Tuvalu Integrated Waste Policy and Action Plan:

TOWARDS CLEANER AND HEALTHIER ISLANDS

2017 - 2026

July 2016

SPREP
Secretariat of the Pacific Regional Environment Programme

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Acronyms

3R plus return	Reduce, reuse, recycle plus return
ACM	Asbestos contaminated materials
ADB	Asian Development Bank
AGs Office	Attorney General's Office
AusAID	Australia Agency for Internationak Development (now DFAT – Department of Foreign Affairs and Trade)
CBA	Cost benefit analysis
DCC	Development Coordinating Council
DOE	Department of Environment
DRD	Department of Rural Development
EDF	European Development Fund
EPA	Environmental Protection Act
EU	European Union
GAO	General Administration Order
GDP	Gross Domestic Product
GEFPAS	Global Environment Facility Pacific Alliance for Sustainability
GHG	Greenhouse gas emission
GoT	Government of Tuvalu
HCW	Healtcare waste
JICA	Japan International Cooperation Agency
J-PRISM	Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in Pacific Island Countries
KPI	Key performance indicator
LDC	Least Developing Countries
MEA	Multilateral Environmental Arrangement
MEYS	Ministry of Education, Youth and Sports
MFAT	Ministry of Foreign Affairs and Trade (NZ)
MHARD	Ministry of Home Affairs and Rural Development
NAPA	National Adaptation Programme of Action
NIP	National Indicative Programme

PacWaste	Pacific Waste Project
PPE	Personal protective equipment
PPP	Public-Private Partnership
PRIF	Pacific Regional Infrastructure Facility
PWD	Public Works Department
ROC	Republic of China
SDE	Special Development Expenditure
SPC	Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
SC	Steering Committee
SWAT	Solid Waste Agency of Tuvalu
TANGO	Tuvalu Association of Non-Governmental Organization
TISIP	Tuvalu Infrastructure Strategy and Investment Plan
TKIII	Te Kakeega III National Strategy for Sustainable Development 2016 to 2020
TNPSO	Tuvalu National Private Sector Organisation
ULABS	Used lead acid batteries
UNDP	United Nations Development Programme
WB	WorldBank
WCP	Waste, chemicals and pollutants
WMLC	Waste Management Levy Committee
WMMC	Waste Management Monitoring Committee
WOSA	Waste Operations and Services Act
WWII	World War II

Foreword

I am pleased to present the Tuvalu Integrated Waste Policy and Action Plan (2017 to 2026). This policy strives towards cleaner and healthier islands and provides a roadmap that sets a clear direction for Tuvalu to improve waste management hence improving the health and the living environment for all Tuvaluans.

The policy is predicated on the strategic actions specified in the previous Tuvalu Integrated Solid Waste Plan 2005 and encompasses a range of measures across all 5 tiers namely, prevention and minimisation, reuse, recycling, recovery and disposal. The vision of the policy focuses on creating a cleaner and healthier Tuvalu for today and the future generation through developing, implementing and strengthening appropriate waste strategies through concerted efforts of the Government, stakeholders and communities in order to improve the environment and the health of the people of Tuvalu.

The policy hopes to set a clear direction towards minimising landfill waste, improve management of hazardous wastes to comply with international obligations and manage wastes as resource to deliver socio-economic, health and environmental benefits through to 2026. In addition, the policy will benefit the government economically through its commitment to improve delivery of waste services that will benefit the communities socially through improvement of their health and living environment.

The policy encompasses measures covering the full spectrum of waste management planning, compliance and enforcement. The development of the policy and action plan is a timely response to the Tuvalu National Strategy for Sustainable Development 2016 to 2020 Te Kakeega III that sets out milestones and strategic actions to improve waste management in the country.

This policy statement is not just important in achieving sound environmental objectives, but it is also a crucial component in protecting and enhancing one of our vital assets, namely 'green' image, which is essential for our tourism and food industries, and in attracting inward investment. This policy statement creates a path towards a more modern, innovative and sustainable approach to the management of our waste.

I look forward to the full cooperation of all key stakeholders from individuals and households through to private sector, NGOs and the Government line Ministries in implementing this policy to ensure its success.

Fakafetai Iasi,

Tuvalu mote Atua.

Hon Namoliki Sualiki Neemia

Executive Summary

As in most Pacific Island countries, the nature of wastes and consumption pattern of Tuvalu has significanty changed in the last 10 years. This resulted in substantial solid and liquid waste management issues which need to be addressed in the immediate to short-term period. This is exacerbated by constraints such as limited land space, resources and institutional and human capacity, vulnerability to climate change, among others. It is, therefore, inevitable for the government to explore strategies that will allow reduction and proper management of wastes in the country so as not to compromise the public health, amenity of the environment and the social being of its communities.

In recent years, waste management has become a priority environmental issue in Tuvalu , leading tothe creation of the Solid Waste Agency of Tuvalu (SWAT) which is mandated to oversee the management of wastes both in the main island of Funafuti and the outer islands. However, the sustained operation of this agency will rely on proper directions to deliver desired outcomes by way of a policy and action plan. Thus through the initiative of the government with funding from the European Union (EDF10), the development of the Tuvalu Integrated Waste Policy (2017 to 2026) and Action Plan (2017 to 2021) came into fruition.

The Tuvalu Integrated Waste Policy and Action Plan builds on the strategic actions specified in the previous Tuvalu Integrated Solid Waste Plan 2005. It hopes to set a clear direction for Tuvalu towards minimising wastes to the landfill, improving management of hazardous waste, compliance with international obligations and managing wastes as resource to deliver socio-economic, health and environmental benefits through to 2026. It also seeks to ensure that there will be strong pillars built to strengthen institutional and human capacities that sustain implementation of waste management activities. This policy encourages strong partnership with stakeholders to share the responsibilities for managing waste.

Six strategic goals were established via sectoral and wider stakeholder consultations:

Goal #1: Strengthened institutional systems to address gaps in waste management

Goal #2: The stakeholders fully understand the merits of proper waste management and co-share the responsibility of managing wastes.

Goal #3: Established strong partnerships between the public and the private sector in the delivery of waste services

Goal #4: Delivered waste services follow best practice and cost effective approach tailored to local conditions with continuous improvement

Goal #5: Enhanced capacity of waste practitioners

Goal #6: Waste activity outcomes are reported and disseminated to relevant stakeholders

In order to achieve these strategic goals, the following strategic actions are identified:

1. The government shall ensure that institutional and organisational structure of the waste sector in all the islands is properly set up, i.e. well-trained and qualified staff are delivering waste services and are properly compensated for the hazards involved in the discharge of their functions according to the Employment Bill.

2. The government shall create, amend and update laws, regulations and policies as required to ensure the orderly delivery of waste services in both the main island of Funafuti and the outer islands, and take measures to ensure that such laws, regulations and policies are well enforced.

3. The government shall undertake negotiations with landowners in the allocation of land for the purpose of siting waste facilities in all the islands.

4. The government shall pass legislation that will impose levies and ban certain imported items that are likely to produce significant volumes of waste (levies will fund waste management activities).

5. The central and local governments shall allocate reasonable and sustainable budget to ensure that the delivery of waste services are kept to standard and desired coverage.

6. The SWAT and relevant stakeholders (e.g. women, youth, etc. as focal groups), shall implement public awareness programmes on proper waste management, focusing on waste minimisation through 3R + return approach. These public awareness programmes will follow gender sensitive approaches.

7. The SWAT, in coordination with the Ministry of Finance, shall implement incentive mechanisms that will provide business and livelihood opportunities for certain accredited community-based institutions and individuals using the cooperative approach.

8. The SWAT shall strengthen stakeholder involvement in awareness activities.

9. The SWAT, through coordination with the Ministry of Finance and the Department of Trade, shall develop waste business opportunities to ensure sustainable waste systems, including financial mechanisms to support efficient delivery of waste services.

10. The SWAT, in coordination with the Marine Department, shall explore measures to improve shipping services to allow back loading of recycled waste items (e.g. scrap metal, cans, plastics, etc.) to potential markets.

11. The SWAT shall incorporate obligations under its waste management plan into all international contracts.

12. The SWAT, through cooperation of the Department of Public Works and private contractors, shall undertake detailed infrastructure (including maintenance) planning and develop an asset management programme ensuring that waste facilities and equipment are properly designed based on climate proofing measures to increase resilience to climate change events, and operated within reasonable standard for effective and efficient waste services, with due consideration to the occupational health and safety of the waste workers and the health and well-being of the community and their environment.

13. The SWAT shall implement waste reduction and resource recovery programmes.

14. The SWAT shall promote the recovery of green wastes from the waste stream, implement composting programmes and encourage stakeholders to utilise compost produced from processing of green wastes.

15. The SWAT, the Ministry of Health and the Department of Environment, shall cooperate in the handling, storage and disposal of hazardous wastes (chemicals, asbestos, healthcare wastes, used oil, e-wastes, etc.) according to international convention regulations and best practice management approaches that will minimise health and environmental impacts.

16. The government shall provide short-term and long-term training opportunities for SWAT and other relevant waste workers and stakeholders to improve their skills and capacity to deliver waste services.

17. The government shall participate in regional cooperation and exchange programmes guided by the principle of regionalism.

18. The SWAT shall undertake regular waste data collection and analysis.

19. The SWAT shall implement monitoring and reporting programmes to ensure more informed decisions in the waste sector.

20. The government shall establish a multi-stakeholders monitoring committee and SWAT will act as the Secretariat.

The Tuvalu Integrated Waste Policy will be implemented collectively by relevant sectors, and led by SWAT. This will constitute the long- term agenda for SWAT to fulfil its mandate of addressing waste issues. An action plan to cover the first half of the strategic policy is designed to propel its implementation.

The financial requirements to undertake the action plan will be drawn from government commitment and potential development partners assistance.

The progress of the Tuvalu Integrated Waste Policy will be measured against certain established key performance indicators. A monitoring and evaluation framework will be designed by a multi-stakeholder monitoring committee which wil be disseminated through an agreed reporting process to coincide with the periodic review of the policy.

I. National Waste Policy Statement

1. Background:

This document is presented in two parts:

Part one provides the context for the development of the Tuvalu Integrated Waste Policy and summarises the institutional mechanisms governing the management of wastes in the country as well as the challenges faced in the delivery of waste services. It highlights current efforts in waste management and resource recovery and presents the drivers for change based on issues besetting the waste sector.

Part two presents the Tuvalu Integrated Waste Policy. The policy sets out the purpose, scope, aims, principles, key outcomes, implementation and strategies for action. The actions will define the direction Tuvalu has to take to address the key issues presented in Part One.

2. Vision and Mission Statements

The following vision and mission statements, which were developed by the stakeholders during a consultation, are meant to provide guidance and inspiration as to what Tuvalu is focused on achieving in the next 10 years. This also defines the optimal desired future state of the country with regards to managing wastes.

Vision: A cleaner and healthier Tuvalu for today and the future generation

Mission: To develop, implement and strengthen appropriate waste strategies through concerted efforts of the Government, stakeholders and communities in order to improve the environment and the health of the people of Tuvalu.

II. Part One—Context

1. Introduction

The development of the Tuvalu Integrated Waste Policy and Action Plan is a timely response to the significant changes happening in the waste sector in the Pacific Region and globally. Significantly, in recent years, consumption pattern has changed and most Pacific Island countries have succumbed to the proliferation of more wasteful imported products. This resulted in substantial increases in the amount of wastes generated in the islands. Having to contend with certain constraints such as land space, resources, inadequacy in institutional and human capacity, among others, creates a lot of challenges to the Pacific Island countries. Tuvalu is no exception since the country comprises atoll islands with extremely limited land mass and relies heavily on imported goods which are not strictly regulated.

Previously, there have been extensive support provided by development partners to waste management in Tuvalu (Tupulaga, 2014). AusAID introduced municipal-scale waste management systems from 1999 to 2002 through the Tuvalu Waste Management Project. ADB provided technical assistance through the Tuvalu Effective Waste Management and Recycling Project. Subsequently, through the European Union 8th EDF and 9th EDF, the waste operations in Funafuti was given ample support extending to the outer islands through the 10th EDF.

Since then, the government focus given to the waste sector as a priority environmental issue has been driving changes in this sector. This is evident in the creation of the Solid Waste Agency of Tuvalu (SWAT) which is mandated to oversee the management of wastes both in the main island of Funafuti and the outer islands. The sustained operation of this agency will rely on proper directions to deliver

desired outcomes by way of a policy and action plan. While there has been an exhaustive study conducted by Asian Development Bank (ADB) to come up with an Integrated Solid Waste Plan for Tuvalu in 2005, progress on the plan has not been monitored and reported. Its limitation in coverage of Funafuti alone raised a lot of concerns among the dispersed population in the outer islands.

The Government of Tuvalu, through SWAT, needs to facilitate an approach to waste management that minimises the volume of wastes generated in the islands and diverting more wastes away from the disposal sites which have very limited capacity. Every possible opportunity to recycle and re-use waste materials have to be taken so as to reduce costs, resource consumption and environmental impact.

Through the EDF11 bilateral funding commitment by the European Union, waste was selected as the focal sector in its environmental protection agenda. The conceptualisation of the proposed programme was coordinated with various development partners and other stakehoders in the country. The programme will support the government's commitments to waste management, i.e. adopting a policy and strategy, coordinating financial and technical support of development partners and regional organisations towards policies and investments in the waste sector, undertaking awareness campaigns and capacity building (European Union, 2014).

While proper management of wastes has proven to be essential to protecting the health of the community and amenity of the environment, the recovery of resources from wastes can provide further environmental and economic benefits to atoll islands like Tuvalu. In particular, it can address global issues such as resource depletion and climate change. With climate change at the forefront of Tuvalu's current and future state, it is imperative to explore any resilience strategies to minimise impacts which includes proper waste management that contributes to ecological and social wellbeing.

2. Country Profile

Geography

Tuvalu comprises nine islands scattered over a 676 km long arc of the Pacific Ocean, situated in the Central Pacific approximately 1,100 km north of Fiji and 250 km south of Kiribati. The islands that make up Tuvalu are Nanumea, Niutao and Nanumaga in the northern area; Nui, Vaitupu and Nukufetau in the central area; and Funafuti, Nukulaelae and Niulakita in the southern end. The combined land area of the Tuvalu island group is just 25.6 km^2 (Tonkin & Taylor, 2005).

The map of Tuvalu is shown in Figure 1.

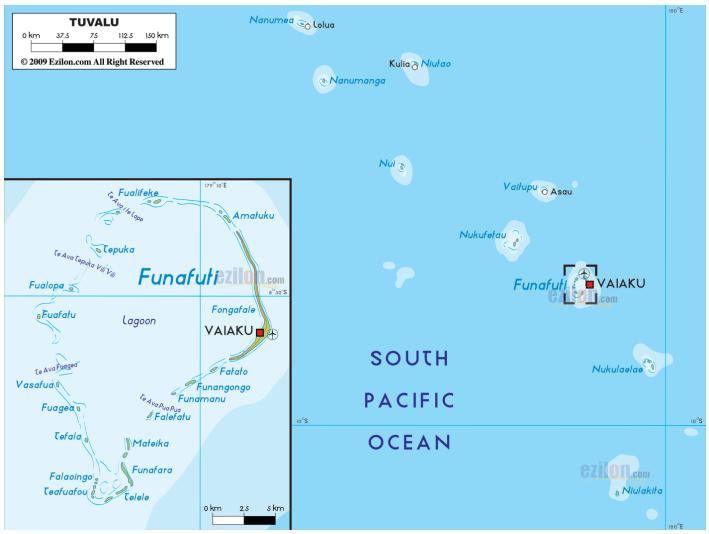


Figure 1. Map of Tuvalu

Climate

The daytime average temperature in Tuvalu is between 29°C to 31°C. With low-lying atoll islands (highest land is merely 5metres above sea level), it has one of the most fragile environments in the Pacific Region with threats such as cyclones and sea level rises. The country has a very high risk of vulnerability to increased severity of cyclones, projected sea level rise, increased ocean temperature and ocean acidification.

Population

The total population for Tuvalu is around 10,782 based on 2012 census with consistent increase of 0.2% annually. The distribution of the population is quite uneven, with more than 5,000 people living on the main population centre of Funafuti which has the only airport in the country. The rest of the population is dispersed around the outer islands.

Income

With a real GDP (annual percent change) of 2.6% in 2015 and 3.9% projected for 2016 [1], Tuvalu's main sources of national income include regular draw-downs from the Tuvalu Trust Fund, remittances from overseas workers, sale of internet.tv domain name and revenues from foreign vessels operating fishing activities.

The trade balance is consistently negative with imports substantially outdoing exports to cover its basic needs. Copra and stamps are the only export commodities. The country is classified as a "Least Developed Country" (LDC) with a narrow economic base and lack of exploitable resources.

About two-thirds of the population rely on subsistence farming and artisanal fishing, with coconuts, bananas and breadfruit as the major local produce.

Transportation and Communication

There is only one airport located in the capital island of Funafuti with flights running twice a week to Suva and back. The capital island also hosts the only commercial port in the country which links the 8 islands. Figure 2 shows the domestic routes to the central, northern and southern islands. Commercial vessels also run every month or periodically to carry goods to and from Fiji.

