</p> <p>Landfill areas are managed under DEC staff but daily operation is contracted out. Currently the management of both landfills in Upolu and Savaii are not sufficient. There is shortage of staffs and needs of practical landfill operation manual.</p> <p>One recycling company and composting company are operating leased land in Tafaigata Landfill. The others (recycling company and composting company) are operating in their private property but there is no regulation on the storage.</p> <p>There is no other approved dumping or waste storage sites.</p>	<p>Secure landfill staffs.</p> <p>Update ToR for landfill based on current needs.</p> <p>Improve landfill operation manual.</p> <p>Monitor contractor's compliance on ToR.</p> <p>Require sound management to recyclable storage site.</p>
(e)	Impose requirements and make arrangements for the proper management of areas after they have ceased to be used as landfill areas and dumping sites;	<p>Proper management of areas after used as</p> <ul style="list-style-type: none"> Landfill areas Dumping sites 	<p>(e)-1 Impose requirements</p> <p>(e) -2 Making arrangements</p>	<p>(e)-1 Former dump sites in Upolu had been cleaned up when Tafaigata Landfill was developed. There might be some illegal dump site which is not identified.</p> <p>There is no standard for requirements and arrangement for ceased landfill.</p>	<p>Strengthen the monitoring for illegal dumping.</p> <p>Develop standard for ceased landfill.</p>
(f)	Regulating the operation of waste treatment, storage and disposal facilities;	<p>The Operation of</p> <ul style="list-style-type: none"> Waste Treatment; Storage; Disposal facilities 	(f) -1 Regulating	<p>(f)-1 The operation of waste collection and landfill operation is somehow regulated by the contract although there is no specific regulation. There might be a need of developing regulation for recyclables since some are contains hazardous material.</p>	<p>Develop regulation for recycling operation.</p>

	Description	Main Objective	Action	Current condition	Necessary action
(g)	Ensuring that adequate waste management services are provided to aircraft and ships, and the imposition of requirements to be observed by pilots and ships masters in this regard;	Waste management service to aircraft and ships	(g) -1 Ensuring the provision of (g) -2 Imposition requirements	(g)-1 Waste generated from airport is collected by Airport Authority (AA) and Samoa Shipping Corporation (SSC) collects waste generated by their ships and facilities. The waste generated by other private ships is not collected by SSC.	Collect information for waste generated by private ship.
(h)	Promoting recycling, and implementing measures to minimize wastes having particular adverse implications for human health and the environment;	Waste minimization	(h) -1 Promoting recycling (h) -2 Implementing measures	(h)-1 MNRE is leasing land to recycling company and composting company to promote recycling. (h)-2 There used to be "Plastic Bag Prohibition on Importation Regulations 2006" which regulates the importation of plastic products to provide bio degradable plastic bags. (h)-2 Both Upolu and Savaii have incinerator for health care waste (Under MoH).	Promote 3R and waste minimization at generation source.
(i)	Monitoring the effects of wastes on human health and the environment, and enhancing cooperation with all officers in the discharge of their lawful responsibilities relating to regulating and monitoring wastes and monitoring processes and facilities;	Effects of wastes on human health and the environment	(i) -1 Monitoring (i) -2 Enhancing cooperation with all officers	(i)-1, 2 The water quality of the landfill was surveyed with cooperation of SROS and monitored by MNRE on a regular basis until 2015 but not updated since then. This might be related to the budget and change in staffs at landfill. (i)-1, 2 Illegal dumping is monitored by MNRE with cooperation of environmental ranger and local people.	Develop staff for conducting survey. Improve monitoring system by making use of the environmental ranger.
(j)	Regulating persons involved in the transportation, storage and disposal of wastes in accordance with this Act and any law relating to the management of wastes;	Persons involved in the transportation, storage and disposal of wastes	(j) -1 Regulating	(j)-1 The Contract somehow regulates the person involved in rubbish collection and landfill operation but there is challenge in its enforcement. There is no specific regulation. Need some regulation on waste.	Enforce the condition. Develop recyclable regulation.

	Description	Main Objective	Action	Current condition	Necessary action
(k)	The preparation, adoption and enforcement of rules, operating manuals, codes of practice and standards regulating activities associated with the management of wastes in Samoa;	<ul style="list-style-type: none"> Rules Operating Manuals Codes of practice 	(k) -1 Preparation (k) -2 Adoption (k) -3 Enforcement	(k)-1, 2, 3 There is some condition mentioned in contract. But not covered for all aspects.	Improve Landfill operation manual. Develop regulation on recyclable.
(l)	Implementing litter and waste control measures;	Litter and waste control measures	(l) -1 Implementing	(l)-1 Litter maintenance service is contracted out. But situation on the litter is not improved.	Conduct awareness for prevent litter.
(m)	The preparation of reports and the compilation of statistics relevant to the management of wastes in Samoa, and the regular reporting of such matters in accordance with this Act;	Reports and Statistics	(m) -1 Preparation of reports (m) -2 Compilation of statistics (m) -3 Regular Reporting	(m)-1, 3 Monitoring report on littering, rubbish collection, landfill and illegal dumping are prepared monthly but not efficient. (m)-2 There are variety of data on statistics but most of data is out dated and not utilized.	Improve monitoring efficiency. Conduct surveys on a regular basis.
(n)	Raising public awareness of matters concerning the minimization of the generation of wastes and the effective management of wastes;	<ul style="list-style-type: none"> Minimization of the generation of wastes Effective Management of wastes 	(n) -1 Raising awareness	(n)-1 Awareness is implemented in some schools and communities depend on the request. (n)-1 Environment week is one of the opportunities for awareness. (n)-1 Schedule of rubbish collection is advertised on TV and newspaper.	Conduct efficient awareness for specific target.
(o)	The formulation, implementation and enforcement of policies, programs, initiatives, standards and requirements aimed to reduce the generation of wastes	<ul style="list-style-type: none"> Policies Programs Initiatives Standards Requirements To reduce the generation of wastes	(o) -1 Formulation (o) -2 Implementation (o) -3 Enforcement	(o)-1 Waste management policy was formulated but it's already outdated. There is no program, initiatives on waste reduction.	Formulate and implement the National Waste Management Strategy.

