

Vava'u Development Plan – Waste Management

December 2012

1. Present Status and Issues for Solid Waste Management (SWM)

a. Waste generation amount in Vava'u

- According to the baseline survey, waste generation amount is estimated as shown in Table 1. Household waste generation rate was estimated at 1.2 g per person per day based on a population of 5,768 inhabitants in Neiafu area, for all waste generation sources. And, household waste generation rate was estimated as 505 g per person.

Table 1: Waste generation amount

Items		Neiafu	Vava'u
Total Population ¹	Person	5,768	14,936
Number of Household	Households	1,082	2,828
Area	Km2		121.0
Total Waste Generation (H.H. + B.E.)	Ton/day	7.0	20.9
Total Waste Generation Rate	Kg/day/person	1.2	1.4
Household Waste Generation (H.H)	Ton/day	5.8	15.1
Household Waste Generation Rate	g/day/person		505

b. Waste composition

- Waste composition in Vava'u is estimated as shown in Table 2. The ratio of kitchen waste is relatively low as most of residents feed kitchen waste to pigs and dogs. It is noticed that about total amount of waste generation can be decreased by half if organic waste by feeding of kitchen waste to pigs and dogs and composing of green waste. This table also indicated possibility of recycling, i.e, metal.

Table 2: Waste composition

Type of waste	Neiafu		Vava'u
	Household (H.H.)	H.H. + B.E.	H.H. + B.E.(Neiafu)
Green waste	20.6	18.3	18.2
Kitchen waste	30.9	27.4	26.8
Papers	7.4	22.4	23.4
Plastics	13.4	12.3	12.2
Glass	5.9	10.2	9.8

¹ According to Tonga National Population and Housing Census 2011, Preliminary Result, Statistics Department Tonga, 2011

Metal	9.0	4.4	4.5
Textile/Ceramic	4.1	1.7	1.7
Others	8.9	3.5	3.6
Total	100.0	100.0	100.0

- Waste composition varies according to the waste generation source and business type.

