



SPREP
Secretariat of the Pacific Regional
Environment Programme



This initiative is supported by **PacWastePlus**-a 72 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) **to sustainably and cost effectively improve regional management of waste and pollution.**

PacWaste Plus

GESTION DES DECHETS ORGANIQUES



Présenté par Mme Julie Pillet
Pour le compte du projet PacWaste Plus

Séminaire Inter Régional du Pacifique :
Valorisation des Matières Organiques
Mars 2025

Aperçu de la Session



Présentation du PROE et du projet PacWastePlus

Données sur les matières organiques dans le Pacifique

Etudes de cas de ETIO

Utilisation de l'outil d'aide à la décision

Ressources disponibles

Présentation du PROE

Le **Programme régional océanien de l'environnement (PROE / SPREP)** est une organisation régionale créée par les gouvernements et les administrations du Pacifique pour **protéger et gérer l'environnement** et les **ressources naturelles** de la région.

Le PROE compte **21 membres** incluant les **pays et territoires insulaires du Pacifique** et 5 pays « métropolitains ».

Objectifs régionaux

- Objectif régional 1 : Les **populations** du Pacifique bénéficient d'une **résilience** renforcée face au changement climatique.
- Objectif régional 2 : Les **populations** du Pacifique bénéficient d'**écosystèmes** insulaires et océaniques **sains et résilients**.
- Objectif régional 3 : Les **populations** du Pacifique bénéficient d'une **meilleure gestion des déchets** et d'un **meilleur contrôle de la pollution**.
- Objectif régional 4 : Les **populations** du Pacifique et leur environnement bénéficient d'un engagement et de **bonnes pratiques en matière de gouvernance environnementale**.

« Un environnement pacifique résilient, qui préserve nos moyens de subsistance et notre patrimoine naturel en harmonie avec nos cultures ».



This initiative is supported by **PacWastePlus**-a 72 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) **to sustainably and cost effectively improve regional management of waste and pollution.**

L'objectif général du programme : générer des avantages économiques, sociaux, sanitaires et environnementaux pour les pays du Pacifique grâce à une intégration économique régionale plus forte et à une gestion durable des ressources naturelles et de l'environnement.

L'objectif spécifique : assurer une gestion sûre et durable des déchets en tenant compte de la préservation de la biodiversité, de la santé et du bien-être des communautés insulaires du Pacifique, ainsi que des exigences en matière d'atténuation et d'adaptation au changement climatique.

