



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.**

ORGANICS FACTSHEET

ANIMAL FEED

Collection and processing suitable organic materials for use as animal feed (primarily fresh food organics, particularly fruit and vegetables)

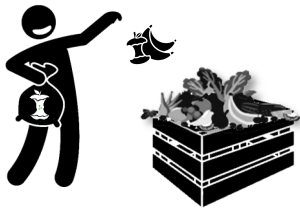
December 2022



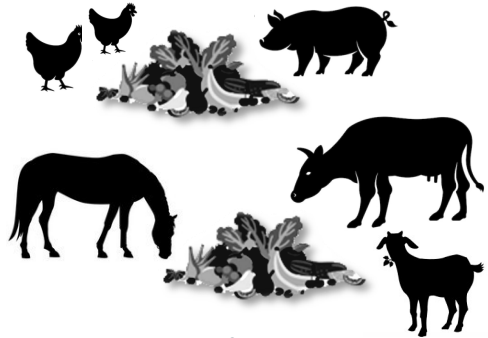
Households in the Pacific commonly feed their fresh food organics to pigs, chickens and other animals. This is an effective organics management solution; it diverts the material away from land disposal or burning into a beneficial use.

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



This factsheet is for decision-makers and private sector entrepreneurs considering the management of organics through the establishment of an **animal feed system** and provides information on recommended conditions, design features, equipment, and an overview of typical operations.

This publication enables an informed decision on whether this solution is appropriate.

