

MONITORING AND EVALUATION FRAMEWORK FOR GREEN WASTE MANAGEMENT IN FUNAFUTI, TUVALU



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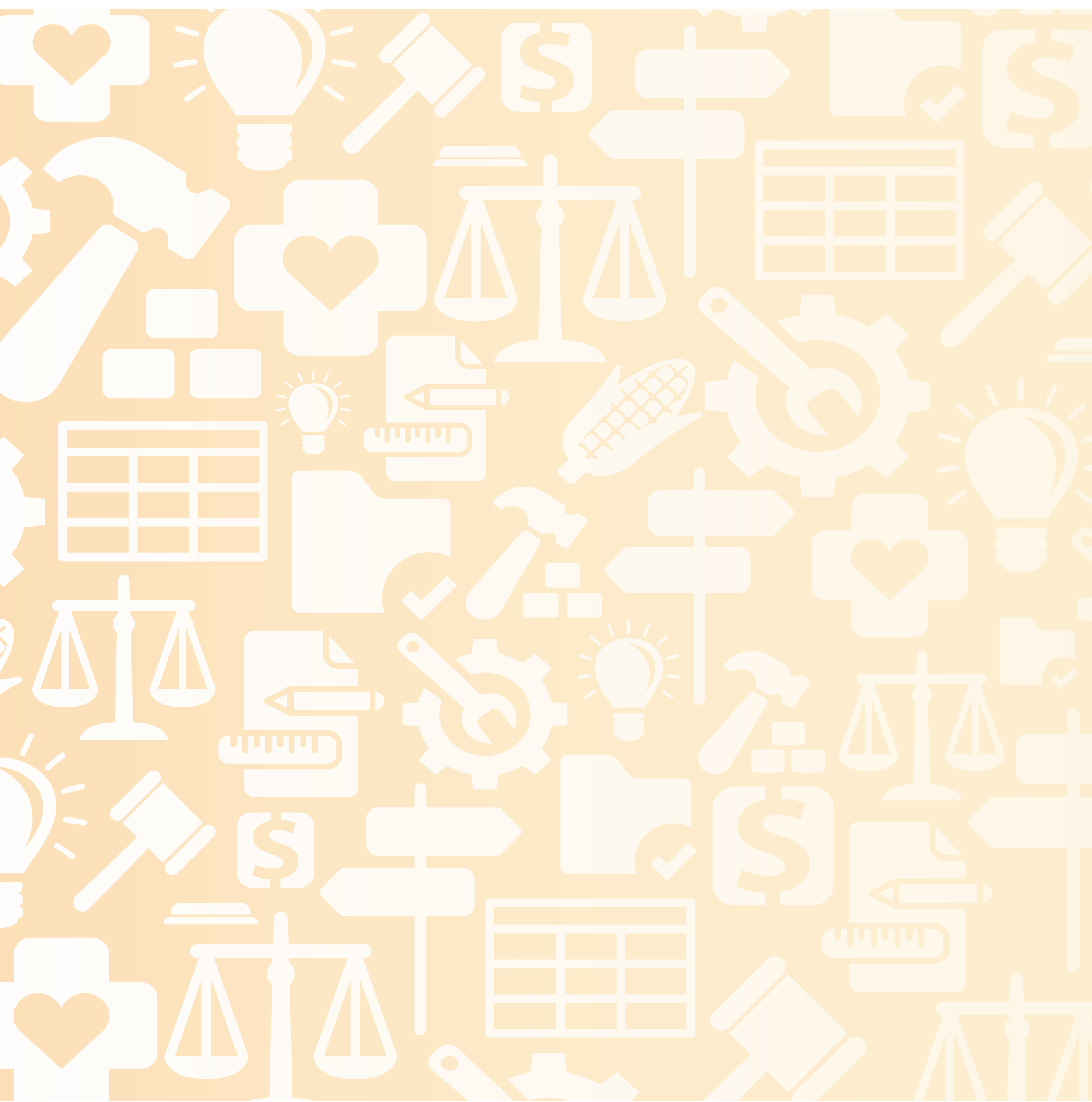
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Introduction and Approach

The Government of Tuvalu (GoT) is about to start a new programme to improve the management of 'green waste' in Funafuti. This programme is being implemented with support from the European Union (EU) and the Secretariat of the Pacific Regional Environment Programme (SPREP) and is a key part of the new Tuvalu National Integrated Waste Policy and Action Plan (2017 to 2026).

This document is the monitoring and evaluation (M&E) framework for the 'Funafuti green waste programme'. The purpose of this framework is to guide monitoring and evaluation of the programme in a structured and systematic fashion. An emphasis of the framework is to support learning by the GoT, particularly lessons for informing adaptive management of the programme as it is being implemented and informing design of future (related) programmes.

The M&E Framework follows the approach outlined in the *Guidance Note for Developing Monitoring & Evaluation Frameworks for Overseas Development Assistance (ODA) in Tuvalu*. A copy of this Guidance Note is available from the Evaluation Coordination Administrator based within the Office of the Prime Minister (OPM).

The M&E framework document for the Funafuti green waste programme is organised into six sections as follows:

- Section 1 provides a summary of the Funafuti green waste programme design, to ensure there is a sound and shared understanding of the project on which to base the M&E work;
- Section 2 specifies the Key Evaluation Questions. These questions are the main learning interests of the Go, and thus provide direction and focus for the monitoring and evaluation activities.
- Section 3 outlines the Monitoring Plan. The Monitoring Plan sets out the basic data that must be collected to answer the key evaluation questions (and to input to quarterly and annual progress reports) as well as, who is responsible for collecting this information, where and when.
- Section 4 outlines the Evaluation Plan. The Evaluation Plan details the methods for collecting in-depth information needed to complement basic monitoring data to provide a complete answer to the key evaluation question. In particular, to explore reasons why or why not objectives (or performance areas more generally) were achieved, or to identify specific success factors or barriers.
- Section 5 outlines a Basic Communication and Knowledge Management Plan to make sure that knowledge generated is effectively communicated and made available in a timely manner. Concluding remarks are offered at the end.

A key activity in developing the M&E framework was a two and a half day participatory workshop conducted in Funafuti in October 2016. A report documenting this workshop is included as Appendix 10.

In addition, this M&E framework is intended to be a model approach to be used by other 'programmes' within the Tuvalu National Integrated Waste Policy and Action Plan. The intention is that programme-level M&E frameworks will be prepared for the most important (i.e. highest programs) programmes included in the Tuvalu National Integrated Waste Policy and Action Plan. These programme-level M&E frameworks will be integrated/combined to inform M&E for the broader Tuvalu National Integrated Waste Policy and Action Plan.

The development of this M&E Framework has been supported by the Secretariat of the Pacific Regional Environment Programme (SPREP) and the Asian Development Bank (ADB) through the Program Programme for Climate Resilience: Pacific Regional Track (PPCR-PR). More information on the PPCR-PR can be found at <https://www.climateinvestmentfunds.org/cif/node/7295>.

1. Definition of the Funafuti Green Waste Program

This section provides a summary description of program design and its context. The purpose of this is to provide for a sound and shared understanding of the program on which to base (and focus) the M&E work. The section includes (i) a description of the policy problem(s) the program is trying to address, (ii) a statement of program objective, (iii) a description of program strategies and how it is expected to lead to change, (iv) a graphical illustration of the elements of the program and how they logically link, and (v) a summary of key risks to the project.

i PROBLEM STATEMENT

Green waste (tree branches, leaves, etc.) is a very significant issue in Funafuti because of the limited land available for landfill.

Unlike other waste streams (e.g. household waste), the generation of green waste cannot be effectively reduced because it is a byproduct of vegetation growth. Rather, the challenge for green waste is to find options to ensure it is recycled and used as an economic resource, and, therefore, is not disposed of in landfill sites.

There are currently two waste-collection systems in Funafuti: . The general waste collection that is a service delivered by the Kupule, and the green waste service provided by the Solid Waste Authority of Tuvalu (SWAT).¹

The general household waste collected by the Kupule often includes a proportion of green waste because this waste has not been properly segregated. This green waste can go to landfill.

The green waste collected by SWAT is estimated at approximately 1,800 m³ per annum. Through awareness campaigns and bylaws, SWAT has been working hard to ensure green waste that is left for collection is free from contaminants and is suitable for mulching.²

However, current use of mulch is lower than the generation of mulch, and mulch is stockpiling at the hanger. Eventually, this excessive green waste will need to be disposed of.

There are a number of effects associated with the current inefficient collection, conversion, and use of green waste. One of the current landfill sites has a low economic value as because volumes of waste delivered to the landfill are high.

- Green waste in landfills will increase leachate into the lagoon, which has negative impacts on water quality. In addition, green waste in landfill is a source of CO₂ emissions.
- The current low levels of use of recycled green waste also represent a lost opportunity to increase horticultural production. Food security, particularly of fresh fruit and vegetables, is a major challenge for Tuvalu. Green waste mulch mixed with clean pig dung is a potentially cheap and plentiful source of soil conditioning and formation.
- The underpinning reasons that explain why green waste is currently not efficiently managed are summarised in the below:

¹ Collection, management and disposal activities from the two organisations are not completely compatible and duplication of effort and costs is likely.

² This enables the reduction in the volume of material from the estimated 1,800m³ to around 780m³.

BOX 1. CAUSES AND DRIVERS OF GREEN WASTE PROBLEM

DRIVERS	KEY ELEMENTS / EXAMPLES
Drivers that cannot be controlled by SWAT	<ul style="list-style-type: none"> • Income growth and changing consumption patterns (including less home gardening) • Population growth (natural growth and migration from the outer islands)
Causes	
Information and knowledge	<ul style="list-style-type: none"> • Impacts of green waste are often poorly understood • Green waste management arrangements at the home scale often poorly understood (including differences between long-term residents and immigrants) • Solutions often not known (how effective are alternative options? What will they cost?)
Public goods	<ul style="list-style-type: none"> • No exclusions on dumping (free access and use) • Dumping waste by one person does not stop another doing the same thing
Incentives and disincentives	<ul style="list-style-type: none"> • The lack of pricing of green waste management services does not discourage waste generation or direct disposal to landfill • Lifestyle reasons for not using green waste at home (less home gardening by people with jobs for wages)
Government policies / distortions	<ul style="list-style-type: none"> • Subsidies (e.g. free disposal) distort decisions and investments • Little/no consequences of illegal dumping (e.g. on road side)

Source: Stakeholder workshop 13 May 2016

ii OBJECTIVE STATEMENT

The overall objective of the Funafuti Greenwaste Management project proposal is to *'reduce the volume of green waste going to landfill'*.

iii DESCRIPTION OF STRATEGIES

The project design includes three inter-related strategies to achieve the overall programme objective:

- Strategies to *reduce the amount of green waste generated at source, and to improve segregation at collection points*. These include an awareness initiative for home composting and segregation, and strengthened enforcement of solid waste regulations pertaining to segregation.
- Strategies to *improve the efficiency of green waste collection and conversion services*. These include revisions to the green waste collection schedule, revisions to the asset management plan, modifications to practices for producing mulch, modifications to practices for producing woodchips, and introduction of a new pricing and cost-recovery strategy. A further and key strategy is to produce a new product: compost. Compost is a mixture of mulch and manure.
- Strategies to *increase the (demand and) level of use of recycled product*. This is an advertising campaign for mulch, woodchip, and compost products.

Note, a range of different options were considered and compared using the cost-benefit analysis (CBA) framework. The options included in the Funafuti green waste programme are the ones assessed by the CBA to be the most efficient options to achieve the stated objective.

iv LOGIC MODEL

The logic of the programme design, i.e. the cause-effect linkages between key strategies of the programme design to achieve the intermediary objectives and higher level objective(s), is illustrated in Figure 1.