	Description	Main Objective	Action	Current condition	Necessary action
(p)	The formulation of appropriate arrangements and procedures for the management of landfills and waste management facilities in the event of natural disasters, fires, and other emergencies, consistent with laws dealing with disaster and emergency management;	Management of <ul style="list-style-type: none"> • Landfills • waste management facilities in the emergency cases	(p) -1 Formulation of appropriate arrangements (p) -2 Formulation of appropriate procedures	There is no plan of formulating for appropriate arrangements and its procedures.	Make use of Regional Disaster waste management guideline to be developed.
(q)	Performing any other functions provided for by law or vested in the Ministry by Cabinet	Other functions	(q) -1 Performing	N/A	N/A

3 Understanding Chemical and Hazardous Waste Management System

3.1 Current situation of Chemical and Hazardous Waste Management

Chemical use in Samoa is relatively small, although demand is rapidly rising with increased economic development and improved living standards. About 117 million Samoan Tala was expended on chemical imports in 2009, with petroleum products 82%, consumer chemicals 6%, industrial and pharmaceutical chemicals 5% each, and pesticides 2%. But while recognizing the important role that chemicals play in national development, there is also growing alarm about the hazardous nature of chemicals and their adverse effects on human health and the environment. Concerns have been raised on the lack of effective control of chemical imports, unsafe usage, and improper disposal of chemical waste. To integrate the Chemical and Hazardous component of the Strategy, the national chemical and hazardous status has been analyzed and summarized below:

- International linkages / Implementation of MEAs: strong linkages were established between the government of Samoa and the secretariats of the international chemical and waste conventions, but capacity for effective implementation was lacking.
- Chemical Trade and use: There was limited knowledge of actual inventories of chemical imports and subsequent chemical waste.
- Priority concerns related to chemicals during their life cycle: one of the main concerns in Hazardous and Chemical management was the lack of knowledge of the movement of chemicals – from imports to waste.
- Legal instruments and non-regulatory mechanisms for hazardous and chemical management: existing chemical laws were inconsistent and fragmented, resulting in a lack integrated or interagency approach to hazardous and chemical management.
- Government agencies and private sector organizations participating in hazardous and chemical management: there was limited participation in hazardous and chemical management activities by private sector companies and non-governmental organizations (NGOs).
- Interagency commissions and coordinating mechanisms: there was limited cooperation and collaboration among government agencies and organizations involved in hazardous and chemical management.
- Data access and use: there was lack of information sharing and data exchange among the key chemical stakeholders including regulators, importers users and communities.
- Technical Infrastructure: there were no national bodies with the facilities for scientific research and technical assessment, except for the newly established Scientific Research Organization of Samoa (SROS). There were also no storage, recovery and disposal facilities for hazardous and chemical management in the country.
- Awareness and understanding of stakeholders: a number of mechanisms have been developed to promote public awareness generally, but very little was done to create specific understanding among stakeholders of the risks to health and the environment from exposure to hazardous chemicals.
- Resources available and needed for hazardous and chemical management: insufficient financial and other resources were allocated for the implementation of chemical management program.

3.2 Legal and institutional framework

3.2.1 Waste Management Act 2010

This act is the most fundamental legal framework on waste management in Samoa. It defines the roles and responsibilities of MNRE and relevant stakeholders by waste category in the general context of waste management. There are 17 MNRE's mandated functions. MNRE is willing to fulfill those functions as the main responsible ministry for waste management. However, the insufficient capacity of MNRE limits its ability to fulfill its obligations. The current status of MNRE's performance for each of the functions is summarized in the Table 2-2. Regarding to chemical and hazardous waste, the Act also highlighted the Conventions that Samoa has already a party of.

3.2.2 Waste Management (Importation of Waste for Electricity Generation) Regulations 2015

This regulation developed in 2015 cited as the Waste Management (Importation of Wastes for Electricity and Energy Recovery) through the generation of electricity through a pyrolysis process or combustion of waste, the controlled extraction of material or the retrieval of energy from waste or any operation for energy recovery specified in the Basel Convention and the Waigani Convention in an environmentally sound manner.

4 Issues and Challenges

4.1 Solid Waste Management Issues and Challenges

Issues and challenges on SWM in Samoa are summarized by sub-category of SWM based on the result of the baseline survey as well as consultation in the formulation process.

4.1.1 Generation source

- Littering issue along the road and river
- Open dumping and burning waste at back yard of household
- Illegal dumping in both public and private property
- Inappropriate discharge practice at collection point
- Large amount of green waste
- Lack of cooperation with community and business with regards to waste management
- Increase in waste amount

4.1.2 Collection

- Inefficient monitoring system for contractors' operation
- Insufficient database on boundary, route and collection point for rubbish collection
- Frequent complaints from households and contractors.

4.1.3 Disposal

- Fire accidents or improper operation at landfill
- Inefficient monitoring system for contractors' operation

4.1.4 SWM Finance

- Increase of operational cost
- Shortage of operational budget
- Lack of resource (staff/equipment)

4.1.5 Capacity for SWM

- Limited institutional and human capacity
- Lack of effective feedback system as output from technical training
- Lack of regulation on recycling
- Insufficient enforcement of existing act
- Insufficient awareness and promotion of waste issues and solutions

4.1.6 Survey and Analysis on SWM

- Limited availability for SWM basic data
- Lack of vision for future SWM system

4.2 Chemical and Hazardous Waste Management Issues and Challenges

The important and urgent issues identified in the development of this strategy shown in the table below, where major weakness were identified to be the top priorities of hazardous and chemical management in Samoa, which would have to be addressed for better sound management of hazardous and chemical management in Samoa.

Table 2-10 Chemical and Hazardous Waste Management Issues and Challenges

Priorities for Hazardous and Chemical Management	Issues and Challenges	Objectives
Strengthen of national governance of chemicals	Lack of integrated policy on chemical management	Governance of Chemicals
	Lack of inter-agency coordination	
	Limited stakeholder participation in chemical management	
Increased awareness of chemical hazards	Limited stakeholder awareness and understanding of chemical hazards	Knowledge and Information
Enhanced and Improved Chemical Legislation	Inconsistent and fragmented legislations	
Effective implementation of chemical related regional and international conventions	Ineffective implementation of international conventions	
Sustainable management of chemicals during their lifecycle	Inconsistent approach to classification of chemical	
	Ineffective management of chemicals, including waste, during their life cycle	
Greater availability of information and data	Lack of data on existing chemicals and waste	
	Inadequate data on impacts of chemical on health and environment	
	Insufficient data and information on hazardous and chemical management in terms of collection, transport, storage, analysis, dissemination and disposal	
Improved response to chemical accidents	Lack of national systems to deal with chemical accidents	Risk reduction
	Insufficient capacity for prevention, preparedness and response	
Adequate local resources for chemical management	Lack of qualified staff engaged in chemical management activities	Capacity building and technical cooperation
	Lack of specialized technical skills for chemical management	
	Shortage of financial resources for chemical management.	

Part 3 Strategy

1 Purpose

This Strategy will be the first waste-related Strategy endorsed in Samoa. This will serve as a guide in proper management of wastes to achieve the vision of “clean and healthy” Samoa by 2023. While there were a lot of initiatives implemented and challenges being addressed in the recent years, the roadmap has to be re-directed to allow for changes and emerging issues currently faced by the waste sector.

2 Formulation Process

The NWMS has been developed through the following consultation process with relevant ministries, private sectors and community.