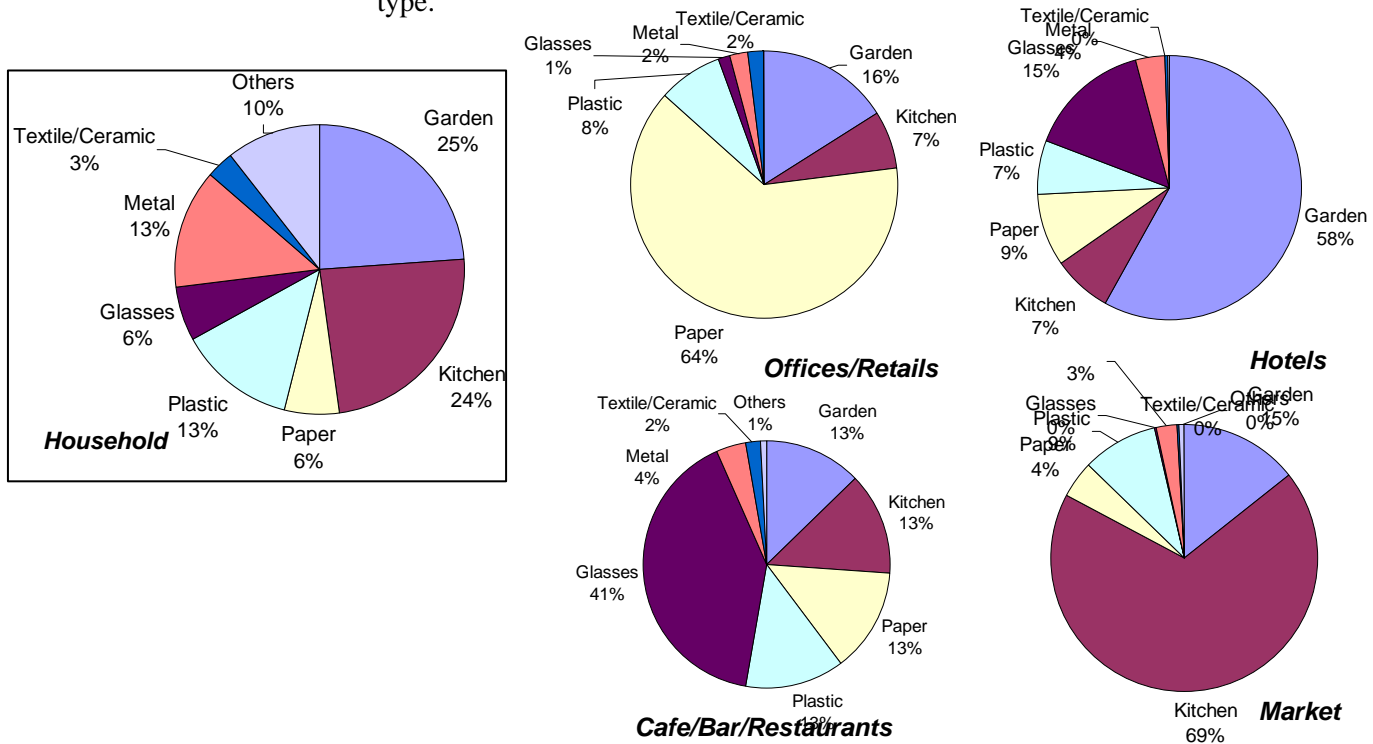


Figure 1: Waste composition (by business type)

c. Waste stream diagram for Neiafu Town

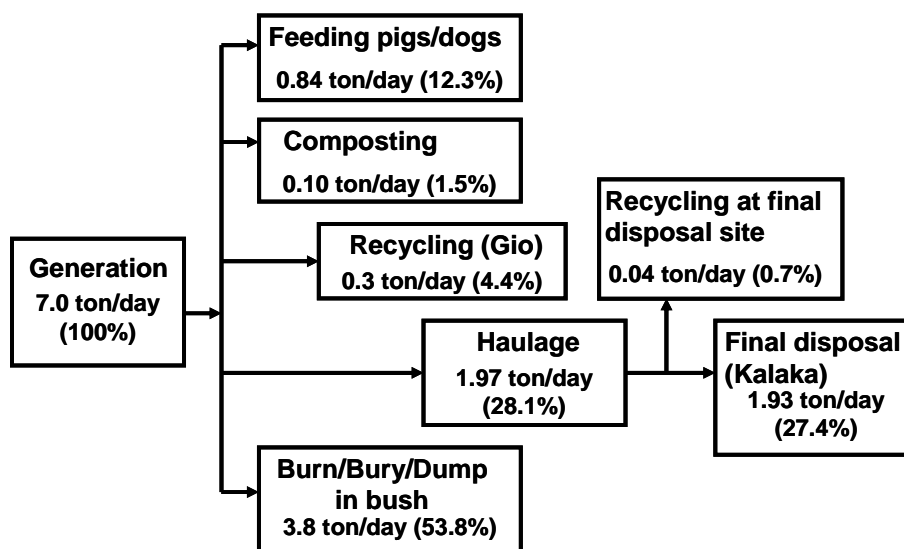


Figure 1: Waste stream diagram

- Total disposal waste amount at Kalaka dumpsite is estimated around 1.93ton per day, which accounts for 27.4 % of total waste generation amount.
- More than half of generated waste is burned or buried or dumped in the backyard.
- Present recycling rate is only 5.1 %.

d. Financial situation

- Ministry of Health (MoH) has a responsibility for solid waste management in Vava'u under the Waste Management Act. However, their budget for SWM is not premeditatedly allocated in a comprehensive manner. Revenue and expenditure for SWM is not set out clearly in the accounting system of Vava'u MoH Ngu Hospital. Expenditure for SWM accounts for only 5.0% of total expenditure. Average SWM expenditure in 2009/2010 and 2010/2011 were around TOP\$1,500 as shown in Table 3.