FIGURE 1. RESULTS FRAMEWORK FOR FUNAFUTI GREEN WASTE PROGRAM

	INTERVENTION LOGIC	ASSUMPTIONS
Overall objective	Reduce volume of green waste going to landfill	
Specific objectives/ outcomes	1. Reduce volume of green waste generated at source, and improve segregation	Regulations provide sufficient incentives to improve segregation Knowledge and awareness of composting techniques is adequate/leads to increased household composting
	2. Improve efficiency of green waste collection and conversion services	Opportunities for efficiency gains are real
	3. Increase demand and use of recycled product (mulch, woodchip, compost)	There are no market distortions (e.g. subsidised vegetable sales from Taiwan farm) which materially affect sale of mulch, woodchip, and/or compost
Outputs	1.1 Targeted awareness initiative for home composting and segregation (households, schools, etc.) delivered ³	Sufficient budget allocated to adequately deliver outputs
	1.2 Solid waste regulations pertaining to segregation enforced ⁴	There are no major turnovers of key staff
	2.1 New green waste collection schedule developed and operationalised ⁵	Sufficient budget allocated to adequately deliver outputs
	2.2 New asset management plan developed and operationalised ⁶	There are no major turnovers of key staff
	2.3 Production of mulch	
	2.4 Production of woodchips	
	2.5 Production of compost ⁷	
	2.6 Pricing/cost-recovery strategy developed ⁸	
	3.1 Mulch promotion/advertising campaign delivered	Sufficient budget allocated to adequately deliver outputs
3.2 Woodchip promotion/advertising campaign delivered		
3.3. Compost promotion/advertising campaign delivered	There are no major turnovers of key staff	

The linkages of the Funafuti green waste programme with the National Integrated Waste Policy & Action Plan, the MHARD Corporate Plan, and the National Strategy for Sustainable Development is further illustrated in Appendix 1.

(V) PROGRAMME RISKS

There are a number of internal and external factors which may adversely affect the delivery of the Funafuti green waste programme and achievement of its intended objectives. Key factors, their associated risks, and how they will be treated/managed are summarised in Figure 2.

A more comprehensive Risk Management Plan for the Funafuti Green Waste Management Programme is outlined in Appendix 2.

³ Corresponds to Activity 4.15 of Corporate Plan.

⁴ Corresponds to Activity 4.8 of Corporate Plan.

⁵ Corresponds to Activity 4.24 of Corporate Plan.

⁶ Corresponds to Activity 4.8 of Corporate Plan.

⁷ Corresponds to Activity 4.19 of Corporate Plan.

⁸ Corresponds to Activity 4.5 of Corporate Plan.

FIGURE 2. KAM PROGRAMME RISKS

NATURE OF RISK		MAGNITUDE OF RISK			RISK TREATMENT STRATEGY
Risk factor	Component of project design/ logic affected by risk factor	Likelihood of risk factor occurring (almost certain, likely, possible, unlikely, rare)	Consequence of risk factor, if it occurs (insignificant, minor, moderate, major, severe)	Overall risk rating (low, medium, high, extreme)	
Unwillingness of pig farmers to supply clean dung (inadequate and/or incorrect incentives)	Reduction in compost production + accumulation of green waste at depot/landfill Affects achievement of sub-objective/ strategy 2 ⁹	Possible	Major	High	Dry litter R2R demonstrations based on trials + critical oversight and endorsement of final R2R demonstration design by SWAT (with particular attention to incentives and incorporation within broader Tuvalu Integrated Waste Policy and Action Plan) + close monitoring of quantity and quality of pig dung + evaluative exercise to explore impediments/ inadequate incentives issue(s)
Cyclone and storm surge	Damage to equipment and composting facility Affects achievement of sub-objective/ strategy 2 ¹⁰	Unlikely	Major	Medium	Make sure composting facility includes climate resilient design measures, including additional capacity for peak loads expected if cyclone occurs
Planned expansion of Taiwan farm does not eventuate (funding/ change in policy direction)	Accumulation of products and raw green waste at depot/landfill Affects achievement of sub-objective/ strategy 3 ¹¹	Unlikely	Major	Medium	Monitor progress of farm extension

9 i.e. improve efficiency of green waste collection and conversion services

10 i.e. improve efficiency of green waste collection and conversion services

11 i.e. increase the (demand and) level of use of recycled product.

2. Key Evaluation Questions

Key evaluation questions are the questions that are most important to primary stakeholders for their learning and strategic decision-making needs. They ask the questions to which stakeholders, and in particular the GoT, ‘really need to know’ the answers. These evaluation questions provide direction and focus for the M&E work.¹²

The Key Evaluation Questions for the Funafuti green waste programme were formulated and agreed upon by participants during the workshop conducted in October 2016. This discussion was guided by the logic model and summary of programme risks outlined in the section above, as well as a brief discussion of the standard domains of evaluation as developed by the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (i.e. appropriateness, impact¹³, effectiveness, efficiency,¹⁴ and sustainability¹⁵).

The evaluation questions and sub-questions are outlined in Table 1.

TABLE 1. KEY EVALUATION QUESTIONS

KEY EVALUATION QUESTION	SUB-QUESTIONS
1. To what extent was the green waste programme able to achieve its objective of reducing green waste going to landfill?	1.1. What factors led to change or contributed to lack of change?
2. To what extent was segregation achieved?	2.1 Was the awareness initiative effective in contributing to this? Why? Why not? 2.2 To what extent did the strengthened enforcement and regulation contribute to this outcome? What factors facilitated this? What factors inhibited this?
3. To what extent has SWAT’s collection and conversion services improved?	3.1 To what extent have SWAT’s service delivery costs reduced? To what extent have costs been recovered? What factors have (materially) affected costs and revenues? 3.2 To what extent are the end products (especially compost) of a suitable quality for end users? What factors facilitated this? What factors inhibited this? 3.3 To what extent have climate change risk management measures (i.e. climate-proofing new transfer station) been effective in minimising damage to transfer station, and ensured the ability to accommodate additional volumes of green waste following cyclones? Why? Why not? 3.4 Are these services sustainable? Why? Why not? How can this best be achieved going forward?
4. To what extent has the advertising campaign contributed to the uptake of recycling (use of products: mulch, wood chips, compost)?	4.1 What worked well and what did not work so well? 4.2 Have there been any other factors that affect (+/-) uptake of product (e.g. quality, pricing, accessibility, etc.)?
5. Have the green waste programme outputs been delivered as per the Corporate Plan and Budget? Why? Why not?	5.1 To what extent has the Asset Management Plan been implemented effectively?

¹² Which in turn helps to make the M&E framework achievable and ensure that it can generate reliable lessons, supported by reasonable evidence. The intention is that the key evaluations questions outlined above will be the key focus areas of analysis within each of the OECD DAC evaluation criteria. That is, the priority analysis for the mid-term and end-of-term evaluations. It does not however limit analysis to just these focus areas/questions.

¹³ Impact is a measure of the extent to which longer-term outcomes were achieved, or are expected to be achieved.

¹⁴ Efficiency is a measure of how inputs (funds, expertise, time, etc.) are converted to outputs.

¹⁵ Sustainability is a measure of the continuation of the project benefits beyond the project lifetime.

3. Monitoring Plan

To be able to properly answer key evaluation questions outlined in section 2 above, good quality information and data (i.e. indicators¹⁶) must be collected and collated. The Monitoring Plan outlines the indicators that needs to be collected for the Funafuti green waste program; where this information will be sourced from; and the responsibilities and timelines for doing this information collection.

Information collected as part of the Monitoring Plan is also the primary information collated and communicated in regular (i.e. quarterly and annual) Progress Reports to support everyday management decision-making and to provide for (internal and external) accountability.

The Monitoring Plan for the Funafuti green waste programme is set out in Table 2.

The format used for this Monitoring Plan expands on the core elements of the Results Framework outlined in section 1. It does this by providing a column for indicators; additional columns for data sources (column 5); frequency of data collection (column 6); and responsibilities for data collection and related analysis (column 7). It also includes additional parentheses within in column 1 to show the linkage with relevant evaluation questions (as per section 2 above).

TABLE 2. MONITORING PLAN

Intervention logic [evaluation question]	Indicators	Data Source + Data collection method	Time or schedule and frequency for data collection	Responsibilities and amount of time needed
OO: Reduce volume of green waste going to landfill [EQ 1]	<p>Indicator: Volume (m³/qtr.) of green waste going to landfill</p> <p>Baseline: Existing monitoring data from drivers' log books (including data from quarters 3 and 4 in 2016 as a baseline)</p> <p>Target: 50% reduction in 10 years as per Integrated Waste Policy</p>	Daily drivers' record sheets and waste volume database	Collected daily through existing system Input data daily	<p>Data collection: Waste Management Officer (Miriamia)</p> <p>Data analysis and verification: Automatic in database</p> <p>Data use: Monthly, quarterly, annual reporting</p>
OC 1. Reduce volume of green waste generated at source, and improve segregation [EQ 2]	<p>Indicator: % of green waste at roadside that is mixed</p> <p>Baseline: Existing monitoring data from drivers' log books (including data from quarters 3 and 4 in 2016 as a baseline)</p> <p>Target: 5% reduction in % of contaminated loads per year</p>	Daily drivers' record sheets and waste volume database	Collected daily through existing system Input data daily	<p>Data collection: Waste Management Officer (Miriamia)</p> <p>Data analysis and verification: Automatic in database</p> <p>Data use: Monthly, quarterly, annual reporting</p>

¹⁶ The basic data collected as part of monitoring is commonly referred to as an 'indicator', which is a quantitative or qualitative variable to measure progress in a specific area of intervention performance.

Intervention logic [evaluation question]	Indicators	Data Source + Data collection method	Time or schedule and frequency for data collection	Responsibilities and amount of time needed
OC 2. Improve efficiency of green waste collection and conversion services [EQ 3]	Indicator: Unit cost of collection services (\$/m ³), disaggregated for collection services & product type (i.e. mulch, wood chips, compost) Baseline: Existing monitoring data from drivers' log books (including data from quarters 3 and 4 in 2016 as a baseline). Target: 2% decrease per year	As above for volumes Quarterly financial reports from Finance	As above for volumes Quarterly financial reports from Finance	Data collection: Waste Management Officer (Miriam), financial data from expenditure reports provided by Finance (Executive Officer) Data analysis and verification: See Appendix A3 Data use: Annual
	Indicator: Total cost of collection services (\$/qtr.), disaggregated for collection services & product type (i.e. mulch, wood chips, compost) Baseline: Existing monitoring data from drivers' log books (including data from quarters 3 and 4 in 2016 as a baseline). Target: With annual budget allocation	Quarterly financial reports from Finance	Quarterly financial reports from Finance	Data collection: Financial data from expenditure reports provided by Finance (Executive Officer) Data analysis and verification: See Appendix A3 Data use: Quarterly and annual reporting
	Indicator: Cost recovery rate (%) ¹⁷ , disaggregated for collection services & product type (i.e. mulch, wood chips, compost) Baseline: AMP and budget (including historical budget allocations) Target: To be determined by policy analysis and Government decision	Finalised AMP and annual financial returns	Annual financial reports from Finance	Data collection: Financial data from expenditure reports provided by Finance (Executive Officer) Data analysis and verification: See Appendix A3 Data use: Annual reporting
	Indicator: Asset funding adequacy ratio (ratio) ¹⁸ Baseline: AMP and budget (including historical budget allocations) Target: To be determined by policy analysis and Government decision	Finalised AMP and annual financial returns	Annual financial reports from Finance	Data collection: Financial data from expenditure reports provided by Finance (Executive Officer) Data analysis and verification: See Appendix A3 Data use: Annual reporting
	Indicator: Service disruptions (days/qtr.) Baseline: reported disruptions from operational staff. Use the first quarter as a baseline Target: 5% reduction in disruption days each year	Daily drivers' record sheets and waste volume database	Collected daily through existing system Input data daily	Data collection: Waste Management Officer (Miriam) Data analysis and verification: See Appendix A3 Data use: Quarterly, annual reporting
OC 3. Increase demand and use of recycled product (mulch, woodchip, compost) [EQ 4]	Indicator: Quantity (m ³) of product sold, disaggregated by mulch, wood chips, compost Baseline: Sales revenue data from Finance. Use past year as baseline Target: 100% of mulch, wood chips and compost produced is sold	As above for volumes Quarterly financial reports from Finance	As above for volumes Quarterly financial reports from Finance	Data collection: Financial data from expenditure reports provided by Finance (Executive Officer) Data analysis and verification: See Appendix 3 Data use: Annual reporting
	Indicator: Consumer satisfaction rating ¹⁹ , disaggregated by mulch, wood chips, compost Baseline: Reported customer satisfaction survey results. Use first quarter as a baseline Target: Gradual improvement over time	Consumer satisfaction rating ²⁰	Customer satisfaction survey at time of product sales	Data collection: Waste Management Officer (Miriam). See Appendix 4 Data analysis and verification: See Appendix 4 Data use: Quarterly, annual reporting.