The Telecom network is the only telecommunication company (a public enterprise) operating in the country. Landline services are available in all islands and internet services are available on Funafuti and Vaitupu. Due to the isolation of the islands and inadequacy of infrastructure, communication network is costly and unreliable at certain times . There are also other available forms of communication such as the radio, VHF radios and satellite phones.

[1] http://www.imf.org/external/pubs/ft/weo/2016/01/pdf/text.pdf

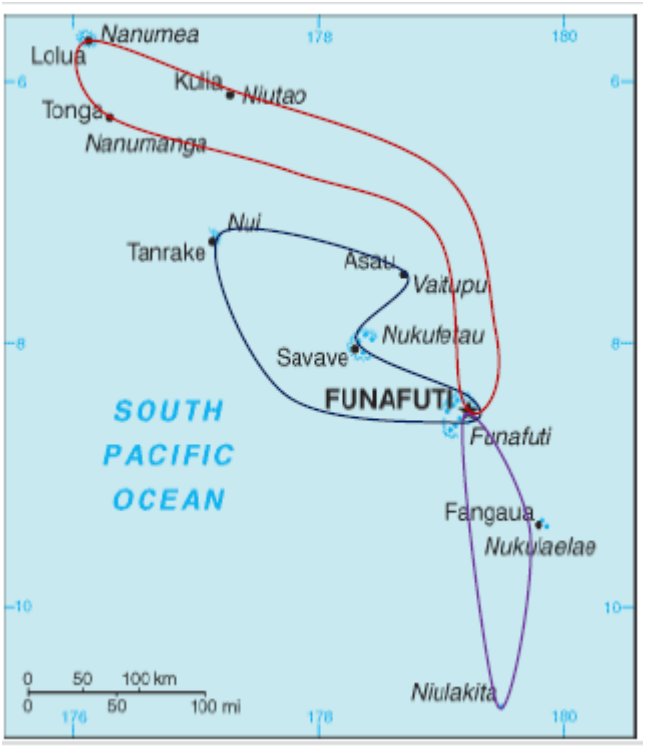


Figure 2. Domestic routes of vessels in Tuvalu

3. Roles and responsibilities Relevant to the Waste Sector

There are two primary legislative Acts that outline the legal roles and responsibilities related to waste management in Tuvalu. In addition to these Acts are a number of international conventions Tuvalu is signatory to that may stipulate additional responsibilities.

The Environment Protection Act (2008) is the overarching Act on maintaining the environment of Tuvalu. Part 6 of this Act outlines the roles and responsibilities specific to budget .

An offshoot of this Act is the adoption of the Waste Services and Operations Act (2009) (which addressed the significant gap in the laws of Tuvalu in the area of waste management. The subsequent Act defined specific roles and responsibilities of waste management in Tuvalu. These are highlighted below.

Tuvalu is also a signatory to a number of international conventions of relevance to the waste sector, including (but not limited to) such conventions as:

- Stockholm Convention on Persistent Organic Pollutants;
- Waigani Convention; and
- Noumea Convention.

A full list of conventions Tuvalu is signatory to can be found in the Environment Protection Act (2008).

Ministry of Home Affairs and Rural Development

This Ministry is the governing body for waste management under which the Solid Waste Agency of Tuvalu and the Kaupule, the main providers of waste services are operating.

Under the Waste Operations and Services Act (2009), the Minister may:

- Make regulations imposing a special levy on particular goods which have an adverse effect on the environment;
- Impose additional charges on commercial premises where waste operators maintain a public service ensuing the surrounding areas (streets, parks, etc. are clear of waste and litter);
- Impose any other type of special levy relating to waste management services for the purpose of recovering costs incurred in the management of wastes.

Solid Waste Agency of Tuvalu (SWAT)

This agency which sits under the Ministry of Home Affairs and Rural Development oversees and manage the overall handling wastes. Specifically, SWAT is responsible for:

- Management and operation of waste disposal facilities if needed to provide 'additional technical and operational capacity to ensure the proper processing and disposal of wastes'. This function is exercised by the agency in Funafuti.
- Handling the collection and disposal of wastes that cannot be managed by Kapules or designated waste management operators – including the storage and disposal of hazardous and bulky wastes. This function is exercised by this agency in the collection of green wastes, recyclable wastes and hazardous wastes in Funafuti. The Kaupule collects general wastes from households and commercial premises.
- Ensuring the proper siting, development and management of landfill areas and approved dumping and waste storage sites
- Provision of other appropriate waste treatment, storage and disposal facilities,
- Formulation and implementation of policies, programs and initiatives aimed to reduce the generation of wastes;
- Public awareness on effective management of wastes to ensure waste reduction and prevention of health and environmental risks
- Audit of wastes being generated or disposed of in Tuvalu; and
- Preparation and issuance of reports and compilation of statistics relevant to management of wastes in Tuvalu

Kaupule

The Kaupule is the local government unit in each island which is designated as the waste management operator in the waste service areas in their particular area of jurisdiction. The Kaupule sits under the Department of Rural Development within the Ministry of Home Affairs and Rural Development. The Kaupule may make by-laws under the Falekaupule Act 1997 in relation to any matter and perform the function under section 15(2) of the Waste Operations and Services Act 2009.

Specifically, the Kaupule is responsible for community obligations such as the:

- Management of waste dumps,
- Provision of compulsory collection services to residential and commercial premises,
- Cleaning of streets and public areas,
- Provision of waste receptacles in public areas and other facilities to assist in the reduction of littering and waste in public areas, roads and reserves,
- Provision of waste management services to aircraft, ships and other vessels,
- Implementation of litter and waste control measures such as promotion of recycling and other waste minimisation programmes,

- Preparation, adoption and enforcement of rules, operating manuals, codes of practices and standards relating to the waste management services, and
- Preparation of reports and maintenance of statistical records relating to its waste management activities submitted to SWAT.

Waste Recycling Operator
Currently, the recycling operation is undertaken by a sole private recycler who is licensed and contracted by SWAT. The responsibilities include collection, processing and export of items.

Ministry of Health
This Ministry is responsible for the collection, treatment and disposal of medical wastes. Section 7(2) of the Public Health Act 2008 provides that public health standards relating to waste management practices and facilities may be prescribed by the Minister of Health and the Ministry of Health is responsible for the monitoring and enforcement of the approved standards.

Department of Environment (DOE)

The Department of Environment shall ensure that there is proper regulation and control of pollution, littering, wastes (including hazardous wastes) in Tuvalu, and shall take appropriate measures to minimise the impacts of pollution, litter and wastes on the environment. This includes such tasks as monitoring pollution, licensing polluting industries, regulating the disposal of wastes, and raising public awareness related to waste management. Specifically,

- In accordance with Part VII of the Environment Protection Act (2008), DOE is responsible for the implementation of international conventions relating to the management of hazardous wastes; and
- In accordance with section 19(2)(g) of the Environment Protection Act 2008, DOE is responsible for regulatory control over waste dumps and waste disposal sites based on environmental impact assessment procedures;

Marine Department

The department is responsible for the regulation of waste disposal at sea under the Marine and Pollution Act 1991 together with DOE which implements the relevant international conventions.

4. Current Waste Management

a. Current Waste Situation

Waste Generation and Composition

The household waste stream of Funafuti in Tuvalu is dominated by green waste comprising 45.34% of total waste generated (Tupulaga, 2014). This consists mostly pandanus, breadfruit and kanava trees. Other recyclable materials such as paper and cardboard, textiles, tin cans, plastic bags, and glass are also generated in reasonable amounts.

In a recent study (Mainstream, 2016), it was noted that the estimated collection of greenwaste by SWAT amounts to 2,265 m^3 per annum with an average of 2.5 m^3per household per annum. Estimated annual volume of mulched material is 788 m^3.

The same report (Tupulaga, 2014) estimated that each household in Funafuti generates 23kg of wastes per week or an average of 0.37kg per person per day as shown in Table 1.

Table 1: Household waste generated in Funafuti, 2014

Group	Waste Name	Total Kg	Av. Kg/HH/wk	Av.Kg/HH/ day	Total Vol	Av.kg/HH /wk	Av.Kg/HH /day	% Weight
1. Organic	1.1 Paper & Cardboard	49.20	2.24	0.32	831.15	37.78	0.25	9.56
	1.2 Food/kitchen	27.27	1.24	0.18	202.25	9.19	0.06	5.30
	1.3 Garden	233.23	10.60	1.51	2262.05	102.82	0.67	45.34
	1.4 Wood/Timber	7.14	0.32	0.05	55.80	2.54	0.02	1.39
2. Inorganic	2.1 Glass	14.84	0.67	0.10	128.40	5.84	0.04	2.88
	2.2 Aluminium Cans	3.96	0.18	0.03	73.65	3.35	0.02	0.77
	2.3 Tin Cans	20.45	0.93	0.13	292.65	13.30	0.09	3.98
	2.4 Other Metals	9.53	0.43	0.06	46.65	2.12	0.01	1.85
	2.5 Plastic bottles & Cntrs	0.15	0.01	0.00	3.75	0.17	0.00	0.03
	2.5.1 PET	8.40	0.38	0.05	240.90	10.95	0.07	1.63
	2.5.2 HDPE	0.62	0.03	0.00	12.90	0.59	0.00	0.12
	2.5.3 PVC	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.5.4 LDPE	0.03	0.00	0.00	0.12	0.01	0.00	0.01
	2.5.5 PP	1.11	0.05	0.01	28.05	1.28	0.01	0.22
	2.5.6 Polystyrene	0.90	0.04	0.01	5.55	0.25	0.00	0.17
	2.5.7 Others - No # or label	15.28	0.69	0.10	226.77	10.31	0.07	2.97
	2.6 Plastic Bags and Film	24.57	1.12	0.16	600.75	27.31	0.18	4.78
	2.7 Rock & Soil	49.04	2.23	0.32	76.19	3.46	0.02	9.53
	2.8 Leather, Textiles, Rubber & Vinyl Flooring	42.27	1.92	0.27	542.70	24.67	0.16	8.22
	2.9 Aluminium Foil	3.16	0.14	0.02	44.70	2.03	0.01	0.61
	2.10 Nappy/pads	2.96	0.13	0.02	20.40	0.93	0.01	0.58
3. Hazardous	3.1 Batteries, fluorescent tubes, syringes, electronic items, chemical residues, medicines fibreglass and glue	0.31	0.01	0.00	3.60	0.16	0.00	0.06
4. Large Items	4.1 Large Items	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The proliferation of bulky wastes is also very evident in Funafuti. The same survey result released in 2014 show significant quantitites of bulky wastes (Table 2).

Table 2: Bulky wastes generated in Funafuti

Waste Name	Condition	Location	QTY	VOL (m3)
Aluminium Cans	Crushed and stacked	Kaupule Office/Apelaamo Res		4
Chipney Bus	Still intacked	Vancamp Workshop	1	
Chipper	rusted and racked	Hangar	1	
Container	rusted and racked	Blue Ocean, Suka Res, TCS, Wharf & disposal site	10	
Double Cab	Await spareparts	Togabiri Residence	1	
excavator	rusted and racked	Disposal site	1	
Fire truck	rusted and racked	Vancamp Workshop	2	
Folklift	rusted and racked	Matanle Res	1	
Heavy Duty truck	rusted and racked	Wharf	3	
Mini Van	rusted and racked	Penehulo & Fakaiaiamanu	2	
Rav4 mini car	rusted and racked	Ese Residence	1	
Saloon Car	rusted and racked	Disposal site, Vancamp, & others	49	
Trailer truck	rusted and racked	Disposal site & Wharf	2	
Truck	rusted and racked	Vancamp Workshop, Vaea & Togab	10	
Wooden boat	damaged	Wharf	1	
Other metals	piled and stored	PWD & Apelaamo Res		4
TOTAL			**85**	**8**

A separate study in the outer island of Nanumaga revealed a domestic waste generation of 0.33kg/person/day or 1080m^3/year (Tupulaga and Wu, 2010). Table 3 presents the waste composition in Nanumaga Island.

Table 3: Waste composition and generation in Nanumaga

Waste Classification	Total Weight (kg)	Average Waste Stream by % weight	Average Waste Stream per Household per week (kg)	Average Waste stream per person per week (kg)
Paper/Cardboard	32.41	10.82	1.62	0.26
Garden Waste	106.05	35.42	5.30	0.84
Wood & Timber	5.20	1.74	0.26	0.04
Glass	42.05	14.04	2.10	0.33
Aluminium Cans	1.20	0.40	0.06	0.01
Tin cans	20.57	6.87	1.03	0.16
Other metals	12.10	4.04	0.61	0.10
Plastic containers	26.90	8.98	1.35	0.21
Plastic bags & films	13.95	4.66	0.70	0.11
Rock & soil	1.83	0.61	0.09	0.01
Leahter, textiles, rubber, floor tiles	29.60	9.89	1.48	0.23
Hazardous	5.57	1.86	0.28	0.04
E-wastes	2.00	0.67	0.10	0.02
TOTAL	**299.43**	**100.00**	**14.97**	**2.36**

Another major concern is the amount of hazardous wastes generated in the island as shown below (Table 4).

Table 4: Hazardous wastes generated in Funafuti, 2014

Waste Name	Condition and Status	Location	QTY
Batteries (Lead-Acid)	Full and Empty casing	Hangar	273
Chemicals	stored in buckets	Hangar	24
Transformers	still contained oil	Hangar	15

Tuvalu theoretically generates 5,000 litres of used oil per year of which 80% are exported to Fiji's steel mill. Around 14,500 litres are stockpiled in the island of Funafuti (SPREP, 2016).

In terms of asbestos contaminated materials (ACM), through the EU-funded PacWaste Project, Tuvalu is assessed to have 251 m^2 of confirmed ACM with 120 m^2 of moderate risk and 130 m^2 low risk (Contract Environmental and Geosciences Consulting, Ltd, 2015).

The amount of reported healthcare wastes in Tuvalu is below the Pacific Island average (0.8 kg/occupied bed) with only 0.3 kg generated per occupied bed on a daily average (ENVIRON, 2015) underatken through the EU funded PacWaste Project. No stockpiles are reported since the healthcare wastes are immediately incinerated.

Waste Collection

Household wastes in Funafuti are collected by the Kaupule and taken directly to the dumpsite manned by SWAT. The Kaupule also collects wastes from schools, government buildings, churches and other institutions, commercial establishments. They also collect aircraft, ship and other vessel wastes. These collection services is monitored by SWAT ensuring that most households and buildings are properly serviced (Telakau, 2016).

A separate collection of green wastes is the responsibility of SWAT and are deposited and processed through shredding at the hangar. SWAT also collects bulky wastes and scrap metal. The hangar is the only waste facility in Funafuti apart from the dumpsite. The e-wastes collected by SWAT is also stored at the hangar awaiting processing and disposal by an offshore recycling company. The same is done for used oil which are stored in tanks at the hangar waiting for shipment to Fiji. Nappies are collected separately as well and disposed in a designated area in the dumpsite.

The people living along the shoreline and community groups collect shoreline wastes with assistance from Kaupule for disposal. The responsibility for clearing up these wastes is quite uncertain and needs to be streamlined. Similarly, the system for managing disaster wastes is very ad hoc.

The shipping wastes deposited in bins at the port is also collected and disposed at the dumpsite by the Kaupule.

There is currently no collection of asbestos and chemicals since there is no existing storage facility for such. The PacWaste Project supports the removal and disposal of stockpiles of ACM in high risk PICs within the available budget. Since there are no high risk ACM in Tuvalu, there is no definite plan yet for asbestos removal. However, due to increased incidence of cyclones, the need to address dispersal of ACM in moderate to low risk areas should be considered in future projects.

The bulky wastes and scrap metal are supposed to be collected by the sole recycler, stored and packed in containers for shipment. However, due to underperformance of the sole recycler, SWAT took over this responsibility. The recycler also currently collects healthcare wastes which poses risks due to lack of training in handling these wastes and the lack of proper functional incinerator. Through the EU funded PacWaste Project, a new incinerator was installed close to the Princess Margaret hospital and an agreement was made to designate and train hospital staff on proper handling and disposal of healthcare wastes and operating the new incinerator. The operation of the newly-installed incinerator will be transferred to the Ministry Of Health after the training as agreed with the Permanent Secretary of Health.

The collection schedule for specific waste types is specified in Table 5 below.

Table 5: Current collection schedule of wastes in Funafuti

Type of waste	Schedule	Responsible
Household waste	Monday - Friday	Kaupule
Green waste	Monday, Tuesday, Thursday and Friday	SWAT
Recycled metals	Wednesday	SWAT
Nappies	Monday and Friday	SWAT

3R plus Return

Unfortunately, there is no known 3R plus return programme undertaken except for the green waste processing and the scrap metal recovery.

Waste Disposal

There is only one currently used dumpsite in Funafuti. Through the assistance of MFAT, the borrow pits from WWII which have been previously used as mini dumpsites have been covered and converted into a different land use. However, the rehabilitation of the dumpsite resulted in the landowners'reluctance to lease further portions of their land to expand the dumpsite seeing the opportunity to convert their land into other uses. The negotiations are still ongoing which if not successful will cause problems in expanding the capacity of the current dumpsite or relocating to another suitable site. There is no feasible relocation site identified yet.

b. Review of Previous Plans

The Integrated Solid Waste Plan 2005 (Tonkin & Taylor, 2005) was the output of the ADB funded "Effective Waste and Management and Recycling Project". The plan, however, was mainly focused on the more pressured capital, Funafuti. There was no available monitoring report for the implementation of this plan and the following information is a superficial assessment of achievements in the plan based on communication with SWAT and previous SWAT Director.