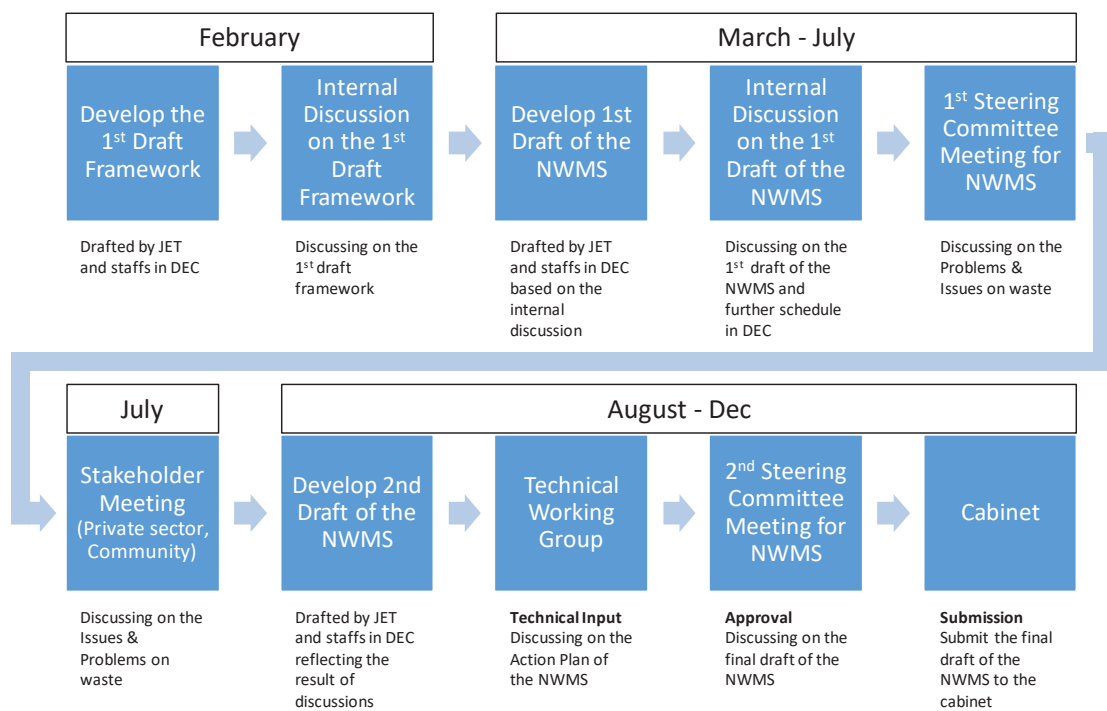


Figure 3-1 Formulation Process of the strategy

3 Priority areas

Based on the current situation, followings were extracted as priority areas.

A Enhance environmental awareness of the public on waste related issues and the countermeasures

Due to lack of awareness of public on waste and its negative impact on environment if treated inappropriately, there are lots of issues at waste generation source. This area targets general people, community and school children as well as businesses and government agencies to raise their understanding on waste related issues and promote activities which can be conducted by them for attracting better cooperation and participation for waste management.

B Strengthen operational planning on SWM

There are needs of developing operational plan in order to secure sustainable waste management through proper provision of waste collection services and landfill operations. This area includes the conduction of activities to develop practical operational plan on waste management.

C Implement regular survey for Basic SWM data collection

Lack of basic data makes it difficult to identify and clarify current status of waste management hence; reliable data is the key information for decision making. This area includes activities to enhance availability of basic data related to waste management through the implementation of surveys.

D Study Feasibility of future SWM options

There are different options to improve waste management. Therefore, it is important to assess and identify feasibility of potential SWM options. This area includes activities to conduct feasibility studies of some potential future SWM options.

E Establish efficient monitoring system on SWM operation

Due to the nature of Samoan waste management system which adopts contract out of waste collection and landfill operation, securing proper monitoring for contractors is very important. This area includes activities to establish efficient monitoring system.

F Strengthen legal framework and enforcement

There are needs of developing new regulations as well as enforcing existing acts and regulations considering global context of waste management. This area includes activities to strengthen legal framework and enforcement for Samoa.

G Improve capacity of officials related to SWM

There are opportunities of enhancement of the capacity of officials involved in waste management. Therefore, it is important to make use of opportunities through trainings and sharing and transferring of knowledge and skills to the others effectively. This area includes activities to improve capacity of officials related to waste management.

H Improve Chemical and Hazardous Waste Management

There is a need to improve Chemical and Hazardous Waste management based on the gaps identified. This area targets all activities with regards to Chemical and Hazardous Waste Management.

4 Risks

The following risks should be assessed by the Steering Committee during the implementation of this Strategy:

- Withdrawal of support of donors on selected activities
- Change in governance reducing financial commitment to waste services
- Failure to gain expected community and stakeholders' commitment
- Natural calamities damaging waste infrastructure and interrupting delivery of waste services

5 Assumptions

- Economic growth will be maintained regardless of changes to global economy.
- The current political system remains stable and will continue to provide commitment to the waste sector in adherence to the sustainable development goals.
- The implementing agencies will remain compliant to its mandate of improving waste management in the country; the Waste Management Sections of MNRE will continue to be a dedicated office for waste management.
- Measurement of waste data will be a priority for more informed decisions and translated to management actions.
- The principle of waste hierarchy will be the prevailing guide for resolving waste issues geared more towards 3R + Return with global market prices favouring recycling.
- Traditional and cultural values are highly regarded in providing sustainable solutions, e.g. composting to assist in food security.
- Positive results of waste management initiatives will not be negated by natural disasters.
- There will still be assistance from development partners during the course of the Strategy.

6 Action Plan

The specific activities to support the implementation of the strategy have been determined and presented in the action plan. The action plan will define the priorities in the next five years which should be translated into the annual work programme of the MNRE's Waste Management Sections as well as other relevant government and NGOs such as SRWMA as well as institutions and businesses.

Priority area A: Enhance environmental awareness of the public on waste related issues and the countermeasures

Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)		
				2019	2020	2021	2022	2023			2024-	
1 Implement "No litter campaign" at Main Bus Terminal in the Upolu and Savaii Island	Campaign is planned	STA, LTA, MESC, Media, NUS	6	X	X	X	X	X	X	Media Awareness material (billboard, poster) Field Assistant (Can be environmental Rangers)	TBC in the implementation phase.	
	Campaign is implemented			X	X	X	X	X	X			
2 Implement awareness for the community newly included in the collection area and assistance for installment of proper discharge point	Target area is identified	Matai, Contractor, MWCSD, MESC	4, 5, 6, 11	X						Workshop (Venue, Lunch)	20,000 (2.1.3.1, NESP)	
	Awareness is planned Awareness is implemented			X	X							
3 Promote 3R (Reduce campaign / On site compost/Off site compost/ Aluminum can collection)	Appropriate 3R measure is identified.	Reduce Campaign (Ministry, Businesses) On-site for community (MWCSD, Matai, MAF, WIBDI etc.) Off-site compost (Private sector, Large scale farmer, hotels MAF) Aluminum can collection (Community, SRWMA, waste picker)	1, 2, 3, 8	X	X	X	X	X	X	Media Awareness material Cages for recycling material	1,120,000 (2.1.3.3/2.1.3.4/2.1.3.6/2.1.3.7/2.1.3.10, NESP)	
	Target area is identified.			X	X	X	X	X	X			
	Conduct in pilot 3R activities in government sector			X	x	X	X	X	X			X
	Methodology of promotion is identified.			X	X	X	X	X	X			X
4 Implement clean school program in regards to proper waste treatment and 3R for primary level	3R promotion is implemented (Promote 3R initiative in ministry level).	NUS, USP, MESC, Private Sector	1, 2, 3, 4, 6, 13	X	X	X	X	X	X	Material to implement program	TBC in the implementation phase. (2.1.3.5, 2.1.3.11, NESP)	
	Teget school is identified Contents of program is planned Program is implemented			X	X	X	X	X	X			X