17 This is calculated as all green waste revenue divided by costs.

18 This is calculated as actual allocation for assets divided by AMP budget.

19 See Appendix 4.

20 See Appendix 4.

Intervention logic [evaluation question]	Indicators	Data Source + Data collection method	Time or schedule and frequency for data collection	Responsibilities and amount of time needed
OP 1.1 Targeted awareness initiative for home composting and segregation (households, schools, etc.) delivered ²¹ [EQ 5]	Indicator: Number of schools who received awareness training in home composting and segregation Baseline: 0 Target: All schools in Funafuti	Awareness training event reports	Quarterly	Data collection: Waste management officer (Miriam) Data analysis and verification: Director, SWAT (Susana) Data use: Quarterly, annual reporting
OP 1.2 Solid waste regulations pertaining to segregation enforced ²² [EQ 5]	Indicator: Number of infringement notices issued per qtr. Baseline: Use first quarter as baseline Target: not determined	Infringement notice database	Quarterly	Data collection: Waste management officer (Miriam) Data analysis and verification: Director, SWAT (Susana) Data use: Quarterly, annual reporting
OP 2.1 New green waste collection schedule developed and operationalised ²³ [EQ 5]	Indicator: Development of new collection schedule, informed by efficiency trials Baseline: n/a Target: New collection schedule developed by mid 2018, informed by efficiency trials	Collection schedule document	Quarterly	Data collection: Waste management officer (Miriam) Data analysis and verification: Director, SWAT (Susana) Data use: Quarterly, annual reporting
OP 2.2 New asset management plan developed and operationalised ²⁴ [EQ 5]	Indicator: Development of new asset management plan, informed by policy analysis Baseline: n/a Target: New asset management plan developed by mid 2018, informed by policy analysis	Asset management plan document	Quarterly	Data collection: Waste management officer (Miriam) Data analysis and verification: Director, SWAT (Susana) Data use: Quarterly, annual reporting
OP 2.3 Production of mulch 2.4 Production of woodchips [EQ 5]	Indicator: New transfer station completed ^{25, 26} Baseline: n/a Target: New transfer station complete by mid-2019	PWD inspection report	Quarterly	Data collection: Waste management officer (Miriam) Data analysis and verification: Director, SWAT (Susana) Data use: Quarterly, annual reporting
OP 2.5 Production of compost ²⁷ [EQ 5]	Indicator: Quantity (m ³) of compost produced by SWAT Baseline: 0 Target: not determined ²⁸	As above for volumes Quarterly financial reports from Finance	As above for volumes Quarterly financial reports from Finance	Data collection: Financial data from expenditure reports provided by Finance (Executive Officer) Data analysis and verification: See Appendix A3 Data use: Annual reporting
OP 2.6 Pricing/cost-recovery strategy developed ²⁹ [EQ 5]	Indicator: New pricing strategy developed, informed by policy analysis Baseline: n/a Target: New pricing strategy developed by mid 2018, informed by policy analysis	Pricing strategy document	Quarterly	Data collection: Waste management officer (Miriam) Data analysis and verification: Director, SWAT (Susana) Data use: Quarterly, annual reporting

21 Corresponds to Activity 4.15 of Corporate Plan.

22 Corresponds to Activity 4.8 of Corporate Plan.

23 Corresponds to Activity 4.24 of Corporate Plan.

24 Corresponds to Activity 4.8 of Corporate Plan.

25 Corresponds to Activity 4.7 of Corporate Plan.

It is an input activity to outputs 2.3, 2.4, and 2.5.

26 Locating out of storm surge zone + infrastructure facilities built to category 5 cyclone standard + increased size of storage area to accommodate additional volumes of green waste following cyclone should ensure service disruptions.

27 Corresponds to Activity 4.19 of Corporate Plan.

28 There are a number of different parties that could potentially produce compost including Taiwan Farm, SWAT, and farmers. The targets for SWAT will be determined after this is clearer once the R2R project design is further developed.

29 Corresponds to Activity 4.5 of Corporate Plan.

Further information on the templates and spreadsheets to implement this monitoring plan are outlined in the appendices. It should also be noted that the monitoring databases developed as part of this M&E framework (see Appendices 3, 4, 5 and 6) will save SWAT office staff significant time to develop regular reporting providing data input is kept up to date. Therefore, most of these monitoring activities should be included within the current workloads of SWAT staff with no need for additional budget.

4. Evaluation plan

Monitoring information on its own is generally not sufficient to provide for a complete answer to the key evaluation questions. In particular, monitoring information is not able to explain the reasons why or why not objectives (or performance areas more generally) were achieved or to identify specific success factors or barriers. More in-depth information collected at discrete points in time is needed for this analysis.

The Evaluation Plan outlined in this section details the methods for collecting in-depth information. This includes the evaluation questions (column 1); a summary of relevant indicator information collected as part of monitoring (column 2); the suggested approach for data collection (column 3); and who is responsible for collecting this information and when (column 4).

TABLE 3. EVALUATION PLAN

Evaluation questions	Summary of reporting / indicators used (from monitoring)	Data collection tool / method (more detailed analysis)	Who is responsible and when
<p>1. To what extent was the green waste programme able to achieve its objective of reducing green waste going to landfill?</p> <p>1.1 What factors led to change or contributed to lack of change?</p>	<p>Volumes to landfill</p>	<p>Time series analysis of quarterly indicator data. Analyse trend (should be downward). Identify deviations from trend (e.g. spike after cyclone)</p>	<p>SWAT Director in conjunction with evaluation Technical Advisor</p> <p>Mid-term review (in time to inform TK III update)</p>
<p>2. To what extent was segregation achieved?</p> <p>2.1 Was the awareness initiative effective in contributing to this? Why? Why not?</p> <p>2.2 To what extent did the strengthened enforcement and regulation contribute to this outcome? What factors facilitated this? What factors inhibited this?</p>	<p>Segregation % data & enforcement data</p>	<p>Time series analysis of quarterly indicator data. Analyse trend (segregation should be increasing), while enforcement activities should be decreasing as household behaviour changes</p> <p>Identify deviations from trend (e.g. spike after cyclone)</p> <p>Targeted focus group with SWAT: Qualitative identification of drivers of change, or barriers. Any linkages to other indicators (e.g. service reliability)?</p> <p>Targeted focus group with Falekaupule. Focus on behaviours and awareness at local level</p>	<p>SWAT Director in conjunction with evaluation Technical Advisor</p> <p>Mid-term review (in time to inform TK III update)</p>

Evaluation questions	Summary of reporting / indicators used (from monitoring)	Data collection tool / method (more detailed analysis)	Who is responsible and when
<p>3. To what extent has SWAT's collection and conversion services improved?</p> <p>3.1 To what extent have SWAT's service delivery costs reduced? To what extent have costs been recovered? What factors have (materially) affected costs and revenues?</p> <p>3.2 To what extent are the end products (especially compost) of a suitable quality for end users? What factors facilitated this? What factors inhibited this?</p> <p>3.3 To what extent have climate change risk management measures (i.e. climate-proofing new transfer station) been effective in minimising damage to transfer station, and ensured the ability to accommodate additional volumes of green waste following cyclones? Why? Why not?</p> <p>3.4 Are these services sustainable? Why? Why not? How can this best be achieved going forward?</p>	Suite of indicators outlined in Appendix 3	<p>Time series analysis of indicator data, including examination of climate variability/events (drivers of deviations) where applicable. Adjust indicators for population and price changes where applicable to elicit real trends</p> <p>Review key documents (e.g. Integrated Waste Policy, Corporate Plan, annual Work Plan, budget, etc.)</p> <p>Semi-structured interviews with key stakeholders (SWAT operational staff in Funafuti, Kaupule in outer islands)</p> <p>Semi-structured interviews with pig-farmers focusing on product attributes such as reliability³⁰</p>	<p>SWAT Director in conjunction with evaluation Technical Advisor</p> <p>Mid-term review (in time to inform TK III update)</p>
<p>4. To what extent has the advertising campaign contributed to the uptake of recycling (use of products: mulch, wood chips, compost)? What worked well and what did not work so well?</p> <p>4.1 What worked well and what did not work so well?</p> <p>4.2 Have there been any other factors that affect (+/-) uptake of product (e.g. quality, pricing, accessibility, etc.)?</p>	Sales data and customer satisfaction indicator data	<p>Time series analysis of customer satisfaction indicator data (by attribute). Satisfaction levels should be improving</p> <p>Targeted focus group discussions with customers (on if satisfaction levels or sales are low)</p> <p>Critical review of R2R research on dry litter composting methods, including review of technical reports and interview with R2R coordinator³¹</p>	<p>SWAT Director in conjunction with evaluation Technical Advisor</p> <p>Mid-term review (in time to inform TK III update)</p>
<p>5. Have the green waste programme outputs been delivered as per corporate plan and budget? Why? Why not?</p> <p>5.1 To what extent has the Asset Management Plan been implemented effectively?</p>	Existing quarterly and annual progress reporting to Permanent Secretary and Cabinet	<p>Review of progress reports</p> <p>Interviews with SWAT senior management</p> <p>Interview with courts (if activity 4.8 of Corporate Plan is not fully implemented)</p>	<p>Permanent Secretary and SWAT Director in conjunction with evaluation Technical Advisor</p> <p>Mid-term review (in time to inform TK III update)</p>

A draft terms of reference to further guide the evaluative exercises and synthesise this into Mid-Term Evaluation Report is provided as Appendix 9.

³⁰ particularly examining incentives and disincentives for supplying clean pig dung/dry litter to both SWAT and Taiwan farm.

³¹ only if sales are lower than expected or if customer satisfaction is low. this would especially relate to quality and teasing out specific issues relating to salinity, optimal ratios of element.

5. Communication Plan

To gain the maximum value from the M&E Framework—especially in terms of learning for improvement—it will be important to make sure that knowledge generated is effectively communicated and made available in a timely manner. There are many, many examples from the Pacific where evaluations have not been effectively used by stakeholders to inform their decision-making because communication and knowledge management has been lacking.

Of most importance at this stage is the mid-term evaluation report. This technical report will need to be complemented or 're-packaged' into number of other communication/knowledge products and disseminated through various mediums- so that decision-makers understand the key learnings and make strategic decisions accordingly.

The strategy for re-packaging, disseminating, and storing the mid-term evaluation is summarised in Table 4.

TABLE 4. COMMUNICATION PLAN

Audience(s)	Report type	Timeline (deadline)	How reports will be disseminated	How knowledge will be managed
Multi-stakeholder TNIWP&AP ²⁵ monitoring committee SWAT, Department of Environment, Department of Agriculture, Planning and Budgets TNIWP&AP Steering Committee EU, SPREP	Mid-term evaluation Report (technical)	As per finalised evaluation plan	Print and digital media	GoT library and archives; USP, regional agencies, international development assistance community storage and dissemination systems, public domain
Multi-stakeholder TNIWP&AP ²⁶ monitoring committee SWAT, Department of Environment, Department of Agriculture, Planning and Budgets TNIWP&AP Steering Committee EU, SPREP	Briefing paper (lessons learned and next steps)	End June 2018	Print and digital media	DoE knowledge management system
Cabinet	Cabinet information paper	End June 2018	Print	DoE knowledge management system
Falekaupule, Kaupule and programme beneficiaries	Presentation	July 2018	Visit to islands	PowerPoints stored on DoE knowledge management system

32 Tuvalu National Integrated Waste Policy and Action Plan

33 Tuvalu National Integrated Waste Policy and Action Plan

Concluding remarks

This framework outlines the approach that GoT will take to monitor and evaluate the implementation of the Funafuti green waste programme.

A key feature of the framework is to focus the M&E work on answering a number of key evaluation questions and sub-questions. If properly implemented, the framework will provide evidence-based answers to the key evaluation questions which, in turn, will help to support adaptive management of the programme as it is being implemented and improve the design of future programmes.

The intention for this M&E framework is to be a 'living document' that will be updated and adjusted as needed.

For any questions or queries regarding this M&E framework, please contact Susana Taupo: on susey84@gmail.com.

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- MainStream Economics and Policy (2016a) Background, identification of options, CBA workplan and contextual information
- MainStream Economics and Policy (2016b) Green waste management in Funafuti. Preliminary cost-benefit analysis report
- SPREP (2016) Cleaner Pacific 2025: Pacific Regional Waste and Pollution Management Strategy 2016–2025.