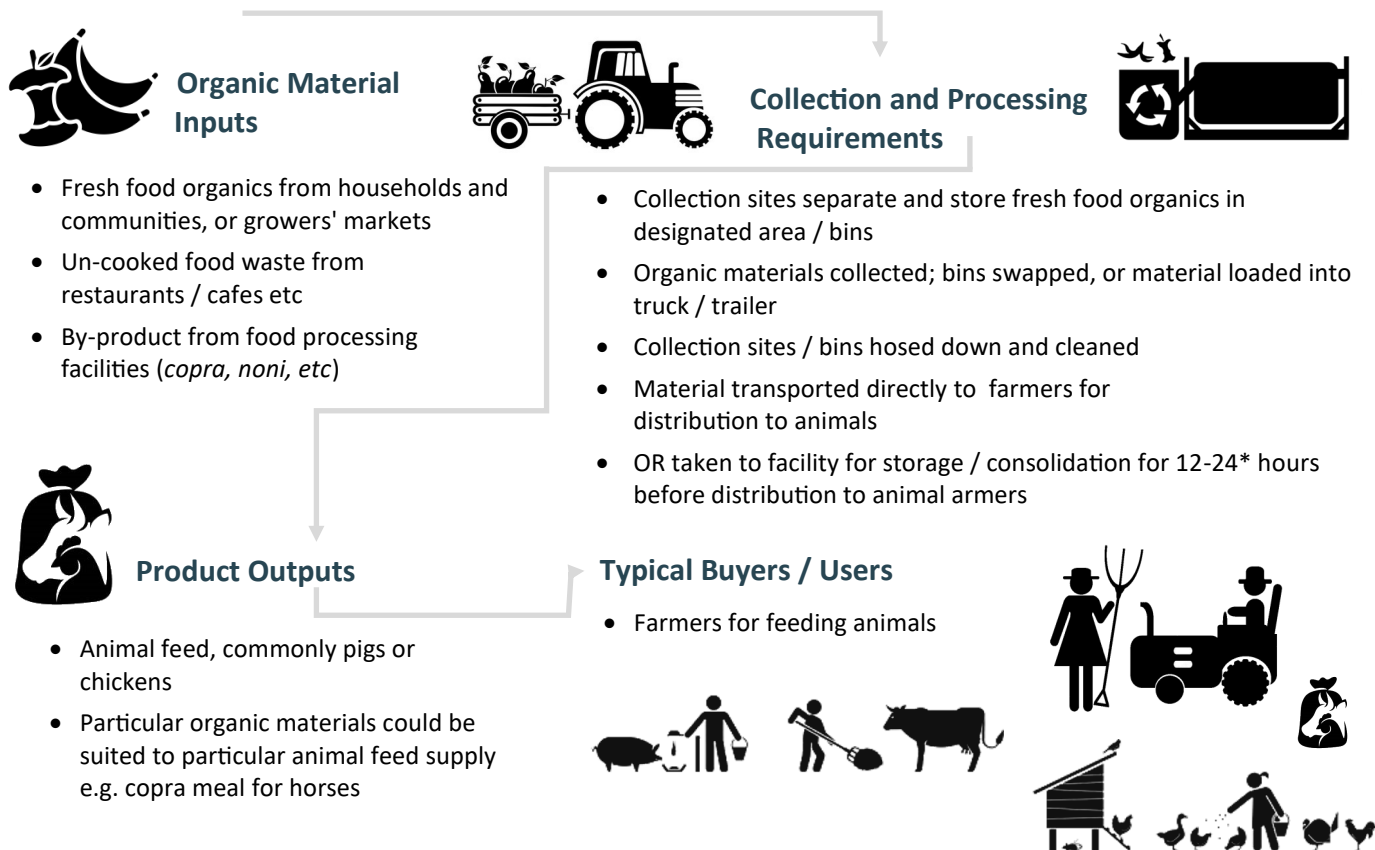


The establishment of an animal feed system is an organics management solution most suited to a situation where:

- fresh food organics makes up a large portion of waste being disposed, or this material is being burnt or otherwise discarded
- fresh food organics can be separated at specific sites (*i.e., growers' markets, food processing facilities, households, restaurants*) and collected in designated bins or containers, with minimal contamination from plastic wrapping or other waste items*
- a suitable collection vehicle is available to transport the expected quantity of fresh food organics from collection points to buyers or end users
- water, hoses, and drainage are available for washdown of collection areas and collection bins
- buyers or users of the animal feed are identified (*i.e., pig or chicken farmers, and animal husbandry facilities*), who will purchase / receive the amount of product expected. As a general rule, 1 tonne / day of fresh food organics will feed approximately 500 pigs (*1 pig eats 2kg /day*).

*** Fresh food organics can also be separated and diverted for animal feed once they have been received at a disposal site. This requires dedicated staff to collect and separate the material from other waste. This process can be more labour intensive, and result is a lower quality input (higher rates of contamination).**