Priority Area B: Strengthen operational planning on SWM

	Actions	Process	Potential Partner	Relevance to indicators	Timeline						Cost item	Cost Estimate (WST)
					2019	2020	2021	2022	2023	2024		
1	Develop landfill operation plan for Tafaigata Landfill and Vaiaata Landfill	The framework of the operation plan of Tafaigata Landfill is developed.	Contractor, MOH, NHS, MWTI, SLC, SROS	8,10	X	X					Printing	TBC in the implementation phase.
		The operation plan of Tafaigata Landfill is developed.			X	X						
		The framework of the operation plan of Vaiaata Landfill is developed.				X	X					
		The operation plan of Vaiaata Landfill is developed.				X	X					
2	Revise zone plan for rubbish collection for the contract from 2020.	Target zone is selected.	Contractor, LTA, SLC	4,5,11	X	X					Fuel, Survey Workshop	TBC in the implementation phase. (2.1.2.3, NESP)
		Issues in the current zoning is analyzed.			X	X						
		Actual situation of collection zone is surveyed.			X	X						
		New zoning is planned.			X	X						
		Zoning for selected collection zone is revised.			X	X						

Priority Area C: Implement regular survey for Basic SWM data collection

	Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)	
					2019	2020	2021	2022	2023			2024
1	Implement waste audit (in rural area in Upolu, Savaii)	Waste audit is planned	SROS, MWCSD, NUS, USP, Environmental Association	1,2,3,4,6,8	X			X			Vehicle Fuel Field Assistant Equipment (Basket, Trashbag, Taperen, Glove, Mask, Measure, Hang weight, Broom, Fork, Brush)	40,000 (2.1.1.6, NESP)
		Waste audit is implemented			X			X				
2	Implement time and motion survey and platform survey	The survey is planned	Contractor, LTA, SLC	5,8,11			X				Vehicle Fuel Field Assistant GPS	TBC in the implementation phase. (2.1.2.5, NESP)
		The survey is implemented					X					
3	Implement landfill survey (Capacity, daily report, water quality test for both in Tafaiagata, Savaii)	The survey is planned (Survey item, Schedule, etc)	SROS, NUS, USP, SBS, MOF, MWTL	8,10	X						Equipment (Drone, Sample bottle, test kit, test fee)	TBC in the implementation phase.
		The survey is implemented			X	X	X	X	X			
		Result of the survey is Summarized			X	X	X	X	X			
4	Implement continuous weighbridge recording (Tafaiagata / Savaii)	The recording system is planned.	MOF, Contractor, MFR	4,6,8	X	X	X	X	X	X	Weighbridge, Monitoring form	N/A
		The recording is implemented.			X	X	X	X	X	X		

Priority Area D: Study Feasibility of future SWM options

Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)
				2019	2020	2021	2022	2023		
1	Implement feasibility study on financial option (User Pay System / CDL)	MOF, MFR, PSC, EPC, SWA, MPE	7	X	X	X			TBC in the implementation phase.	60,000 (2.1.3.9, NESP)
2	Implement feasibility study on Upscaling Solid Waste Management Section	MOF, MFR, PSC, EPC, SWA, MPE	7	X	X	X			TBC in the implementation phase.	1,339,798 (2.1.1.2, NESP)
3	Implement feasibility study on expansion of Tafafata Landfill with Public Private Partnership or relocation of the Landfill	MOF, MFR, LTA, SLA, MWCSD, MOH, SROS, PUMA	6,9			X	X		TBC in the implementation phase.	TBC in the implementation phase. (2.1.4.1, 2.1.4.2, NESP)

Priority Area E: Establish efficient monitoring system on SWM operation

Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)
				2019	2020	2021	2022	2023		
1	Establish rubbish collection monitoring system	MWCSD, SBS	4,5,11	X	X				Vehicle Fuel	TBC in the implementation phase. (2.1.2.1, NESP)
2	Establish landfill operation monitoring system	MPE, MWTI	10		X	X			Sign board	TBC in the implementation phase. (2.1.2.3, NESP)

Priority Action F: Strengthen legal framework and enforcement

	Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate
					2019	2020	2021	2022	2023		
1	Formulate regulation for recyclable	Scope of the regulation is determined. Regulation is developed Regulation is approved	MJCA, MFAT, AG, SRWMA	8,9	X	X				Venue Refreshment	60,000 (2.1.1.3, NESP)
2	Develop regulation for enforcement of littering and illegal dumping	Regulation is developed. Littering and illegal dumping are monitored Enforce regulation for littering and illegal dumping cases. Methodology is planned.	MJCA, AG, MOP	6,9	X	X	X	X	X	Vehicle Camera	60,000 (2.1.1.4, 2.1.2.4, NESP)
3	Enforce code of practices for the contractors and staffs	Contractor's alignment on code of practice is monitored Code of practice is strictly controlled based on WMA 2010	MJCA, MCIL, PSC, AG, MOF, MPE, LTA, SRWMA	9	X	X	X	X	X	safety gear	TBC in the implementation phase.
4	Enforce waste disposal fee by weight at the Tafaigata Landfill	Methodology is planned. Fee collection is monitored based on the weighbridge record Waste disposal fee collection is strictly controlled.	MJCA, MOF, MFR, AG	7,9	X	X	X	X	X	Sign board Gate	TBC in the implementation phase.
5	Enforce regulation on plastic ban	Methodology is planned. Plastic item is monitored. Import of plastic is strictly controlled.	MJCA, MOF, MFR, AG	12	X	X	X	X	X	Awareness Vehicle Camera	8,000 (2.1.3.2, NESP)
6	Revise Waste Management Policy	Review the Waste Management Policy 2001.	AG, MWCS, MOF, MCIL	9			X	X	X	Venue	10,000 (2.1.1.1, NESP)

Priority Area G: Improve capacity of officials related to SWM

Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)	
				2019	2020	2021	2022	2023			2024-
1 Develop the technical capacity of the relevant officials efficiently.	Organize the available training opportunity	PSC, MOH	9	X	X	X	X	X	X	N/A	TBC in the implementation phase.
	Dispatch appropriate officials relevant to the contents of the training			X	X	X	X	X	X		
	Obligate trainees to present the summary of the training			X	X	X	X	X	X		
	Archive the reports and materials obtained from trainings			X	X	X	X	X	X		