Appendix 1. Linkages of Funafuti green waste programme with other Tuvalu strategic documents

CONTRIBUTION OF GREEN WASTE PROGRAMME TO NATIONAL GOALS



Appendix 2. Risk Management Plan for Funafuti green waste program

NATURE OF RISK		MAGNITUDE OF RISK			RISK TREATMENT STRATEGY	RESPONSIBILITY	TIMING
RISK FACTOR	Component of programme design/logic affected by risk factor	Likelihood of risk factor occurring (almost certain, likely, possible, unlikely, rare)	Consequence of risk factor, if it occurs (insignificant, minor, moderate, major, severe)	Overall risk rating (low, medium, high, extreme)			
Insufficient financial resources	Equipment failure at end of life, leading to service disruptions. Affects achievement of sub-objective/strategy 2 ³⁴	Likely	Major	High	Funded asset management plan + Pricing/cost-recovery strategy	Consultant engaged to develop AMP and pricing strategy Funafuti green waste programme manger SWAT Director	Third and fourth quarter 2017
Unwillingness for households to pay for collection services	SWAT reliance on (variable) Government and Donor funding sources + related service standard decline Affects achievement of sub-objective/strategy 2 ³⁴	Likely	Moderate	High	Well-researched pricing/cost-recovery strategy	Consultant engaged to develop AMP and pricing strategy Funafuti green waste programme manger SWAT Director	Third and fourth quarter 2017
Unwillingness of pig farmers to supply clean dung (inadequate and/or incorrect incentives)	Reduction in compost production + accumulation of green waste at depot/landfill Affects achievement of sub-objective/strategy 2 ³⁴	Possible	Major	High	Dry litter R2R demonstrations based on trials + critical oversight and endorsement of final R2R demonstration design by SWAT (with particular attention to incentives and incorporation within broader Tuvalu Integrated Waste Policy and Action Plan) + close monitoring of quantity and quality of pig dung + evaluative exercise to explore impediments/inadequate incentives issue(s)	R2R programme co-ordinator Funafuti green waste programme manager SWAT Director	Ongoing
Cyclone and storm surge	Damage to equipment and composting facility Affects achievement of sub-objective/strategy 2 ³⁴	Unlikely	Major	Medium	Make sure composting facility includes climate resilient design measures, including additional capacity for peak loads expected if cyclone occurs	Compost design 'engineer'–consultant Funafuti green waste programme manager SWAT Director	Third and fourth quarter 2017
Sea spray	Damage and depreciation of equipment Affects achievement of sub-objective/strategy 2 ³⁴	Almost certain	Minor	Medium	Asset management plan factors in shorter life cycle of key equipment, and particular attention to maintenance	Consultant engaged to develop AMP and pricing strategy Funafuti green waste programme manager SWAT Director	Third and fourth quarter 2017
Unwillingness for consumers to pay for final product (mulch, wood chips, compost)	Accumulation of products and raw green waste at depot/landfill Affects achievement of sub-objective/strategy 3 ³⁵	Possible	Major	High	Well-researched pricing/cost-recovery strategy + location of product and cashier at (more convenient) new depot	Consultant engaged to develop AMP and pricing strategy SWAT Director	Ongoing
Planned expansion of Taiwan farm does not eventuate (funding/change in policy direction)	Accumulation of products and raw green waste at depot/landfill Affects achievement of sub-objective/strategy 3 ³⁵	Unlikely	Major	Medium	Monitor progress of farm extension	Funafuti green waste programme manager SWAT Director	Ongoing

34 i.e. improve efficiency of green waste collection and conversion services

35 i.e. increase the (demand and) level of use of recycled product

Appendix 3. Monitoring waste volumes and segregation

This appendix includes the revised collection forms for the use on Funafuti and the outer islands and advice on entering and analysing waste data for monitoring and evaluation. Note this appendix covers all waste streams.

Waste collection forms

There are separate forms for:

- Funafuti (collections five days a week and four different waste streams); Vaitupu (collections five days a week and two waste streams); and
- all other outer islands (collections three times a week and two separate waste streams).

Actions required by SWAT operational or Kaupule staff

- Training should also be provided to operational staff in the use of the forms. Forms in local language are provided for the outer islands.
- Operational team must complete forms as they finish each collection run. Operational staff in Funafuti should drop off forms at SWAT office at the end of every day. Operational staff in outer islands are to email completed forms to Walter at the end of every week.



OUTER ISLAND COLLECTION DATA FORM

Collections on: Monday, Wednesday and Friday.

Instructions: Fill in this form at the end of each collection day. At the end of the week, please scan the form and email it to Walter.

ISLAND NAME:

DATE AT START OF WEEK:

Green waste

Day	Load number	How full? (quarter, half, three-quarters, or full)	Number of households with contaminated waste	Names of households with contaminated waste
Monday	1			
	2			
	3			
	4			
Wednesday	1			
	2			
	3			
	4			
Friday	1			
	2			
	3			
	4			

Household waste

Day	Load number	How full? (quarter, half, three-quarters, or full)	Number of households with contaminated waste	Names of households with contaminated waste
Monday	1			
	2			
	3			
	4			
Wednesday	1			
	2			
	3			
	4			
Friday	1			
	2			
	3			
	4			

Any problems, fuel use or maintenance to report?

Write down any problems with waste collection this week. For example, did the tractor break down? If there is nothing to report, just leave blank.

How many litres of fuel did you use in the tractor this week?

Write down any maintenance you did on the tractor or trailer.

PEPA FAKAFONU MO 'KAIGA I FENUA I TUA

ASO E 'TAE IEI: ASOGAFUA, ASOTOLU & ASOLIMA

Fakatonuga: Fakamolemole fakafonu a vaega konei mai lalo i fakaotiga o vaiaso katoa ko fakaako mai iei kite Ulu Ofisa o te SWAT i Funafuti (meli iti)

Igoa o te Fenua:

Te Aso ne kamata iei:

'Kaiga Pala

Aso	Te Aofaki o Uta	Pefea te uke? (Kuata, afa, tolu Kuata & Fonu)	Te Aofaki o fale e Pulutaki olotou 'kaiga	Igoa o fale (matai) kona e Pulutaki olotou 'Kaiga
Asogafua	1			
	2			
	3			
Asolua	1			
	2			
	3			
Asotolu	1			
	2			
	3			
Asofaa	1			
	2			
	3			
Asolima	1			
	2			
	3			

'Kaiga mai Fale ('Kaiga se Pala)

Aso	Te Aofaki o Uta	Pefea te uke? (Kuata, afa, tolu Kuata & Fonu)	Te Aofaki o fale e Pulutaki olotou 'kaiga	Igoa o fale (matai) kona e Pulutaki olotou 'Kaiga
Asogafua	1			
	2			
	3			
Asolua	1			
	2			
	3			
Asotolu	1			
	2			
	3			
Asofaa	1			
	2			
	3			
Asolima	1			
	2			
	3			

Fakalavelave fakafeagai, te Fuel a koutou io mene mea masei o te Tulakita/Trailer

Tusi ki lalo a fakalavelave e fakafeagai mo koutou ki luga i mea fakateletele (Tractor/trailer) i taimi e galue ei koutou

E mata e fia te aofaki o lita tiisolo ne fakaaoga/utu ne koutou ite vaiaso nei?

E mata e isi ne otou galuega (faite/fakalei/sevesi) ne fai kite Tractor io meko te trailer ite vaiaso nei

PEPA FAKAFONU MO 'KAIGA I FENUA I TUA VAITUPU

Fakatonuga: Fakamolemole fakafonu a vaega konei mai lalo i fakaotiga o vaiaso katoa ko fakaako mai iei kite Ulu Ofisa o te SWAT i Funafuti (meli iti)

Igoa o te Fenua:

Te Aso ne kamata iei:

'Kaiga Pala

Aso	Te Aofaki o Uta	Pefea te uke? (Kuata, afa, tolu Kuata & Fonu)	Te Aofaki o fale e Pulutaki olotou 'kaiga	Igoa o fale (matai) kona e Pulutaki olotou 'Kaiga
Asogafua	1			
	2			
	3			
Asolua	1			
	2			
	3			
Asotolu	1			
	2			
	3			
Asofaa	1			
	2			
	3			
Asolima	1			
	2			
	3			

'Kaiga mai Fale ('Kaiga se Pala)

Aso	Te Aofaki o Uta	Pefea te uke? (Kuata, afa, tolu Kuata & Fonu)	Te Aofaki o fale e Pulutaki olotou 'kaiga	Igoa o fale (matai) kona e Pulutaki olotou 'Kaiga
Asogafua	1			
	2			
	3			
Asolua	1			
	2			
	3			
Asotolu	1			
	2			
	3			
Asofaa	1			
	2			
	3			
Asolima	1			
	2			
	3			

Fakalavelave fakafeagai, te Fuel a koutou io mene mea masei o te Tulakita/Trailer

Tusi ki lalo a fakalavelave e fakafeagai mo koutou ki luga i mea fakateletele (Tractor/trailer) i taimi e galue ei koutou

E mata e fia te aofaki o lita tiisolo ne fakaaoga/utu ne koutou ite vaiaso nei?

E mata e isi ne otou galuega (faite/fakalei/sevesi) ne fai kite Tractor io meko te trailer ite vaiaso nei

Entering data into waste volume monitoring spreadsheets

Two spreadsheet databases have been developed for the monitoring waste: one for Funafuti, and one for the outer islands. Both of these forms use the data collected by the operational teams.

These data form the major source of data for M&E. Therefore, it is vital that the data are accurate and kept up to date.

Actions required by SWAT office staff

1. The Waste Operation Officer (Funafuti) should enter data from the collection forms for into the spreadsheet on a daily basis.
2. The Waste Operation Officer (outer islands) should enter data from the collection forms for into the spreadsheet on a weekly basis.
3. SWAT Director should check data is kept up to date on a weekly basis.
4. Monthly summary data are to be provided to the SWAT Director for reporting to the Permanent Secretary as per the current arrangements.

FUNAFUTI WASTE DATA

Start a new waste data spreadsheet each month and save it into a computer drive that is easily accessible to all SWAT staff. The spreadsheet has separate sheets for each waste stream (e.g. “green waste”) and one called “Monthly summary”.

On a daily basis, enter data from collection data form for the day in the cells shaded green for each waste stream that has been collected on that day (Figure 5).

Monthly statistics: enter data from log books in the cells shaded green									
		Large truck	Vehicle size (m3)	1.8					
Date	Time beginning of collection	Time end of collection	Time arriving to disposal area	Time leaving disposal area	Co-mingled waste? (1 = yes)	Time to complete run	Disposal time		
14/07/2016	9:42:00	10:27:00	10:34:00	10:37:00	1	0:45:00	0:		
14/07/2016	10:42:00	11:17:00	11:30:00	11:34:00		0:35:00	0:		
14/07/2016	11:37:00	12:00:00	12:20:00	12:23:00	1	0:23:00	0:		
15/07/2016						0:00:00	0:		
15/07/2016						0:00:00	0:		
15/07/2016						0:00:00	0:		
18/07/2016	10:18:00	10:47:00	10:58:00	11:05:00		0:29:00	0:		
18/07/2016	13:59:00	15:29:00	15:38:00	15:58:00		1:30:00	0:		
18/07/2016									
18/07/2016									

FIGURE 5. ENTER DATA FROM COLLECTION DATA FORM FOR THE DAY IN THE CELLS SHADED GREEN

If the data are correctly entered, the spreadsheet will automatically calculate summary monitoring data. This is displayed in the “Monthly summary” worksheet and is shown in Figure 6.. This provides a monthly summary of:

- the number of collections, the volume of collections, and the % of collections with mixed waste for each waste stream;
- the average times per load (collection, disposal, and transit times to and from the depot or landfill); and
- the spreadsheet also automatically generates charts for inclusion in reports.

	A	B	C	D	E	F	G
1	Monthly report table						
2		Green waste	Waste to landfill				Total waste
3			Household waste	Recycled waste	Nappy waste	Total waste to landfill	
4	Volumes						
5	Number of collections	58	36	10	7	53	111
6	Volume of collections (m3)	86	281	10.5	7.35	299	385
7	% of loads with co-mingled waste	22.4%	73.0%	2.7%	1.9%	77.6%	100.0%
8	Times (average per load)						
9	Total time per load	0:56:27	2:52:18	1:39:18	1:06:43	1:46:55	1:35:37
10	Collection	0:29:27	1:24:15	0:33:18	0:05:17	0:50:07	0:45:29
11	Disposal / unloading	0:03:40	0:15:27	0:03:12	0:12:17	0:09:19	0:08:03
12	Transit (to and from depot)	0:23:21	1:12:37	1:02:48	0:49:09	0:47:29	0:42:05
13							

FIGURE 6. MONTHLY SUMMARY DATA–FUNAFUTI

The spreadsheet to collect this data and analyse the results is on the project delivery folder. Excel file called *Waste collection Fun–July 2016–JB*. This includes data for July 2016.

OUTER ISLANDS WASTE DATA

Start a new waste data spreadsheet each month and save it into a computer drive that is easily accessible to all SWAT staff. The spreadsheet has separate sheets for each island and one called “Monthly summary”.

On a weekly basis, enter data from collection data form for the day in the cells shaded green for each waste stream that has been collected on that day. This is shown in the figure below.