Less than 50% of the twenty activities planned have been implemented due to insufficient funding and limited human resource capacity. The following Table 6 summarizes the progress of the 2005 waste plan.

Table 6: Progress of 2005 integrated solid waste plan for Tuvalu

Activity	Progress
1. Green waste diversion	Occurring
2. Improved landfill management	Undertaken although still struggling with limited capacity
3. Improved community awareness	Undertaken in Funafuti
4. Short term improvements to waste collection system efficiency	Trucks were dispatched to collect waste in Funafuti where there is no previous collection service
5. Institutional waste system improvements	A Waste Management Unit was established to oversee delivery of waste services
6. Improved organic waste diversion, composting and household and community gardening	Diversion of organic waste is ongoing; Composting using windrow method was done for a few months but was stopped due to site issues; Green wastes are currently shredded and allowed to mature with substantial volumes taken by the Taiwanese nursery; Processing is limited due to insufficient space in the hangar.
7. User charges	User charge was reviewed but the proposed charge was way too high and expensive
8. Waste drop-off and recycling centre	Not accomplished due to land issue; Plan underway
9. Packaging wastes (non-plastic)	Not accomplished
10. Plastics	Not accomplished

Activity	Progress
11. Non-ferrous metals	Recycling of aluminium cans exist but not fully addressed as expected
12. Steel/ferrous metal	Undertaken with the recycler
13. Glass	Not accomplished
14. Bulky and difficult wastes	Not fully addressed
15. Hazardous wastes	Collection undertaken
16. Construction and demolition wastes	Not fully addressed
17. Septic tank servicing	Not managed well
18. Medical waste	Not managed well
19. Waste flow controls, tariffs and bans	Investigation in progress
20. Waste by-law	Waste regulation was submitted to AG Office for review - still in progress; Environment Protection Regulation 2013 is currently enforced.

In a review conducted in 2011 by SPREP, the following issues were highlighted:

- Tuvalu still does not have the capacity to deal with e-wastes.
- Waste levy was identified as the most suitable financial mechanism to sustain waste management activities in Tuvalu.
- The existing Integrated Solid Waste Plan is not well-aligned with the Regional Strategy and Tuvalu needs to decide whether the National Strategy should be aligned with the Regional Strategy.
- There is a need to include indicative costs to the identified activities in the Strategy.
- Tuvalu needs to have a permanent and on-going steering committee to champion SWM. While there was a steering committee established as part of the project, its existence ended up with the end of the project life.
- While green waste composting is in the plan, it has to be adjusted to current situations. Green waste is still recognised as the major component in Tuvalu's waste stream.

While there were attempts to revise the existing Plan, this did not come into fruition. This currently developed Waste Policy and Action Plan will replace the Tuvalu Integrated Solid Waste Plan 2005.

c. The Solid Waste Agency of Tuvalu

As a result of the enactment of the Waste Operations and Services Act 2009, the SWAT became the legal name of the then Waste Management Unit of Tuvalu. SWAT was officially registered as a new department under the Ministry of Home Affairs following Cabinet approval during its special cabinet meeting in June 2010.

Apart from overseeing the delivery of waste services, the department also deals with planning, financing, awareness programs, enforcement of the new act and the overall management of all activities. SWAT is now extending its waste operation to the outer islands and working directly with the Island councils (Kaupule). (Susana Telakau, personal communication, Tupulaga, 2014).

The agency originally consisted of a Director and an Executive Officer.The European Union 10th EDF recommended that an operations officer and a regulatory officer be employed to provide more middle management support. Currently, the agency has grown to 13 staff including field workers.

The Kaupule as part of their mandate described in Section II.3 ais working closely with SWAT in the delivery of waste services. Other departments in relevant line ministries and private sector are also assisting in the waste sector.

The organisational structure is shown below (Figure 3):

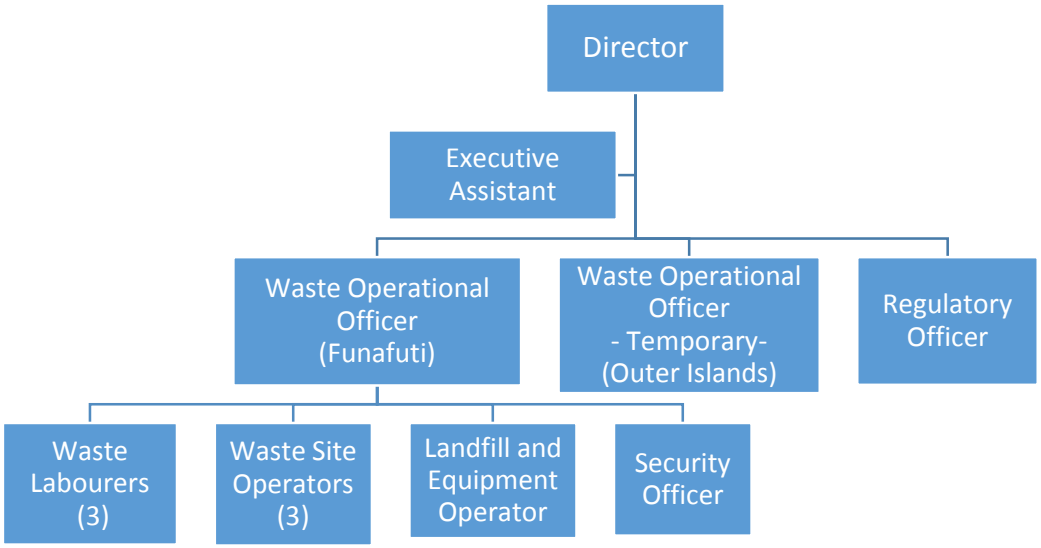


Figure 3: Organisational structure of SWAT

d. Functional Structure of Waste Management

SWAT operates in conjunction with other relevant sectors as shown below in Figure 4 (Wolff, Greg, 2012). The Kaupule plays a major role in delivering waste services in Funafuti and the outer islands. Taiwan is a major co-player in the composting initiatives of SWAT. Recycling and plant maintenance is delegated to the private sector.

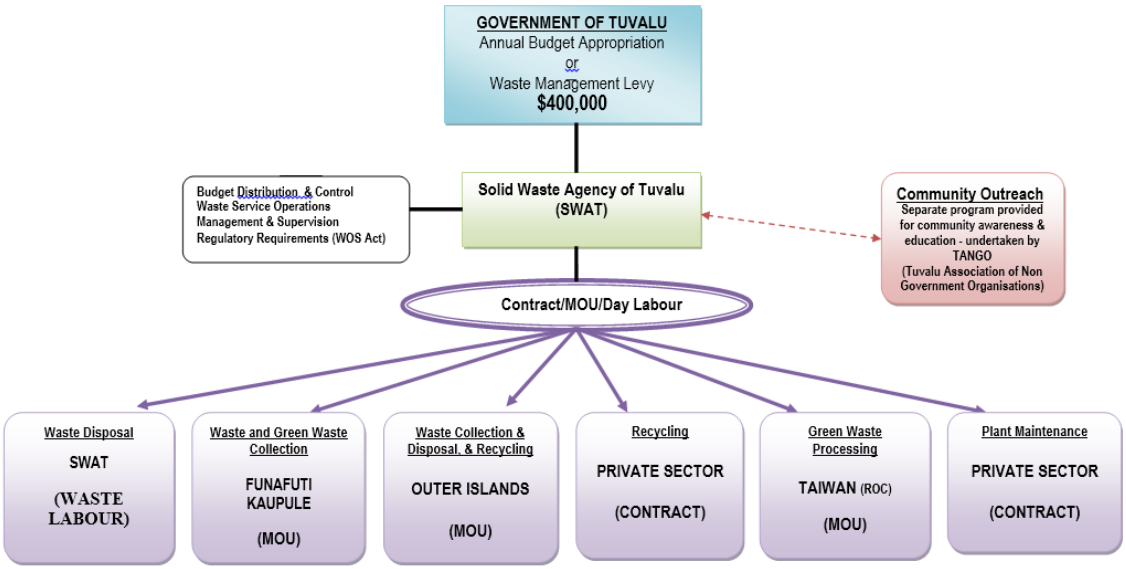


Figure 4: Functional structure of waste management in Tuvalu

e. Resources

Budget

Since the development of a Waste Program for Funafuti and the establishment of SWAT, the government allocated a specific budget for waste management. In the last 3 years, budget allocation increased significantly as shown below in Figure 5 (Government of Tuvalu, 2015)

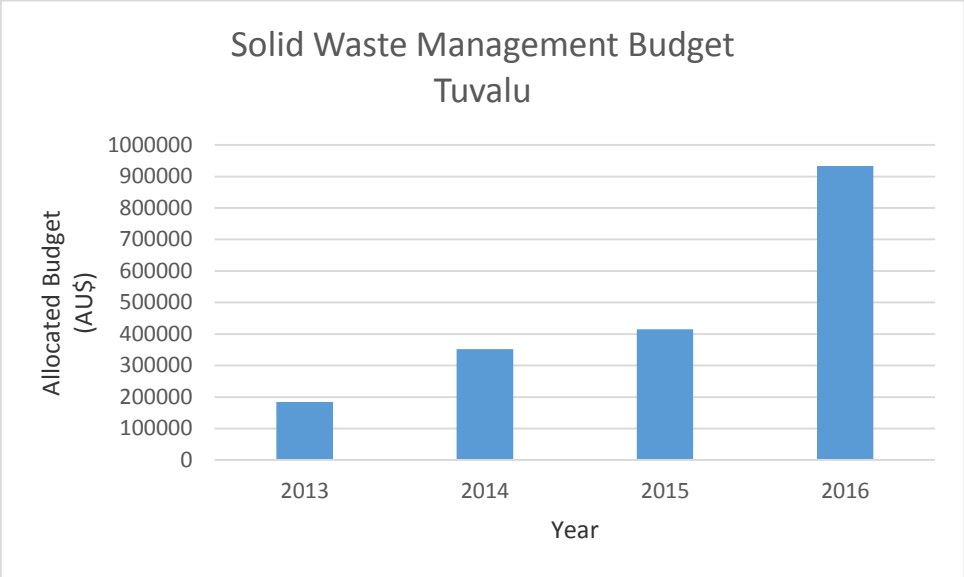


Figure 5: Budget allocation for waste management in Tuvalu

The increases in budget are mainly taken from the Special Development Expenditure (SDE) as a result of approval to build a Transfer and Recycling Station facility. Staffing expenditure also almost doubled from $76,286 in 2013 to $143,820 in 2015 with the recruitment of field staff in the outer islands.

The steady increase in allocation for waste management resulted in major accomplishments such as recruitment of staff to implement the waste collection program, more awareness and enforcement activities to the Environment Protection (Litter and Waste Control) Regulation 2013, establishment of Waste Levy Committee to establish waste levy for imported products, lease of Northern Dumpsite, and continuous diversion of green wastes easing the limited capacity of the dumpsite.

Sustained funding for waste management is also evident in 2015 (Government of Tuvalu, 2015). There was increased coverage of collection service in Funafuti and the outer islands. In Funafuti, there is already an existing Waste Collection Plan with mapped areas and reporting and monitoring forms to collect data. The land lease arrangements and survey for dumpsites in all the islands is progressing well. The enforcement of litter and waste control is being enhanced. The Waste Levy Committee is actively pursuing the waste levy-related tasks. Awareness campaigns have been expanded to businesses and institutions and green waste diversion is continuously implemented.

It is interesting to note that in 2015, SWAT generated a revenue of AUD 2,582 from the sale of compost and equipment hire. This can be further enhanced through sustainable financing mechanisms being investigated by the Waste Levy Committee.

Additional funding was secured from EU for the development of this Tuvalu Integrated Waste Policy and Action Plan and from Aviation Project for a recycling equipment, procurement of which is in progress.

Despite raised profile of the waste sector in Tuvalu, a number of priorities for 2015 have not been achieved yet, to wit:

- Rehabilitation of dumpsites in the outer islands to improve waste disposal
- Rehabilitation of the Funafuti Northern dumpsite to increase capacity
- Construction of the Transfer and Recycling Station in Funafuti to implement segregation and increase recycling opportunities and remove green wastes and hazardous wastes from the waste stream disposed at the dumpsite.
- Waste levy system has not been established yet.
- Shipment of scrap metal for recycling overseas.
- Training of field staff in the outer islands and Funafuti on dumpsite management and collection service, among others.
- Medical wastes are handled by an untrained recycler.

This indicates that the Ministry of Home Affairs and Rural Development, through SWAT, needs to pursue a more proactive approach in looking for other sources of funding to augment current budget allocation.

In the 2016 budget, there is a waste-related budget, with contributions from the EU, to support the installation and operation of biogas facilities in the amount of 400,000 AUD. The project will be managed by the Ministry of Public Utilities and Infrastructure. There is a potential for SWAT to capitalise on this project for the management of piggery wastes as input to the biogas facility.

For other waste-related functions such as management of liquid (sewer) wastes, medical wastes, processed green waste (compost) and even pollution control, there are no specific budget allocation for departments who are supposed to undertake these functions, i.e. Public Utilities, Health, Agriculture and Environment, respectively.

For the current year (2016), the Ministry of Home Affairs and Rural Development, through SWAT, indicated the following priorities in their budget application:

- Development of dumpsites in the outer islands to assist with waste disposal and waste management.
- Enhancement of the Waste Program in Funafuti and Outer Islands focusing on waste collection services as well as waste management for all islands.
- Improve waste collection services as well as providing composts to the public.
- Development of a Waste Policy for Tuvalu.
- Construction of a Transfer and Recycling Station Phase 1 on Funafuti to assist the Government in waste segregation process and increase recycling opportunities for recyclable wastes through exporting to overseas. This station will improve waste management system as well as maximizing the lifespan of the dumpsite as recyclable wastes are removed from the waste stream as well as hazardous wastes and green wastes.
- Development of Waste levy for import products/items to assist Government with the disposal of the item or shipping costs to recycling companies overseas.
- Awareness programs and activities for outer islands as well as Funafuti to assist the public to understand the impacts of wastes on human health and environment.

- Awareness programs for the public to understand the currently developed Waste Operation and Services Regulation to supersede the Environment Protection Regulation.
- Shipment of recyclable wastes for recycling overseas.
- Training of staffs under the Waste Program in the outer islands as well as the staffs for Funafuti Island on waste management, management of dumpsites, waste collection services, etc.

Assets
The existing assets used for waste service delivery are listed in Table 7 (SWAT, 2016).

Table 7: Assets used by SWAT in delivering waste services

Asset Description	Year Acquired	How acquired
Truck (Mitsubishi)	2009	
Pick Up Mini Truck		donated by AusAid
600XL CHIPPER (VERMEER)	2014	donated by NAPA
600XL CHIPPER (VERMEER)	2010	
600XL CHIPPER (VERMEER)		
VEGETATION CHIPPER (HANSA C30)	2013	donated by EU
ALERT CAN & METAL BALER	2013	donated by EU
LOADER (CAT)	2013	donated by EU
EXCAVATOR (CAT)	2013	donated by EU
LOADER (KOMATSU)		donated by EU
KUBOTA 4X4	2013	donated by EU
DAELIM 250CC	2010	
TRACTOR & TRAILER (FUN KP)	2013	donated by EU
TRACTOR & TRAILER (FUN KP)	2013	donated by EU
TRACTOR & TRAILER (RECYCLER)	2013	donated by EU
TRACTOR & TRAILER (NNMEA)	2013	donated by EU
TRACTOR & TRAILER (NMGA)	2013	donated by EU
TRACTOR & TRAILER (NTO)	2013	donated by EU
TRACTOR & TRAILER (NUI)	2013	donated by EU
TRACTOR & TRAILER (VTP)	2013	donated by EU
TRACTOR & TRAILER (NKFT)	2013	donated by EU
TRACTOR & TRAILER (NKL)	2013	donated by EU

f. Development Partners Assistance

The current renewed focus given to waste management is an outcome of the technical and financial assistance of development partners since the late 1990s. A summary of the assistance received by Tuvalu in the management of wastes is shown in Table 8.

