



Australian Government  
Australian Centre for  
International Agricultural Research

PARDI

# ACIAR

Pacific Agribusiness Research for Development Initiative (PARDI)

## Fisheries Program

*Improving Sea Cucumber Processing*

Ravinesh Ram





# Introduction

- Sea cucumber: an Asian delicacy
- Harvested in Fiji for over two centuries





# Introduction

---

- Sea cucumbers are nutritionally rich in protein (43%), minerals (21%), fatty acids (5-61%).
  - Has a number of health benefits and is a traditional remedy for hypertension, asthma, rheumatism, cuts and burns, impotence and constipation.
  - Sea cucumber in perishable state processed to a dry form known as *bêche-de-mer* (BDM).
  - Simple processing – boiling and drying stages
-



# Introduction

---



Australian Government  
Australian Centre for  
International Agricultural Research

PARDI

- Fiji exports 28 commercial species:
    - *Holothuria* sp.
    - *Actinopyga* sp.
    - *Stichopus* sp.
    - *Thelenota* sp.
    - *Bohadschia* sp.
    - *Pearsonothuria* sp.
-



# Main target species

---

## Target species

- *Holothuria scabra* (Sandfish) (US\$ 16-45/kg dry/ Fiji \$US 90/kg) VH
- *Holothuria fuscogilva* (White teatfish) (\$US 45-85/kg dry) VH
- *Holothuria lessoni* (Golden Sandfish) (US\$ 16-45/kg dry/ Fiji \$US 60/kg) H
- *Holothuria whitmaei* (Black teatfish) (\$US 25-65/kg dry) H
- *Thelenota ananas* (Prickly redfish) (\$US 25-65/kg dry) H
- *Stichopus chloronotos* (Greenfish) (\$US 25-65/kg dry) H
- *Actinopyga echnites* (Deep water redfish) (\$US 25-65/kg dry) H
- *Actinopyga mauritiana* (Surf redfish) (\$US 25-40/ kg dry) H

VH – very high value H – High value M- medium value (10 species)

L-Low value (4 species)

---

# Sea cucumber processing



Australian Government  
Australian Centre for  
International Agricultural Research

PARDI



Sea Cucumber (fresh)

Bêche-de-mer (dried)

# Sea Cucumber Processing



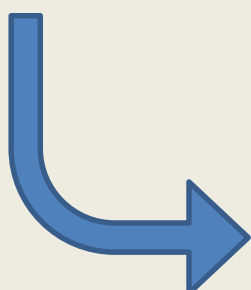
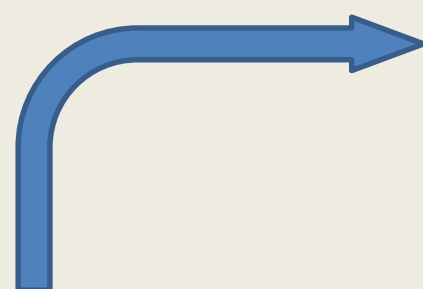
Harvesting

Salting

First Cook

Second Cook

Drying





# Fiji industry challenge

---



Australian Government  
Australian Centre for  
International Agricultural Research

PARDI

- Over – harvesting
  - Lack of resource management in Fiji
  - Tackling post harvest handling and processing in Fiji (Fisher level)
  - Improving product quality for better value
-

# Fiji industry challenge



Australian Government  
Australian Centre for  
International Agricultural Research

PARDI

## Quality Issues of BDM in Fiji



# Fiji industry challenge



Australian Government  
Australian Centre for  
International Agricultural Research

PARDI

## Quality Issues of BDM in Fiji



# PARDI outcomes

---



Australian Government  
Australian Centre for  
International Agricultural Research

# PARDI

## Sea Cucumber processing

- Project finished in 2012
- A survey of processing methods in target countries was completed.
- A ‘best practice’ processing manual was published and distributed to assist processors to improve processing techniques and BDM quality
  - the manual is multi-lingual

Processing sea cucumbers  
into beche-de-mer:  
A manual for Pacific Island fishers



Southern Cross  
University

SPC  
Secretariat  
of the Pacific  
Community

# PARDI outcomes

---



Australian Government  
Australian Centre for  
International Agricultural Research

PARDI

Results provided the basis for new ACIAR Fisheries Program Project '*Benefits of improving postharvest processing of sea cucumbers in the Western Pacific*' (Purcell, SCU)

- a four-year project begun in 2013
  - incorporates research to further advance BDM processing methods and to investigate the potential of novel methods (e.g. retort processing, canning etc)
-

# PARDI outcomes

---



Australian Government  
Australian Centre for  
International Agricultural Research

# PARDI

- Value chain work within PARDI established:
    - opportunity for development of novel non-dried BDM products for SE Asian and Chinese markets
    - links with Pacific island based processors producing novel BDM products
    - links with Australian companies developing and exporting non-dried BDM products to Asia
  - The PhD work of Ravinesh Ram brings these aspects together and in partnership with QDAFF Food Science Centre will assess potential of various novel processing and packaging methods.
  - There is considerable potential for Pacific islands to benefit from development of novel processing methods for BDM and obvious opportunities for further research interventions
-

# PARDI outcomes



Australian Government  
Australian Centre for  
International Agricultural Research

# PARDI

## Trainings on improving sea cucumber processing at community level





# Novel sea cucumber processing



Novel non-dried BDM products from Tonga: vacuum-packed whole (left) and shredded wet product (right)





Australian Government  
Australian Centre for  
International Agricultural Research

**PARDI**

---

*Thank You*

---