	A	B	C	D	E	F	G	H	I	J	K
1											
2	Trailer size (m3)	2.5									
3											
4											
5	Green waste					Household waste					
6	Date	Load for month	How full?	Mixed waste? (1 = yes)	Estimated volume	Date	Load for month	How full?	Mixed waste? (1 = yes)	Estimated volume	
7	1/11/2016	1	50%	1	1.3	1/11/2016	1	50%	1	1.3	
8	1/11/2016	2	50%	1	1.3	1/11/2016	2	75%	1	1.9	
9	1/11/2016	3	100%	1	2.5	2/11/2016	3	100%	1	2.5	
10		4	0%		0.0		4	0%		0.0	
11					0.0					0.0	

FIGURE 7. ENTER DATA FROM COLLECTION DATA FORM FOR THE WEEK IN THE CELLS SHADED GREEN

If the data are correctly entered, the spreadsheet will automatically calculate summary monitoring data. This is displayed in the “Monthly summary” worksheet and is shown in the figure below. This provides a monthly summary of the number of collections, the volume of collections, and the % of collections with mixed waste for each waste stream.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Monthly statistics - outer islands											
2												
3	Green waste			Household waste			Total waste					
4	Island	Number of collections	Volume (m3)	% loads with mixed waste	Number of collections	Volume (m3)	% loads with mixed waste	Number of collections	Volume (m3)	% loads with mixed waste		
5	NMMEA	6	9.4	33%	4	8.1	75%	10	17.5	50%		
6	NMGA	3	5.0	67%	3	5.6	100%	6	10.6	83%		
7	NTO	2	2.5	50%	3	5.6	67%	5	8.1	60%		
8	NUI	3	5.0	67%	3	5.6	67%	6	10.6	67%		
9	VTP	5	10.0	80%	3	5.6	100%	8	15.6	88%		
10	NFKT	3	4.4	67%	3	5.6	100%	6	10.0	83%		
11	NKL	3	5.0	67%	2	3.1	100%	5	8.1	80%		
12	Total / average	25	41.3	61%	21	39	87%	46	81	73%		
13												

FIGURE 8. MONTHLY SUMMARY DATA–OUTER ISLANDS

The spreadsheet to collect this data and analyse the results is on the project delivery folder. Excel file called *Waste collection–Outer islands–JB*. Note: Current data in files are “dummy data” to show how the spreadsheet works. The spreadsheet will also need to be updated to include the measurements of the trailers (when available).

Appendix 4. Monitoring awareness and enforcement activities

Mixed waste (contamination) in Funafuti is a big problem. This is a major focus of SWAT's awareness and enforcement activities. There are no specific indicators for awareness. Rather, this is measured by the outcomes (levels of segregation and *necessary* enforcement activity).³⁶ It is assumed that when the level of segregation is improving, measures of mixed loads will decrease, and the number of *necessary* enforcement activities will decline.

The basic process for enforcement is as follows:

- Field staff record breaches on the modified waste volume collection form (this avoids the need to fill in two forms).
- Field staff provides collection forms to SWAT office staff daily.
- Awareness and Enforcement Officer visits household that breached regulation. Action is either:
 - making households aware of their responsibilities if it is a first offence and no further action is taken; or
 - issuing a Penalty Notice.
- A Court fine may be imposed if breaches continue or the requirements of previous Penalty Notices are not met.

This monitoring tool builds on the existing practice of field staff reporting breaches on a daily basis to the Awareness and Enforcement Officer for action the following day.

On a daily basis, the Awareness and Enforcement Officer enters the data reported by drivers and any other activity undertaken. Information on the name of the household and the relevant waste stream will be available from the recording sheets provided by the drivers.

Daily reported breaches										
Date	Name of household	Address	Waste collection Green waste	Household waste	Recycled waste	Nappys	Action Awareness visit	Penalty Notice	Court	Comments from SWAT
23/09/2016	Sileta Sigano	Kavatoetoe			1			1		Needed 1 rubbish bin for trash
23/09/2016	Vaglia Hosea	Kavatoetoe			1			1		He said that their bin was broken
23/09/2016	Monilise Taliu	Kavatoetoe					1	1		She said that their bin was broken
23/09/2016	Esilia Telelei	Vaiaku			1				1	Needed to clear their hazardous waste
23/09/2016	Alefaio Lagilua	Luapou, (Behind the Utukai building)			1					1 Complaint that their green waste was not collected
23/09/2016	Vaevalu Teo	Vaiaku			1			1		His observation that the Kaupule is not as good as SWAT collection
23/09/2016	Laupula Tekapu	Close to PMH		1				1		
23/09/2016	Savaliga Maleko	Kavatoetoe			1			1		Complaint that their green waste was not collected
23/09/2016	Iosefa Nemia	Kavatoetoe		1					1	Complaint that their green waste was not collected
23/09/2016	Liberty Patala	Kavatoetoe			1			1		Complaint that their green waste was not collected
23/09/2016	Taiane Amasone Apelu	Vaiaku		1				1		She said that their green waste was not collected

FIGURE 9. ENTER DATA FOR REPORTED BREACHES IN THE CELLS SHADED GREEN

The spreadsheet automatically calculates monthly summary statistics as shown below.

Monthly Summary - enforcement activity							
Enforcement actions							
Number				%			
Total enforcement actions	Awareness visit	Penalty Notice	Court	Total enforcement actions	Awareness visit	Penalty Notice	Court
11	8	2	1	100%	73%	18%	9%
Enforcement action by waste stream							
Number				%			
Green waste	Household waste	Recycled waste	Nappys	Green waste	Household waste	Recycled waste	Nappys
3	7	0	1	27%	64%	0%	9%

FIGURE 10. MONTHLY SUMMARY DATA—ENFORCEMENT ACTIVITY

³⁶ We have assumed that changes in enforcement activity are attributable to compliance and not to changes in enforcement effort (i.e. SWAT staff actually reporting breaches).

Appendix 5. Monitoring SWAT performance

The following table shows how to calculate the monitoring indicators for Sub-objective 2: Improve the efficiency of green waste collection and conversion services. These indicators are based on data from various internal sources outlined in Appendices 3 and 4. Note. Full training in calculating these indicators will be provided in November 2016.

TABLE 11. MONITORING PLAN

INDICATOR	DATA SOURCE & COLLECTION METHOD	HOW TO CALCULATE THE INDICATOR (STEPS)
<p>Indicator 1: Unit cost of collection services (\$/m³)</p> <p>Baseline: Waste volumes and finances</p> <p>Target: Gradual decrease over time</p>	<p>As in Appendix 3 for volumes</p> <p>Quarterly financial reports from Finance</p>	<ul style="list-style-type: none"> • Add together the salary and operating costs (fuel, maintenance) for the quarter from the financial reports provided by Finance • Estimate the costs for green waste (using the % of total waste collection volumes that are green waste sourced from the collections database; Appendix 3) • Divide the costs attributable to green waste by the volume of green waste collected
<p>Indicator 2: Total cost of collection services (\$/quarter.)</p> <p>Baseline: Budget and finances</p> <p>Target: With annual budget allocation</p>	<p>Quarterly financial reports from Finance</p>	<ul style="list-style-type: none"> • Add together the salary and operating costs for the quarter from the financial reports provided by Finance • Add the estimated annual costs of asset use to 1. These costs are \$18,650 (see Table 13)
<p>Indicator 3: Cost recovery rate (%)</p> <p>Baseline: AMP and budget</p> <p>Target: To be determined by policy analysis and Government decision</p>	<p>Finalised AMP and annual financial returns</p>	<ul style="list-style-type: none"> • Use Indicator 2 as cost base • Divide revenue (collection fees and or product sales) by the answer calculated from Indicator 2
<p>Indicator 4: Asset funding adequacy ratio (ratio)</p> <p>Baseline: AMP and budget</p> <p>Target: To be determined by policy analysis and Government decision</p>	<p>Finalised AMP and annual financial returns</p>	<ul style="list-style-type: none"> • Divide annual asset funding requirement (see Table 13 in Appendix 6) by the actual budget allowance for asset replacement
<p>Indicator 5: Service disruptions (days/quarter)</p> <p>Baseline: Reported disruptions from operational staff. Use first quarter as a baseline</p> <p>Target: decline in disruption days each year</p>	<p>Daily drivers' record sheets and waste volume database</p>	<ul style="list-style-type: none"> • Add up and reported service disruptions recorded by operational staff for the previous three months

Appendix 6. Monitoring customer satisfaction

A key indicator is customer satisfaction of the use of recycled product that is sold (mulch, woodchips, compost). There are three things we want to measure:

- **Product easy to buy.** Was the product that you purchased easy to get and pay for? Rank your view (1 = poor, 2 = average, 3 = good).
- **Product quality.** Was the product you purchased good quality? Rank your view (1 = poor, 2 = average, 3 = good).
- **Product price.** Is the product reasonably priced? Rank your view (1 = too expensive, 2 = reasonable, 3 = cheap).

Below is a suggested format for the customer satisfaction survey. It includes some example responses. Each time a sale is made, the sales staff would request that the customer provide a ranking against each of the three measures. The number of bags for the sale is also noted.

CUSTOMER SATISFACTION SURVEY			
Product:	Mulch		
Dates:	January to March 2017		
Purchase	Product easy to buy?	Product is good quality?	Product is good price?
Number of bags	Was the product that you purchased easy to get and pay for? Rank your view (1 = poor, 2 = average, 3 = good)	Was the product you purchased good quality? Rank your view (1 = poor, 2 = average, 3 = good)	Is the product reasonably priced? Rank your view (1 = too expensive, 2 = reasonable, 3 = cheap)
1	2	1	3
2	3	2	3
1	1	3	3
50	2	3	2
1	2	1	3
2	3	2	3
1	1	3	3

A separate survey would be done for each product (mulch, wood chips, compost).

The spreadsheet to collect this data and analyse the results is in the project delivery folder. Excel file called *Green waste sales–customer satisfaction*.

A	B	C	D
1	Instructions Fill in the cells shaded green with the responses from the customer satisfaction survey		
2			
3	Product: Mulch		
4	Dates: January to March 2017		
5			
6	Purchase	Product easy to buy?	Product is good quality?
7	Number of bags	Was the product that you purchased easy to get and pay for? Rank your view (1 = poor, 2 = average, 3 = good).	Was the product you purchased good quality? Rank your view (1 = poor, 2 = average, 3 = good).
8		Is the product reasonably priced? Rank your view (1 = too expensive, 2 = reasonable, 3 = cheap).	
9	1	2	1
10	2	3	2
11	1	1	3
12	50	2	3
13	1	2	1
14	2	3	2
15	1	1	3

FIGURE 11. CUSTOMER SATISFACTION SURVEY–DATA INPUT SHEET

This spreadsheet has been designed to automatically calculate overall customer satisfaction ratings. This is shown in the quarterly summary of the spreadsheet. The output table to be used for reporting is shown below (based on the example responses).

A	B	C	D	E
Quarterly summary				
Product	Mulch			
Period	January to March 2017			
	Average scores (1 is poor, 3 is best)			
Total sales (bags)	Product easy to buy?	Product is good quality?	Product is good price?	Overall satisfaction
58	2.0	2.1	2.9	2.3

FIGURE 12. CUSTOMER SATISFACTION SURVEY–QUARTERLY SUMMARY DATA

If this data are collected at the time of sale and analysed on a quarterly basis, customer satisfaction can be measured, and progress can be tracked over time. The aim is to improve customer satisfaction over time.

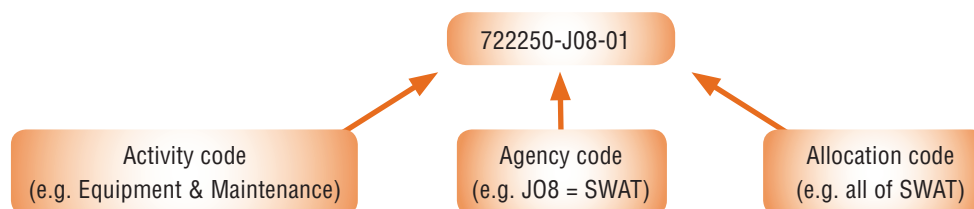
Analysis of the data can show what aspects of the product (easy to buy, product is good quality, product is good price) need improvement. Analysis of the data can also provide insight into product marketing. For example, if the average response for price is low (e.g. 1.5) and sales volumes are low, the data tells us that perhaps the price is too expensive. Therefore, consider adjusting the price down a little to see if that increases sales.



Appendix 7. Necessary changes to budget/accounting codes

Currently, the budgets and accounts for SWAT are not disaggregated by location (Funafuti or outer islands) or waste stream (green waste, household waste, etc.), or product (e.g. mulch, woodchips).