Table 3: Financial situation on Solid Waste Management (MoH Vava'u)

Items	Unit	2009	2010	2011
		Actual	Actual	Planned
Total Revenue MoH Vava'u (Ngu Hospital)	T\$	1,114,260.00	1,218,500.00	1,277,613.00
Total Expenditure MoH Vava'u (Ngu Hospital)	T\$	1,114,250.00	1,218,495.00	1,227,597.00
Revenue for Kalaka dumpsite management	T\$	4,875.00	1,500.00	500.00
Expenditure for Kalaka dumpsite management	T\$	4,850.70	1,499.97	499,99
Expenditure for SWM administration	T\$	53,959.00	54,649.00	57,281.00
Total Expenditure for SWM	T\$	58,809.70	56,148.97	57,780,99
Ratio of Total SWM Expenditure to Total Expenditure of MoH Vava'u	%	5.0	5.0	4.7

- Waste/Garbage fee is not included in current taxation system.
- Tipping fee is also not charged at Kalaka final disposal site.

e. Organization for SWM

- Ministry of Health Vava'u has a responsibility for solid waste management in Vava'u. Under the Ministry, two Health Inspectors under the Environmental Health Section are assigned. Their current main works are;
 - 1) Issue and renewal of business licenses such as food promises,
 - 2) Inspection of quarantine item at wharf,
 - 3) Vector control at communities, and
 - 4) Kalaka dumpsite management.

For 4) Kalaka dumpsite management, Health Inspectors visit the site irregularly to inspect the situation. Pushing of the disposed waste is undertaken when the working space become full with disposed waste.

- Waste collection is implemented only for normal waste generated from the Nqu hospital and staff compounds, and for waste in public trash bins placed on the street twice a week. 2.0 ton truck owned by MoH Vava'u is used for waste collection, however, it is often broken down.
- MoH Vava'u does not own heavy equipments like bulldozer, Wheel loader and Excavator and its operators. Therefore, pushing waste to create working space is undertaken by using a wheel loader owned by a private company when needed.

f. Other institutional Issues

- SWM is enforced by MoH Vava'u based on the Waste Management Act and Public Health Act No29 of 1992, however, the integrated legislation and regulation for SWM is not enacted.
- MoH Vava'u has not owned a specific program for environment education, while sometimes Ministry of Environment and Climate Change (MECC) carries out awareness program as a part of National Environment Week. Environment education is mainly carried out by local environmental NGO, Vava'u Environmental Protection Association (VEPA), using their own funded programs like placing recycling bins on the street, TV programs.

g. Technical Issues

- Kalaka disposal site is being managed within MoH's capacity. Incoming vehicles are guided by a caretaker to the designed place.
- According to the results of various baseline surveys which were conducted since July 2011, the existing final disposal site might reach its' capacity **within 5 or 6 years**. However, the life span of the existing disposal site might be extended if the current site is expanded to the actual boundary.

2 Vava'u Solid Waste Management Plan

2.1 Aim

Waste management system is a mix of complementary factors such as waste collection and final disposal, waste minimization, financial and organizational aspects, and others. The Solid Waste Management Plan for Vava'u is a document that establishes goals and programs for the handling of solid waste in a manner that meets local needs and is consistent with Vava'u solid waste management priorities.

2.2 Vision

“Establish an effective Solid Waste Management system in Vava'u by the year 2021 to keep great Vava'u clean and healthy.”

2.3 Key factors

To achieve the above vision, the following key factors need to be required;

- Involvement of community to change People's behaviour
- Start at household level/community level
- Everybody's responsibility for waste management

2.4 Implementation body

Ministry of Health has a responsibility for Solid Waste Management as specified by Under the Waste Management Act, however, their technical, institutional and financial capacity is limited. Therefore, appropriate solid waste management system should be established in close collaboration with Ministry of Environment and Climate Change and the Vava'u Solid Waste Management Steering Committee.

The Committee consisting of the following members will be key actor as SWM requires involvement of all sectors of society.

[Members of Solid Waste Management Steering Committee]

Governor of Vava'u, Members: District Officers, Town Officers, Leaders of Women's group, Related Ministries and Departments, Schools, Recycling Company, NGOs

2.5 Target year

The final target year of the Solid Waste Management Plan (SWM-P) is set up the year **2021**. The above vision will be achieved step by step over 10 years.