Priority Area H: Improve Chemical and Hazardous Waste Management

Priority Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)		
				2019	2020	2021	2022	2023			2024-	
1 Strengthening of National Governance of Chemicals	Establishing a Task Team	MWCSD, MOF, MIR, MOH, STA, MESC, SCC, SROS, MPE, MAF, MCIL, MFAT, MICA, NHS, MWTI, AG, PSC, NUS, EPC, SBS, SILC, LTA, USP, SUNGO, SPREP, MOP, SAA, SPA, SSC, SFESA, RAS	1, 3	X						resource materials, meeting venue, record keeping materials, refreshments	30,000 (2.2.3.1)	
	Develop Terms of Reference			X								
	Collecting necessary data			X								
	Develop and endorse the integrated policy through the government process			X								
	Prepare a concept paper for inter-agency coordination			X								
	Establishing a Chemical & Hazardous Coordination Committee with its own TOR			X								
	Develop framework for promoting inter-agency coordination on chemical and hazardous management system			X								
	Implement the coordination process - encourage and improve partnerships and coordination and ensuring necessary procedures are put into place			X			X	X	X			X
	Identify and confirm relevant stakeholders and their roles in chemical & hazardous wastes management			X								
	Develop a framework to promote the active involvement of all stakeholders			X								
Keep records of stakeholders participation	X			X	X	X	X	X				

Priority Area H: Improve Chemical and Hazardous Waste Management

Priority Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)
				2019	2020	2021	2022	2023		
2	Identify what types of hazards exposed to health and environment during chemical and management process Develop and improve awareness raising materials based on the identified hazards faced Undertake awareness-raising activities for consumers/stakeholders, in particular by educating them on best practices for chemical use, risks that chemicals may pose to their health and the environment. Establish timely arrangements for the exchange of information to minimize barriers in information exchange (local language and simple terms used)	MAF, MfR, MOH, NHS, MCIT, MESC	1, 2, 3, 4	X	X	X	X	X	promotional materials - posters, pamphlets, billboards, signages, advertisements	130,000 (2.2.3.1, 2.2.3.2, 2.2.3.3 NESP)
				X	X	X	X	X		
3	Prepare Terms of Reference Identifying Technical Consultants Holistic review of Legislation system for Chemical and Hazardous with the aim of harmonizing the legislation Prepare improved/revised legislation for chemical management	MAF, MfR, NHS, AG, MOF, MWCSD,	3	X		X			advertisements, evaluation meetings, workshops, community consultations, refreshments	140,000 (2.2.1.1, 2.2.1.6, 2.2.1.7 NESP)
							X	X		

Priority Area H: Improve Chemical and Hazardous Waste Management

	Priority Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)	
					2019	2020	2021	2022	2023			2024-
4	Effective Implementation of Chemical Related Regional and International Conventions	Develop national chemical guidelines and align with international requirements, especially the obligations under each of the conventions.	MAF, MIR, MFAT, SPREP,	1, 2, 3	X	X		X			workshops and meeting venues, awareness and promotional materials	120,000 (2.2.1.2, 2.2.1.4, 2.2.1.5, NESP)
		Promote ratification and implementation of all relevant international instruments on chemicals and hazardous wastes			X	X		X		X		
		Ensure international procedures are followed as per party's obligations			X	X		X		X		
		Collect and manage data and records for reporting purposes			X	X		X		X		
		Prepare reports for conventions annually			X					X		
5	Sustainable Management of Chemicals during their Lifecycle	Establish technical working group to work on classification of chemicals in Samoa	MAF, MIR, MOH, NHS, MESC, SROS, USP, NUS, MFAT, SPREP, SFESA, MOP, LTA	1, 2, 3, 4		X					meeting venues and materials, PPEs, resource tools,	68,000 (2.2.2.2, 2.2.2.5, 2.2.2.7, NESP)
		Align all classifications with the international classification system, especially the Global Harmonized System (GHS)				X						
		Develop a program on to introduce the GHS into the classification system for chemicals nationally				X						
		Implementation of the program with relevant key stakeholders				X	X	X	X	X		
		Conduct review after every five (5) years								X		
		Apply life-cycle management approaches to ensure that chemicals management decisions are consistent with the goals of sustainable development			X	X	X	X				
		Apply Basel and Waigani Conventions regimes in the management of chemical wastes in Samoa			X	X	X	X				

Priority Action H: Improve Chemical and Hazardous Waste Management

Priority Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)	
				2019	2020	2021	2022	2023			2024-
6 Greater availability of Information and data	Conduct baseline survey	SBS, MOF, MIR, MAF, MOH, NHS, MESC, MCIT	1, 3, 4		X					transportation, petrol, resource materials	67,000 (2.2.1.3, 2.2.2.3, 2.2.2.11, NESP)
	Develop database and inventories for Chemical and Hazardous				X						
	Regularly update and revise these database and inventories					X	X	X			
	Develop national profiles and implement action plans for sound management of chemicals				X						
	Through the inter-agency committee, collaborate with MOH to take lead on this work, especially for the health and environment work				X	X	X	X			
	Prepare national report on a regular basis, every two (2) years				X		X		X		
	Establish roles and responsibilities for different sectors related to the trade and use of chemicals				X						
	Develop a program on inventory and database of chemicals and hazardous wastes in Samoa				X						
	Regularly update and revise these database and inventories				X	X	X	X	X		

Priority Action H: Improve Chemical and Hazardous Waste Management

Priority Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)	
				2019	2020	2021	2022	2023			2024-
7 Improved response to chemical accidents	Prepare and provide safety data sheets for effective monitoring and safety of workers	SFESA, MOP, MOH, MCIL,	2, 4	X						PPEs, training equipments, printing materials, technical tools	30,000 (2.2.2.9, NESP)
	Develop a procedure for responding to chemical accidents with the involvement of the emergency services such as fire, health, police, etc			X							
	Conduct training on how to use the procedure with the general public and relevant stakeholders			X	X						
	Establish database of record keeping process			X	X						
	Identify gaps that currently exist at the national level			X							
	Development capacity building training program based on the gaps analysis			X							
	Implement and improve trainings for prevention, preparedness and response for all workers involved in chemicals use				X	X	X		X		

Priority Action H: Improve Chemical and Hazardous Waste Management

Priority Actions	Process	Potential Partner	Relevance to indicators	Timeline					Cost item	Cost Estimate (WST)		
				2019	2020	2021	2022	2023			2024-	
8 Adequate local resources for chemical management	Identify gaps that currently exist at the national level	MOF, MAF, MOH, NHS, RAS, SPREP, SROS, NUS, USP	2, 3, 4	X							printing materials, meeting venues, resource materials	TBC in the implementation phase.
	Establish programs for scientific and technical training of personnel, including customs personnel			X								
	Promote necessary training needs and capacity-building for all people involved directly and indirectly with chemical use and disposal			X	X	X	X	X	X			
	Implement the capacity building training with specific agencies and stakeholders			X	X	X	X	X	X			
	Evaluate the capacity on a regular basis			X	X	X	X	X	X			
	Undertake gaps and needs analysis for the specialized technical skills in the country and prepare report			X								
	Develop a program to improve the specialized technical skills nationally			X	X							
	Implement the program to establish national laboratory facilities, complete with modern technologies and equipments for testing emissions and setting national standards				X							
	Develop resources for national implementation plans and projects			X	X	X	X	X	X			
	Explore funding mechanisms and procure resources to support chemical management initiatives			X	X	X	X	X	X			
	Make available sufficient financial and technical resources to support national and regional capacity-building projects			X	X	X	X	X	X			

7 Monitoring and Evaluation

7.1 Measuring Progress

The likelihood of success in implementing the NWMS will depend on an established mechanism to regularly monitor and periodically evaluate progress of the planned activities. The monitoring and evaluation mechanism will take into account feedback on findings through a Waste Monitoring System and lessons learned to enhance performance and results.