Animal Feed System Overview



Process Overview

Suitable Organic Material Inputs	<ul style="list-style-type: none"> Fresh food organics, particularly fruit and vegetables 	
Unsuitable Organic Material Inputs	<ul style="list-style-type: none"> Meat products, processed food, cooked foods Garden and woody organics 	
Product Output	<ul style="list-style-type: none"> Animal feed 	
Speed	<ul style="list-style-type: none"> 12 – 24 hr 	
Difficulty	<ul style="list-style-type: none"> Very easy, no specialist training required 	
Typical Collection Sites	<ul style="list-style-type: none"> Growers' markets Non-meat & dairy food processing and preparation facilities (<i>i.e., copra, noni</i>) Restaurants / cafes / resorts Households / shared community facilities 	
Processing throughput	<ul style="list-style-type: none"> Very scalable. Limited by estimated volume of organic material to be processed, availability of storage, labour, vehicle capacity, and buyers in local vicinity (<i>if seeking to travel large distances, refrigeration may be required</i>). Suitable scale (<i>for manual operation, without mechanical equipment</i>) = up to 1 tonne, or 20 wheelbarrows per day 	
Typical output production for processing 1 tonne / day input material	<ul style="list-style-type: none"> 1 tonne / day of fresh food organics will feed approximately: <ul style="list-style-type: none"> – 500 pigs (<i>1 pig eats 2kg / day</i>) – 6,500 chickens (<i>1 chicken eats 0.15kg / day</i>) 	
Space requirement for processing 1 tonne / day input material	<ul style="list-style-type: none"> For collecting 1 tonne per day, or 20 wheelbarrows of fresh food organics, an approximately 10m² footprint at the collection site(s) is recommended. The collection site(s) are recommended to house between 15 – 25 bins (<i>with capacity of 40-80kg</i>). Container size is recommended to provide a maximum weight for the number of staff to handle manually e.g., maximum of 40kgs (<i>if 1 collector</i>) or 80kgs (<i>if 2 collectors</i>). 	
Capital Cost \$US	<ul style="list-style-type: none"> US\$<1,000 (<i>excluding collection vehicle / trailer</i>) 	
Typical operating costs US\$/tonne	<ul style="list-style-type: none"> US\$<20 /tonne * <i>for purchase of recommended equipment and facilities (discussed on the following page); excluding collection vehicle / trailer, and site purchase</i> 	
Key Equipment / Requirements	Recommended Elements	Description
	Collection sites	<ul style="list-style-type: none"> Designated collection sites at large producers of fresh food organics (<i>i.e., growers' markets, food processing facilities, households, restaurants</i>) Can be permanent (<i>fixed in place</i>) or a temporary (<i>able to move around different markets or events</i>) Size of the collection site / source separation area and number of bins provided will depend on quantity of organic material expected (<i>details provided above</i>) Located on flat surface, providing for easy transfer of containers to collection vehicles, and undercover or somewhere rainwater can readily drain
	Collection receptacles (bins, containers, tarpaulin)	<ul style="list-style-type: none"> Washable receptacles to provide for collection of fresh food materials Container size chosen to provide a maximum weight for the number of staff to handle manually (<i>e.g., maximum of 40kgs if 1 collector</i>) Containers recommended to have lids to prevent odour / vermin, but lids not so heavy to restrict access use by children, elderly, or people with physical disabilities. Containers or collection area fenced/covered to prevent dog or other animal access.
	Collection vehicle	<ul style="list-style-type: none"> Suitable collection vehicle (<i>truck or trailer</i>) appropriate for collection of the expected quantity, and suitable for road conditions and distances
	Cleaning / washdown	<ul style="list-style-type: none"> Good water supply (<i>with hose</i>) and drainage to wash out bins and / or storage area
	Signage	<ul style="list-style-type: none"> Effective signage and delineation at collection sites to signify organic materials will be used for animal feed, ensuring contamination (<i>from plastic wrappers and other waste materials</i>) is kept to a minimum
	Education materials	<ul style="list-style-type: none"> Education materials (<i>flyers, posters, videos</i>) at collection sites to educate market stall holders, households etc on how to separate organics and store correctly Promotion materials for selling output to local growers
	Staff	<ul style="list-style-type: none"> Collection site can be staffed or unstaffed Staff required for collection and transport of bins
	Procedures and training	<ul style="list-style-type: none"> Standard Operating Procedure for collection / delivery driver, and at collection sites Training recommended for collecting material, cleaning area, manual handling, liaising with farmers, delivering awareness messages
	Optional	<ul style="list-style-type: none"> Roof over collection sites to prevent rainwater Additional storage / consolidation facility (<i>if materials not delivered direct to farmers</i>) Refrigeration system if seeking to store and consolidate inputs for more than 12 hours Bin lifters to assist load the bins onto truck or trailer