PacWastePlus Priority Waste Streams

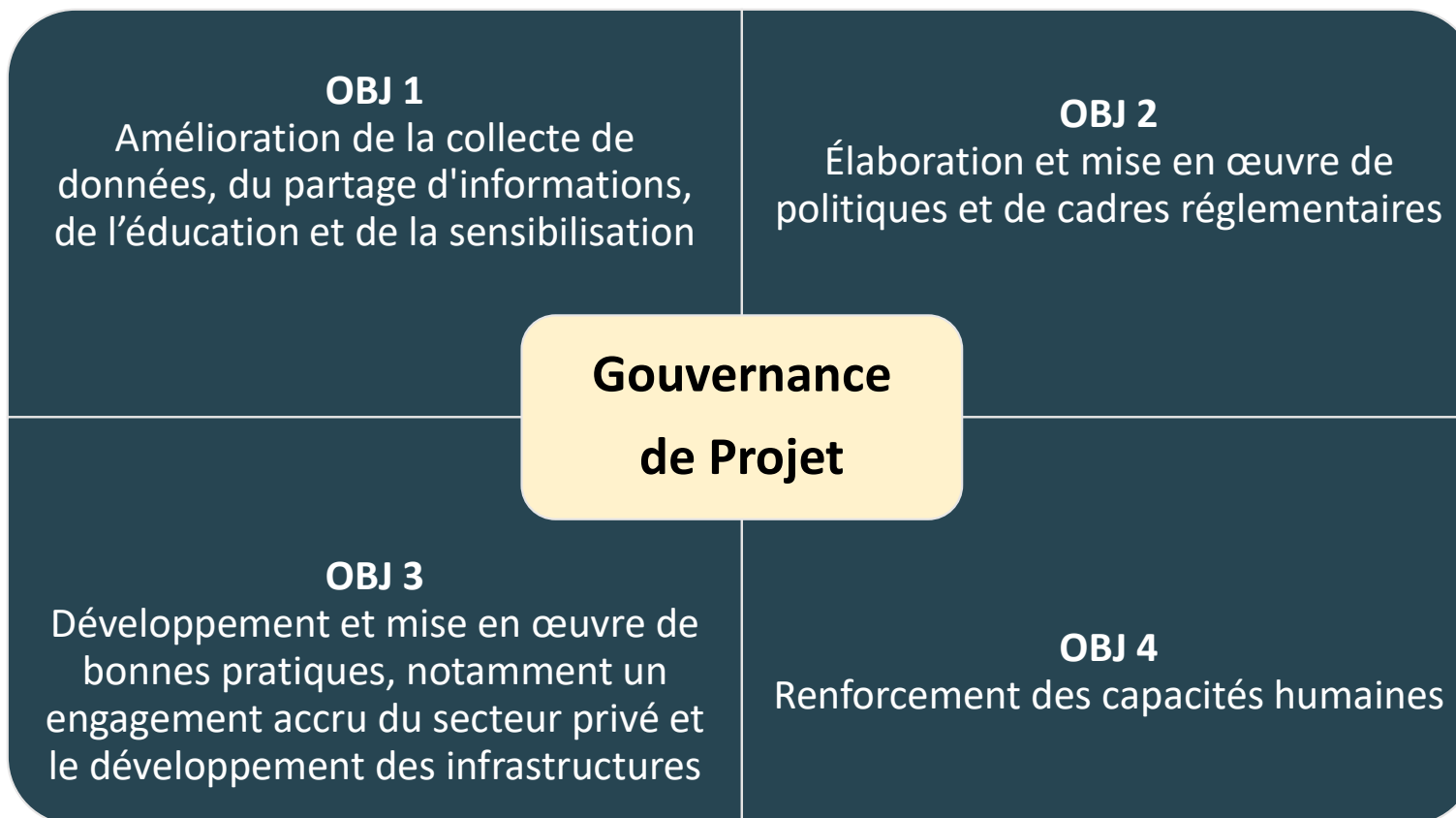


Déchets dangereux



Déchets solides

Objectifs visés par le PacWastePlus



Odeur

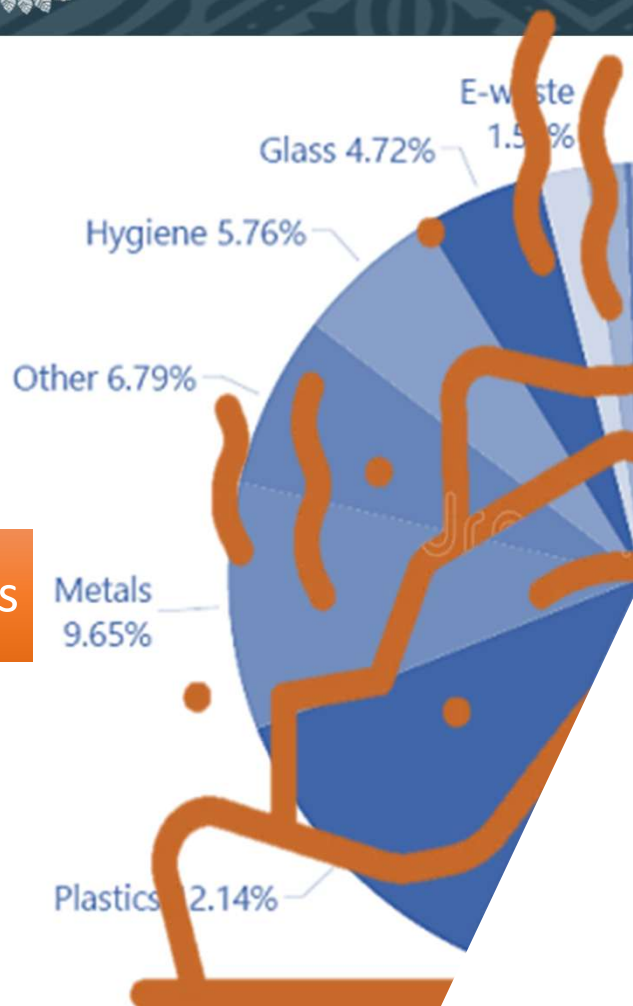
Méthane

Lixiviats

Capacité des décharges

Coût

417 000 tonnes
139 000 m³
16,6 million USD



56,9% =

180 000 tonnes
60 000 m³
7,2 million USD

Retour des nutriments

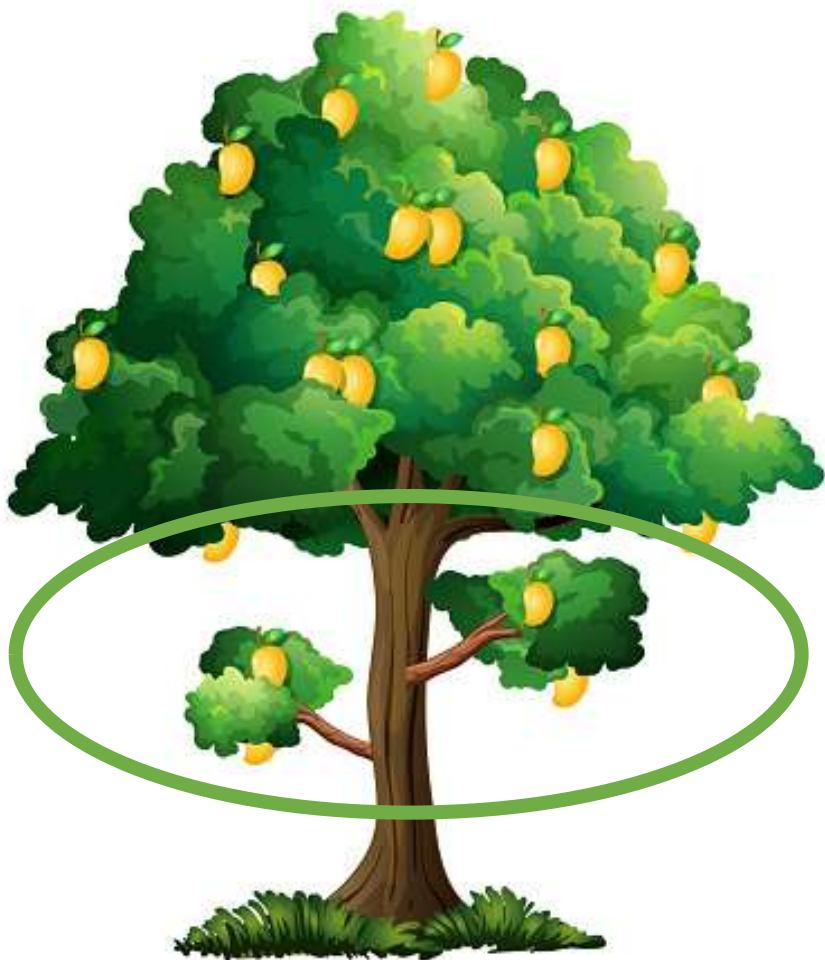
Sols sains / rendement
des cultures

Emplois

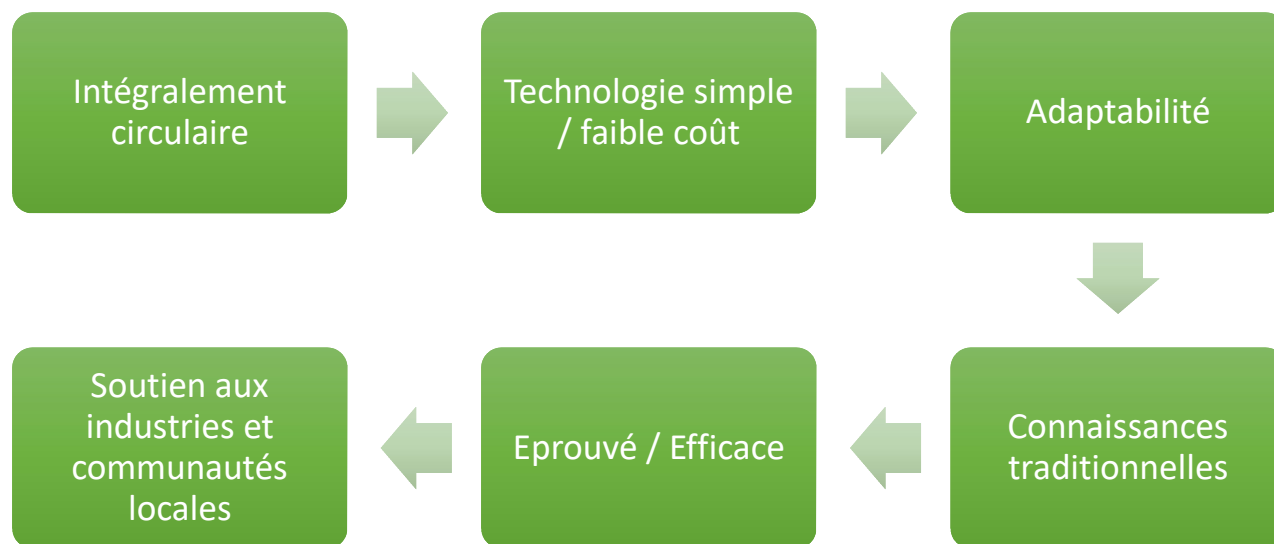
Résistance au climat

Économies

Moins de produits
chimiques

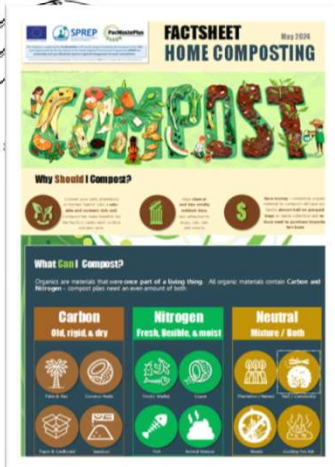


Pourquoi ne pas commencer par des actions simples ?