The budget codes for all activities across GoT follow a common set of rules shown below.



Because some of the indicators use financial data, it will be necessary to separate out the last part of the budget code (allocation code) for *some* of the budget codes to represent data for different locations and products.

The technical Assistant and SWAT staff reviewed the budget codes and identified a minimum of budget codes to be modified.

SWAT action

Update budget codes as per Table 12 for the 2017 budget.

TABLE 12. UPDATES FOR BUDGET CODES REQUIRED

CURRENT BUDGET DESCRIPTION	CURRENT CODE	NEW BUDGET DESCRIPTION	NEW BUDGET CODE
Sale of Compost Materials	442250-J08-01	Sale of much and wood chips	442250-J08-01
		Sale of manure	442250-J08-02
Salaries	711110-J08-01	Salaries (head office)	711110-J08-01
		Salaries (Funafuti operations) Include Miriama	711110-J08-02
		Salaries (outer island operations) Include Walter	711110-J08-03
		Salary payment to Funafuti Kaupule (household waste)	????
Equipment & maintenance	722250-J08-01	Equipment & maintenance (Funafuti) ³⁷	722250-J08-01
		Equipment & maintenance (outer islands)	722250-J08-02
Vehicle maintenance	722500-J08-01	Vehicle maintenance (Funafuti)	722500-J08-01
		Vehicle maintenance (outer islands)	722500-J08-02
Petrol and oil	723320-J08-01	Petrol and oil (Funafuti)	723320-J08-01
		Petrol and oil (outer islands)	723320-J08-02

³⁷ This budget code cannot be separated by waste stream because the equipment used (tractors, trailers, etc.) is commonly used across all waste streams. The exception is the shredders, but this level of detail will be very costly.

Appendix 8. Green waste budget

This appendix outlines some of the key financial data required to establish the annual budget for green waste in Funafuti. Some of the data are also required for calculating some of the key performance indicators for green waste.

Allocation of asset costs across waste streams

As part of the waste baselines study also being undertaken, a detailed asset register has been developed. This register includes all assets controlled by SWAT. That asset register also includes estimates of the annual costs of asset ownership, often called an asset renewals annuity. This is the AUD amount that should be set aside to replace assets when they come to the end of their lives. While this money is not spent every year, it should be set aside in a holding account. For a waste business to be financially sustainable, it should at least cover operational costs, maintenance costs, and asset renewals costs.

Table 13 shows an allocation of the renewals annuity where the costs of each asset class have been allocated across the waste streams based on volumes of waste collected. This approach is common with waste management businesses.

The key point to note is that the renewals annuity attributable to green waste on Funafuti is estimated at AUD 18,654 per annum.

TABLE 13. ANNUAL ASSET RENEWALS COST (AUD)

	GREEN WASTE	HOUSEHOLD	RECYCLED	NAPPIES	ALL STREAMS
Asset allocations (%)					
Waste stream proportions (all waste streams)	30%	66%	2%	2%	100%
Waste stream proportions (land fill only)	0%	94%	3%	3%	100%
Annual renewals annuity (AUD)					
Office equipment	\$1,704	\$3,750	\$114	\$114	\$5,681
Chippers	\$9,600	\$0	\$0	\$0	\$9,600
Can baler & bottle shredder	\$0	\$0	\$2,500	\$0	\$2,500
Loader (Cat)	\$0	\$5,657	\$171	\$171	\$6,000
Excavator (Cat)	\$0	\$16,971	\$514	\$514	\$18,000
Kubota 4 x 4	\$972	\$2,138	\$65	\$65	\$3,240
SWAT scooter	\$168	\$370	\$11	\$11	\$560
Tractors (3) (Funafuti)	\$4,050	\$8,910	\$270	\$270	\$13,500
Trailers (3) (Funafuti)	\$2,160	\$4,752	\$144	\$144	\$7,200
Hanger	\$0	\$0	\$0	\$0	\$0
Land fill shed, fencing & tank	\$0	\$2,879	\$87	\$87	\$3,053
Totals (AUD)	\$18,654	\$45,427	\$3,877	\$1,377	\$69,335

It should be noted that in developing the estimates above, we have 'optimised' the assets. This means that where an asset is redundant (not needed) or would not be replaced, no financial allocation is made for that asset in the renewals annuity. This optimisation has included:

- Only two chippers (of the four) are included. Our analysis of volumes of green waste collected indicates that only one chipper is required for normal use, with the need for an additional chipper for backup.

- Only the excavator that is currently operational has been included. Our analysis of volumes of green waste collected indicates that only one excavator is required for normal use. Backup is available from equipment owned by the Department of Public Works and the Kaupule.
- No allocation is made for the current hanger building because this asset will be disposed of once the new waste facilities are established.

Overall budget

SWAT is currently in the process of developing their budget for 2017 that includes *all* of the actions identified for green waste. We have used this as a base to develop a green waste budget for Funafuti for 2017 (Table 14).

TABLE 14. GREEN WASTE BUDGET

ITEM	BUDGET ESTIMATE (AUD)
Operations and maintenance	
SALARIES	\$35,301
TEMPORARY OFFICER	\$4,568
DIRT ALLOWANCES	\$5,554
ALLOWANCES	\$4,451
TNPF	\$3,896
RELIEVING PROVISION	\$614
OVERSEAS TRAVEL	\$300
LEAVE TRAVEL	\$530
TELECOM AND INTERNET	\$872
EQUIPMENT MAINTENANCE	\$278
VEHICLE MAINTENANCE	\$3,000
FUEL AND OIL	\$3,872
OFFICE EXPENSES	\$60
OFFICE STATIONERIES	\$60
ELECTRICITY	\$1,650
SAFETY GEAR	\$300
LOCAL TRAVEL	\$884
AWARENESS PROGRAM	\$1,266
Sub-total	\$67,455
Asset renewals	
Asset renewals annuity	\$18,654
Other	\$0
Annual allowance for evaluations	\$10,000
Technical assistance to underpin new policies and initiatives	\$30,000
Total	\$126,109

Costs that are common to multiple waste streams (e.g. office salaries or use of tractors) where SWAT has a single budget code have been allocated to green waste based on the % of collections that are green waste. Costs that are exclusively for green waste (e.g. mulching) have been allocated 100% to this budget, while costs that do not relate to green waste on Funafuti (e.g. costs of outer island waste management) have been excluded altogether.

The table above also includes an allowance for evaluations (external Technical Assistant) and the renewals annuity. We estimate the total annual budget allocation required from the Government of Tuvalu to undertake green waste management on Funafuti is approximately AUD 126,000, which would reduce to approximately AUD 96,000 in 2018 (additional technical assistance no longer required). The budget does not include new capital expenditure (e.g. transfer station and expansion of Taiwan Garden project).

Appendix 9. Draft Terms of Reference for Mid-Term Evaluation

TOR—evaluation of green waste programmes in Funafuti, Tuvalu

Background and context

Tuvalu is one of the most vulnerable countries in the South Pacific to environmental risks, both external risk factors such as climate change and internal risk factors such as solid waste disposal. Green waste management is one of the key challenges facing the nation, particularly in Funafuti due to high population densities and declining landfill availability.

The key objective of the green waste programme is to reduce the volume of green waste going to landfill. This reduction is being delivered through three key strategies:

- reduce the amount of green waste generated at the source and improve segregation; improve the efficiency of green waste collection and conversion services; and increase the (demand and) level of use of recycled products.

The three strategies are specifically designed to focus green waste interventions in an integrated way and at the appropriate entities along the green waste management system (generation, collection and processing, and use of recycled product). The strategies comprise a number of specific actions. These are consistent with the National Sustainable Development Strategy, the Integrated Waste Policy and Strategy, and the Ministry's Corporate Plan.

Objectives, audience, and results

The primary objective of this assignment is to undertake a mid-term evaluation of the Funafuti green waste programme, consistent with the approach outlined in the M&E Framework prepared for this programme [see attachment].

- A secondary objective is to work with relevant officials from the Government of Tuvalu in undertaking the evaluation to provide opportunities for capacity building in approaches used for evaluation.

The key audience for the evaluation is the Government of Tuvalu (elected officials and senior executives). However, the evaluation will also be of interest to donor agencies (particularly the European Union) and the general public that have contributed to the results through changes in behaviour and the use of recycled green waste products.

Existing information and data to be provided

A full suite of background information will be provided to the consultant. This will include:

- All relevant government policies and reports, including the green waste monitoring and evaluation framework, and regular progress reports provided under the existing monitoring program.
- An extensive package of monitoring data in spreadsheet form. This includes time series data on volumes collected, the degree of mixing of waste streams (contamination of green waste), a number of efficiency measures (time and costs of collections), sales of recycled product, and surveyed customer satisfaction.

In addition, full access to relevant Government of Tuvalu officials will be possible during the program.

Key evaluation questions

Evaluation questions to be addressed under this evaluation programme are:

KEY EVALUATION QUESTION	SUB-QUESTIONS
1. To what extent was the green waste programme able to achieve its objective of reducing green waste going to landfill?	1.1. What factors led to change or contributed to lack of change?
2. To what extent was segregation achieved?	2.1 Was the awareness initiative effective in contributing to this? Why? Why not? 2.2 To what extent did the strengthened enforcement and regulation contribute to this outcome? What factors facilitated this? What factors inhibited this?
3. To what extent has SWAT's collection and conversion services improved?	3.1 To what extent have SWAT's service delivery costs reduced? To what extent have costs been recovered? What factors have (materially) affected costs and revenues? 3.2 To what extent are the end products (especially compost) of a suitable quality for end users? What factors facilitated this? What factors inhibited this? 3.3 To what extent have climate change risk management measures (i.e. climate-proofing new transfer station) been effective in minimising damage to transfer station, and ensured the ability to accommodate additional volumes of green waste following cyclones? Why? Why not? 3.4 Are these services sustainable? Why? Why not? How can this best be achieved going forward?
4. To what extent has the advertising campaign contributed to the uptake of recycling (use of products: mulch, wood chips, compost)?	4.1 What worked well and what did not work so well? 4.2 Have there been any other factors that affect (+/-) uptake of product (e.g. quality, pricing, accessibility, etc.)?
5. Have the green waste programme outputs been delivered as per the Corporate Plan and Budget? Why? Why not?	5.1 To what extent has the Asset Management Plan been implemented effectively?

These evaluation questions specifically relate to the outputs and outcomes under the green waste programme and form the key focus of this evaluation.

Suggested approach (tasks)

Given the nature of the information available and key evaluation questions, a number of approaches will be required ranging from statistical analysis of data through to focus groups to provide qualitative insight. The suggested approach through a number of phases and subsequent tasks is outlined below.

- Inception and background research.** Inception meeting via Skype to confirm key evaluation questions, access to data, and gain a better understanding of the context of the evaluation. Review key green waste management policies and documents (provided by SWAT). Using monitoring data provided by SWAT (volumes, contamination rates, enforcement activity, financial information, sales and use of recycled green waste materials, and customer satisfaction survey data), undertake a time series statistical analysis of monitoring data to identify trends. Compare trends to stated baselines and targets. This task should take approximately 6 days of inputs and would be undertaken remotely.
- In-country consultation and information gathering.** A series of meetings, focus groups and workshops to elicit additional information relating to the evaluation. These activities will be undertaken in Funafuti and in conjunction with relevant SWAT staff. At least 5 working days should be allocated to this phase of the program.

- **Analysis and draft reporting.** Undertake quantitative and qualitative analysis to underpin the evaluation based on all sources of data and information available. Document results in a short, targeted Draft Report (15-20 pages). This task should take approximately 5 days of inputs and would be undertaken remotely.
- **Reporting back.** Presentation of key findings and recommendations. Follow-up capacity building initiatives (e.g. training in any modifications to Monitoring Plan). This phase would be undertaken in Funafuti. At least 4 working days should be allocated to this phase of the program.

Key technical capabilities and evaluation criteria

The assignment requires inputs from a highly competent and experience evaluation professional that can both undertake programme evaluations and deliver capacity building to officials from the Government of Tuvalu. Key criteria for this programme are:

- Qualification and Experience: Degree qualified (Masters preferred) in evaluation or a field closely aligned to evaluation.
- Experience and Expertise:
 - At least 10 years working experience in preparing monitoring and evaluation frameworks with an emphasis on supporting the learning needs of Pacific Island Country Governments in a practical and achievable fashion. This should include both quantitative and qualitative approaches to evaluation.
 - Skills in supporting participatory programme evaluation suitable for the Pacific region context.
 - Experience working in the Pacific region on public sector policy issues. Specific experience in Tuvalu and/or waste management is an advantage.
- Financial proposal (all inclusive, fees and all travel related costs as well as in country costs)

Required reports, including guidance on structure and content

A number of reports and deliverables will be progressively required for this evaluation.