The baseline data presented in the strategy context is very critical as reference points to establish targets for the achievement of the set goals for the duration of the plan. The monitoring framework will be developed in consultation with the constituted multi-sectoral Steering Committee using the guidance to be provided at the regional level (Regional Waste Monitoring System).

7.2 Periodic Review of the Action Plan

The following framework outlines the proposed review process of the implementation of the Strategy and Action Plan.

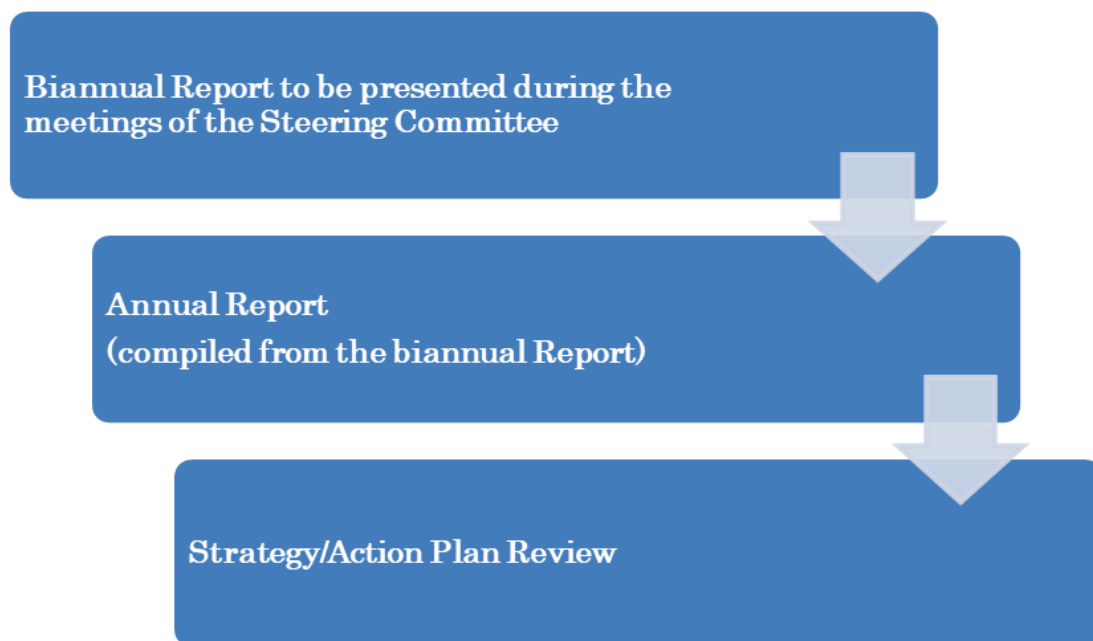


Figure 3-2 Process for reviewing the implementation of the Strategy

7.3 NWMS Steering Committee

7.3.1 Member of Steering Committee

CEO, ACEO and principal officers or equivalent officers of following ministries and government agency were identified as member of Steering Committee. Chairman is CEO of MNRE.

The Committee performed its functions and responsibilities agreed through an approved Terms of Reference

Table 3-1 Member of Steering Committee

1	MNRE	Ministry of Natural Resource and Environment
2	MWCSD	Ministry of Women Community & Social Development
3	MOF	Ministry of Finance
4	MfR	Ministry for Revenue
5	MOH	Ministry of Health
6	STA	Samoa Tourism Authority
7	MESC	Ministry of Education Sports & Culture
8	SCC	Samoa Chamber of Commerce
9	SROS	Scientific Research Organization of Samoa
10	MPE	Ministry of Public Enterprises
11	MAF	Ministry of Agriculture & Fisheries
12	MCIL	Ministry of Commerce Industry & Labour
13	MFAT	Ministry of Foreign Affairs & Trade
14	MJCA	Ministry of Justice & Courts Administration
15	NHS	National Health Services
16	MWTI	Ministry of Works & Transport & Infrastructure
17	MPMC	Ministry of the Prime Minister & Cabinet
18	AG	Attorney General
19	PSC	Public Service Commission
20	NUS	National University of Samoa
21	EPC	Electric Power Corporation
22	SBS	Samoa Bureau of Statistics
23	SLC	Samoa Land Corporation
24	LTA	Land Transport Authority
25	USP	University of South Pacific / Alafua
26	SUNGO	Samoa Umbrella of Non-Governmental Organization
27	SPREP	Secretariat of the Pacific Regional Environment Programme
28	MOP	Ministry of Police
29	SAA	Samoa Airport Authority
30	SPA	Samoa Port Authority
31	SSC	Samoa Shipping Corporation
32	SFESA	Samoa Fire Emergency Services Authority
33	SWA	Samoa Water Authority
34	SRWMA	Samoa Recycling & Waste Management Association

7.4 NWMS Sub Steering Committee

The NWMS Sub Steering Committee might be formulated under the NWMS Steering Committee depends on its necessity for monitoring of the implementation of the NWMS. A separate TOR will be developed to indicate the specific operational functions of the Committee.

7.5 Financial Considerations

The implementation of the strategy requires substantial financial and technical resources. Funding can be sourced through national budget allocation and development partners' assistance.

The following recommended strategies can be explored:

- Establishing user-pay and polluter-pay systems to cover costs for waste service delivery,
- Mainstreaming waste management with other priority development areas such as climate change, economic development (agriculture and tourism), and biodiversity conservation, among others, allowing for cross-sectoral issues to be addressed and multi-sectoral engagement enhanced,
- Continuously raising the profile of waste management among politicians, decision-makers, communities and development partners to invite more funding to the sector; and
- Ensuring that project outcomes and outputs are significantly achieved to encourage more investment into the waste sector from both the government and development partners.

Part 4 Annex

1 Future forecast of indicators

Below table shows future forecast of indicators without any strategic action until 2023.