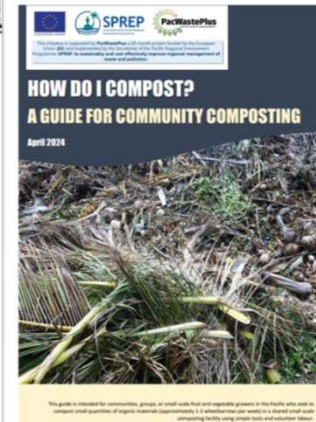
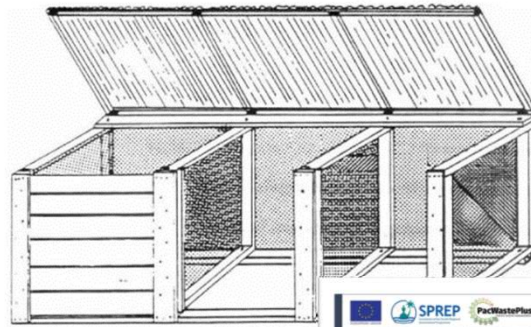


Projets PacWastePlus et déchets organiques

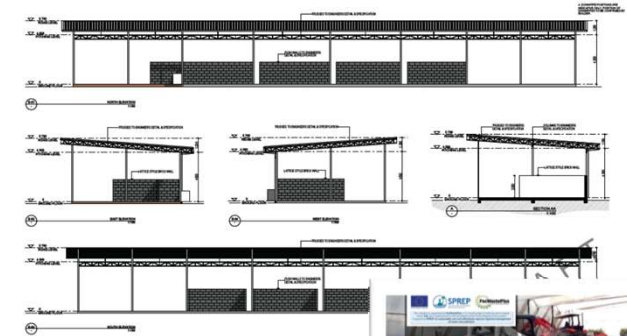
Ménages / Jardins



Communautés



Larges installations



Autres solutions de gestion des déchets organiques

ORGANICS FACTSHEET
ANIMAL FEED
Collection and processing suitable organic materials for use as animal feed (primarily fresh food organics, particularly fruit and vegetables)
December 2022

Households in the Pacific commonly feed their fresh food organics to pigs, chickens and other animals. This is an effective organics management solution; it diverts the material away from land disposal or burning into a beneficial use.

Through upscaling this existing household practice to a commercial scale, fresh food organics can be collected on mass from large producers of this material – such as growers' markets, food processing facilities (i.e., noni, copra), households/communities, and restaurants – processed, transported, and sold/distributed to pig or chicken farmers, and animal husbandry facilities.

This type of operation can result in dual benefits:

- Diverts fresh food organics away from land disposal or burning
- Provides regular and fresh locally produced food for animals

BENEFITS

Alimentation animale

ORGANICS FACTSHEET
MULCH AND WOODCHIPS
Collection and processing suitable organic materials to use as mulch and / or animal bedding (primarily garden and woody organics)
December 2022

Garden and woody organics are comprised of branch litter, whole trees, stumps, and pruned clippings from hedges generated during household and community landscaping or land clearing projects. Woody organics can also include untreated wood materials from pallets or used in construction. Mulching and chipping is the process of shredding this material to a consistent particle size, usually <100mm.

Mulched and chipped material can be useful for a variety of applications in the Pacific including landscaping, weed cover in gardens, and animal bedding. Application of mulch in landscaping can assist with water retention, improve aeration of clay soil, and provide nutrients to sandy soil.

Pacific landfills currently receive a high portion of garden and woody organics. This material includes "high fibrous" material such as coconut fronds, pandanus, and banana leaves which can be very strong and stringy. Processing and using this material as mulch/woodchips may provide an effective management solution without the need for the construction of a specialist compost facility or training.

The high fibrous vegetation in the Pacific requires careful selection of the type of mulch/chipper equipment to purchase. Research suggests that "drum style" chippers are better for processing this vegetation compared to disc/flywheel style chippers. More information on selecting appropriate equipment is provided later in this factsheet.

An effective use for mulch/woodchips may be as bedding and/or lining of pig and chicken pens to absorb the animal manure. This use provides multiple benefits:

- Animal welfare:** Animals have a more comfortable pen in comparison to concrete or mud flooring
- Less water use / contamination run-off:** Mulch in the pens will absorb animal manure. To clean the animal pens, mulch can be simply swept up, therefore reducing the need for large washdowns
- Composting:** Once the mulch has absorbed the animal manure, it can be added to a composting process – providing an effective way to increase the nitrogen balance and enhance composting processes.

Paillage et copeaux de bois

ORGANICS FACTSHEET
SMALL-SCALE ANAEROBIC DIGESTION (WET)
Controlled decomposition of organic materials without oxygen in a large, sealed bag or drum that produces biogas and liquid fertiliser
December 2022

As worldwide energy prices increase and globally we seek to move away from fossil fuel use, finding alternative renewable energy supplies are becoming increasingly important. Small-scale anaerobic digesters may provide an effective opportunity – converting locally produced organic materials such as food organics, animal manure, and, if desired, biosolids (sewage sludge) into two usable resources:

Biogas, create clean, green renewable energy or cooking gas

Digestate, used as a liquid fertiliser

Small-scale anaerobic digestion may be suitable for digesting (breaking down) small quantities of organic materials (less than 1 tonne or 20 wheelbarrows/day) in a pre-fabricated digester with a <10 m³ total capacity and processing it into biogas and digestate. Small-scale anaerobic digestion may be appropriate in community facilities, local growers' markets, or at small businesses.

Small-scale anaerobic digestion can be supplied prefabricated or in kits with basic assembly required. Organic material is loaded and unloaded by hand. Biogas is stored in a bag or drum, filtered, and then piped to a burner for cooking or heating of water.

Digestion anaérobie à petite échelle

Ménages / Jardins



Programmes de promotion du compostage domestique

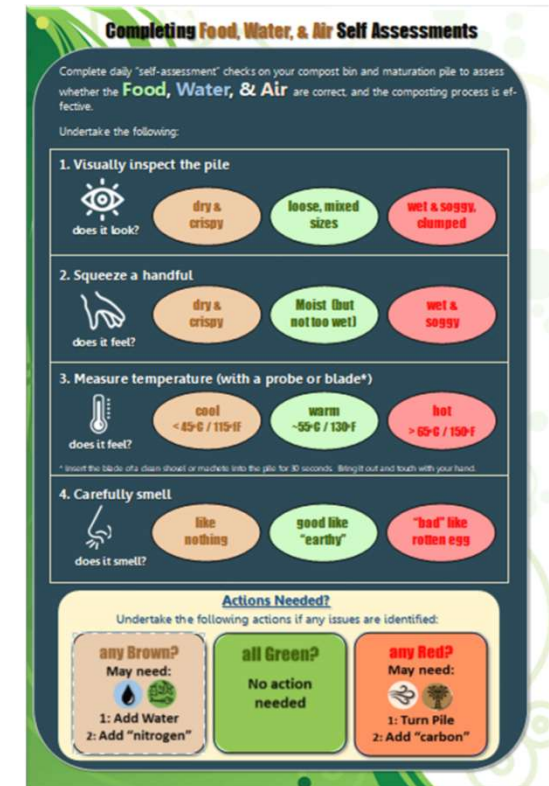
- Fourniture de bacs à compost
- Programme d'éducation –
 - comment / pourquoi utiliser cette technologie - avantages pour les jardins
 - Pas de déchets organiques dans les déchets généraux
- Arrêt de la collecte des déchets organiques par les ménages