Table 8: Developmnet partners assistance provided on waste management in Tuvalu

Development Partner	Assistance Provided
AusAID	Introduction of municipal-scale waste management system
ADB	Development of the Integrated Solid Waste Plan 2005
EU (EDF 8-10)	• Drafting of the Waste Operations and Services Act 2009 • Provision of financial support for the initial operation of SWAT • Solid waste survey of Nanumaga island

Development Partner	Assistance Provided
	• Provision of equipment and household bins to improve delivery of waste services • Capacity building to SWAT • Support to enhance awareness in the waste sector, through TANGO
MFAT	Closure of borrow pits and improvement of the Funafuti dumpsite
WorldBank	Solid waste inventory for Funafuti and Nanumaga and feasibility studies on the options for exportation of wastes
Republic of China (Taiwan)	Support to green waste processing by buying the mulch and converting to compost product for their garden
UNDP	Preparation of the waste/debris component of the TC Pam Recovery and Vulnerabiity Reduction Plan
SPREP	• Provision of waste management trainings • Assistance to the development of the Tuvalu Integrated Waste Policy and Action Plan • Management of healthcare wastes, asbestos, and e-wastes through the EU-SPREP PacWaste Project • Management of chemicals through the GEFPAS Project
JICA	• Provision of one training for Kaupule, through the J-PRISM project

g. Other Waste Management Activities

SWAT undertakes community awareness campaigns encouraging proper containment of wastes and segregation of green wastes and hazardous wastes from general wastes. The planned establishment of the transfer and recycling centre will allow SWAT to expand its community awareness campaigns to include 3R plus Return.

SWAT is also collaborating with SPREP to provide technical assistance for chemical management and proper turnover of responsibility of managing healthcare waste to the Ministry of Health, mandate of which is provided in the Public Health Act 2008.

5. Potential Linkages

Biogas Project

The Biogas Facility Project ran by the Department of Energy in collaboration with SPC (through an EU funded project) and UNDP can be a good collaborative avenue to reduce impacts of piggery wastes (Lifuka, 2016). The SWAT can facilitate the provision of piggery waste inputs to run the facility and achieve the desired output. This initiative will create a huge positive outcome by reducing environmental impacts from improper management of animal wastes apart from the social and economic benefits of having renewable source of energy.

Ridge 2 Reef Project

A project component will look into the use of pig manure for compost which can be aligned with the results of a Cost-Benefit Analysis for greenwaste processing conducted recently.

Shipping Improvement Plan

In a study conducted by JICA in 2013, it was identified that for reverse logistics to work in Tuvalu, this should be mainly run by the public sector with involvement from the private sector. Reverse logistics or backloading will allow recyclable waste materials to be shipped to a processing centre off the islands when the vessel sails off after dropping imported goods to the islands. Because of the low export base

of Tuvalu, the vessels carrying imported goods will return with no significant loads. This is not a very economical trading system and puts pressure on freight costs.

During the development of the International Shipping Plan of Tuvalu, the concept of reverse logistics was introduced and well accepted by the marine transport stakeholders. This was eventually made part of the Improvement Plan.

6. Challenges and Opportunities

The delivery of proper waste services can be a daunting task due to the following apparent challenges:

- The cost impact of providing waste services to the dispersed, low density and remote outer island communities and transporting recyclable wastes to the main island's processing centre and to a growing urban population with limited land space and waste handling practices;
- The impact of distance to a resource recovery infrastructure from Tuvalu to other countries;
- The low volume of potential recyclable wastes in relation to the economy of scale;
- The lack of return of many recyclable wastes currently being experienced globally (e.g. no demand for scrap metal, plastics)
- The small size of the current landfill in the main island and the difficulty of expanding the same site and the lack of available land for a new site – planning for waste disposal beyond the current 3-year lifespan of the site;
- The cost liabilities and commitment to improving waste service sites to best practice to achieve maximum diversion of waste from the landfill given the constrained resources available;
- The sustained active commitment of stakeholders (government and non-government) to co-share the responsibility of managing wastes – raising and maintaining the profile of waste management in the government's agenda;
- The regulation of imported goods through imposition of waste levies; and
- The initiation of more affordable and financially sustainable, low-technology solutions to waste issues but involving greater community and stakeholder participation – community based programmes.
- Vulnerability of the islands to disaster and climate change impacts which has the potential to increase greenwaste and disaster debris and can cause catastrophic impact on land especially near the coast, resulting in loss and damage to core public infrastructure assets, such as landills.
- Major infrastructure projects being carried out or in the pipeline which will generate large volumes of building and hazardous waste (for example, the airport terminal upgrade, the construction of the new fisheries building and court house)

Opportunities which exist that can be beneficial in the delivery of waste services include:

- The existence of a designated department in the government to specifically oversee the management of wastes shows the government's focus on waste management as a priority environmental issue in the island;
- The resulting policy and action plan will attract increased level of program support and funding;
- The endorsed Pacific Regional Waste and Pollution Management Strategy (Cleaner Pacific 2025) defines certain elements of countries' commitments from which the Tuvalu Integrated Waste Policy and Action Plan can be aligned;

- Through the Cleaner Pacific 2025, there may be opportunities for regional collaborative arrangements and having clear, concise strategic actions in the Tuvalu Integrated Waste Policy and Action Plan will give Tuvalu a significant headstart;
- The Tuvalu Integrated Waste Policy and Action Plan will facilitate initiation of more sustainable, community-based, resource management programmes relevant to the waste sector;
- The Media Office can be involved in the development of social media platforms for cost-effective educational campaigns;
- The willingness of the different sectoral representatives in getting involved in addressing waste issues will enable a multi-stakeholder monitoring programme. This will ensure that outcomes on the delivery of the plan reach out to the wider public and will provide an audit mechanism on the delivery of waste services;
- The planned baseline survey with assistance from EU and SPREP will provide reference points to check progress of the Action Plan; and
- Social acceptance and demand for reused and recycled items given the lack of product availability and low material consumerism.

III. Part Two—the Policy

Tuvalu Integrated Waste Policy and Action Plan: Towards cleaner and healthier islands

1. Purpose

The Tuvalu Integrated Solid Waste Plan of 2005 documented the overall waste policies and strategic elements of managing wastes particularly in the main island of Funafuti. This currently developed Tuvalu Integrated Waste Policy and Action Plan builds on the strategic actions specified in this plan after a review done as part of the development process. One of the major improvement is the coverage of the outer islands apart from Funafuti.

The commitments to minimise waste to landfill through organic waste diversion, get residual disposal options fully operational, develop and implement measures to achieve significant long-term waste reduction, and develop community-based schemes and institutional mechanisms to promote waste reduction are all taken on board and assessed as to how the existing plan progressed.

The nature of wastes and the consumption pattern of the community has significantly changed in the last 10 years and this resulted in some emerging waste issues which need to be addressed in the immediate to short-term period. The Tuvalu Integrated Waste Policy and Action Plan builds on earlier commitments and responds to the new waste environment covering both solid and hazardous wastes which pose imminent risks to public health and the receiving environment.

The policy and action plan hopes to set a clear direction for Tuvalu towards minimising wastes to the landfill, improving management of hazardous wastes to comply with international obligations and managing wastes as resource to deliver socio-economic, health and environmental benefits through to 2026. It also seeks to ensure that there will be strong pillars built to enable strengthened institutional and human capacities to sustain implementation of waste management activities. It is also expected to complement actions that will provide best practices that will minimise risks and achieve optimum and resource-efficient benefits.

The role of community and stakeholders are paramount in the success of any waste management initiative. This policy and action plan intends to build relationships among stakeholders and encourage co-sharing of responsibilities in managing wastes. This would include promotion of wider community involvement and public-private partnerships.

This policy statement articulates the vision, aims and principles to guide actions, sets key directions and priority strategies for integrated waste management and resource recovery to 2026, and provides a mechanism for measuring progress and responding to change.

2. Scope

This policy encompasses wastes, including hazardous wastes and substances, in the household, institutional and commercial waste streams, and covers liquid and solid wastes from the main island Funafuti and the outer islands. The specific types of wastes covered in the policy are illustrated below (Figure 6):

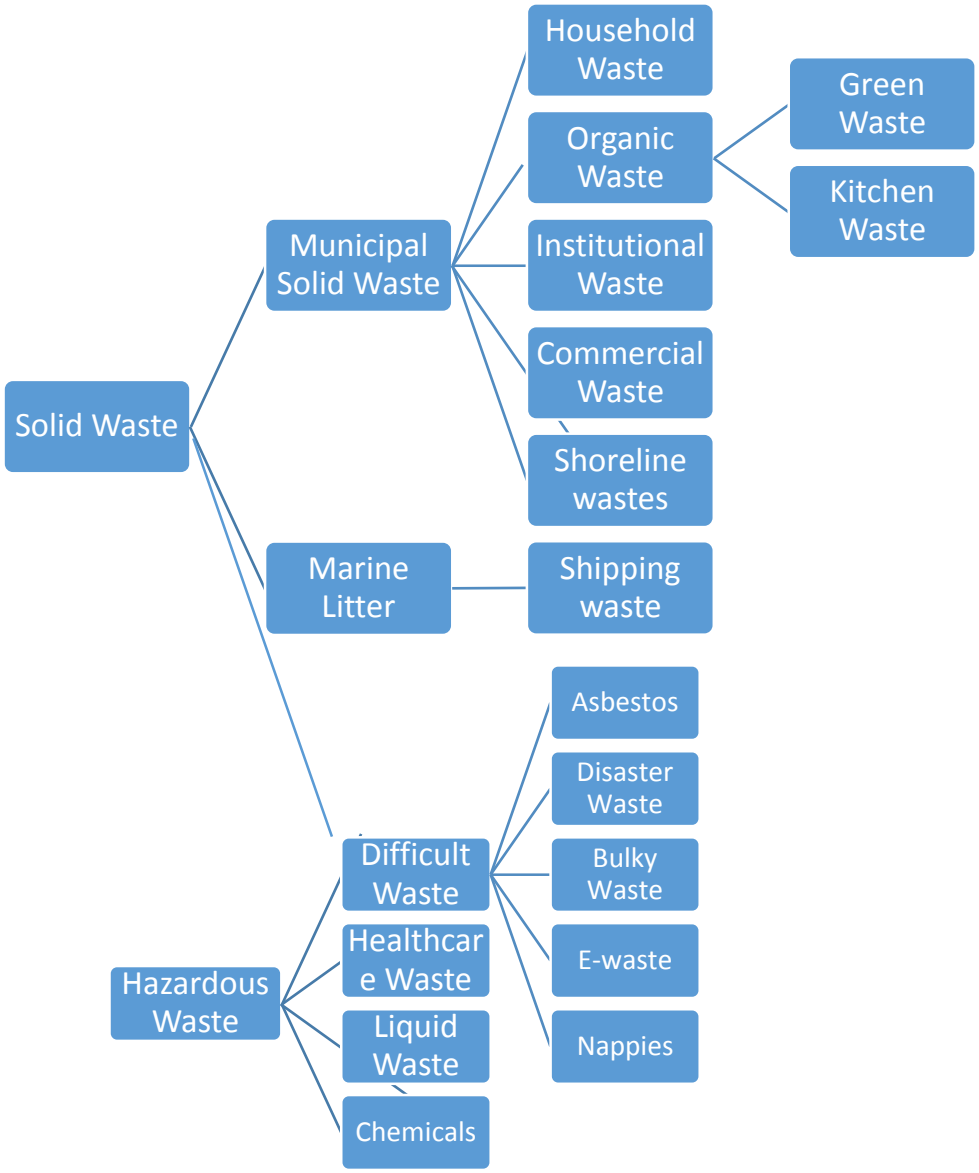


Figure 6: Types of wastes generated in Tuvalu

The policy does not cover gaseous wastes although greenhouse gas (GHG) emissions resulting from waste activities will be assessed.

The policy provides the Government of Tuvalu the strategic direction to develop and deliver waste services and resource recovery mechanisms that will assist communities minimise wastes and maximise diversion of more wastes away from the landfill. It looks at cost-effective and sustainable options of managing wastes based on issues raised during wide sectoral consultations.

An action plan was developed to articulate the vision of a cleaner and healthier Tuvalu today and in the future. Goals and strategic actions are developed to achieve this 10-year vision to 2026. The action plan details activities covering the first 5 years of the policy through to 2021. The intent is to have these activities updated after 5 years commencing implementation in 2017 with an annual review to ensure effectiveness and track progress of the proposed actions.

3. Aims

The Tuvalu Integrated Waste Policy and Action Plan aims to:

- Synergise efforts in waste management among different line agencies of the government and the wider community;
- Improve the environment, health and socio-economic conditions of the people of Tuvalu by managing wastes properly through 3R+return programmes and provision of safe and environmentally sound collection, storage, treatment and disposal systems; and
- Sustain the initiatives on waste management through the legislative process of Cabinet adopting this policy.

4. Policy Context

The ***Te Kakeega III National Strategy for Sustainable Development 2016 to 2020*** (TKIII) which was just recently adopted by the Government of Tuvalu spells out national plans in different development areas attuned to the Sustainable Development Goals. The people of Tuvalu through intensive consultations have established the strategic goals and actions which can alleviate their socio-cultural, economic, environmental and political state in the next 5 years departing from the previous National Strategy TKII.

TKIII defines the government's goal to support the Falekaupule's governance and promote island development through provision of quality services and creation of more opportunities. This is clearly stated in Strategic Area #5: Falekaupule and Island Development. The management of solid wastes is covered in this strategic area where the challenge of extending the land space and lifespan of the national dumpsite in Funafuti was specifically recognised. It also identified the need to improve the state and operation of the outer island disposal sites building on the Funafuti experience. The SWAT endeavours to address the dumpsite issues, build capacities of its staff, identify equipment and infrastructure needs to better manage wastes, and continuously improve organic waste processing.

In the same strategic document (TKIII), Strategic Area #10 deals with multilateral environmental agreements of which Tuvalu is a party to a number of waste and pollution conventions. Section 11.2 on Urban Population Growth described poor liquid and solid waste disposal as issues and suggests designing and implementing a recycling scheme for reusable wastes (plastic, metal, paper, etc.). Section 12 on Oceans and Seas deals with marine pollution and recommends the need for proper sewage disposal.

The roles and responsibilities of the SWAT, Kaupule and other relevant sectors described in Section II.3 are derived from Part IV of the ***Waste Operations and Services Act 2009***. The Act was enacted to enable systems in the collection and disposal of solid wastes and other waste-related operations and services in Tuvalu. This Act constitutes the basis for activities undertaken in this sector. This Act addressed the legislative gap in the area of waste management which was built up from the ***Environment Protection Act 2008*** broadly covering the management and protection of the environment with specific provisions dealing with waste management issues.

The ***Falekaupule Act 1997*** spells out some functions and powers of Falekaupule exercised through their Kaupule and officers relating to waste management issues.

The ***Tuvalu Integrated Waste Policy and Action Plan 2016*** is a departure from the ***Tuvalu Integrated Solid Waste Plan 2005*** with lessons learned and good outcomes to be considered in the implementation of this current policy. The policy hopes to facilitate the legislation of a Waste By-law as the enforcement instrument to deliver better outcomes.

The Tuvalu Asset Management Framework and Infrastructure Management Support (ADB and PRIF, 2016) aims, when fully implemented, to help achieve enhanced public satisfaction resulting from improved service levels; improved public health, safety and environmental performance, higher economic return on infrastructure investments through more efficient life cycle operation of the assets, including waste related assets ; ability to validate and demonstrate to all stakeholders that "the best value for money" is being delivered by assets.

The ***Tuvalu Infrastructure Strategy and Investment Plan (TISIP) 2012*** (ADB and PRIF, 2012) responded to the needs and priorities for economic investments and infrastructure development as called for in the ***National Strategies for Sustainable Development 2005-2015 Te Kakeega II (TKII)*** . The plan strengthened the capacity of the Government to plan and manage infrastructure development through proper coordination with the development partners. Through this plan, the delivery of waste services was improved by provision of equipment and improvement of disposal sites. TISIP, updated in 2016, aims at strengthening the pipeline of infrastructure investment proposals available to GOT through promoting more rigorous project preparation, appraisal, prioritization and sequencing of investments. The TISIP 2016 Update also takes an important step forward by linking the investment plan to the asset management framework and plan which will provide a much more systematic process for the maintenance and eventual replacement of infrastructure assets, including those in the waste sector.

The ***Tuvalu TC Pam Recovery: Vulnerability Reduction Plan 2015*** identified required financial resources for debris management from TC Pam which is expected to be a long-term undertaking. The plan seeks to ease the pressure of the already difficult handling of wastes in the islands.

Other Tuvalu laws relevant to this policy are described below (Powell, 2009).

Marine Zones Act 1983 (Cap. 24a): This law is relevant in the context of the implementation of Tuvalu's international treaty obligations.

Marine Pollution Act 1991 (No. 1 Of 1992), Harbours Act (Cap. 88), Shipping Act (Cap. 89), Merchant Shipping Act (Cap. 64a): These laws deal with marine pollution and the dumping and incineration of wastes at sea and ports.

Marine Resource Act 2006: Section 63 provides that discharging hazardous wastes such as oil, chemicals, petroleum or sewage to fishery water shall be subject to conviction.

Conservation Areas Act 1999 (No. 3 Of 1999): This law makes some provision in relation to dumping of wastes etc.

Emergencies And Threatened Emergencies (Special Powers) Act (Cap. 9a): This law may have some relevance to the management of the environment during periods of emergency or threatened emergency.

Water Supply Act (Cap. 40): Some provisions of this law aim to protect Tuvalu's water resources from pollution and wastes.

Public Health Act (Cap. 35): Some provisions of this law relate to the management of wastes and the use of certain waste receptacles.

Pharmacy and Therapeutic Products Act 2016: Section 6(1)(b) provides that Committee must develop and review relevant guidelines for medical waste management.

Foreshore And Land Reclamation Act (Cap. 26): The provisions dealing with land reclamations should be considered in the context of exercising controls over the use of certain wastes when land reclamation activities are undertaken.