- A PowerPoint presentation summarising the key findings from the review of key documents and time series analysis of monitoring data. This should be completed prior to consultation in Funafuti. This will be presented during the first in-country trip.
- A Draft Report summarising the key findings and draft recommendations from the evaluation. This document will be provided prior to the second in-country trip.
- A presentation of findings and recommendations to relevant Government of Tuvalu officials and other stakeholders (as part of second on-country trip).
- Final report.

Appendix 10. Workshop report

Developing a Monitoring and Evaluation Framework for the Tuvalu green waste management program

FUNAFUTI, 26–28 OCTOBER 2016

Background

The Pilot Programme for Climate Resilience: Pacific Regional Track (PPCR-PR) is a regional programme which aims to strengthen integration of climate change and disaster risk considerations into ‘mainstream’ policy making and related budgetary and decision-making processes (i.e. ‘climate change and disaster risk mainstreaming’).

The PPCR-PR is being implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) and Asian Development Bank (ADB) and is funded through the Climate Investment Funds (CIF). More information on the PPCR-PR is can be found at More information on each of these programmes can be found at <https://www.climateinvestmentfunds.org/cif/node/7295>.

One initiative being implemented under the PPCR-PR is a monitoring and evaluation (M&E) initiative. The objectives of this initiative include to:

- further build capacity within Government of Tuvalu (GoT) to develop, implement and use Monitoring and Evaluation frameworks, and climate change and disaster risk elements therein;
- develop good quality M&E frameworks to help inform adaptive management and future design of strategic plans/programmes/projects; and
- strengthen linkages between relevant parts of national, sector, programme and project-level M&E (and planning more generally).

The initiative endeavors to take a practical, learning-by-doing approach to build Government of Tuvalu’s capacity in the use of M&E. The key components of the M&E initiative for Tuvalu comprise (1) development of brief guidance materials³⁸; (2) in-country training workshops, (3) mentoring to support Government of Tuvalu (GoT) officials prepare and implement M&E frameworks for food-security and infrastructure related sector plans, programmes, and projects; and (4) mentoring to help GoT strengthen linkages between M&E of (relevant sub-sectors of) the National Strategic Development Plan (currently TKIII), national food-security and infrastructure related sector plans, and food-security and infrastructure related sector programmes.

This report documents an in-country training workshop—i.e. component 2 of M&E initiative. Consistent with the ‘learning-by-doing’ approach of the M&E initiative, this training workshop included a focus on preparing a M&E framework for a green waste management programme in Tuvalu³⁹.

Overview of workshop

The workshop was conducted in Funafuti on Wednesday 26, Thursday 27, and Friday 28 October 2016.

The primary objectives of the training workshop were to:

- strengthen GoT capacity in the preparation of Monitoring and Evaluation (M&E) frameworks;
- raise awareness of the important role M&E plays in the context of adapting to climate change; and
- draft key elements (a logic model, key evaluation questions, parts of monitoring plan, parts of evaluation plan) of the M&E framework for the green waste management programme in Tuvalu.

Workshop participants are listed at Appendix 1.

³⁸ A copy of the current draft version of this Guidance Note is available at the following dropbox link: <https://www.dropbox.com/sh/ikytr0j7stwc5dc/AADnoNq0ctwcBQxQmiwSIYj9a?dl=0>.

³⁹ The Government of Tuvalu (GoT) has recently endorsed a new Tuvalu National Integrated Waste Policy and Action Plan (Waste Sector Plan). One programme within this Waste Sector Plan is for the Solid Waste Agency of Tuvalu (SWAT) to “promote the recovery of green wastes from the waste stream, implement composting programmes, and encourage stakeholders to use compost produced from processing of green wastes”.

Structure of the training workshop

The structure of the workshop closely followed the step-wise approach for preparing a M&E framework as outlined in the draft Guidance Note for Developing Monitoring and Evaluation Frameworks in Tuvalu.

Each session comprised an introduction presentation on key concepts pertaining to that given 'step' and was then followed by group activity to apply this step to the green waste management program.

In addition, the workshop included sessions to:

- provide background information on the new Tuvalu National Integrated Waste Policy and Action Plan (Waste Sector Plan) and green waste management programme therein; and
- outline how project and programme-level M&E frameworks should align with M&E work being done at the National Strategic Development Plan level (i.e. TKIII) and with reporting against the Corporate Plan.

A copy of the workshop agenda is provided at Appendix 2. And workshop presentations are available at the following dropbox link: <https://www.dropbox.com/sh/ikytr0j7stwc5dc/AADnoNq0ctwcBQxQmiwS1Yj9a?dl=0>.

The workshop facilitators were Lototasi Kauga (Monitoring and Coordination Administrator, Monitoring and Evaluation Unit, Office of the Prime Minister), Aaron Buncle (SPREP), Jim Binney (consultant, Mainstream), and Ma Bella Guinto (SPREP).

Workshop outputs

The key outputs of the workshop were:

- a draft logic model of the green waste management program;
- a draft risk matrix;
- draft evaluation questions to guide the M&E work;
- select elements of the Monitoring Plan; and
- select elements of the Evaluation Plan.

A copy of these outputs is provided at Appendix 3.

Facilitator reflections

This workshop incorporated some of the participant feedbacks received from the previous M&E workshop run in May 2016 and which focused on developing a M&E framework for the Tuvalu Community Biogas Project. These were to (i) include sessions pertaining to all steps of the 8-step procedure for developing a M&E framework (not just steps 1 to 4), and (ii) provide further emphasis to explain the inter-connectedness of each of the 8 steps. These additions appeared to work well and improved the training workshops.

This October 2016 workshop also included a new session to provide guidance for ensuring coherency and alignment of project/programme-level M&E with the TKIII processes and quarterly budget reporting processes. This was an excellent addition to the workshop, with associated workshop discussions highlighting that ODA projects historically do a bad job of this which in turn creates a lot of problems for GoT implementation and planning. This session is a very substantial contribution and should be retained in future workshops.

Concluding Remarks and Next Steps

Overall, the M&E workshop was wellreceived by GoT participants and was an important step to help strengthen the capacity of Government agencies to develop monitoring and evaluation frameworks for development projects.

The next steps for this case-study application are for Jim Binney to work with the green waste M&E team over the coming week(s) to collect baseline information and complete a first draft M&E framework. Jim will visit again in late November to present the final M&E framework to the green waste M&E team and other key stakeholders.

It was also emphasised that the Guidance Note (for developing monitoring and evaluation frameworks of development projects in Tuvalu) is still in draft form.

Participants are encouraged to provide feedbacks on the draft Guidance Note to Lototasi Kaua at tasialiki@gmail.com or Aaron Buncle at aaronb.ext@sprep.org. A participatory workshop is also planned for February 2017 to solicit further feedbacks from GoT officials to make sure the Guidance Note fully meets the needs and expectations of GoT.

Workshop participants

NAME	ORGANISATION
Lototasi Morikao	Evaluation & Co-ordination Administrator, Office of the Prime Minister (OPM)
Savali Kelese	Planning, Budget, Aid Co-ordination Department
Uatea Vave	Agriculture Department
Faiatea Latasi	Funafuti Kaupule
Amouta Falaina	Department of Rural Development
Vavau Fafuuuga	Deputy EU NAO
Fuaitai Taounua	Planning, Budget and Aid Co-ordination (PBACD)
Fialua Olouise	Farmer
Betty Aselu	PERMU
Ivy Latasi	Tuvalu R2R project
Pesega Lifulaa	Tuvalu R2R project
Jamie Ovia	Climate Change Unit, OPM

Workshop Agenda

DEVELOPING A MONITORING AND EVALUATION (M&E) FRAMEWORK FOR THE GREEN WASTE MANAGEMENT COMPONENT OF THE NEW TUVALU NATIONAL INTEGRATED WASTE POLICY AND ACTION PLAN

WEDNESDAY 26, THURSDAY 27 AND FRIDAY 28 OCTOBER 2016

The Government of Tuvalu (GoT) has recently endorsed a new Tuvalu National Integrated Waste Policy and Action Plan (Waste Sector Plan). One strategic action within this Waste Sector Plan is for the Solid Waste Agency of Tuvalu (SWAT) to “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”. This workshop is to develop a monitoring and evaluation (M&E) framework for the abovementioned strategic action.

The main purposes of the M&E framework will be to (i) inform adaptive management of the strategic action as it is being implemented; and (ii) enable learning about how best to manage green waste in Tuvalu into the longer term future. The monitoring and evaluation framework will also support regular progress reporting and accountability.

In addition, the M&E framework developed for the green waste strategic action will serve as a model approach for monitoring and evaluating other strategic actions of the Waste Sector Plan—as part of a coherent and workable approach to monitoring and evaluating the broader Waste Sector Plan.

Workshop objectives

The specific objectives of the training workshop are to:

- strengthen GoT capacity in the preparation of Monitoring and Evaluation (M&E) frameworks;
- raise awareness of the important role M&E plays in the context of adapting to climate change; and
- draft key elements (a logic model, key evaluation questions, and monitoring plan) of the M&E framework for the strategic action to “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”.

The workshop is being supported by the Pilot Programme for Climate Resilience: Pacific Regional Track (PPCR-PR). The PPCR-PR is a regional programme implemented by SPREP and ADB which aims to strengthen integration of climate change and disaster risk considerations into ‘mainstream’ policy making and related budgetary and decision-making processes (i.e. <climate change and disaster risk mainstreaming>).⁴⁰ The workshop is also being supported by the EU funded SPREP administered PacWaste Project (EDF10).

A copy of the Guidance Note and other reference material that will be used in the workshop to develop the M&E framework for the green waste strategic action are available at the following dropbox link: <https://www.dropbox.com/sh/ikytr0j7stwc5dc/AADnoNq0ctwcBQxQmiwSIYj9a?dl=0>.

For more information about the workshop, please contact either Litiana Talake at lititalake@gmail.com or Aaron Buncle at aaronb.ext@sprep.org.

⁴⁰ The PPCR-PR is being implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) and Asian Development Bank (ADB) and is funded through the Climate Investment Funds (CIF).

Wednesday 26 October		Activity	Facilitator
Morning	8:45–9:00	Registration	
	9:00–9:20	Opening prayer and address	TBD
	9:20–9:40	Workshop introduction and objectives	Aaron Buncle (SPREP)
	9:40–10:00	Overview of Monitoring and Evaluation (PART A of Guidance Note)	Aaron Buncle (SPREP)
	10:00–10:30	Background presentation on the Tuvalu National Integrated Waste Policy and Action Plan, and strategic actions therein to address green waste	Litiana Talake (SWAT) Ma Bella Guinto (SPREP)
	10:30–11:00	Morning tea break	
	11:00–11:45	STEP 1: Defining the Programme Design	Aaron Buncle (SPREP)
	11:45–12:30	Group work to prepare a logic model for the programme to “promote the recovery of green wastes from the waste stream, implement composting programmes, and encourage stakeholders to use compost produced from processing of green wastes”	Jim Binney (Mainstream) Ma Bella Guinto (SPREP) Aaron Buncle (SPREP)
	12:30–1:30	Lunch	
Afternoon	1:30–3:00	Group work to prepare a logic model cont..	Jim Binney (Mainstream) Aaron Buncle (SPREP) Ma Bella Guinto (SPREP)
	3:00–3:15	Afternoon tea break	
	3:15–3:30	STEP 2: Incorporating External Factors and Risk	Aaron Buncle (SPREP)
	3:30–4:30	Group work to incorporate external factors and risk into the logic model for the programme to “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”	Jim Binney (Mainstream) Aaron Buncle (SPREP) Ma Bella Guinto (SPREP)

Thursday 27 October		Activity	Facilitator
	9:00–9:15	Recap of Day 1	Jim Binney (Mainstream)
	9:15–9:30	STEP 3: Formulate Evaluation Questions	Lototasi Kaua (Monitoring and Coordination Administrator, OPM)
	9:30–10:30	Group work to formulate key evaluation questions for the programme to “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”	Aaron Buncle (SPREP) Jim Binney (Mainstream) Ma Bella Guinto (SPREP)
	10:30–11:00	Morning tea break	
	11:00–11:15	STEP 4: Prepare a Monitoring Plan	Jim Binney (Mainstream)
	11:00–12:30	Group work to prepare monitoring plan for the programme to “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”	Jim Binney (Mainstream) Aaron Buncle (SPREP)
		12:30–1:30	Lunch
Afternoon	1:30–2:00	Update on arrangements for monitoring implementation of the TKIII Hints and tips for ensuring coherency and alignment of programme and sector-plan level M&E with the TKIII processes	Lototasi Kaua (OPM)
	2:00–3:00	Group work to prepare monitoring plan cont..	Jim Binney (Mainstream) Aaron Buncle (SPREP) Ma Bella Guinto (SPREP)
	3:00–3:15	Afternoon tea break	
	3:15–4:30	Revisiting the key evaluation questions: - is the monitoring plan practical? - is it achievable? - do we need to further prioritise key evaluation questions?	Ma Bella Guinto (SPREP)