Ménages / Jardins

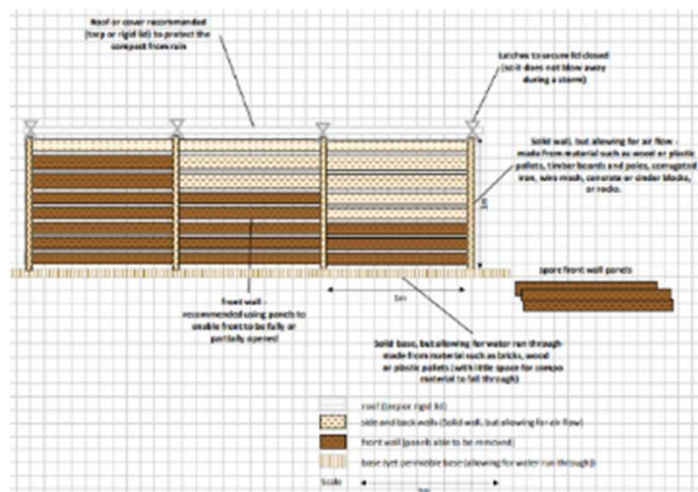
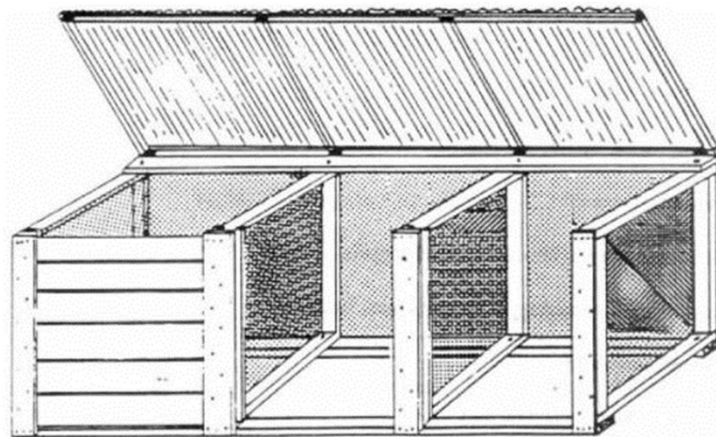


Ressources Disponibles



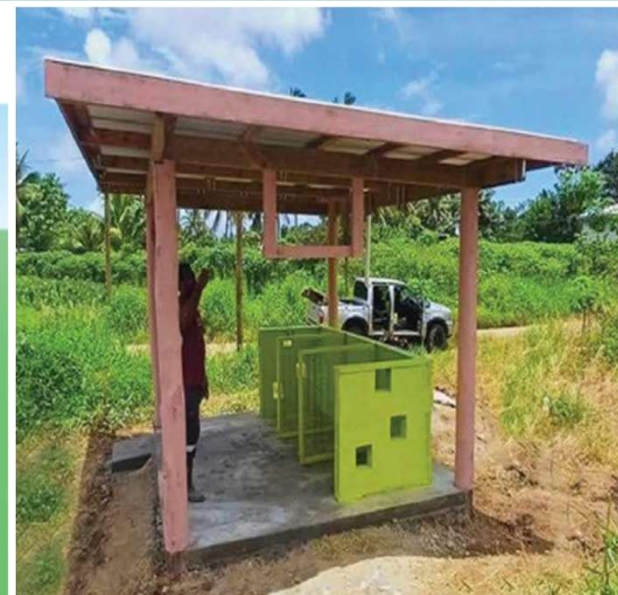
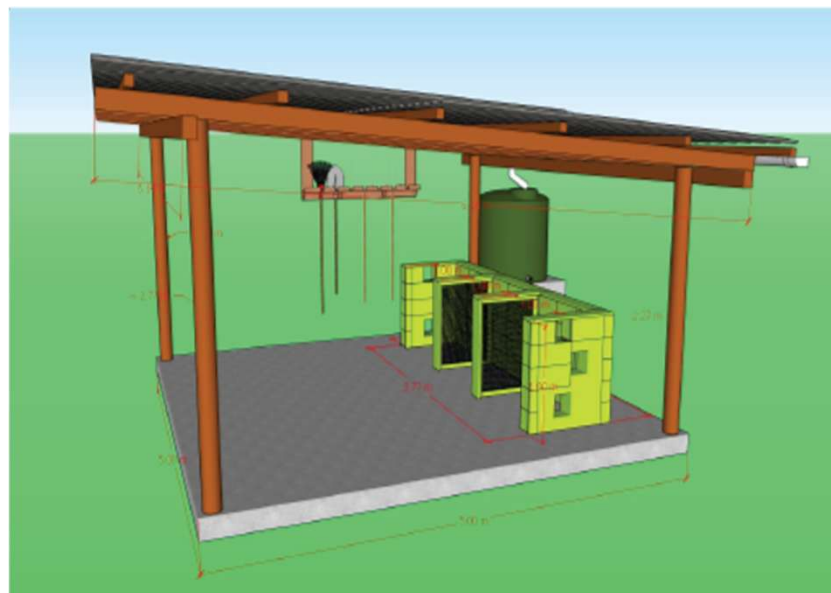
Projets communautaires

- Fidji
- Etats fédérés de Micronésie (Chuck et Yap)

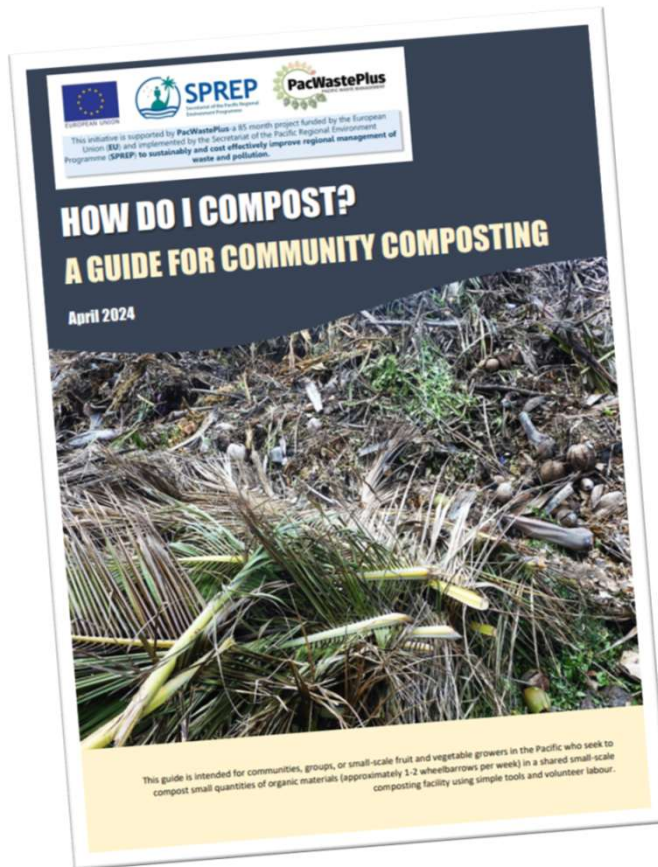


Fidji

- Aménagement de stations de compostage dans 25 villages
- Éducation et sensibilisation à grande échelle - engagement des villages
- Plan de gestion des déchets de la communauté
- Coûts de construction : 5 000 USD



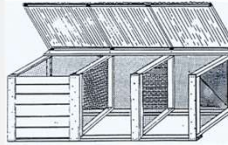
Ressources Disponibles



Step 2a – Make a Compost Bin from NEW MATERIALS

To guide the construction of a community-scale of a 3-bin composting facility using new materials, the following considerations are recommended. [Design Drawings](#) are available to assist. You can tailor these drawings to match your expected throughput and specific site conditions.