2.6 Planning Framework

The following frameworks are set up for planning of Solid Waste Management Plan.

- The actual population in Vava'u Island is 15,505 people (5,787 people in Neiafu area) in 2006 based on the latest Tonga census report, and the future population in Vava'u island is forecasted to be 18,901 people (7,054 people in Neiafu area) in 2021, the final target year. The population growth rate per year in Vava'u is 0.02%. Based on the above forecast, total waste generation amount is expected to be 8.8 ton per day in 2021.
- Due to the limited capacity of the existing final disposal site, Solid Waste Management for Vava'u should be implemented following the priority order.
 - Waste reduction and reuse is encouraged at the generation source (households/businesses). Proper self-disposal method like; feeding of kitchen waste etc to pigs and dogs, and composting.
 - Waste generated after the attempt of waste reduction and reuse, is separated for recycling as much as possible.
 - Only after the effort of waste reduction, reuse or recycling, waste is properly collected, treated, and finally disposed of in a proper manner without negative environmental impacts.

- Through implementation of the above waste minimization practices, over 20% of disposal waste amount is expected to be reduced by the year 2021.
- Final disposal site is operated and maintained as sanitary landfill, which means that waste is disposed at designated landfill area which is designed and planned for minimizing environmental and human health impact.

3 Action Plan

The vision of the SWM Plan is to be achieved through the following five main actions.

1. Establish a Sustainable SWM Financial System
2. Strengthen the capacity of SWM Organizations and Coordination with Respective Sectors
3. Establish a SWM Related Institutional System
4. Establishment of Proper SWM Technical System
5. Establishment of Safety Management System for Hazardous, Toxic, Infectious Waste

3.1 [Action Plan 1] Establish a sustainable SWM Financial System Financial Plan

Proper Solid Waste Management (SWM) system requires necessary expenditures as follows;

- (1) Operation and Maintenance of final disposal site

Necessary operation and maintenance works	Required cost
(i). Monthly pushing and compaction of incoming waste.	Hiring of wheel loader/excavator: TOP\$350/hour (a) Monthly: TOP\$350 (b) Yearly: <u>TOP\$4,200</u> (= (a) x 12)
(ii). Regular Maintenance of Leachate treatment facility, drains, access road (during rainy seasons: Oct –Mar, for 6 months)	Hiring of wheel loader/excavator: T\$350/hour Purchase of coral: T\$150/load (a) Monthly: TOP\$500 (b) Yearly: <u>TOP\$3,000</u> ((a) x 6)
(iii). Administration costs (safety and protection gears for caretaker, facility expenses such as water tank, fuel cost for inspection, etc)	(a) Monthly: TOP\$100 (b) Yearly: <u>TOP\$1,200</u> ((a) x 12)
Total	(Yearly) TOP\$8,400

- (2) Operation of garbage collection

Item	Unit	
Target area		Neiafu town, Makave, Utui, Okoa
Population		5,056
Household number		950
Required cost		
h. Labor cost (1 driver + 2 collection workers by using existing MoH workers)	\$/ton	0
i. Fuel cost	\$/ton	36
j. Maintenance cost for truck (=5% of fuel cost)	\$/ton	1.8
k. Total cost (h+i+j)	\$/ton	37.80
l. Total cost (monthly)	\$/month	1,216.04
m. Total cost (l x 12) (yearly)	\$/year	14,592.54

(3) Administration and management.

Items	Unit	2011 Planned
Expenditure for SWM administration	T\$	57,281.00

In order to ensure the sustainable finance system, revenue should cover these SWM expenditures. MoH Vava'u has very limited budget, so proper solid waste management system will need to secure further financial sources by the following methods;

- Increase government's budget allocation to Solid Waste Management,
- Introduce waste fee from dumpsite users,
- Introduce garbage collection fee from service users,
- Introduce environment fee for tourists,
- Establish a special account in Vava'u

Expenditure	Management of final disposal site		Operation of garbage collection	Administration and management
			
Revenue	MoH budget	Waste fee	Garbage collection fee	Environment fee

Figure 3: SWM Expenditure and Revenue

3.1.1 Increase government's budget allocation to Solid Waste Management

First of all, Ministry of Health Vava'u should make all possible efforts to increase the budget allocation to the Solid Waste Management for Vava'u.