Crown Acquisition of Lands Act (Cap. 24): Lands may be acquired under this Act for any public purpose related to the management and disposal of wastes.

Customs Act (Cap. 55): The powers under this Act to prohibit and restrict imports and exports is an important means by which the trans-boundary movement of certain goods and substances can be controlled. Such controls can be exercised in relation to goods which may become problematic wastes in Tuvalu.

Quarantine Act (Cap. 34): The effective imposition of quarantine arrangements and requirements are an important aspect of environment protection. It is also relevant in the context of trans-boundary movements.

Apart from these laws, the management of wastes also carries certain legislative obligations in waste-related international conventions such as ***Regional Seas Conventions, Basel Convention and Waigani Convention*** to control the transboundary movements and disposal of hazardous wastes, and ***Stockholm Convention*** which addresses persistent organic pollutants.

5. Policy Development Process

In developing the policy and action plan, preliminary work included meetings with the Solid Waste Agency of Tuvalu (SWAT), review of waste-related reports to set the scene for undertaking the site assessments and consultations.

The multi-sectoral consultations were undertaken in three levels, i.e. focused groups, wider sectoral representatives, and key government agencies. These consultations provided some degree of confidence that the delivery of waste programmes and activities align with community expectations and within institutional capacity. The output of the workshops also provided valuable feedback information to assist in improving and refocusing the delivery of waste services and waste minimisation programmes.

Figure 7 summarises the process taken to develop this strategy.

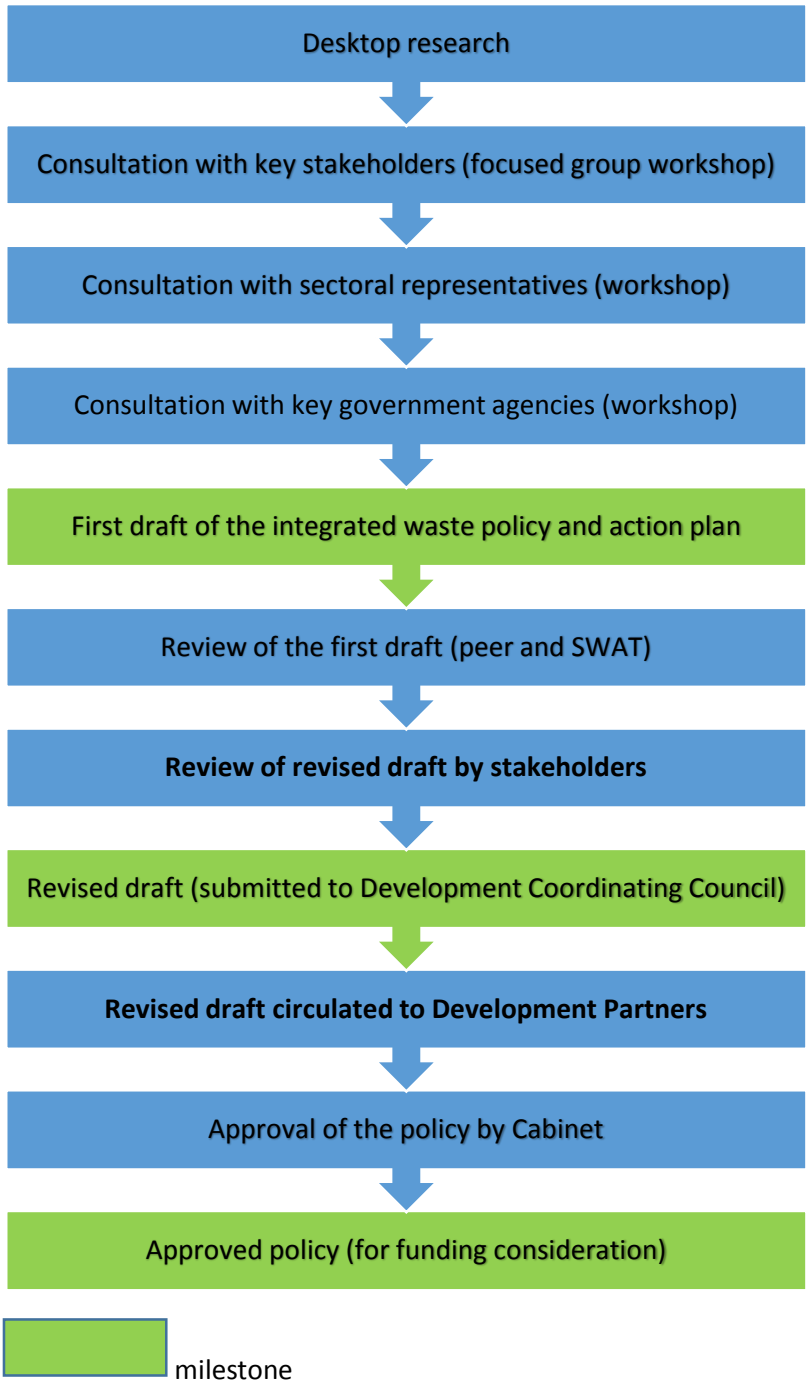


Figure 7: Process of developing the policy

The consultation process (Figure 8) involve review of the current Tuvalu Integrated Solid Waste Plan and identification of issues besetting the waste sector from a stakeholder and institutional point of view. From the identified issues, the stakeholders also provided inputs as to how these issues can be addressed. The outputs from these consultations form the significant basis for establishing strategic goals, actions and specific activities contained in the policy and action plan.

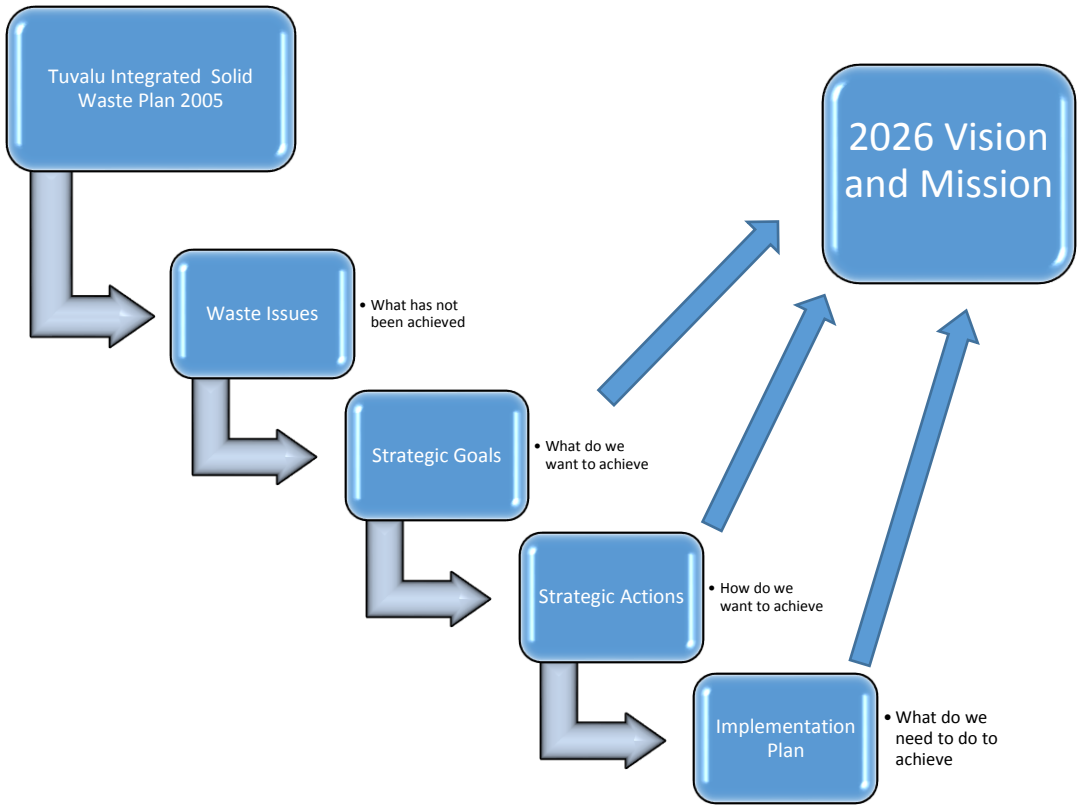


Figure 8: Consultation process for developing the policy

6. Guiding Principles

The same guiding principles as the Cleaner Pacific 2025 will be adhered to in the implementation of this policy as follows:

PRINCIPLE 1: Reduce, Reuse, Recycle, and Return (3R + Return)

In prescribing waste management interventions, the preference shall be to refuse products that result in problem wastes; reduce the generation of waste and pollutants; to reuse if appropriate and safe to do so; to recycle domestically when technically and economically feasible; and to return waste resources to appropriate recycling facilities in other countries. Residual waste that cannot be reused, recycled, or returned for recycling shall be disposed of in an environmentally sound manner.

PRINCIPLE 2: Product stewardship

Those involved in producing, importing, selling, using and disposing of products have a shared responsibility to ensure that those products or materials are managed throughout their lifecycle in a way that reduces their impact on the environment and on human health and safety.

PRINCIPLE 3: Polluter pays principle

Waste producers and polluters should pay the cost of managing their waste or cleaning up the pollution and remediating associated environmental damage.

PRINCIPLE 4: Proximity principle

The treatment and disposal of waste and pollutants should take place at the closest possible location to the source, in order to minimise the risks involved in its transport.

PRINCIPLE 5: Transparency

All waste management activities shall be conducted in an open and transparent manner.

PRINCIPLE 6: Public consultation and participation

Public consultation shall be integrated into the planning of national and regional waste management and pollution control activities, and participants shall be given the opportunity to provide informed input, which shall be considered as advice by relevant decision-makers. Participants shall also be informed of the results of the consultation process.

PRINCIPLE 7: Multisectoral approach

Waste management and pollution control approaches shall involve multiple sectors (such as climate change, biodiversity conservation, health, tourism and agriculture) in order to improve the success and effectiveness of interventions.

PRINCIPLE 8: Regionalism

Regional cooperation and collaboration through genuine partnerships shall be undertaken where appropriate to complement national efforts, overcome common constraints, share resources and harness shared strengths.

PRINCIPLE 9: Sound decision-making

Decision-making shall be based on scientific information and risk-analysis from national, regional and/or international sources and shall promote the optimum utilisation of resources.

PRINCIPLE 10: Proactive approach

All WCP activities shall be undertaken using a planned rather than reactive approach to ensure limited resource allocations are optimised.

PRINCIPLE 11: Adherence to regional and international conventions

Pacific island countries and territories shall abide by their obligations to regional and international treaties related to waste, chemicals, hazardous waste and marine pollution.

PRINCIPLE 12: Public-private partnership

The comparative and competitive advantages of the private sector shall be harnessed to improve the delivery of waste management and pollution control services through a contractual relationship between private and public entities.

PRINCIPLE 13: Selection of appropriate and affordable technology

Selection (development and/or transfer) of environmentally sound technologies for waste management and pollution control shall fully consider the prevailing socio-economic conditions and capacity of the country and, where deemed necessary, shall be part of an overall management strategy that prioritises public health and environmental protection, sustainability and compliance with international and regional treaties (such as reduction in greenhouse gas and ODS emissions and uPOPs generation).

7. Key Strategic Goals, Actions and Targets

As an outcome of the consultations, the stakeholders of Tuvalu deemed that the following goals and actions will help them achieve the vision for a cleaner and healthier Tuvalu in 2026.

The policy sets the directions from which the strategic actions emanate resulting into more clarity and certainty for the community and the other stakeholders. These actions will offer more benefits from a national or coordinated approach focusing on the work across all relevant sectors and complementing current programs and activities in the waste sector. These strategies will be delivered under the leadership of the SWAT mandated to oversee and implement waste-related activities of the government.

INSTITUTIONAL DEVELOPMENT

Goal #1: **Strengthen institutional systems to address gaps in waste management**

This goal hopes to reform and strengthen institutions and governance to effectively drive the successful achievement of outcomes of waste management and resource recovery actions. These relate to policies and legislation, organisational structure, responsibilities, and resource allocation. The increased capacity of the government to make informed decisions will raise the profile of the waste sector.

Current Situation (Driver):

The establishment of SWAT institutionalised the management of wastes in the country. This is an outcome of investigations which evolved since the late 1990s through technical assistances provided by AusAID Municipal Waste Management Project, ADB through the Effective Waste Management and Recycling Project, and EU though the EDFs 8-10. Through the ADB Project, the Tuvalu Integrated Solid Waste Plan was developed in 2005. This is already a very outdated plan which requires urgent updating.

Another significant outcome is the enactment of the Waste Operations and Services Act 2009 which specifically define management systems in the waste sector. This Act formed the basis for the responsibilities among the different actors in the waste sector mainly the SWAT and the Kaupule.

However, in some instances, confusion arise between line ministries on responsibilities of managing certain waste types, e.g. shoreline, shipping wastes, healthcare and liquid wastes.

The provision of waste services was extended to the outer islands through the provision of collection vehicles (tractor and trailer) and recruitment of workers to undertake collection of wastes for a maximum of 15 hours in a week. Supervision of the staff is delegated to the Kaupule but the management of expenditures stays with the SWAT. There is an existing MOU which spells out responsibilities between the Kaupule (as waste management operator) and SWAT with regards to waste management in the outer islands. Part of Kaupule's task is to provide required data through a daily monitoring template provided by SWAT. The information generated is supposedly transmitted to SWAT on a fortnightly basis which is a requirement for processing of staff payroll but due to communication and internet issues, the system is not working well most of the time. This information is consolidated and processed for submission of reports and for planning purposes.

With roles defined and coverage of services expanded, community expectations have increased and resulted in more demand for waste services. The current organisational structure is believed to be inadequate to meet current demands particularly in the area of monitoring, data collection, education campaign, enforcement and the various operational flow such as collection, processing and disposal of wastes. There are also issues raised on pay schemes of waste workers. These were also brought up in the outer island consultations which, according to the community, results in service not reaching some of the households.

The enforcement aspect of waste management in the country is very weak and the need for a regulation and island by-laws to justify SWAT's and Kaupule's imposition on violations is becoming very urgent. This was reiterated in the outer islands during the outer island consultations and as a result littering and illegal dumping seem to be a common practice.

In the TKIII, it was recognised that land acquisition for waste disposal is quite challenging. Despite the urgency of the need to expand or relocate the existing site, there is no definite plan developed for this yet due to land lease issues. This is an immediate concern which needs to be prioritized.

The changing consumption pattern in the country attracted more imported goods which often times are unregulated – low quality electronic goods, food commodities close to expiry, and overly-packaged items. These resulted in voluminous wastes generated in the island particularly in Funafuti. Particularly, bulky goods end up lying around roadsides and coastal areas.

While there has been reasonable allocation of resources for waste management in view of the government's renewed focus on the protection of health and the environment, such national budget allocation may not be enough. The operational costs of waste service delivery particularly the infrastructure and equipment and requirements needs to be addressed and sustained. Currently, there is a Waste Management Levy Committee formed to explore measures to impose levies for import goods and regulate imported goods, ban certain wasteful items and create funds to support waste services and recycling operations. The issue of importation of substandard goods which eventually easily become waste was also brought up in one of the outer island consultations. The stakeholders is fully aware that this results in proliferation of bulky items in the waste stream of the outer islands.

The establishment of the Waste Management Levy Committee was formalised in 2015 to explore financial options to sustain waste management activities through imposition of waste levies for imported goods. The waste levy is expected to allow for funding of waste collection including separate green waste collection, and replacement of plant and equipment on their end-of-life through a sinking fund. The waste levy allows for an equitable "user-pays" method with the potential to eliminate problematic fee collection issues. The waste levy is also expected to assist the Government of Tuvalu in exporting recyclable wastes to recycling companies overseas.

Strategic Actions:

1. The government shall ensure that institutional and organisational structure of the waste sector in all the islands is properly set up, i.e. well-trained and qualified staff are delivering waste services and are properly compensated for the hazards involved in the discharge of their functions according to the employment legislation.
2. The government shall create, amend and update laws, regulations and policies as required to ensure the orderly delivery of waste services in both the main island of Funafuti and the outer islands, and take measures to ensure that such laws, regulations and policies are well enforced.
3. The government shall undertake negotiations with landowners in the allocation of land for the purpose of siting waste facilities in all the islands.
4. The government shall pass legislation that will impose levies and ban certain imported items that are likely to produce significant volumes of waste (levies will fund waste management activities).
5. The central and local governments shall allocate reasonable and sustainable budget to ensure that the delivery of waste services are kept to standard and desired coverage.

The following key performance indicators (KPIs) are expected to measure the achievement of this goal:

- New organisational structure for the whole sector including the outer islands are endorsed and implemented;
- At least 1 waste regulation and 1 waste policy passed and enforced;
- Each outer island to pass and enforce waste by-laws based on the waste regulation;
- At least 5 agreements on land lease and reclamation successfully achieved;
- 1 regulation on import waste levy passed and enforced;
- Increased budget allocation of at least 2.5% secured every year for waste management from the 2016 baseline;

STAKEHOLDER AWARENESS

Goal #2: **The stakeholders fully understand the merits of proper waste management and co-share the responsibility of managing wastes.**

The success of any waste management initiative relies heavily on behavioural changes of the people generating wastes. The community needs to be fully aware of the adverse environmental and health impacts of improperly managed wastes. By being fully aware, the community will view wastes in a different perspective and develop and demonstrate a willing behaviour to co-share the responsibility of managing wastes.