- Choose a flat easily accessible location with sufficient size allow for the 3 x 1m² bins, clear a space to access to the bins, a water tank and tool shed if needed, and space to receive materials and store the finished compost. Typical site may be approximately 10-30m².
- It is advantageous to construct the bins using hardwood timber and galvanised iron.
Note: ferrous metal will rust, and timber will rot over time in the composting environment.
- For small-scale composting (i.e., approx. 1m³ per month) it is suitable to have a solid, yet permeable base for the bins (i.e., made from paving stones, bricks, hardwood planks or (plastic) pallets). The base is recommended to be flat, so shovelling material is not hindered.
Note: for larger composting systems it is necessary to have a non-permeable base (i.e., concrete pad), to enable capture of water runoff (leachate).
- To facilitate turning of the compost and moving it from one bin to the next, it is helpful if the front walls of the compost bin can be opened fully or partially.
- A roof or cover is recommended (tarp or rigid lid). If a rigid structure is used to protect the bin from rain, it is recommended that it can be opened easily, and can be secured when open to avoid the risk of it falling onto somebody. The one lid design may be heavy for some people, you may consider constructing a lid for each bay.
- Consider if your site will need fencing to keep animals such as dogs and pigs out.
- Consider water sources, if your site has no water supply you will need to capture rainwater – i.e., installing guttering and a water tank.
- Consider the need for a small storage shed to store tools and equipment.



Depending on chosen design and materials, the following can be a guide for construction of a 3-bin composting facility:

Wood: 2x4 planks: 25-30m 1x4 planks: 90-100m 2x2 planks: 10-12m	Other considerations: - Fence - Water tank and guttering (if you do not have another nearby water source) - Toolshed
Other Materials: 1x3m corrugated iron roof - Paving stones, bricks, hardwood planks or (plastic) pallets to use as solid yet permeable base - Non-toxic wood sealer/preservative (optional) - Quick set concrete to secure corner posts into the ground	Tools: - Saw - Drill - Carpenter's square - Tape measure - Safety gear (gloves, glasses, ear plugs) - Level - Shovel
Hardware: - Large box of 2" decking screws 3x Hinges 3x Handles 4x Latches - Chain or cable to hold the lid open (make sure it is sturdy so it doesn't break!)	

How Do I Compost? A Guide for Community Composting

9

Animations

1. Add your Carbon and Nitrogen materials (see [Figure 1](#) on Page 6) to Bay 1 daily or as they are received, ensuring the right balance of Food, Air, and Water:

Adding Food

- Your compost will need **1 part carbon rich material for every 1-part nitrogen rich material**. This rule of thumb helps you achieve the ideal carbon to nitrogen ration of 30:1 by weight.
- For every bucket full of "nitrogen rich" material you add, cover it with an equal amount of "carbon rich" materials. Items containing both carbon and nitrogen can be added without layering.
- The correct balance of carbon and nitrogen will provide nutrients for the microbes.

Adding Water

- Add water as needed to ensure your compost pile does not dry out. Your compost pile should be damp all the way through, but not be so wet that water leaks out the bottom.
- The correct moisture will provide water for the microbes to live.

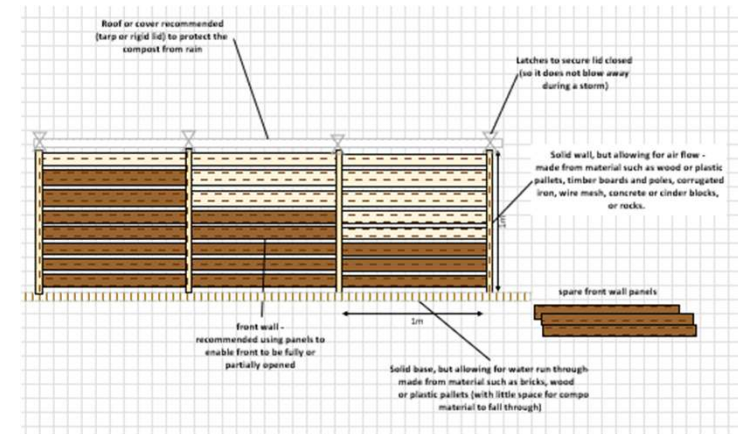
Ensuring Airflow

- Your compost pile should contain a mix of small and large items, up to 1-5cm diameter. If your items are larger than this you may need to shred the material using a shared mobile shredder (preferred) or cut larger items (coconut fronds etc) with a machete.
- The correct mix of items will enable air to flow through, providing oxygen for the microbes.

Simple Guide - Complete an Organics Materials Waste Audit

1. Determine Sample Size and Scope

- Undertake consultation to understand who is producing organics in your community – this might be households, growers' markets, plantations or growers, or other food processing facilities (noni-juicing, fish processing, or copra etc).



Larges installations

- Compostage en vrac
 - Îles Cook
 - Vanuatu



Compostage par compartimentation

- Fidji
- Tuvalu
- Etats fédérés de Micronésie (Yap)
- République des Îles Marshall



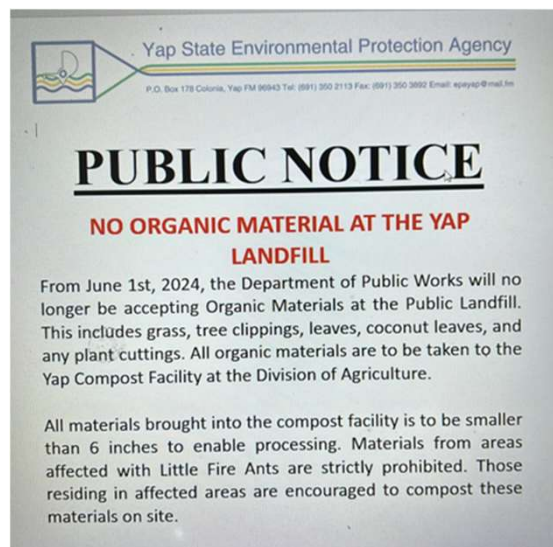
Îles Marshall : Centre national

- Installation de compostage existante à Laura – formation et procédure d’opération, alimentation en eau supplémentaire, et sonde de température
- Nouvelle déchiqueteuse à tambour (pas de disque)
 - La nature très fibreuse de la végétation dans le Pacifique rend les déchiqueteuses à disque performatantes
 - Broyeurs à tambour recommandé, offrant :
 - Puissance et durabilité
 - Fonctionnement plus rapide et plus sûr
 - Entretien réduit

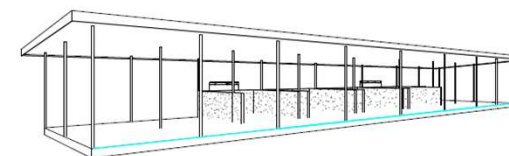


Etats fédérés de Micronésie : Centre national

- Yap – Déchets organiques interdits à la décharge de Yap
- Installation existante à Yap – Formation et procédures opérationnelles
- Chuk - construction d'une nouvelle installation par le biais du PWP - 120 000 USD
- Nouvelle déchiqueteuse à tambour



CHUUK STATE GOVERNMENT
PROJECT TITLE
COMPOST FACILITY
NEAUO VILLAGE, WENO, CHUUK STATE, FEDERATED STATES OF MICRONESIA



NOTES: DO NOT SCALE THIS DRAWING USE DIMENSIONS INDICATED ONLY		PROJECT PROPOSED COMPOST FACILITY		CLIENT CHUUK ENVIRONMENT PROTECTION AGENCY CHUUK STATE GOVERNMENT		DATE 2024
DESIGNER JAC		ADDRESS NEAUO VILLAGE, WENO, CHUUK STATE, FEDERATED STATES OF MICRONESIA		SCALE 1:100		BY JAC
COVER SHEET		PROJECT		CLIENT		DATE



SPREP
Secretariat of the Pacific Regional
Environment Programme



This initiative is supported by **PacWastePlus**-a 72 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to sustainably and cost effectively improve regional management of waste and pollution.