In order to ensure a durable SWM system, the budget plan should be reflected actual cost for activities related to SWM.

MoH Tongatapu with Ministry of Finance should support Vava'u's initiative on SWM as it is expected that Vava'u SWM system will become a model for other outer islands in Tonga.

Table 4: Financial situation on Solid Waste Management (MoH Vava'u)

Item	2011/2012	2012/2013	2013/2014	2014/2015
Budget for Kalaka dumpsite management (TOP\$)	1,000	1,000	5,000	5,000

3.1.2 Introduce waste fee from dumpsite users

Management of final disposal site requires a cost. In a very basic sense, fees based on a transparent user pay principle are a requirement if existing final disposal site is to be made available to society on a sustainable basis.

There are two options (a) Waste fee or (b) Tipping fee to collect levy from dump users. Each option has advantages and disadvantages. In Vava'u, it seems a bit risky to control collected fees at dumpsite, and need to discourage illegal dumping. In order to secure a certain amount of money, it is recommended to introduce waste fee in Vava'u.

Table 5: Waste Fee and Tipping Fee

Options	Timing of payment	To whom to pay	Advantage	Disadvantage
(a) Waste fee	at the beginning of the year	(1) MoH, or (2) Authorized agency (i.e. Waste Management Committee)	- ensure certain amount of revenue - encourage people to use dumpsite (prevent from illegal dumping)	- need to convince people to pay. - need to consider the scale of shop and their waste discharge amount. - No incentive for waste minimization
(b) Tipping fee	When disposed waste at dumpsite	MoH's caretaker of dumpsite	-fair charging system for dumpsite users - Good incentive for waste minimization	- need to train MoH's caretaker for strict gate control - will discourage people from using of dumpsite. - Need legislation to prevent open burning and illegal dumping

Waste fee should be levied according to waste generation amount. The estimated revenue from waste fee is expected as shown in Table 6.

All business establishments are required to pay business license fee to MoH every year, and these businesses discharge large amount of waste compared to households. Therefore, it is recommended to start charging a fee to businesses first, then to residents later on.

Table 6: Estimated revenue from waste fee

Type of waste	Target area	(a) Number of unit	unit	(b) Expected waste fee	Annual revenue (Number ((a) x (b)) (TOP\$)
				\$TOP	\$TOP
Household waste	Neiafu town, Makave, Utui, Okoa (users of Kalaka dumpsite)	950	households	6	5,700
Market waste		1	market	80	80
Hotel		12	hotel	40	480
Restaurant		13	restaurant	20	260
Offices/Retails		100	shop	20	2,000
				TOTAL	8,520

3.1.3 Introduce garbage collection fee from service users

It is expected to introduce garbage collection service in Vava'u by the year 2021. If MoH provides a garbage collection service to the Neiafu Town Area on a weekly basis, it costs TOP\$14,592.54 per year. Therefore, each household is required to pay TOP\$15.36 at least to cover the operation and maintenance cost for garbage collection.

Table 7: Estimated garbage collection fee for each household in Neiafu Town Area

Item	Unit	
Target area		Neiafu town, Makave, Utui, Okoa
Population		5,056
Household number		950
Required cost		
h. Labor cost (1 driver + 2 collection workers by using existing MoH workers)	\$/ton	0
i. Fuel cost	\$/ton	36
j. Maintenance cost for truck (=5% of fuel cost)	\$/ton	1.8
k. Total cost (h+i+j)	\$/ton	37.80
l. Total cost (monthly)	\$/month	1,216.04
m. Total cost (l x 12) (yearly)	\$/year	14,592.54
(4) Estimated garbage collection		
n. Garbage collection fee (l/household) (monthly)	\$/household/month	1.28
o. Garbage collection fee (m/household) (yearly)	\$/household/year	15.36

If all 950 households living in Neiafu pay TOP\$20.00 garbage collection fee yearly, the total revenue will reach to TOP\$19,000, which can cover the required cost for operation of garbage collection.