SWOT Analysis – Animal Feed

Strengths	Weaknesses
<ul style="list-style-type: none">• Already a familiar practice in the Pacific• Low capital and operational costs Low requirements for space and training Very scalable• Demand for output product• Reduces demand for imported animal feedstock• High portion of waste from sites such as growers' markets and food processing facilities are fresh food organics and so behaviour change for stall holders etc to separate this material from remaining plastics may be easier than for other organics management solutions• Effective circular economy solution	<ul style="list-style-type: none">• If operated badly (food stored for too long becomes putrefied) it presents risk of spreading pathogens/disease Suitable only for a limited range of fresh food organics• Organics are suitable as stock feed for limited time before they putrefy, therefore collection sites must be relatively close to existing animal farms (or refrigeration may be required)• Collection sites (<i>growers' markets etc</i>) may experience increased odour or vermin if not managed and cleaned correctly
Opportunities	Threats
<ul style="list-style-type: none">• Increases food security and climate resilience for local communities• Scalable and easy to replicate in any community where there are collection sites (<i>such as growers' markets etc</i>) and animal farms• Production of animal feed can be a possible organics management solution alongside other solution (<i>typically mulching (factsheet #2)</i>) to provide low-cost, non-specialist organics management solution.	<ul style="list-style-type: none">• An incident occurs where transfer of pathogens to animals or humans is linked to supplied animal feed• Local farmers do not need or not willing to pay for animal feed• Collection sites (<i>growers' markets etc</i>) suddenly seek to use the organics materials for their own uses – threat to animals (<i>hunger</i>)• Local farmers suddenly change their mind on receiving the animal feed – may have a large pile of putrescible material to dispose/discard safely• Farmers perceives high risk to animal health Generators of fresh food materials (<i>growers' markets, food processing facilities, households, restaurants</i>) do not have or are not willing to allocate space for separation and collection of materials, or do not separate material correctly



PacWastePlus Programme

The Pacific – European Union (EU) Waste Management Programme, PacWastePlus, is a 72-month programme funded by the EU and implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP) to improve regional management of waste and pollution sustainably and cost-effectively.

About PacWastePlus

The impact of waste and pollution is taking its toll on the health of communities, degrading natural ecosystems, threatening food security, impeding resilience to climate change, and adversely impacting social and economic development of countries in the region. The PacWastePlus programme will generate improved economic, social, health, and environmental benefits by enhancing existing activities and building capacity and sustainability into waste management practices for all participating countries. Countries participating in the PacWastePlus programme are: *Cook Islands, Democratic Republic of Timor-Leste, Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Republic of Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.*

KEY OBJECTIVES

Outcomes & Key Result Areas

The overall objective of PacWastePlus is “to generate improved economic, social, health and environmental benefits arising from stronger regional economic integration and the sustainable management of natural resources and the environment”.

The specific objective is “to ensure the safe and sustainable management of waste with due regard for the conservation of biodiversity, health and wellbeing of Pacific Island communities and climate change mitigation and adaptation requirements”.

Key Result Areas

- **Improved data collection, information sharing, and education awareness**
- **Policy & Regulation** - Policies and regulatory frameworks developed and implemented.
- **Best Practices** - Enhanced private sector engagement and infrastructure development implemented
- **Human Capacity** - Enhanced human capacity

Our Regional Organics Project

Organic material is biodegradable matter such as kitchen scraps (food); garden cuttings, grass and branches; and paper. Combined data from 13 waste audits in the Pacific found that approximately 40% of waste disposal to our landfills and dumps is organics. When processed correctly (in an “aerobic” or oxygen-filled environment), organic materials can produce valuable nutrient rich products, such as compost, suitable for soil enhancement and food cultivation. However, when intermingled with other waste and disposed in a landfill or dump (an “anaerobic” environment), organic material can release toxic leachate and generate methane gas.

The purpose of this regional project is for Pacific stakeholders, now and into the future, to have practical and resources and decision-support needed to design and implement their own effective organics management solutions, appropriate for their own context and communities. Fiji, FSM, RMI, and the Solomon Islands have chosen organics as a priority or secondary priority of their PacWastePlus country project. The Organics regional project will review existing Organic facilities from the region, undertake technical research, and adopt findings and resources from Country Projects to develop:

- a “Minimum Standard” technical framework for countries to have as a resource when designing and operating their own organics processing facility
- a “decision guidance resource/tool” – to guide informed decision making around processing system design/ technologies, size and equipment requirements, operational processes, etc to suit any context and scale
- on-line training package to guide the application of “decision guidance resource/tool”
- resources to communicate with and empower communities to convert their organic “waste” to a valuable “resource” using appropriate solutions available (i.e., backyard, on-farm, community-level, or national-level organics processing).

Learn more about our regional organics management programme by visiting

<https://pacwasteplus.org/regional-project/organics-management/>

For more information please contact:



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Disclaimer

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Or visit - www.pacwasteplus.org

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