DECISION SUPPORT TOOL: Choosing Organics Solution



Questions:

Answer

TIPS

How to find this information

Quel est le poids de la matière organique à traiter quotidiennement ?

> 10 tonnes / jour

Find this information by reviewing data from your Waste Audit (available on the PacWastePlus Website), or by collecting your own data on the daily weight of organics material using the organics section of the approved Waste Audit methodology:
<https://pacwasteplus.org/resources/waste-audit-methodology-a-common-approach/>

If your organic materials are recorded in volume (m3) - convert to tonnes by multiplying the m3 by approximately:
0.3 - for unshredded yard/plantation organic materials, or
0.45 - for shredded yard/plantation organic materials, or
0.6 - for wet/compacted materials dense items such as food organics

Use an average of 0.5 if you have a mix of materials. For example, if you have 3.5m3 of material, multiply by 0.5 to find the approximate tonne: $3.5\text{m}^3 \times 0.5 = 1.75 \text{ tonnes}$

<https://pacwasteplus.org/resources/decision-support-tool-choosing-organics-solution/>

Quel est le ratio « Carbone » vs « Azote » dans vos matières organiques ? 2	> 50% Carbone / 50% Azote	Analyse your organic materials received and roughly record what percentage of items are: "Carbon" (i.e., dead or brown materials such as dry palm and flax, coconut husks, cardboard, sawdust) "Nitrogen" (fresh or green materials such as food organics, fish or copra processing by-product, manure) Round to the nearest category - For example, if your items are about 70% Carbon and 30% Nitrogen, select 75 / 25 Be aware that some common organic materials, such as materials from yard/community clean-ups and plantation already contains a mix of Carbon and Nitrogen. For more information on identifying the Carbon and Nitrogen percentage of your ingredients, review the Pacific and Timor-Leste Composting Common Organic Handbook https://pacwasteplus.org/resources/composting-common-organic-materials-in-the-pacific-and-timor-lemte-handbook-for-compost-operators/
Quelle est la principale source d'apport en azote ? 1	Alimentation / Poissons / Résidus de coco	organics, food organics, fish or copra processing by-product, animal manure, or human sludge) For more information on Nitrogen sources, please review the Pacific and Timor-Leste Composting Common Organic Handbook https://pacwasteplus.org/resources/composting-common-organic-materials-in-the-pacific-and-timor-lemte-handbook-for-compost-operators/
Quel est votre budget (installation de compostage + équipements) ? 3	100 000 – 250 000 USD	Record the budget available for facility set-up/establishment (Capital Expenditure). Capital expenditure may typically include items such as site work and drainage, buildings, equipment such as shredders and turners, establishing a water supply, vehicles, fencing, and signage
Quel est votre pour l'exploiter l'installation (hors personnel) ? 5	50 000 – 20 000 USD / an	Record the budget available for ongoing operation of the facility (Operating Expenditure). Operating expenditure may typically include items such as fuel, power, water, equipment maintenance, labour, and delivering community awareness

Combien de personnes pour exploiter l'installation (hors volontaires) ?

Quel est le niveau de formation du personnel et des volontaires ?

7

Existe-t-il des ateliers pouvant assurer la maintenance et l'entretien des équipements ?

8

Quelle est la sensibilité de l'environnement ?

9

5 – 10 personnes

Moyen (du personnel a été formé et/ou a de l'expérience en compostage)

Moyen (peu d'ateliers disponibles / Mécaniciens avec peu d'expérience pour ces équipements)

Haute (zones sensibles à proximité)

Record the estimated number of staff that will be working or volunteering in the organics facility

Record the level of expertise the staff or volunteers you will have for your organics facility operation, from:
Low - staff/volunteers have received minimal training and have limited experience in organics management
Medium - staff/volunteers have received some training or/and have some experience in organics management
High - staff/volunteers have been trained and are experienced in organics management

Record the level of workshop support you will have to support your organics operation, from:
Low - limited facilities available - no workshop and limited equipment, and unskilled mechanics
Medium - medium facilities available, no workshop but good equipment, and mechanics with some experience and knowledge
High - good workshop facilities and equipment available, and skilled mechanics

The sensitivity of your surrounding environment mean what is its vulnerability to any possible unplanned discharges from an organics operation such as contaminated water run-off, smell, noise, and traffic. Sensitive areas may include waterways such as rivers or the ocean, schools, and houses.

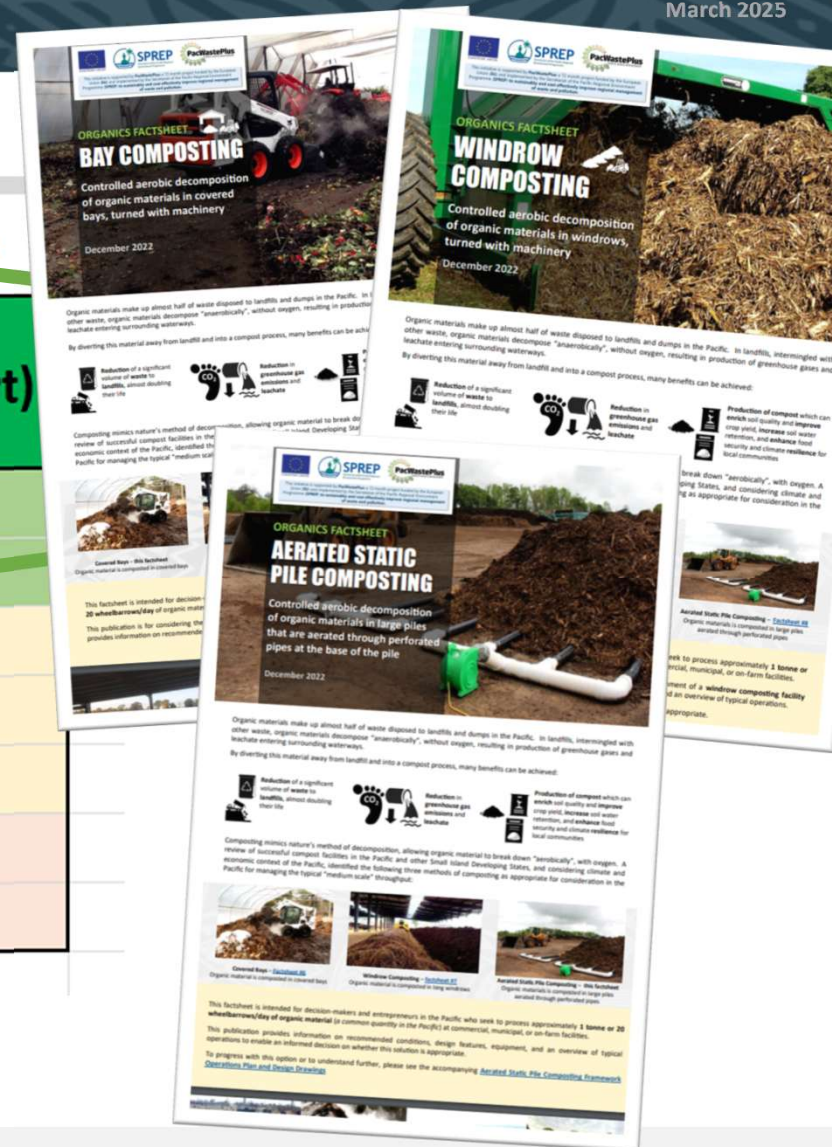
"Nearby" - includes within approximately 100m of your proposed organics facility