Table 6: Estimated revenue from garbage collection fee

(a) Garbage collection fee (TOP\$)	(b) Household number	Annual revenue ((a) x (b)) (TOP\$)
20.00	950	19,000.00

3.1.4 Introduce environment fee for tourists

Vava'u has been growing in popularity for beautiful environment such as whale watching and dream destination for yachties. An average of 8,500 people by air and 450 yachties² a year visits Vava'u.

Increased tourism means that the nature and cultural environment in Vava'u is becoming more exposed to deterioration and disturbance. One of the greatest challenges we currently face in Vava'u is to manage the increase in generation amount of waste.

To ensure sustainable management of the unique natural areas and cultural environments, an environmental/waste fee should be introduced for tourists including yachties.

² Information source: Ministry of Tourism, Vava'u

MoH Vava'u has conducted a questionnaire survey targeted yachties who visited Vava'u from June 2012 to December 2012, and received 188 answers, in summary;

- 77.1% of them are willing to pay to support the concept

(while 15.4% said "No", N/A: 7.4 %)

- Average of affordable fee per boat: TOP\$28.60

Based on the above questionnaire survey, it is found that 62% of yachties stay less than 1 month and 38% of them are long-stay tourists who stay more than 1 month. The revenue from environment fee is estimated as shown in the Table 7.

Table 7: Revenue from environment fee

	No. Yacht /visitors		Fee	Revenue
Yacht	454	281 (short-stay) (62%)	TOP\$20 / yacht	TOP\$ 5,630
		173 (long-stay) (38%)	TOP\$30 / yacht	TOP\$ 5,190
			(a) Sub-total	TOP\$ 10,820
Air	8,432	8,000 (short-stay)	TOP\$2 / person	TOP\$ 16,000
		432 (long-stay)	TOP\$5 / person	TOP\$ 2,175
			(b) Sub-total	TOP\$ 18,175
TOTAL (=a)+(b))				TOP\$ 28,995

The detailed system as shown Table 8 should be examined before implementation.

Table 8: Matters to be examined for implementation of Environment fee

Item	Note
(1) Fee	Depends on length of stays? or Apply a single-price? Charging to local visitors and residents?
(2) Payment timing	When do visitors have to pay the tax? And, Who will collect the fee? (When visitors purchasing airline tickets or registering of yacht by airlines and yacht management companies? During inspection by Health Inspectors? When visitors leave Vava'u? When they book environment tour? etc.)
(3) Management system	- Which organization should be authorized for management of the fund? (Related Ministries or Departments? Governor's Office? Independent agency/board? NGO?)
(4) Utilization of the fund	- Effective way to use the collected money - Need to ensure transparent accounting system

Also, regulation relating to an environment fee for visitors to Vava'u should be pursuant to the existing current legal system.

- The collected fee will be kept in a special account in Vava'u as Vava'u' Sustainable Environmental Fund (VSEF – tentative).

3.1.5 Special account for SWM in Vava'u

As shown in Table 9, sustainable SWM finance system is ensured as long as the above revenue system can be established.

Table 9: SWM Financial Plan

Item	2011/2012	2012/2013	2013/2014	2014/2015
Expenditure (TOP\$)				
(a) Management of final disposal site	1,000	1,000	8,400	8,400
(b) Garbage collection	0	126	14,593	14,593
(c) Administration	57,781	57,781	57,781	57,781
(1) Total expenditure ((a)+(b)+(c))	58,781	58,907	80,774	80,774
Revenue (TOP\$)				
(d) MoH budget	58,781	58,781	62,781	62,781
- Management of final disposal site	1,000	1,000	5,000	5,000
- Administration	57,781	57,781	57,781	57,781
(e) Waste disposal fee / Tipping fee	0	0	5,700	8,520
- Household	0	0	0	2,820
- Commercial	0	0	5,700	5,700
(f) Garbage collection fee (\$20/household)	0	0	19,000	19,000
- Target household number	0	0	950	950
(g) Environmental fee	0	0	10,820	28,995
- Yacht	0	0	10,820	10,820
- Visitors by air	0	0	0	18,175
(2) Total revenue ((d)+(e)+(f)+(g))	58,781	58,781	101,301	119,296
Balance (TOP\$) ((2)-(1))	0	-126	20,527	38,522