Friday 28 October		Activity	Facilitator
	9:00–9:30	Recap of Day 2	Jim Binney (Mainstream)
	9:30–10:00	STEP 5: Prepare an Evaluation Plan STEP 6: Prepare a Terms of Reference for Key Evaluation Exercises	Aaron Buncle (SPREP)
	10:00–10:30	Group work to prepare a draft evaluation Plan	Jim Binney (Mainstream) Aaron Buncle (SPREP) Ma Bella Guinto (SPREP)
	10:30–11:00	Morning tea break	
	11:00–11:15	STEP 7: Prepare a Communication and Knowledge Management Plan STEP 8: Putting it all together	Aaron Buncle (SPREP)
	11:15–12:00	Group work to prepare a draft Communication and Knowledge Management Plan	Jim Binney (Mainstream) Aaron Buncle (SPREP) Ma Bella Guinto (SPREP)
	12:00–12:30	Wrapping up loose ends Next steps	Jim Binney (Mainstream) Aaron Buncle (SPREP) Ma Bella Guinto (SPREP)
	12:30–1:30	Lunch	

1. DRAFT LOGIC MODEL/RESULTS HIERARCHY

Overall Goal: improve agriculture production to support business and food security increased by healthy and committed people

Result: sustainable crop production increased

Medium-term outcome: farmers have improved access (reliable, affordable, and sufficient quality, quantity and diversity) to seeds and seedlings

Activity: Import and distribute vegetable seeds working through NGO and qualified private entities - for both the domestic and export market

Activity: Acquire, trial and research new vegetable crop varieties with assistance from JICA, SPC, FAO and other Development Partners

2. DRAFT RISK MATRIX

NATURE OF RISK		MAGNITUDE OF RISK			RISK TREATMENT STRATEGY
External factor	Component of project design/ logic affected by external factor	Likelihood of external factor occurring (almost certain, likely, possible, unlikely, rare)	Consequence of external factor, if it occurs (insignificant, minor, moderate, major, severe)	Overall risk rating (low, medium, high, extreme)	
Sub-objective 2: Improve the efficiency of green waste collection and conversion services					
Insufficient financial resources	Equipment failure at end of life, leading to service disruptions	Likely	Major	High	Funded asset management plan + Pricing/cost-recovery strategy
Unwillingness for households to pay for collection services	SWAT reliance on (variable) government and donor funding sources + related service standard decline	Likely	Moderate	High	Well-researched pricing/cost-recovery strategy
Unwillingness of pig farmers to supply clean dung (inadequate and/or incorrect incentives)	Reduction in compost production + accumulation of green waste at depot/landfill	Possible	Major	High	Dry litter R2R demonstrations based on trials + critical oversight and endorsement of final R2R demonstration design by SWAT (with particular attention to incentives and incorporation within broader Tuvalu Integrated Waste Policy and Action Plan) + close monitoring of quantity and quality of pig dung + evaluative exercise to explore impediments/ inadequate incentives issue(s)
Storm surge and cyclone	Damage to equipment and composting facility	Unlikely	Major	Medium	Make sure composting facility includes climate resilient design measures, including additional capacity for peak loads expected if cyclone occurs
Sea spray	Damage and depreciation of equipment	Almost certain	Minor	Medium	Asset management plan factors in shorter life cycle of key equipment and particular attention to maintenance
Sub-objective 3: Increase the level of (demand and) use of recycled product					
Unwillingness for consumers to pay for final product (mulch, wood chips, compost)	Accumulation of products and raw green waste at depot/landfill	Possible	Major	High	Well-researched pricing/cost-recovery strategy + location of product and cashier at (more convenient) new depot
Planned expansion of Taiwan farm does not eventuate (funding/change in policy direction)	Accumulation of products and raw green waste at depot/landfill	Unlikely	Major	Medium	Monitor progress of farm extension

3. DRAFT EVALUATION QUESTIONS

EVALUATION QUESTION

1. To what extent was the green waste programme able to achieve its objective of reducing green waste going to landfill?
2. To what extent was segregation achieved?
 - Was the awareness initiative effective in contributing to this? Why? Why not?
 - To what extent did the strengthened enforcement and regulation contribute to this outcome? What factors facilitated this? What factors inhibited this?
3. To what extent have SWAT's collection and conversion services improved?
 - To what extent have SWAT's service delivery costs been reduced? To what extent have costs been recovered? What factors have (materially) affected costs and revenues?
 - To what extent are the end products (especially compost) of a suitable quality for end users? What factors facilitated this? What factors inhibited this?
 - To what extent have climate change risk-management measures (i.e. climate-proofing new transfer station⁴¹) been effective in minimising damage to transfer station, and ability to accommodate additional volumes of green waste following cyclone? Why or why not?
4. To what extent has the advertising campaign contributed to the uptake of recycling (use of products—mulch, wood chips, compost)? What worked well and what did not work so well?
 - Have there been any other factors that affect (+/–) uptake of product (e.g. quality, pricing, accessibility, etc.)?
5. Have the green waste programme outputs been delivered as per corporate plan and budget? Why? Why not?
 - To what extent has the AMP been implemented effectively?

41 Locating out of storm surge zone + infrastructure facilities built to category 5 cyclone standard + increased size of storage area to accommodate additional volumes of green waste following cyclone.

4. SELECT ELEMENTS OF MONITORING PLAN

EVALUATION QUESTION	PROJECT DESCRIPTION	INDICATOR
1. To what extent was the green waste programme able to achieve its objective of reducing green waste going to landfill?	Objective: Reduce green waste going to landfill	Volume (m ³ /quarter) of green waste going to landfill
2. To what extent was segregation achieved? Was the awareness initiative effective in contributing to this? Why? Why not? To what extent did the strengthened enforcement and regulation contribute to this outcome? What factors facilitated this? What factors inhibited this?	Outcomes: Improved segregation of waste streams at roadside	% of green waste at roadside contaminated Number of infringement notices per quarter
3. To what extent has SWAT's collection and conversion services improved? <ul style="list-style-type: none"> To what extent have SWAT's service delivery costs reduced? To what extent have costs been recovered? What factors have (materially) affected costs and revenues? To what extent are the end products (especially compost) of a suitable quality for end users? What factors facilitated this? What factors inhibited this? To what extent have climate change risk-management measures (i.e. climate-proofing new transfer station⁴²) been effective in minimising damage to transfer station, and ability to accommodate additional volumes of green waste following cyclone? Why or why not? 	Outcomes: Improved efficiency of SWAT operations	Unit cost of collection services (\$/m ³), disaggregated for collection services & product type (i.e. mulch, wood chips, compost) Total cost of collection services (\$/quarter), disaggregated for collection services & product type (i.e. mulch, wood chips, compost) Cost recovery rate (% ⁴³), disaggregated for collection services & product type (i.e. mulch, wood chips, compost) Asset funding adequacy ratio (ratio ⁴⁴) Service disruptions (days/quarter)
4. To what extent has the advertising campaign contributed to the uptake of recycling (use of products: mulch, wood chips, compost)? What worked well and what did not work so well? <ul style="list-style-type: none"> Have there been any other factors that affect (+) uptake of product (e.g. quality, pricing, accessibility, etc.)? 	Outcome: Increase uptake of recycled green waste	Quantity (m ³) of product sold Customer satisfaction rating ⁴⁵
5. Have the green waste programme outputs been delivered as per corporate plan and budget? Why? Why not? <ul style="list-style-type: none"> To what extent has the AMP been implemented effectively? 	Outputs	Set up (green) waste database [activity 4.2 of CP] Public awareness involving communities and schools through radio, training, etc. on all waste service areas in Tuvaluan language [activity 4.15 of CP] Take measures to uphold the laws and regulations [activity 4.8 of CP] Collection schedule review completed and (any) recommendations adopted Investigate and implement options of waste containment and collection of wastes to enable a more reliable and efficient service [activity 4.24 of CP] Pricing strategies developed and implemented (for collection services & product type: mulch, wood chips, compost) Set up user-pay programme for (green) waste management [activity 4.5 of CP] Asset management plan developed (including to identify/acquire equip. & machinery for waste disposal) Construct a transfer and recycling station [activity 4.7 of CP] Develop a waste asset management plan [activity 4.8 of CP] Implement composting of mulch with piggery waste in conjunction with pig owners [activity 4.19 of CP] Variance from budget (\$ variance from budget)
	Activities	

42 Locating out of storm surge zone + infrastructure facilities built to category 5 cyclone standard + increased size of storage area to accommodate additional volumes of green waste following cyclone.

43 This is calculated as revenue divided by cost.

44 This is calculated as actual allocation for assets divided by AMP budget.

45 rubric to be developed to define highly satisfied, moderately satisfied, unsatisfactory etc

5. SELECT ELEMENTS OF EVALUATION PLAN

EVALUATION QUESTION	RELEVANT MONITORING INFO	EVALUATION DATA COLLECTION
1. To what extent was the green waste programme able to achieve its objective of reducing green waste going to landfill?	Volume (m ³ /quarter) of green waste going to landfill	Time series analysis of indicator data
2. To what extent was segregation achieved? <ul style="list-style-type: none"> Was the awareness initiative effective in contributing to this? Why? Why not? To what extent did the strengthened enforcement and regulation contribute to this outcome? What factors facilitated this? What factors inhibited this? 	% of green waste at roadside contaminated Number of infringement notices per quarter	Time series analysis of indicator data Targeted focus group with SWAT Targeted focus group with Falekaupule
3. To what extent has SWAT's collection and conversion services improved? <ul style="list-style-type: none"> To what extent have SWAT's service delivery costs reduced? To what extent have costs been recovered? What factors have (materially) affected costs and revenues? To what extent are the end products (especially compost) of a suitable quality for end users? What factors facilitated this? What factors inhibited this? To what extent have climate change risk-management measures (i.e. climate-proofing new transfer station⁴⁶) been effective in minimising damage to transfer station and ability to accommodate additional volumes of green waste following cyclone? Why or why not? 	Unit cost of collection services (\$/m ³), disaggregated for collection services & product type (i.e. mulch, wood chips, compost) Total cost of collection services (\$/quarter), disaggregated for collection services & product type (i.e. mulch, wood chips, compost) Cost recovery rate (% ⁴⁷), disaggregated for collection services & product type (i.e. mulch, wood chips, compost) Asset funding adequacy ratio (ratio ⁴⁸) Service disruptions (days/quarter)	Time series analysis of indicator data, including examination of climate variability/events where applicable Semi-structured interviews with key stakeholders (SWAT operational staff in Funafuti, Kaupule in outer islands) Semi-structured interviews with pig-farmers ⁴⁹
5. To what extent has the advertising campaign contributed to the uptake of recycling (use of products: mulch, wood chips, compost)? What worked well and what did not work so well? <ul style="list-style-type: none"> Have there been any other factors that affect (+/-) uptake of product (e.g. quality, pricing, accessibility, etc.)? 	Quantity (m ³) of product sold Customer satisfaction rating ⁵⁰	Time series analysis of indicator data Critical review of R2R research on dry litter composting methods, including review of technical reports and interview with R2R co-ordinator ⁵¹

46 Locating out of storm surge zone + infrastructure facilities built to category 5 cyclone standard + increased size of storage area to accommodate additional volumes of green waste following cyclone.

47 This is calculated as revenue divided by cost.

48 This is calculated as actual allocation for assets divide by AMP budget.

49 Particularly examining incentives and disincentives for supplying clean pig dung/dry litter to both SWAT and Taiwan farm

50 Rubric to be developed to define highly satisfied, moderately satisfied, unsatisfactory, etc. This satisfaction would be in accordance with the following key product attributes: quality, pricing, and accessibility. Note that the explanatory variables for quality are primarily clean pig dung and to a lesser degree uncontaminated mulch.

51 Only if sales are lower than expected or if customer satisfaction is low. This would especially relate to quality and teasing out specific issues relating to salinity, optimal ratios of element, etc.

52 The precise method for preparing compost will be determined by R2R trials and demonstrations.

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