Table 4-1 Future forecast of indicators without any strategic action

Item	Unit	Past										Future Forecast			
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Population	person	187,820	189,425	191,029	192,634	194,238	195,843	197,448	199,052	200,657	202,261	203,866	205,471	207,075	
Population in Upolu	person						152,344	153,592	154,840	156,089	157,337	158,585	159,833	161,081	
Population in Savaii	person						43,499	43,855	44,212	44,568	44,925	45,281	45,637	45,994	
Green waste	g/person/day							26.54	26.62	26.70	26.78	26.86	26.94	27.02	
Food scrap	g/person/day							138.15	138.56	138.97	139.39	139.80	140.21	140.62	
Paper	g/person/day							37.30	37.41	37.52	37.63	37.75	37.86	37.97	
Cardboard	g/person/day							10.95	10.98	11.02	11.05	11.08	11.11	11.15	
Plastic bags/papers	g/person/day							39.55	39.67	39.79	39.90	40.02	40.14	40.26	
PET bottles	g/person/day							7.33	7.35	7.37	7.40	7.42	7.44	7.46	
Plastic containers	g/person/day							14.23	14.27	14.31	14.36	14.40	14.44	14.48	
Diaper	g/person/day							46.26	46.40	46.54	46.67	46.81	46.95	47.09	
Glass	g/person/day							14.59	14.63	14.68	14.72	14.76	14.81	14.85	
Ceramic	g/person/day							2.42	2.43	2.43	2.44	2.45	2.46	2.46	
Steel	g/person/day							21.65	21.71	21.78	21.84	21.91	21.97	22.04	
Aluminum	g/person/day							3.69	3.70	3.71	3.72	3.73	3.75	3.76	
Other metal	g/person/day							4.87	4.88	4.90	4.91	4.93	4.94	4.96	
Textile	g/person/day							11.31	11.34	11.38	11.41	11.45	11.48	11.51	
Rubber	g/person/day							3.07	3.08	3.09	3.10	3.11	3.12	3.12	
Others	g/person/day							5.02	5.03	5.05	5.06	5.08	5.09	5.11	
Total	g/person/day	380						386.93	388.09	389.24	390.40	391.55	392.71	393.86	

Item	Unit	Past									Future Forecast				
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
General waste from household in Upolu	ton/day							59.43	60.09	60.76	61.42	62.09	62.77	63.44	
General waste from household in Savaii	ton/day							16.97	17.16	17.35	17.54	17.73	17.92	18.12	
General waste from business in Upolu	ton/day							47.91	48.72	49.55	50.39	51.25	52.12	53.01	
General waste from business in Savaii	ton/day							13.68	13.91	14.15	14.39	14.63	14.88	15.14	
General waste in Upolu	ton/day							107.34	108.81	110.31	111.81	113.34	114.89	116.45	
General waste in Savaii	ton/day							30.65	31.07	31.50	31.93	32.36	32.80	33.25	
General waste in Samea	ton/day							137.99	139.88	141.80	143.74	145.71	147.69	149.70	
Off-site compost in Upolu	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Off-site compost in Savaii	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Aluminium cans from household separated for recycling in Upolu	ton/day							0.24	0.24	0.25	0.25	0.25	0.26	0.26	
Aluminium cans from household separated for recycling in Savaii	ton/day							0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Aluminium cans from business separated for recycling in Upolu	ton/day							0.06	0.06	0.06	0.06	0.06	0.06	0.07	
Aluminium cans from business separated for recycling in Savaii	ton/day							0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Recycling Ratio of Aluminium cans from household in Upolu	%							44.00	44.00	44.00	44.00	44.00	44.00	44.00	
Recycling Ratio of Aluminium cans from household in Savaii	%							0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Recycling Ratio of Aluminium cans from business in Upolu	%							N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Recycling Ratio of Aluminium cans from business in Savaii	%							0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Household Waste transported by contractor at Tafaiagata	ton/day							22.60	22.91	23.22	23.54	23.86	24.19	24.52	
Business Waste transported by contractor at Tafaiagata	ton/day							1.20	1.22	1.23	1.25	1.27	1.28	1.30	
Household Waste directly transported at Tafaiagata	ton/day							2.20	2.23	2.26	2.29	2.32	2.35	2.39	
Business Waste directly transported at Tafaiagata	ton/day							19.00	19.26	19.53	19.79	20.06	20.34	20.61	
Household Waste transported by contractor at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Business Waste transported by contractor at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Household Waste directly transported at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Business Waste directly transported at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Item	Unit	Past										Future Forecast				
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
Waste incoming to Tafāigata Landfill	ton/day							45.01	45.63	46.25	46.89	47.53	48.18	48.83		
Waste incoming to Vaiaata Landfill	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Volume of Waste incoming to Tafāigata Landfill	m ³							22.51	22.81	23.13	23.44	23.76	24.09	24.42		
Volume of Waste incoming to Vaiaata Landfill	m ³							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Aluminum can collected at Tafāigata Landfill	ton/day							0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Aluminum can collected at Vaiaata Landfill	ton/day							0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Final Disposed waste at Tafāigata	ton/day							45.00	45.62	46.24	46.88	47.52	48.16	48.82		
Final Disposed waste at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Final Disposal ratio in Upolu	%							42	42	42	42	42	42	42		
Final Disposal ratio in Savaii	%							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Remaining Capacity of Tafāigata Landfill	m ³							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Remaining Capacity of Vaiaata Landfill	m ³							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Collection coverage for Upolu by waste amount	%							38	38	38	38	38	39	39		
Collection coverage for Savaii by waste amount	%							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Length of collection route in Upolu	m							806,734	806,734	806,734						
Length of collection route in Savaii	m							345,540	345,540	345,540						
Length of actual track confirmed at T&M in Upolu	m							495,224	495,224	495,224						
Length of actual track confirmed at T&M in Savaii	m							235,427	235,427	235,427						
Collection coverage for Upolu by track	%							61.00	61.00	61.00				61.00		
Collection coverage for Savaii by track	%							68.00	68.00	68.00				68.00		
Unmanaged Waste in Upolu	ton/day							62.04	62.89	63.75	64.63	65.51	66.40	67.31		
Unmanaged Waste in Savaii	ton/day							N/A	N/A	N/A						
Ratio of unmanaged waste in Upolu	%							58	58	58	58	58	58	58		
Ratio of unmanaged waste in Savaii	%							N/A	N/A	N/A						
Cost for waste collection service in Upolu	WST/year							1,686,966								
Cost for waste collection service in Savaii	WST/year							673,138								
Cost for litter maintenance	WST/year							433,638								
Cost for Lawn maintenance	WST/year							25,450								
Cost for Landfill Maintenance in Upolu	WST/year							299,805								
Cost for Landfill Maintenance in Savaii	WST/year							144,000								
Revenue from weighbridge	WST/year							102,959	N/A	N/A	N/A	N/A	N/A	N/A		
Ratio of SWM revenue in cost	%							3						3		
Ratio of plastics in discharged waste from household	%							16	16	16	16	16	16	16		