The remaining balance will be used to initiate and stimulate activities with the purpose of protecting Vava'u environment like;

- Management of final disposal site
- Public area cleansing such as road sweeping and drain cleaning
- Awareness and education program (in collaboration with VEPA)
- Promotion of waste minimization/3R (working with Gio Recycling)
- Subsidy for community-based garbage collection system which is promoted in villages
- Unscheduled expenses such as repairs of garbage collection trucks

All the above revenues related to SWM, should be kept in the special account for SWM in Vava'u. And, its accounting system to be established should be fair and transparent one.

For this special account, the specific committee involving key stakeholders should be established to oversee a special account for SWM. And, all statements of account should be informed among stakeholders on a regular basis. Transparent accounting system specific for the whole SWM expenditure should be also established.

3.2 Strengthen the capacity of SWM Organizations and Coordination with Respective Sectors (Organizational Plan)

- **Ministry of Health Vava'u:** Solid Waste Management in Vava'u is carried out under the responsibility of Ministry of Health Vava'u. The capacity for SWM should be strengthened through implementation of the J-PRISM Project as SWM is still new concept for them.
- **Ministry of Environment and Climate Change:** MECC is policymaking organization. It is expected to work together closely for implementation of SWM.
- **Steering Committee for Solid Waste Management in Vava'u:** In order to make up for the capacity of MoH Vava'u, the Steering Committee involving key stakeholders has been already established to oversee Solid Waste Management in Vava'u. The Committee includes Governor of Vava'u, District officers, Town officers, Leaders of Women's groups, Recycling company, Private garbage collector, NGOs, and related Ministries and Departments. Expected roles of the Committee are as follows.
 - Planning for SWM
 - Monitoring of the implementation of SWM Plan
 - Management of data and information for SWM
 - Management of revenue, expense and budget data for SWM (supervision of a special account for SWM)
- **Technical Steering Committee for SWM:** In order to share and discuss about activities and problems for SWM from a technical point of view, Technical Steering Committee for SWM will be held on a quarterly basis. Progress of the activities and collected data will be presented by the Ministry of Health Vava'u in cooperation with Ministry of Environment and Climate Change. The summarized agenda and minutes of meeting will be also presented to the above Steering Committee Meeting to share good practices and lessons learnt of SWM in Vava'u.

3.3 Establish a SWM Related Institutional System

3.3.1 Legal System for SWM

Legal system should be established as there will be the difficulty in bringing about behavioral change amongst people and embracing SWM as it is still new concept. Hence, legislations are enacted would compel people to engage and practice appropriate SWM.

The following legal system for SWM should be introduced involving the related Ministries;

- Enactment of SWM legislation and regulation in Vava'u complimentary to the related Acts like Waste Management Act, Public Health Act, National Solid Waste Management Strategy, etc.
- Enactment of legislation, regulation and control for;
 - Illegal waste dumping
 - Waste fee

- Garbage collection fee
- Environmental fee

3.3.2 Environment Education and Awareness for SWM

Preparation and implementation of program, tools and events for environment education is undertaken in coordination with relative sectors, especially with Ministry of Education and Vava'u Environmental Protection Association (VEPA).

3.4 Establishment of Sustainable SWM Technical System

3.4.1 Proper Operation and Maintenance of Kalaka Final Disposal Site to Maximize it's Capacity

a. Outline of Rehabilitation Plan for Kalaka Final Disposal Site

Kalaka final disposal site will be rehabilitated through the Japanese Government Assistance to become a "Sanitary Landfill", which is designed disposal area for minimizing environmental and human health impact.