Record the sensitivity of your surrounding environment, from:

Low - no sensitive areas such as waterways or houses nearby
Medium - some sensitive areas such as waterways or houses nearby
High - sensitive areas such as waterways or houses are nearby

Ranked - Possible Organic Management Solutions for your Context:

1st	Bay or Windrow Composting (with Mechanical Support)
2nd	Aerated Static Pile Composting (with Mechanical Support)
3rd	Small Scale Composting (Manual)
4th	Small Scale Anaerobic Digestion
5th	In-vessel Compost
6th	Mulch and Woodchip
7th	Animal Feed
8th	Centralised Anerobic Digestion (Dry)



SWOT Analysis – Bay Composting

Strengths	Weaknesses
- Already a familiar practice in the Pacific - Well understood, proven technology, with extensive training materials available - Relatively low cost (per tonne) and high capacity form of commercial scale composting - Effectively manages risks of pathogens and plant propagules - Biosolids can be composted in a bay composting facility with controls to ensure pathogens are managed (<i>note: finished compost is not recommend to be used for growing food (in gardens or crop fields). A separate organic facility may need to be established to process this material).</i>	Shredder/chipper, and mechanical turning equipment are expensive to purchase and maintain
Opportunities	Threats
- Increases food security and climate resilience for local communities - Scalable and easy to replicate where there are sufficient organics materials (such as on-farm at a grower co-op / association) and capital investment is available - Could be constructed on capped landfill sites to share hardstand and drainage infrastructure	- There may be cultural barriers to community purchasing compost - Requires behaviour change from community to separate organic materials for collection - Labour, transport, and operating costs mean composting facility is non-viable for amount of material available - Processing costs not covered by product sales and no gate fee available - Pollution of surface and groundwater due to poor design and operation - Odour complaints due to poor process design and operation - Equipment provided is not used, or is put to other uses

Formation

Processus de contrôle et impacts sur l'environnement

Construction de bâtiments

Possibilités d'expansion limitées

SWOT Analysis – Aerated Static Pile Composting

Strengths	Weaknesses
- Well understood, proven technology, with extensive training materials available - Relatively low cost (per tonne) and high capacity form of commercial scale composting - Requires less turning than windrow composting - Improved control of process and impacts on local environment - Effectively manages risks of pathogens and plant propagules - Biosolids can be composted in an aerated static pile composting facility with controls to ensure pathogens are managed (<i>note: finished compost is not recommend to be used for growing food (in gardens or crop fields). A separate organic facility may need to be established to process this material).</i> - Shredder/chipper, and mechanical turning equipment are expensive to purchase and maintain - Requires a large area and large amounts of fresh water - Can pollute air and water if poorly built or managed - Requires impermeable hardstand and drainage, which can be expensive to install	Shredder/chipper, and mechanical turning equipment are expensive to purchase and maintain
Opportunities	Threats
- Could be constructed on capped landfill sites to share hardstand and drainage infrastructure - There may be cultural barriers to community purchasing compost - Requires behaviour change from community to separate organic materials for collection - Labour, transport, and operating costs mean composting facility is non-viable for amount of material available - Processing costs not covered by product sales and no gate fee available - Pollution of surface and groundwater due to poor design and operation - Odour complaints due to poor process design and operation - Equipment provided is not used, or is put to other uses	- There may be cultural barriers to community purchasing compost - Requires behaviour change from community to separate organic materials for collection - Labour, transport, and operating costs mean composting facility is non-viable for amount of material available - Processing costs not covered by product sales and no gate fee available - Pollution of surface and groundwater due to poor design and operation - Odour complaints due to poor process design and operation - Equipment provided is not used, or is put to other uses

Processus de contrôle et impacts sur l'environnement

Construction plus rapide

Adaptable au débit de matériaux

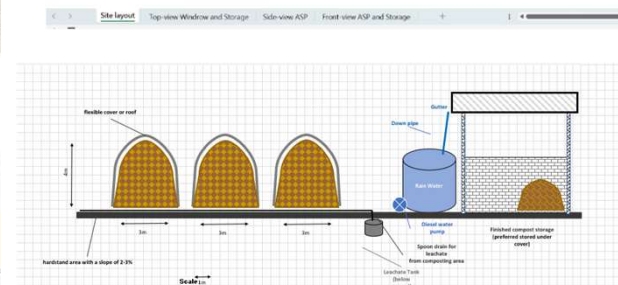
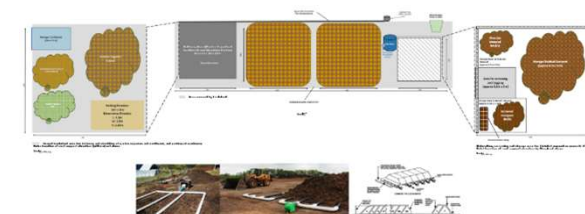
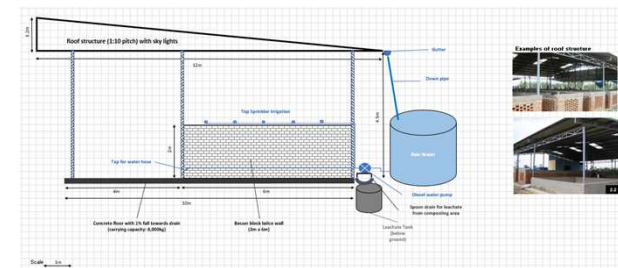
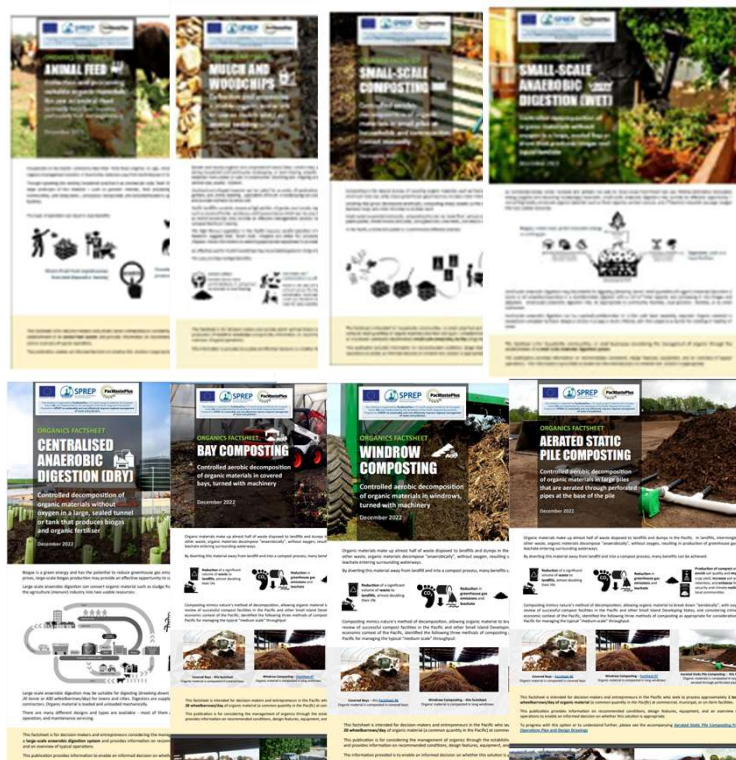
Ressources Disponibles

Questions:

- 1 What is your weight of organic material to be processed daily?
- 2 What is the "Carbon" v "Nitrogen" ratio of your organic materials?
- 3 What is your main source of Nitrogen input?
- 4 How much budget is available for establishing facilities and equipment?
- 5 How much budget is available for ongoing operations (excluding labour)?
- 6 How much labour is available (including volunteers)?
- 7 What level training do your staff or volunteers have?
- 8 What level of workshop support do you have for equipment maintenance and servicing?
- 9 How sensitive is your surrounding area?