Current Situation (Driver):

The stakeholders agree that the current level of understanding of appropriate waste collection, processing and disposal system is still very low in Tuvalu as evident in the proliferation of illegal dumps along roadsides and areas close to the coastline. The health and environmental benefits of proper waste management has not been inculcated in the minds of the community. Currently, SWAT is undertaking awareness programmes in the schools of Funauti.

Poor waste practices such as burning, littering and dumping of wastes are socially acceptable. There is no established community engagement with any existing groups to co-share the responsibility of managing wastes. The level of understanding on segregation of organic and inorganic wastes and the 3R + return concept in Funafuti and outer islands is very limited but some stakeholders who have lived overseas are fully aware of good recycling systems they were accustomed to.

The use of compost for home gardening offers huge potential for diverting more green waste from the dumpsite.

Despite low awareness on 3R + return, the stakeholders recognise the challenges faced by the government in finding a location for a new dumpsite and are aware that land in Tuvalu is very limited specifically in the highly dense Funafuti Island which makes it difficult to site a new disposal area or even expand the current dumpsite.

The low level of economic activity overcasts the social benefits of proper waste management such as health and aesthetics of the surroundings. The community perceives subsistence or livelihood as more important than keeping the island clean. Offering economic incentives will drive people to reduce wastes. This will also address the issue of not having appropriately-sized bins to accommodate household wastes and odour emanating from the bins by learning to practice good segregation of wastes.

The involvement of women, youth and other groups of society in waste management are not fully explored and needs to be strengthened. The inherent skills of women to attend to finer details, and the strong desire to alleviate economic condition and protect the health of the family can be utilized to promote waste activities that can reduce environmental and health impacts. The youth also has the potential to drive changes. Other willing community groups would likely prefer a clean environment.

Stakeholders in some outer islands believe that, with the current state of littering in the islands, a clean-up campaign will help stir up the community to get involved in managing wastes. Moreso, by putting public litter bins and enforcing by-laws, there will be cleaner coastal environment and communities will realise the social benefits of having beautiful surroundings.

Strategic Actions:

1. The SWAT and relevant stakeholders (e.g. women, youth, etc. as focal groups), shall implement public awareness programmes on proper waste management, focusing on waste minimisation through 3R + return approach. These public awareness programmes will follow gender sensitive approaches.
2. The SWAT, in coordination with the Ministry of Finance, shall implement incentive mechanisms that will provide business and livelihood opportunities for certain accredited community-based institutions and individuals using the cooperative approach.
3. The SWAT shall strengthen stakeholder involvement in awareness activities.

The following KPIs are expected to measure the achievement of this goal:

- Top three bad public behaviours identified (e.g. burning of wastes, public littering, dumping in lagoon), and a gender sensitive public awareness programme to change behaviour planned;
- Key sites presenting examples of poor community behaviour audited to provide measurable baseline data.
- At least 1 gender sensitive public awareness programme weekly;
- At least 10 recipients of incentives in a year;
- At least 2 national activities co-implemented successfully with stakeholders in a year; and
- Regular monitoring of key sites to assess effectiveness of the awareness programmes on community awareness and behaviour.

PUBLIC –PRIVATE PARTNERSHIPS

Goal #3: **Establish strong partnerships between the public and the private sector in the delivery of waste services**

The objective of this goal is to provide business opportunities out of wastes, improve markets for wastes and ensure that financial savings and sustainable financing is achieved. Through this goal, there will be some degree of assurance that waste management can be continuously improved because of well-resourced systems in place. The goal also seeks to optimise the economic value of wastes.

Current Situation (Driver):

The recycling operation is undertaken by a sole private recycler who is licensed and contracted by SWAT. The responsibilities include collection, processing and export of ferrous and non-ferrous materials and plastics. Due to lack of competition, SWAT is left with no option but to engage the services of the sole recycler despite sub-standard performance. The process of engagement of the recycler is not based on informed decision which resulted in the inability to cope with the challenges. The recycler's inadequate experience and skills to operate the business became evident as he demonstrates unpreparedness for the big task of exporting the items. This is further aggravated by the global fluctuation of the prices of recyclable items which makes the business not quite as profitable as expected.

The economies of scale limits the establishment of local businesses not just in waste but other sectors as well. The unreliable and less frequent transport service is exacerbated by extremely high freight cost. The long distances, remoteness of the islands, limited volume of demand for products due to low population, insignificant reverse transport load due to low export base, fragile economy and a whole lot of other factors contribute to the high freight costs. This is not encouraging to the waste recycling business.

The reverse logistics study conducted by JICA in 2013 recommended strong public sector involvement in the recycling business. Owing to the issues above, there has to be significant government intervention in the shipping operation to enable more cost-effective export of recycled waste materials. Any prospective recycling business operation requires strong partnership with the Marine Department. If this can be established, it is highly feasible to reduce freight costs if recyclable waste

materials can be back loaded to a recycler in Suva on the same shipping schedule as collection of imported goods. This requires cost benefit analysis.

There are available recycling markets in Australia and New Zealand through Fiji which can be explored and networks can be established if reasonable freight costs can attract profit.

Another issue brought to fore by the stakeholders is the huge amount of wastes generated by contractors undertaking infrastructure projects. These put a strain on the waste collection and disposal capacity of SWAT and Kaupule. There has to be a waste management component in the environmental management plans of the construction projects.

Strategic Actions:

1. The SWAT, through coordination with the Ministry of Finance and the Department of Trade, shall develop waste business opportunities to ensure sustainable waste systems, including financial mechanisms to support efficient delivery of waste services.
2. The SWAT, in coordination with the Marine Department, shall explore measures to improve shipping services to allow back loading of recycled waste items (e.g. scrap metal, cans, plastics, etc.) to potential markets.
3. The SWAT shall incorporate obligations under its waste management plan into all international contracts.

The following KPIs are expected to measure the achievement of this goal:

- Roadmap for improved PPP approved
- Secured funding for private sector to be incorporated into the currently drafted Import Waste Levy legislation;
- At least 1 recycling business established and maintained in a year;
- Tuvalu has access to a functioning recycling regional network;
- System of back loading of recycled wastes is established and operating well; and
- Waste management planning is incorporated in infrastructure project approval system.

BEST PRACTICE AND COST EFFECTIVE APPROACHES

Goal #4: **Delivered waste services follow best practice and cost effective approach tailored to local conditions with continuous improvement**

The best practice approach to waste management can significantly reduce the impacts of environmental and public health risks which also have social and economic implications. By following best approaches, the safety and health of the waste operators and community served will not be jeopardised. Apart from this, an efficient, reliable and sustainable waste service can be assured if delivered with due regard for specific local conditions. This includes the need to adopt climate proofing measures to increase resilience of waste related infrastructure to climate change events.

There will be greater likelihood that equitable and accessible services can be provided to a wider scale of the community.

Current Situation (Driver):

A drawdown in the efficient delivery of waste services is the inadequacy, inappropriateness and frequent breakdown of existing plant and equipment. This is exacerbated by the unavailability of spare parts and inadequacy of proper fixing and repairing skills in Funafuti and worse in the outer islands. Oftentimes, the lifetime of the equipment is jeopardised ending up as bulky wastes. There is evidently lack of maintenance plan and likely issues of depreciation are not captured early on. It is also possible that equipment operators do not receive proper training which becomes an occupational risk as well. Most equipment in the outer islands do not have sheds which contributes to faster depreciation.

Similarly, the waste service facilities, particularly the disposal sites, lack operational guidelines which results in operational inefficiencies and occupational health and safety risks. The closure of the borrow pits and the bigger-size dumpsite in Funafuti was initiated by MFAT. This reduced the pollution impacts but puts pressure on the remaining smaller active dumpsite. Proper dumpsite operation of this remaining smaller-sized dumping area can further extend the lifespan and prevent significant overflows of pollution to the receiving environment. Despite this, the problem of capacity issues still remain and needs immediate attention.

The disposal sites in the outer islands are not well investigated in terms of suitability of the sites and proper engineering to enable bigger capacity to accept wastes on a longer term basis. Aside from the small area and the flat topography, the disposal facilities are not well managed to extend their lifespan. The tractor and trailer which was designed for pushing and compacting wastes is not fully utilised for such purpose. The staff are not able to do this either because of the limited time allocated to complete the waste service delivery or certain inefficiencies in the system.

The improper management of the disposal sites in almost all the outer islands is very evident during the site visits with no particular designated active sites. Dumped wastes are scattered and spilling over the access roads and valleys. In fact, in some sites, the boundary is not well defined allowing drivers to just dump anywhere. The sites are not secured and the absence of operational procedures or guidelines and an operator to direct the dumping exacerbate the poor state of the sites.

In the largest island Vaitupu, villages are so scattered which makes it difficult to complete the waste delivery within the allocated time for areas far from the disposal site. The stakeholders believe that there should be another disposal site on the other side of the island which may not be cost effective and environmentally sound. A transfer station may be a more viable solution to address this issue apart from addition of more collection vehicles.

The stakeholders in Niutao think, otherwise, and suggested closure of the other disposal sites and just have one legal site. This will enable a more cost-effective system and efficient monitoring.

In addition, the inadequacy of existing access roads will add costs to the establishment of additional disposal sites. The issue of poor access roads in most disposal sites was brought up during the consultations which substantiates the need for proper investigations prior to establishing disposal sites.

Inefficiencies in the system and the outdated time and motion study limits the coverage of collection service. The issue of collection service not reaching some of the households in some outer islands is

raised during consultations. However, a number of changes in the system can probably address these issues.

The lack of personal protective equipment (PPE) gears is observed during operation in both Funafuti and the outer islands which highlights the weak enforcement of occupational health and safety protocols despite regular quarterly in-country refresher trainings and daily meetings. This needs to be mitigated by SWAT. It was also noted that the SWAT workers in the outer islands do not have a washing facility considering that they are dealing with wastes and a place to store tools and gears. It was suggested that an office close to the equipment shed can be built to provide storage and washing facility.

Green wastes remain the most generated waste in Tuvalu with over 50% of the waste stream occupied by this waste type. Due to the inadequacy of facilities and equipment to process and store this waste, a lot of green wastes are still lying uncollected around the island. Despite arrangements with the Taiwan-operated nursery for the use of the compost, the inability to process more efficiently and effectively creates a huge dump of unprocessed green waste in the SWAT's hangar.

The National Adaptation Programme of Action (NAPA) Project provided the shredders and some of the compost is used by the Agriculture Department to demonstrate increased crop productivity. This is working well in some of the outer islands. The composting programme should be promoted in all the islands to reap the benefit of improved soil quality for growing crops and diverting more wastes away from the already small disposal facilities. The islands should be provided with bigger wood chippers to allow processing of more green wastes on a regular basis and after disasters when large trunks from fallen trees are generated.

The impacts of piggery wastes are very obvious in Funafuti and the outer islands. The air is filled with the odour of pig manure. There is no regulation or licensing system for establishing piggery business more so with backyard piggeries. Most of the piggeries address subsistence requirement. It is more likely that untreated liquid waste from piggeries flows directly into the land and water body creating significant pollution.

Each household has septic tanks for their human wastes. The septic tanks are emptied once every 2 years upon request to the Public Works Department at a cost. The sludge is not treated and just disposed at a banana patch in a non-residential area close to the lagoon side. Prior to 2012, the sludge is disposed at the dumpsite mixed with rubbish. Currently, there is no definite plan to establish a liquid waste management system except for the composting toilets from EU assistance through EDF10 partly address this issue on a medium scale. In a study conducted (Lal, 2006), the ecological sanitation system based on compost toilet is the only economically viable option with such limiting financial and physical environments in Tuvalu. The stakeholders in the outer island of Nanumaga thinks that composting toilets similar to those provided in Funafuti will work well in the island.

The scrap metals and aluminium cans are collected and recycled in Funafuti. Storage capacity is not adequate to host these items if intensive campaigns will be successful. There is no recycling undertaken in the outer islands since only negligible amounts are generated. The outer islanders still prefer traditional produce like coconut juiceover bottled water or soda drinks. However, in the island of Nukulaelae, large amounts of glass wastes are generated, according to the stakeholders, which requires a recycling system. Currently, these are dumped in the ocean.

SWAT does not have the proper training in handling, storage and disposal of hazardous wastes which puts waste workers at greater risk. The lack of proper storage facilities for hazardous wastes in all the

islands also puts the community, the terrestrial and potentially the marine environment at risk. Apart from this, there is no assessment undertaken as to how much hazardous wastes are present in the islands.

Currently, through the PacWaste Project funded by the EU, an incinerator for healthcare wastes was erected close to the Princess Margaret hospital, which will be followed by associated proper training on proper operation and management of hospital wastes. The project also addresses asbestos (survey in Funafuti and collection) and e-waste issues. The GEFPAS Project will also initiate chemical management training for hazardous waste handlers in Tuvalu as well as orientation training on Basel Convention compliance.

It is very apparent that there is no management plan for difficult wastes such as bulky wastes and WWII wrecks. These items are lying around the islands. The bigger wrecked vessels are still very evident in the seas of some of the outer islands. SWAT and the stakeholders in the outer islands see the need for appropriately-geared equipment to collect and clear these difficult wastes.

The immense intensity of Tropical Cyclone Pam which badly hit the country in March 2015 prompted the government and international partners to develop a Tuvalu Recovery and Vulnerability Reduction Plan (Government of Tuvalu, 2015). In the development of the plan, damages and losses and impacts to the different sectors and cross cutting issues were assessed. Key interventions were identified before the recovery and vulnerability reduction plan was formulated with strategic objectives and priority actions established to guide the government and partners in their recovery efforts. Interventions and specific activities are planned to expedite recovery in the immediate term and reduce vulnerabilities in the long-term.

The plan needs to be communicated with the stakeholders so that they can have better understanding of how the country can concertedly increase resilience to disasters including management of associated disaster wastes. The inadequacy of awareness raising on the vulnerability reduction plan may have attributed to the very low level of voluntary initiative of the stakeholders during the recovery activities in Funafuti. In the outer islands, there was actually a high level of voluntary community initiative to collect and dispose cyclone debris but it took a while for national response to reach the island level. Aside from this, no protective gears are provided to the volunteers as raised in one of the outer island consultations as well as the absence of appropriate equipment like wood chippers and loaders for bulky wastes.

Nappies create a big problem in Funafuti and the outer islands. Red ants attack the nappies and waste workers refuse to collect these. It is also a public health hazard when dogs spread the used nappies into people's habitation areas. There are also concerns that crabs which are usually consumed in the outer islands may chomp on the scattered nappies in the dumpsites. A separate contained disposal system for nappies is suggested by the outer islanders. Somebody even suggested regulation of importation of nappies.

The only secondary school in the country are also facing challenges in managing their wastes. For one, there is no provision of collection service. As a result, wastes are improperly disposed, i.e. green wastes are burned, kitchen wastes and general wastes dumped in the ocean side and hazardous wastes lying around within the school premises. Management of liquid wastes also needs to be improved.

Strategic Actions:

1. The SWAT, through cooperation of the Department of Public Works and private contractors, shall undertake detailed infrastructure (including maintenance) planning and develop an asset management programme ensuring that waste facilities and equipment are properly designed based on climate proofing measures to increase resilience to climate change events, and operated within reasonable standard for effective and efficient waste services, with due consideration to the occupational health and safety of the waste workers and the health and well-being of the community and their environment.
2. The SWAT shall implement waste reduction and resource recovery programmes.
3. The SWAT shall promote the recovery of green wastes from the waste stream, implement composting programmes and encourage stakeholders to utilise compost produced from processing of green wastes.
4. The SWAT, the Ministry of Health and the Department of Environment, shall cooperate in the handling, storage and disposal of hazardous wastes (chemicals, asbestos, healthcare wastes, used oil, e-wastes, etc.) according to international convention regulations and best practice management approaches that will minimise health and environmental impacts.

The following KPIs are expected to measure the achievement of this goal:

- Adherence to the Procurement Policy of the Ministry of Finance;
- Waste facilities and equipment are designed incorporating climate proffing measures and are operated with minimal health and environmental risks;
- Occupational and public health and safety incidents are reduced to nil;
- 100% coverage of collection in the main island and at least 80% coverage of collection in the outer islands;
- At least 10% of wastes are diverted from the landfill progressively each year;
- Reduction of green wastes by at least 50% after 5 years;
- At least 3 composting programmes implemented;
- 1 national landfill rehabilitated;
- All outer island disposal sites improved;
- 1 national transfer station established and 1 smaller-scale transfer station in the biggest island of Vaitupu;
- 1 detailed infrastructure and maintenance plan developed;
- 1 asset management plan developed;
- Collection, storage and transport of hazardous wastes comply with international protocols;
- At least one hazardous waste storage facility established; and
- Reduction of hazardous wastes disposed in the landfill by 80%.
- At least 80% of piggery wastes eliminated from the raising site and converted to energy or compost

HUMAN CAPACITY DEVELOPMENT

Goal #5: **Enhanced capacity of waste practitioners**

It is highly essential to increase the capacity of waste service providers so that the agency in charge can demonstrate good waste management practices to the community. This will offer greater degree of confidence in discharging functions and the capability to tailor solutions according to prevailing conditions.