Table 4-2 Future forecast of indicators with strategic actions

Item	Unit	Past										Future Forecast				
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
Population	person	187,820	189,425	191,029	192,634	194,238	195,843	197,448	199,052	200,657	202,261	203,866	205,471	207,075		
Population in Upolu	person						152,344	153,592	154,840	156,089	157,337	158,585	159,833	161,081		
Population in Savaii	person						43,499	43,855	44,212	44,568	44,925	45,281	45,637	45,994		
Green waste	g/person/day							26.54	26.62	25.82	25.02	24.22	23.42	22.63		
Food scrap	g/person/day							138.15	138.56	134.41	130.25	126.09	121.93	117.78		
Paper	g/person/day							37.30	37.41	61.39	68.76	68.96	69.16	69.37		
Cardboard	g/person/day							10.95	10.98	11.02	11.05	11.08	11.11	11.15		
Plastic bags/papers	g/person/day							39.55	39.67	15.91	15.96	16.01	16.06	16.10		
PET bottles	g/person/day							7.33	7.35	7.37	7.40	7.42	7.44	7.46		
Plastic containers	g/person/day							14.23	14.27	14.31	7.18	7.20	7.22	7.24		
Diaper	g/person/day							46.26	46.40	46.54	46.67	46.81	46.95	47.09		
Glass	g/person/day							14.59	14.63	14.68	14.72	14.76	14.81	14.85		
Ceramic	g/person/day							2.42	2.43	2.43	2.44	2.45	2.46	2.46		
Steel	g/person/day							21.65	21.71	21.78	21.84	21.91	21.97	22.04		
Aluminum	g/person/day							3.69	3.70	3.71	3.72	3.73	3.75	3.76		
Other metal	g/person/day							4.87	4.88	4.90	4.91	4.93	4.94	4.96		
Textile	g/person/day							11.31	11.34	11.38	11.41	11.45	11.48	11.51		
Rubber	g/person/day							3.07	3.08	3.09	3.10	3.11	3.12	3.12		
Others	g/person/day							5.02	5.03	5.05	5.06	5.08	5.09	5.11		
Total	g/person/day	380						386.93	388.09	383.79	379.50	375.21	370.92	366.62		

Item	Unit	Past										Future Forecast				
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
General waste from household in Upolu	ton/day							59.43	60.09	59.91	59.71	59.50	59.28	59.06		
General waste from household in Savaii	ton/day							16.97	17.16	17.10	17.05	16.99	16.93	16.86		
General waste from business in Upolu	ton/day							47.91	48.72	49.55	50.39	51.25	52.12	53.01		
General waste from business in Savaii	ton/day							13.68	13.91	14.15	14.39	14.63	14.88	15.14		
General waste in Upolu	ton/day							107.34	108.81	109.46	110.10	110.75	111.40	112.07		
General waste in Savaii	ton/day							30.65	31.07	31.25	31.44	31.62	31.81	32.00		
General waste in Samea	ton/day							137.99	139.88	140.71	141.54	142.38	143.21	144.06		
Off-site compost in Upolu	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Off-site compost in Savaii	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Aluminium cans from household separated for recycling in Upolu	ton/day							0.24	0.26	0.28	0.30	0.32	0.34	0.36		
Aluminium cans from household separated for recycling in Savaii	ton/day							0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Aluminium cans from business separated for recycling in Upolu	ton/day							0.06	0.06	0.06	0.06	0.06	0.06	0.06		
Aluminium cans from business separated for recycling in Savaii	ton/day							0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Recycling Ratio of Aluminium cans from household in Upolu	%							44.00	47.00	50.00	53.00	55.00	58.00	61.00		
Recycling Ratio of Aluminium cans from household in Savaii	%							0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Recycling Ratio of Aluminium cans from business in Upolu	%							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Recycling Ratio of Aluminium cans from business in Savaii	%							0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Household Waste transported by contractor at Tafaiagata	ton/day							22.60	24.80	27.00	29.20	31.40	33.60	35.80		
Business Waste transported by contractor at Tafaiagata	ton/day							1.20	1.22	1.22	1.23	1.24	1.25	1.25		
Household Waste directly transported at Tafaiagata	ton/day							2.20	2.23	2.24	2.26	2.27	2.28	2.30		
Business Waste directly transported at Tafaiagata	ton/day							19.00	19.26	19.37	19.49	19.60	19.72	19.84		
Household Waste transported by contractor at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Business Waste transported by contractor at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Household Waste directly transported at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Business Waste directly transported at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		

Item	Unit	Past										Future Forecast				
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023		
Waste incoming to Tafāigata Landfill	ton/day							45.01	45.63	45.90	46.17	46.44	46.71	46.99		
Waste incoming to Vaiaata Landfill	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Volume of Waste incoming to Tafāigata Landfill	m ³							22.51	22.81	22.95	23.08	23.22	23.36	23.50		
Volume of Waste incoming to Vaiaata Landfill	m ³							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Aluminum can collected at Tafāigata Landfill	ton/day							0.01	0.01	0.01	0.01	0.01	0.01	0.01		
Aluminum can collected at Vaiaata Landfill	ton/day							0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Final Disposed waste at Tafāigata	ton/day							45.00	45.62	45.89	46.16	46.43	46.70	46.98		
Final Disposed waste at Vaiaata	ton/day							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Final Disposal ratio in Upolu	%							42	42	42	42	42	42	42		
Final Disposal ratio in Savaii	%							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Remaining Capacity of Tafāigata Landfill	m ³							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Remaining Capacity of Vaiaata Landfill	m ³							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Collection coverage for Upolu by waste amount	%							38	41	45	49	53	57	61		
Collection coverage for Savaii by waste amount	%							N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Length of collection route in Upolu	m							806,734	806,734	806,734						
Length of collection route in Savaii	m							345,540	345,540	345,540						
Length of actual track confirmed at T&M in Upolu	m							495,224	495,224	495,224						
Length of actual track confirmed at T&M in Savaii	m							235,427	235,427	235,427						
Collection coverage for Upolu by track	%							61.00	70.00	80.00				80.00		
Collection coverage for Savaii by track	%							68.00	68.00	68.00				68.00		
Unmanaged Waste in Upolu	ton/day							62.04	60.98	59.27	57.56	55.86	54.15	52.46		
Unmanaged Waste in Savaii	ton/day							N/A	N/A	N/A						
Ratio of unmanaged waste in Upolu	%							58	56	54	52	50	49	47		
Ratio of unmanaged waste in Savaii	%							N/A	N/A	N/A						
Cost for waste collection service in Upolu	WST/year							1,686,966								
Cost for waste collection service in Savaii	WST/year							673,138								
Cost for litter maintenance	WST/year							433,638								
Cost for Lawn maintenance	WST/year							25,450								
Cost for Landfill Maintenance in Upolu	WST/year							299,805								
Cost for Landfill Maintenance in Savaii	WST/year							144,000								
Revenue from weighbridge	WST/year							102,959								
Ratio of SWM revenue in cost	%							3						5		
Ratio of plastics in discharged waste from household	%							16	16	10	8	8	8	8		

2 ToR for Steering Committee

2.1.1 Function of Steering Committee Meeting

- Oversee formulation, implementation, monitoring and revision process of NWMS.
- Mobilize and facilitate support in relation to NWMS across the members.
- Address key issues and problems for implementation of NWMS.
- Appraise progress of and constraints of implementation of NWMS.

2.1.2 Meeting schedule

- Regular Steering Committee meetings will be held in every year.
- Extraordinary or Special Steering Committee meetings may be organized as and when required, e.g. to discuss urgent issues related to NWMS.

2.1.3 Coordination of Steering Committee

Coordination is under responsible of MNRE. Followings are the main coordination function of Steering Committee.

- Taking of Minutes
- Drafting Agenda
- Preparation of Presentation Material
- Tabling of Special Matters (Appraisal/Review/Endorsement etc.)
- Providing Logistical Support
- Liaison with Members on Sector Related Matters

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“Clean and Healthy Samoa”