Ranked - Possible Organics Management Solutions for your Context:

1st	Small Scale Composting (Manual)
2nd	Bay or Windrow Composting (with Mechanical Support)
3rd	Small Scale Anaerobic Digestion
4th	Aerated Static Pile Composting (with Mechanical Support)
5th	Mulch and Woodchip
6th	Animal Feed
7th	In-vessel Compost
8th	Centralised Anaerobic Digestion (Dry)



 FRAMEWORK Standard Operating Procedure – Bay County [your facility] Organics Processing Facility Date of last revision: _____	 FRAMEWORK Standard Operating Procedure – Bay County [your facility] Organics Processing Facility Date of last revision: _____	 FRAMEWORK Standard Operating Procedure – Bay County [your facility] Organics Processing Facility Date of last revision: _____
---	--	---

Template for Monitoring Compost Process Static Pile

This initiative is supported by **PacWastePlus** a 12 month project funded by the European Union (EU) and implemented by the Government of the Pacific Regional Environment Programme (SPREP) to sustainably and cost effectively improve regional management of waste and pollution.

Batch Number / Name:	Batch #1	Batch name for Batch										
raw Materials:	Vol (cu ft)	Proportion (%)										
redded garden organic	4.7	53										
g manure	1.2	13										
shen organic	2.4	25										
redded cardboard	1.3	14										
	error	0										
	other	0										
organic	type	0										
material	include	0										
name	of	0										
batch	name	0										
volume of material composted:	3.6	m³										
are mixed / started:	20/02/22	error date batch started										
are composting finished:	24/02/22	error date batch finished										
are composted:	104											
are cold / used:	17/02/22	error date compost cold										
are composted & matured:	207											
composting flowchart:												
ATE	20/02/22	7/02/22	15/02/22	6/3/22	17/03/22	25/3/22	6/4/22	20/4/22	4/5/22	10/5/22	20/5/22	
at of Batch (#)	45	01	60	59	48	51	65	76	90	104	110	125
TEMP (°C)												
t												
p1	5.67	5.31	4.57	4.50	5.36	5.49	5.20	5.77	5.62	5.69	5.66	
p2	5.69	5.26	4.47	4.49	5.20	5.47	5.24	5.70	5.05	5.06	5.04	
mean1	5.66	5.29	4.52	4.53	5.33	5.48	5.22	5.73	5.04	5.63	5.65	
mean2	0.01	0.04	0.07	0.01	0.04	0.01	0.03	0.01	0.02	0.03	0.03	
z (Conductivity (Soluble Salts))												
p1	0.41	0.36	0.31	0.30	0.34	0.28	0.35	0.35	0.44	0.37	0.46	

error date of lab testing

error temperature reading

error pH reading rep 1

error pH reading rep 2

* KOV09 * KOV09

* KOV09 * KOV09

error EC reading rep 1 temperature





ORGANICS MANAGEMENT

Course Introduction and Basic Principles of Composting

Resources to assist decision makers in Pacific Island Countries and Timor-Leste to design and implement successful organics management solutions suitable for their specific scale and context.

BEGIN!

Developed by **ivote**

This initiative is supported by PacWastePlus a 12 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to sustainably and cost effectively improve regional management of waste and pollution.

Organics Management

- Course Introduction and Basic Principles of Composting
- Composting Common Organic Materials in the Pacific and Timor-Leste
- Understanding and Selecting Suitable Organic Management Solutions for the Pacific and Timor-Leste
- Using the Decision Support Tool
- Guidelines and Standards for Composting and Compost Quality for the Pacific and Timor-Leste

Case-Study: Composting

This initiative is supported by PacWastePlus a 12 month project funded by the European Union (EU) and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to sustainably and cost effectively improve regional management of waste and pollution.

May 2022

Problem Being Solved

Food waste is easily managed in Rarotonga, with most families having access to pigs, chickens, and other animals. Landscaping materials and clippings from households, hotels and growers, however, are not as easily managed, with most families and businesses choosing to burn this material. The Tiltawaka Growers Association was started as an informal association by local growers who understood there is a better way to use their "waste" material – by processing it into compost. Not all growers had the space or knowledge to make their own compost, so the association was established. Over the years, the association evolved into a business mode of operation, now operating under Down To Earth Compost N Machinery Ltd. Support from the New Zealand Development and Relief Agency was utilized to purchase equipment and upscale operations.

Design Details

- Operation type: Composting
- Land area: Half acre
- Buildings: 3x5m Workshop, 4x6m finished product storage bay
- Services: Water, power
- Volume product received: 15 t/ week
- Type product received: Primarily landscaping materials and clippings, by-product from fish processing
- Product received from: Hoteliers, fish processing, growers. Dropped off at facility.
- Processing system employed: Large pile open window
- Volume product made: 10 m3/ week (average)
- Cost sale of product: NZD\$200/ m3
- Who purchases product: Home gardeners, flower orchards, hoteliers
- Operating expenses: Labour, diesel, oil, water, maintenance
- Full list of equipment / cost:
 - 8 tonne excavator, NZD\$43,000
 - 12 inch chopper, NZD\$60,000
 - Generator, NZD\$43,000
 - Small plant such as temperature probe, chainsaws, tools, sprayer system, slurry tank, NZD\$10,000
 - Staff number: 3
 - Community engagement: Word of mouth
 - Owner support: New Zealand Development and Relief Agency to set up facility, NZD\$400,000
 - Government support: None

Case-Study: Compos

May 2022

Design Details

- Operation type: Composting
- Land area: Half acre
- Buildings: 3x5m Workshop, 4x6m finished product storage bay
- Services: Water, power
- Volume product received: 15 t/ week
- Type product received: Primarily landscaping materials and clippings, by-product from fish processing
- Product received from: Hoteliers, fish processing, growers. Dropped off at facility.
- Processing system employed: Large pile open window
- Volume product made: 10 m3/ week (average)
- Cost sale of product: NZD\$200/ m3
- Who purchases product: Home gardeners, flower orchards, hoteliers
- Operating expenses: Labour, diesel, oil, water, maintenance
- Full list of equipment / cost:
 - 8 tonne excavator, NZD\$43,000
 - 12 inch chopper, NZD\$60,000
 - Generator, NZD\$43,000
 - Small plant such as temperature probe, chainsaws, tools, sprayer system, slurry tank, NZD\$10,000
 - Staff number: 3
 - Community engagement: Word of mouth
 - Owner support: New Zealand Development and Relief Agency to set up facility, NZD\$400,000
 - Government support: None



SPREP SUPPORT