Current Situation (Driver):

Since SWAT is a newly established agency of the government, the recruited staff still do not have formal trainings on waste management although most of them have relevant qualifications.

Short-term trainings have been provided by SPREP whereby three staff including the Director has participated actively in the training programmes conducted by Griffith University and Fiji National University. The first two programmes are limited in scope covering solid waste management and hazardous waste management separately in two modules. The third programme attended by the Regulatory Officer covers both modules in one training course and covers more Pacific case studies. The SWAT officers should attend the succeeding training programmes scheduled biannually both as a refresher and to learn new topics.

The field workers have not been given formal training programmes but have received brief re-echo trainings from SWAT staff who attended regional trainings. Daily tailgate or brief meetings are conducted religiously before the start of each working day from Monday to Thursday. The meetings last for a maximum of 30 minutes depending on issues raised by the workers. There is no allocated budget for staff training which limits the opportunity to gather and train workers outside working hours and provide more intensive training. The same is true for Kaupules functioning as waste service operators in the outer islands who have very limited training opportunities.

A training of Ministry of Health staff is underway for the operation of the incinerator to be installed and the handling of healthcare wastes.

Strategic Actions:

1. The government shall provide short-term and long-term training opportunities for SWAT and other relevant waste workers and stakeholders to improve their skills and capacity to deliver waste services.
2. The government shall participate in regional cooperation and exchange programmes guided by the principle of regionalism.

The following KPIs are expected to measure the achievement of this goal:

- At least 2 of the 4 current technical staff has undergone long-term training on waste management or relevant field;
- All technical staff has undergone short-term training on various aspects of waste management;
- All field workers and relevant Kaupule staff have undergone in-country trainings and refresher courses conducted at least once a year;
- At least 1 participant in regional cooperation and exchange programmes in a year;
- At least 1 re-echo national training conducted in a year;
- A training progression plan developed for all staff within SWAT and waste operators, with minimum levels developed, induction program and specialist training programs provided for various staff (e.g. driving, waste collection, sorting, hazardous waste identification and handling, healthcare waste handling, etc.);
- Staff (waste sector) turnover reduced by 20% annually.
- Enforcement of proper handover of responsibilities of departing staff as mandated in o3.8.9 of the General Administration Order (GAO);

- Staff in management positions receive training in program and business management to assist their capacity to make appropriate HR and fiscal decisions.
- Staff performance and training tied into addressing the key goals and KPIs outlined in this document.
- Project staff recruited to provide technical support to SWAT during the operation, monitoring and evaluation.

DISSEMINATION OF OUTCOMES AND EXPERIENCES

Goal #6: **Waste activity outcomes are reported and disseminated to relevant stakeholders**

The decision-makers and the community should be given access to meaningful, accurate and up-to-date national waste and recycling data and information so that progress can be measured. This will also allow monitoring the behaviour and choices of the community. By providing evidence through this reporting process, more informed decisions can possibly be generated.

Current Situation (Driver):

Data from SWAT field workers are collected and submitted to the Waste Operations Officer daily. These include the number of loads and type of wastes (green waste, scrap metal and nappies). The Kaupule also collects the same data but categorise the types of wastes as household, community bins and commercial wastes. The data is supposed to be submitted daily but because of communication and internet issues, the SWAT Team needs to follow-up frequently.

SWAT submits annual workplan for approval of the requested budget before commencement of every fiscal year. The progress of the approved work plan is reported back to the Permanent Secretary of Home Affairs and Rural Development every month which, in turn, is submitted to the Minister. The Permanent Secretary compiles progress reports for the year or when the cabinet requests the information on an as-need basis.

The functions of the established Waste Management Levy Committee (WMLC) is now expanded to include all aspects of waste management, i.e. resolving issues emanating from the enforcement of the Waste Operations and Service Act 2009. The plan is to have the TOR of the committee to be revised to include implementation of the Tuvalu Integrated Waste Policy and Action Plan. The current composition of the WMLC is limited to government officials. The Chair of the committee, the Permanent Secretary of the Ministry of Home Affairs and Rural Development, should look into expanding the membership to include other stakeholders and civil society. The role of civil society (particularly the women sector) will be enhanced in constituting the new Committee (Waste Management Monitoring Committee) tasked to monitor progress of the Plan. The idea of a Waste Committee in the outer islands also cropped up during the consultations.

Strategic Actions:

1. The SWAT shall undertake regular waste data collection and analysis.
2. The SWAT shall implement monitoring and reporting programmes to ensure more informed decisions in the waste sector.
3. The government shall establish a multi-stakeholders monitoring committee and SWAT will act as the Secretariat.

The following KPIs are expected to measure the achievement of this goal:

- A data management system is established with proper training on data collection, processing and reporting
- Waste data collected and recorded daily;
- Daily data reported monthly;
- Quarterly data compiled;
- Annual report completed;
- Established monitoring committee is operational;
- Quarterly meetings conducted; and
- Reporting framework developed and implemented.
- SWAT report on waste revenue versus expenditure prepared annually;

The strategic goals, actions and key performance indicators are summarised in Table 9.

Table 9: Summary of strategic goals, actions and KPIs

Thematic Area	Goals	Actions	KPIs
INSTITUTIONAL DEVELOPMENT	Goal #1: Strengthen institutional systems to address gaps in waste management	1. The government shall ensure that institutional and organisational structure of the waste sector in all the islands is properly set up, i.e. well-trained and qualified staff are delivering waste services and are properly compensated for the hazards involved in the discharge of their functions according to the Employment Bill. 2. The government shall create, amend and update laws, regulations and policies as required to ensure the orderly delivery of waste services in both the main island of Funafuti and the outer islands, and take measures to ensure that such laws, regulations and policies are well enforced. 3. The government shall undertake negotiations with landowners in the allocation of land for the purpose of siting waste facilities in all the islands. 4. The government shall pass legislation that will impose levies and ban certain imported items that are likely to produce significant volumes of waste (levies will fund waste management activities). 5. The central and local governments shall allocate reasonable and sustainable budget to ensure that the delivery of waste services are kept to standard and desired coverage.	• New organisational structure for the whole sector including the outer islands are endorsed and implemented; • At least 1 waste regulation and 1 waste policy passed and enforced; • Each outer island to pass and enforce waste by-laws based on the waste regulation; • At least 5 agreements on land lease and reclamation successfully achieved; • 1 regulation on import waste levy passed and enforced; • Increased budget allocation of at least 10% secured every year for waste management;
STAKEHOLDER AWARENESS	Goal #2: The stakeholders fully understand the merits of proper waste management	6. The SWAT and relevant stakeholders (e.g. women, youth, etc. as focal groups), shall implement public awareness programmes on proper waste management, focusing on waste minimisation through 3R + return	• Top three bad public behaviours identified (e.g. burning of wastes, public littering, dumping in lagoon), and a public awareness programme to change behaviour planned;

Thematic Area	Goals	Actions	KPIs
	and co-share the responsibility of managing wastes.	approach. These public awareness programmes will follow gender sensitive approaches. 7. The SWAT, in coordination with the Ministry of Finance, shall implement incentive mechanisms that will provide business and livelihood opportunities for certain accredited community-based institutions and individuals using the cooperative approach. 8. The SWAT shall strengthen stakeholder involvement in awareness activities.	• Key sites presenting examples of poor community behaviour audited to provide measurable baseline data. • Top three bad public behaviours identified (e.g. burning of wastes, public littering, dumping in lagoon), and a public awareness programme to change behaviour planned; • Key sites presenting examples of poor community behaviour audited to provide measurable baseline data. • At least 1 public awareness programme weekly; • At least 10 recipients of incentives in a year; • At least 2 national activities co-implemented successfully with stakeholders in a year; and • Regular monitoring of key sites to assess effectiveness of the awareness programmes on community awareness and behaviour.
PUBLIC – PRIVATE PARTNERSHIPS	Goal #3: Establish strong partnerships between the public and the private sector in the delivery of waste services	9. The SWAT, through coordination with the Ministry of Finance and the Department of Trade, shall develop waste business opportunities to ensure sustainable waste systems, including financial mechanisms to support efficient delivery of waste services. 10. The SWAT, in coordination with the Marine Department, shall explore measures to improve shipping services to allow back loading of recycled waste items (e.g. scrap metal, cans, plastics, etc.) to potential markets. 11. The SWAT shall incorporate obligations under its waste management plan into all international contracts.	• Roadmap for improved PPP • Secured funding for private sector to be incorporated into the currently drafted Import Waste Levy legislation; • At least 1 recycling business established and maintained in a year; • Tuvalu has access to a functioning recycling regional network; • System of back loading of recycled wastes is established and operating well; and • Waste management planning is incorporated in infrastructure project approval system.

Thematic Area	Goals	Actions	KPIs
BEST PRACTICE AND COST EFFECTIVE APPROACHES	Goal #4: Delivered waste services follow best practice and cost effective approach tailored to local conditions with continuous improvement	12. The SWAT, through cooperation of the Department of Public Works and private contractors,, shall undertake detailed infrastructure (including maintenance) planning and develop an asset management programme ensuring that waste facilities and equipment are properly designed and operated within reasonable standard for effective and efficient waste services, with due consideration to the occupational health and safety of the waste workers and the health and well-being of the community and their environment. 13. The SWAT shall implement waste reduction and resource recovery programmes. 14. The SWAT shall promote the recovery of green wastes from the waste stream, implement composting programmes and encourage stakeholders to utilise compost produced from processing of green wastes. 15. The SWAT, the Ministry of Health and the Department of Environment, shall cooperate in the handling, storage and disposal of hazardous wastes (chemicals, asbestos, healthcare wastes, used oil, e-wastes, etc.) according to international convention regulations and best practice management approaches that will minimise health and environmental impacts.	• Procurement guideline on waste management equipment (both mobile and fixed) is prepared and ratified; • Waste facilities and equipment are designed and operated with minimal health and environmental risks; • Occupational and public health and safety incidents are reduced to nil; • 100% coverage of collection in the main island and at least 80% coverage of collection in the outer islands; • At least 10% of wastes are diverted from the landfill progressively each year; • Reduction of green wastes by at least 50% after 5 years; • At least 3 composting programmes implemented; • 1 national landfill rehabilitated; • All outer island disposal sites improved; • 1 national transfer station established and 1 transfer station in the biggest island of Vaitupu; • 1 detailed infrastructure and maintenance plan developed; • 1 asset management plan developed; • Collection, storage and transport of hazardous wastes comply with international protocols; • At least one hazardous waste storage facility established; and • Reduction of hazardous wastes disposed in the landfill by 80%.

Thematic Area	Goals	Actions	KPIs
			• At least 80% of piggery wastes eliminated from the raising site and converted to energy or compost
HUMAN CAPACITY DEVELOPMENT	Goal #5: Enhanced capacity of waste practitioners	16. The government shall provide short-term and long-term training opportunities for SWAT and other relevant waste workers and stakeholders to improve their skills and capacity to deliver waste services. 17. The government shall participate in regional cooperation and exchange programmes guided by the principle of regionalism.	• At least 2 of the 4 current technical staff has undergone long-term training on waste management or relevant field; • All technical staff has undergone short-term training on various aspects of waste management; • All field workers have undergone in-country trainings and refresher courses conducted at least once a year; • At least 1 participant in regional cooperation and exchange programmes in a year; • At least 1 re-echo national training conducted in a year; • A training progression plan developed for all staff within SWAT and waste operators, with minimum levels developed, induction program and specialist training programs provided for various staff (e.g. driving, waste collection, sorting, hazardous waste identification and handling, healthcare waste handling, etc.); • Staff (waste sector) turnover reduced by 20% annually. • Established system on proper handover of responsibilities of departing staff; • Staff in management positions receive training in program and business management to assist

Thematic Area	Goals	Actions	KPIs
			their capacity to make appropriate HR and fiscal decisions. • Staff performance and training tied into addressing the key goals and KPIs outlined in this document. • Project staff recruited to provide technical support to SWAT during the operation, monitoring and evaluation.
DISSEMINATION OF OUTCOMES AND EXPERIENCES	Goal #6: Waste activity outcomes are reported and disseminated to relevant stakeholders	18. The SWAT shall undertake regular waste data collection and analysis. 19. The SWAT shall implement monitoring and reporting programmes to ensure more informed decisions in the waste sector. 20. The government shall establish a multi-stakeholders monitoring committee and SWAT will act as the Secretariat.	• A data management system is established with proper training on data collection, processing and reporting • Waste data collected and recorded daily; • Daily data reported monthly; • Quarterly data compiled; • Annual report completed; • Established monitoring committee is operational; • Quarterly meetings conducted; and • Reporting framework developed and implemented. • SWAT report on waste revenue versus expenditure prepared annually;

8. Implementation

The Tuvalu Integrated Waste Policy and Action Plan will be implemented collectively by relevant sectors led by SWAT. This will constitute the long- term agenda for SWAT to fulfil its mandate of addressing waste issues.

The following 5Es programmes linked to the strategic goals and actions described in previous sections are recommended (Table 10).

Table 10: Recommended programmes to implement the Tuvalu Integrated Waste Policy and Action Plan

5Es	PROGRAMME	LINK	
		Goal	Action
Establishment	Strong Waste Sector of Tuvalu Programme	1, 4, 5, 6	1, 2, 3, 4, 5, 7, 10, 11, 12, 16, 17, 18, 19, 20
Engineering	Tuvalu Waste Infrastructure Development Programme	1, 4	3, 5, 6, 8, 10, 12, 13, 14, 15
Education	Clean Islands Awareness Programme	2, 4, 5	5, 6, 8, 11, 13, 14, 16, 17, 19, 20
Empowerment	Do Your Share on Wastes Programme	2, 4, 5, 6	1, 2, 4, 6, 8, 9, 11, 16, 17, 18, 19, 20
Entrepreneurship	Waste Economic Programme	1, 2, 3, 4	3, 4, 5, 7, 8, 9, 10, 13, 14

The specific activities to support the implementation of this policy have been articulated and presented in the appended Annex 1. This action plan will define the priorities in the next 5 years translated into the annual work programme of SWAT for funding consideration. There will be annual review of progressive actions for each key service areas through the established mandate of a multi-sectoral monitoring committee and monitoring and evaluation matrix developed by the committee.

9. Monitoring and Evaluation

a. Measuring Progress

The likelihood of success in implementing the Integrated Waste Policy and Action Plan will depend on an established scheme to monitor, evaluate progress of the planned activities and take into account feedback on findings and lessons learned to enhance performance and results. The existence of baseline data is very critical as reference points to establish targets for the achievement of the set goals for the duration of the plan. The following framework (Table 11) will be developed in consultation with the constituted multi-sectoral monitoring committee to guide them in measuring progress of the policy and the plan. This framework can be established once baseline information has been gathered in a separate exercise.

Table 11: Evaluation matrix of the integrated waste policy and action plan of Tuvalu

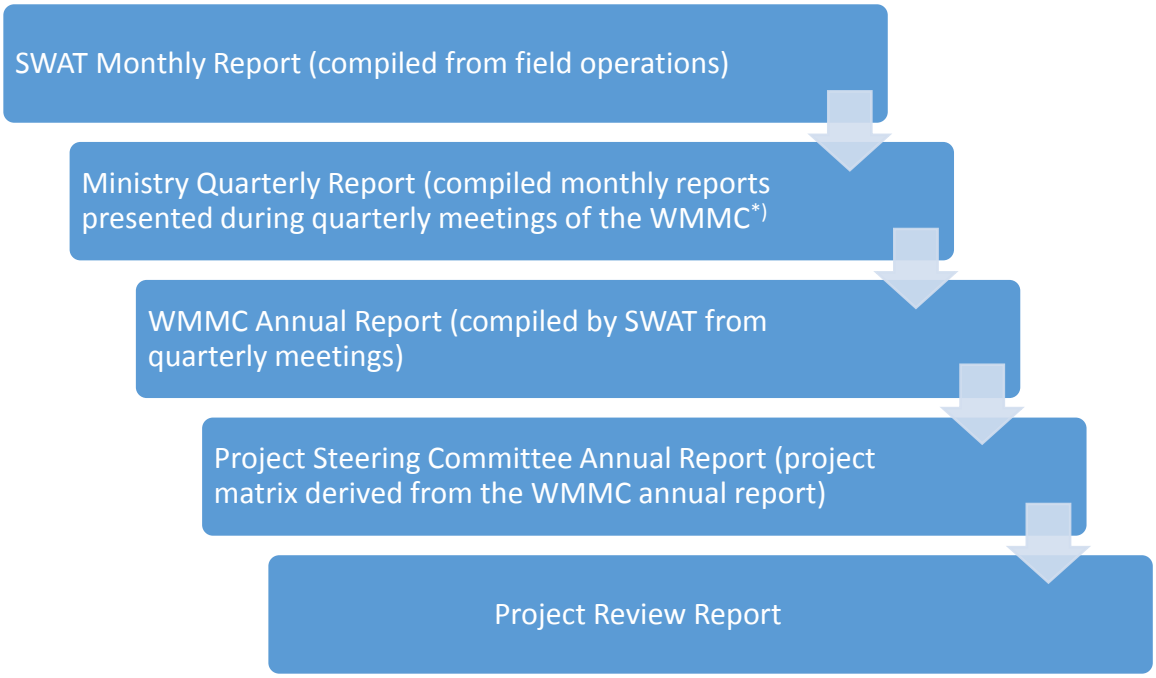
	INDICATOR	DEFINITION How is it calculated?	BASELINE What is the current value?	TARGET What is the target value?	DATA SOURCE How will it be measured?	FREQUENCY How often will it be measured?	RESPONSIBLE Who will measure it?	REPORTING Where will it be reported?
Goal								
Outcomes								
Outputs								

b. Periodic Review of the Plan

The participative review of the plan will coincide with the EU bilateral project review (recommended to be undertaken annually) through steering committee meetings. The outcomes and outputs reported during the periodic committee meetings will be compiled into a project matrix and presented during the annual project steering committee meetings.