Due to the limited technical, institutional, and financial capacity of MoH Vava'u, it requires step-by-step rehabilitation process as shown by each phase as show in Table 10. The rehabilitated disposal site should be operated and maintained within MoH's capability.

There are difficulties of acquiring a new disposal site in Vava'u due to land limitations and complicated landowners system. Therefore, waste minimization practices like proper self-disposal method, composting and recycling, will contribute to extend the life span of existing dumpsite.

Table 10: Expected goals for improvement of the final disposal site

Phase	Year	Expected goal
Phase 1 (Short and Medium term)	during the Project term (FY 2011-2016)	- To mitigate environmental impact caused by current dumpsite. - To extend the life span of the existing dumpsite with the introduction of waste minimization practices <i>(in collaboration with Okinawa Mottainai Project)</i>
Phase 2 (Long term)	5 years after the Project ends (FY 2017-2022)	- To maintain proper operation and management of the existing dumpsite. - To seek candidate sites for a new dumpsite.

b. Planned rehabilitation works

(Refer to Rehabilitation Plan of Kalaka final disposal site in Vava'u)

c. Proper Operation and Maintenance

- Practical operation details will be guided by the "Operation and Maintenance Manual for Kalaka Final Disposal Site" which will be developed in 2013. Using the developed manual, the training for site operation and maintenance will be conducted. The contents of manual will be reviewed and revised when needed.

- Water quality monitoring will be conducted at Vava'u disposal site and nearby environment on regular basis. The results should be shared with the Committee members and communities.

3.4.2 Promote Proper Self-Disposal Method at Household Level

One important and effective method for removing waste generated from man's environment is self-disposal,

In order to reduce the waste to be collected and disposed, the waste generated is treated at generation source as much as possible, which will be achieved through ;

- feeding of kitchen waste etc to pigs and dogs,
- other kitchen waste is composted or buried/burned in proper way,
- green waste is accumulated at designed place in the backyard for manure.

3.4.3 Promote 3Rs (Reduce, Reuse and Recycle) system

3Rs (Reduce, Reuse and Recycle) of waste is a key concept for waste minimization.

In order to establish sustainable recycling system, community-based recyclable collection system should be promoted in collaboration with the existing recycling company.

Awareness program is also conducted at community level and for business establishments.

These activities has been assisted by “Great Vava’u and Okinawa Mottainai Project” which is implemented since Oct 2011 for three years.

3.4.4 Promote Community-based Waste Collection System

(Refer to Garbage Collection Plan in Vava’u)

Community-based waste collection system should be promoted. Necessity of waste collection, frequency, number and location of waste bins, collection vehicle, and collection fee are decided among community. It is preferable to establish a SWM committee in the community. MoH Vava’u and MECC will provide technical advices when needed.

If appropriate collection vehicles could not procured by the community, MoH Vava’u provides a collection truck. Expenses such as fuels for truck, should be borne by community.

3.5 Establishment of Safety Management System for Hazardous, Toxic, Infectious Waste

a. Infectious Waste

- Nqu Princess Hospital is the only general hospital in Vava’u. Medical waste generated from the hospital is segregated as general waste, clinical waste and sharps, cytotoxic waste.

- Thermal processing by incineration is the safest processing method, and incineration at generation sources is appropriate to prevent fly over of waste during transportation and disposal process. It is recommended for infectious waste under a well managed of facility and is the most appropriate operation.
- Clinical and sharps are individually combusted in incinerators installed in the hospital. Remaining residue after combustion, mainly ash, is transported to the Kalaka final disposal site by the hospital's own vehicle.
- It is necessary to give necessary guidance on separation of medical waste to all staff in the hospital.

b. Quarantine Waste

Quarantine waste is generated from two entry points in Vava'u the harbour and airport. Quarantine waste is combusted by an incineration which is located in the harbour. In order to prevent from diffusion and fly all over of harmful insect, thermal treatment by incineration is highly recommended for the quarantine waste at generation points.

c. Industrial Waste

The industrial waste should be controlled by MoH Vava'u and MECC accordance with registration, permit, regulation, control and monitoring etc.