At the end of the 5-year project duration (2021) which coincides with the end of the duration of the action plan, there will be a wider review of the policy to identify corrective actions and recommendations for the remaining half period of the effectivity of the policy. The review is also expected to sustain and further improve uptake of the policy.

The following outlines the review process (Figure 9).



* Waste Management Monitoring Committee

Figure 9: Process for reviewing the implementation of the policy

10. Financial Considerations

The implementation of the policy requires substantial financial and technical resources. Through the action plan developed to support the policy implementation for the first half of the policy period, potential funding can be sourced through national budget allocation and development partners assistance. Resources can also be mobilized through the following strategies: a) 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, b) raising the profile of waste management among politicians, decision-makers, communities and development partners to invite more funding to the sector, including exporing possibilities for blending operations; and c) ensure that project outcomes and outputs are significantly achieved to encourage more investment into the waste sector from both the government and development partners.

The European Union (EU) is planning to invest on the improvement of waste management in Tuvalu through the EDF 11 bilateral and regional programmes. The proposed programmes, expected to start implementation in 2017, are expected to contribute substantially to the implementation of this action plan. Below is the estimated financial requirement for the 5-year action plan (Table 12).

Table 12: Estimated financial requirement for the 5-year waste action plan for Tuvalu

Strategic Goal	**Budget (AUD)**			**Potential Development Partner Assistance**
	Estimated	Committed by the Govt of Tuvalu	Financing Gap	
1. Strengthened institutional systems to address gaps in waste management	3,081,475	1,177,835	1,903,640	
2. The stakeholders fully understand the merits of proper waste management and co-share the responsibility of managing wastes.	885,000	66,665	818,335	
3. Establish strong partnerships between the public and the private sector in the delivery of waste services	684,000	120,000	564,000	
4. Delivered waste services follow best practice and cost effective approach tailored to local conditions with continuous improvement	12,139,890	2,485,512	9,654,378	
5. Enhanced capacity of waste practitioners	310,000	85,000	225,000	

Strategic Goal	Budget (AUD)			Potential Development Partner Assistance
	Estimated	Committed by the Govt of Tuvalu	Financing Gap	
6. Waste activity outcomes are reported and disseminated to relevant stakeholders	280,000	25000	255,000	
TOTAL	17,380,365	3,960,012	13,420,353	

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Annex 1: Implementation Plan

Tuvalu Integrated Waste Acton Plan

A. INSTITUTIONAL DEVELOPMENT

Goal #1: Strengthened institutional systems to address gaps in waste management										
Implementation Activity	Who is responsible	Timing					Budget (AUD)			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	GoT Committed	Financing Gap	
1. Develop new organisational structure and review remunerations	SWAT, Finance, (Planning & Budget), Personnel & Training						2,426,475	1,079,835	1,346,640	
2. Review existing waste-related policies and merge into one policy and regulation, to include non-burning of wastes, plastic ban and anti-littering among others.	SWAT Kaupule Environnent AGs Office Marine Agriculture Health						60,000	36,000	24,000	
3. Take measures to uphold the laws and regulations through proper interpretation and development of MOUs with various agencies in the enforcement of the regulations.	AGs Office SWAT Kaupule Health Environment Agriculture Marine Fisheries						13,000		13,000	
4. Establish coordination mechanisms and responsibilities to manage different waste	SWAT Kaupule Marine Environment						13,000		13,000	

Goal #1: Strengthened institutional systems to address gaps in waste management										
Implementation Activity	Who is responsible	Timing					Budget (AUD)			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	GoT Committed	Financing Gap	
streams including outer island, shoreline and shipping wastes.	Health Agriculture									
5. Investigate impacts of WW wrecks and explore measures for its removal	SWAT Environment Police Health						170,000	6,000	164,000	
6. Develop proper consultation procedures for land use negotiations	SWAT Lands Department						13,000	3,000	10,000	
7. Undertake feasibility studies and EIA for land reclamation in close coordination with the Land and Survey Department	SWAT Environment Department Lands Department						200,000	40,000	160,000	
8. Strengthen the Import Waste Levy Committee.	SWAT Department Customs Department AGs Office Marine Department						13,000	13,000	0	
9. Impose charges/levy for certain types of hazardous wastes and imported materials through a regulation.	SWAT Department Customs Department Marine Department						13,000		13,000	
10. Investigate and implement options for financing mechanisms to sustain delivery of proper waste services including cost benefit analysis, e.g. CDL, pre-paid bag system, etc.	SWAT Department						100,000		100,000	

Goal #1: Strengthened institutional systems to address gaps in waste management									
Implementation Activity	Who is responsible	Timing					Budget (AUD)			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	GoT Committed	Financing Gap	
11. Regulate importation of goods to ensure reasonable length of lifespan.	SWAT Department Customs Department Business Department (Finance) Health Inspector						60,000		60,000	
12. Allocate reasonable budget for waste services by relevant departments.	Ministry of Health Climate Change Department (Project) Ministry of Transport & Communication Public Works Department						As per work programmes			

B. STAKEHOLDER AWARENESS

Goal #2: The stakeholders fully understand the merits of proper waste management and co-share the responsibility of managing wastes.										
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
13. Public Awareness Program involving communities and schools through radio, workshops, posters, training, website, etc. on all waste service areas in Tuvaluan language	SWAT Department TANGO Media Department Kaupule Department of Rural Development (DRD)						120,000	26,665	93,335	
14. Integrate waste management in the school's curriculum – Clean Schools Programme	Ministry of Education, Youth and Sports (MEYS) SWAT						65,000	20,000	45,000	
15. Provide incentives for recycling, e.g. handicraft, junkyard business, etc. to women groups and other community groups	SWAT Kaupule						600,000		600,000	
16. Conduct activities or events which are co-implemented with stakeholders.	SWAT Department plus SWAT key stakeholders						100,000	20,000	80,000	

C. PUBLIC-PRIVATE PARTNERSHIPS

Goal #3: Establish strong partnerships between the public and the private sector in the delivery of waste services										
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
17. Establish waste industry schemes which will involve private businesses heavily – privatisation of some waste services.	SWAT Department Kaupule Public Enterprise Planning & Budget Department STAT Department						500,000	100,000	400,000	
18. Develop recycling networks.	SWAT Kaupule Local Recycler Buyers (Abroad)						13,000		13,000	
19. Incorporate waste management in the permitting process for businesses and international contracts with emphasis on management of bulky wastes.	Ministry of Foreign Affairs, Tourism, Environment & Labour Public Enterprise						6,000		6,000	
20. Acquire handling and storage equipment to facilitate shipping of recycled materials	SWAT Department PDL Shipping Agent Private Recycler						65,000	10,000	55,000	
21. Develop and implement a system with importers and transporters on the back loading of recycled materials off the island.	SWAT PDL Shipping Agent						100,000	10,000	90,000	

D. BEST PRACTICE AND COST EFFECTIVE APPROACHES

Goal #4: Delivered waste services follow best practice and cost effective approach tailored to local conditions with continuous improvement									
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
22. Investigate and implement options of waste containment and collection of wastes to enable a more reliable and efficient service, i.e. for regular, recyclable and difficult wastes generated by households, commercial establishments and institutions (church, school, government buildings, airport, etc.)	SWAT Department 8 Kaupule						1,180,000	200,375	979,625	
23. Undertake a time and motion study to update existing collection service.	SWAT, Kaupule						50,000	10,000	40,000	
24. Provide cost-effective waste containers and collection service based on outcomes of investigations.	SWAT Department 8 Kaupule						100,000	50,000	50,000	
25. Develop and implement waste infrastructure and maintenance plan (disposal sites, collection service, recycling and storage facilities, transportation, etc.). This would include inventory of	SWAT Department PWD Finance DRD 8 Kaupule						300,000	10,000	290,000	

Goal #4: Delivered waste services follow best practice and cost effective approach tailored to local conditions with continuous improvement										
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
existing facilities and equipment (including bins).										
26. Develop a waste asset management plan	SWAT, Public Works Department						25,000		25,000	
27. Acquire well-designed equipment and facility appropriate for particular waste activity and type of waste (including bulky wastes and nappies, among others)	SWAT Department Finance (Procurement Unit) Department of Rural Development (DRD)						250,000	80,000	170,000	
28. Enforce use of PPEs.	SWAT Department						20,250	9,137	11,113	
29. Rehabilitate and operate the existing Funafuti dumpsite or construct new engineered landfill with proper operational procedures (manual) and facilities.	SWAT Department DRD 8 Kaupule Lands Department Finance Environment Department Public Works Department						1,500,000		1,500,000	
30. Investigate suitability of existing disposal sites in the outer islands	SWAT, Public Works Department, Planning Office, Lands Department						60,000		60,000	
31. Improve the operation and security of the outer island	SWAT, Kaupule						1,435,000	66,000	1,369,000	

Goal #4: Delivered waste services follow best practice and cost effective approach tailored to local conditions with continuous improvement										
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
dumpsites (fencing, burying, pushing and compacting)										
32. Provide equipment sheds, storage facilities and workers' washing facilities in the outer islands							1,365,000	1,000,000	365,000	
33. Prepare a disaster waste management plan based on the Vulnerability Reduction Plan and endorse its incorporation in the overall Disaster Response Plan, including acquisition of proper equipment and funding allocation.	SWAT Department Disaster Unit DRD Environment Department Finance						170,000	40,000	130,000	
34. Set up a transfer station and recycling facility – trash palace in Funafuti and Vaitupu	SWAT Department PWD Finance Lands Department						1,600,000	800,000	800,000	
35. Introduce and adopt new recycling and waste minimisation technologies, e.g. biogas facility for piggery and food wastes, back loading of recyclable wastes, centralised and home composting; etc.	SWAT Department Agriculture Department Environment Department PWD DRD Finance 8 Kaupule						224,000	100,000	124,000	

Goal #4: Delivered waste services follow best practice and cost effective approach tailored to local conditions with continuous improvement									
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
36. Actively implement the 3R + return programme to divert as much waste as possible away from the landfill including segregation of wastes at source and in the transfer stations and a designated area in the disposal sites.	SWAT Department Media PWD Finance AGs Office 8 Kaupule DRD						573,200		573,200	
37. Implement community-based composting programmes using traditional means of utilising compost or mulch for gardening in Funafuti and implement pilot activities in the outer islands	Kaupule SWAT Department						150,000	20,000	130,000	
38. Implement Composting of mulch with piggery waste in conjunction with pig growers	SWAT, Agriculture						672,440		672,440	
39. Design and implement a public anti-littering programme (clean-ups and provision of public litter bins as options)	SWAT, Kaupule, PWD						40,000	20,000	20,000	
40. Undertake assessments of stockpiles of hazardous wastes in all the islands	SWAT, Department of Environment						40,000		40,000	
41. Develop and implement systems to properly manage hazardous wastes (chemicals,	SWAT Department Health Department ICT						175,000	30,000	145,000	

Goal #4: Delivered waste services follow best practice and cost effective approach tailored to local conditions with continuous improvement									
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
healthcare, asbestos, e-wastes, etc.), i.e. handling, storage, treatment and disposal	Tuvalu Electricity Cooperation Media 8 Kaupule DRD Pacific Energy Marine									
42. Provide infrastructure and facilities for the proper management of hazardous wastes	DRD SWAT Department 8 Kaupule PWD Finance Health						130,000	50,000	80,000	
43. Implement a liquid waste management programme including collection, storage and disposal.	SWAT Department PWD DRD 8 Kaupule Media						2,080,000		2,080,000	

E. HUMAN CAPACITY DEVELOPMENT

Goal #5: Enhanced capacity of waste practitioners										
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
44. Assess training needs for the waste and relevant sectors for all the islands.	SWAT Department Personnel & Training PWD Health DRD 8 Kaupule TNPSO						10,000		10,000	
45. Implement national learning programmes though trainings, peer tutoring and other informal mentoring approaches.	SWAT Department Education Department Media TNPSO TANGO Personnel & Training						90,000	20,000	70,000	
46. Explore and participate in information exchange programmes with other countries within and outside the region, i.e. South-south cooperation, twinning arrangements, etc.	SWAT Department Personnel & Training Labour						150,000	60,000	90,000	
47. Provide re-echo training programmes after attendance to regional and international trainings	SWAT Department Environment Department Disaster Unit Health Department PWD						60,000	5,000	55,000	

F. DISSEMINATION OF OUTCOMES AND EXPERIENCES

Goal #6: Waste activity outcomes are reported and disseminated to relevant stakeholders									
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
48. Undertake a baseline survey of existing waste conditions and services including inventory of imported goods.	SWAT Department STATs Unit DRD 8 Kaupule Health Department Environment Department						60,000		60,000	
49. Regular collection of data through standard methods.	SWAT Department STAT Unit DRD 8 Kaupule						75,000		75,000	
50. Update country waste profiles	SWAT Department DRD 8 Kaupule						10,000		10,000	
51. Develop a reporting framework and Implementation through media and government channel to ensure dissemination of information.	SWAT Department Media ICT TANGO SC						50,000	5,000	45,000	
52. Undertake regular reporting to the Cabinet and stakeholders	SWAT Department SC						No cost			
53. Create a multi-stakeholder steering committee and establish internal procedures for running the committee;	SWAT						50,000	5,000	45,000	

Goal #6: Waste activity outcomes are reported and disseminated to relevant stakeholders									
Implementation Activity	Who is responsible	Timing					Budget			Potential Dev't. Assistance
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Estimated	Committed	Financing Gap	
Create waste sub-committees in the outer islands.										
54. Create Waste Sub- Committees in the Outer Island	SWAT						35,000	15,000	20,000	

Annex 2: Definitions

3R+Return	The 3R+Return model of waste management for PICTs promotes the return of recyclable commodities to environmentally sound recycling facilities located overseas in recognition of the fact that physically establishing such recycling facilities may not be technically nor economically feasible for the majority PICTs
Advance recycling fee	A fee which is usually applied on imported products to pay for the recycling or disposal of the product when it becomes a waste.
Authorised open dump	This refers to a waste disposal site without any control measures or procedures in place, which operates due to lack of national legislation prohibiting otherwise, or lack of environmentally-friendly waste disposal alternatives.
Biogas	Any gas fuel derived from the decay of organic matter, as the mixture of methane and carbon dioxide produced by the bacterial decomposition of sewage, manure, garbage, or plant crops.
Biomass	Organic matter, especially plant matter,that can be converted to fuel.
Composting	The controlled biological degradation of organic wastes including kitchen and yard waste.
Controlled dump	A waste disposal site whose operation is subject to a permit system and to technical control procedures in compliance with the national legislation in force.
E-waste	Discarded or waste electrical and electronic equipment that no longer serves its original purpose.
Extended producer responsibility	A policy approach under which producers/importers/consumers (i.e., polluters) are made responsible for the financial costs and management functions associated with products throughout the product's life cycle.
Green waste	The vegetative portion of the waste stream, i.e. garden and yard trimmings and litter arising from domestic, commercial and municipal operations
Healthcare waste	The by-product of healthcare provision that includes sharps (needles, scalpels, etc.), blood, body parts, chemicals, pharmaceuticals, medical devices and radioactive materials.
Leachate	The liquid that drains or leaches from a landfill, which can contain a variety of compounds such as toxic heavy metals, and compounds from the decomposition of waste in the landfill.

Marine Litter	Any persistent, manufactured or processed solid material that enters the ocean from any source. May also be referred to as Marine Debris.
Municipal Solid Waste	All solid waste, except industrial and agricultural wastes, generated from residential households, commercial and business establishments, institutional facilities and municipal services. Municipal solid waste may include construction and demolition debris and other special wastes that may enter the municipal waste stream. Generally excludes hazardous wastes.
Sanitary landfill	A method of disposing of solid waste on land that isolates the waste from the environment until it is safe.
Import waste levy	A tax imposed on imported goods to pay for processing, treatment and disposal of wastes.
Waste-to-energy	The process of creating energy, in the form of electricity or heat, from the incineration of a waste source.
Wastewater	Any combination of domestic effluent consisting of blackwater (excreta, urine and faecal sludge) and greywater (kitchen and bathing wastewater); water from commercial establishments and institutions, including hospitals; industrial effluent, stormwater and other urban run-off; agricultural, horticultural and aquaculture effluent, either dissolved or as suspended matter.

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