



# The challenges in reducing postharvest losses: Lessons from the PNG cocoa and coconut industries

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# Outline



- Introduction
- The case of PNG cocoa industry
- Cocoa postharvest processing
- The cocoa value chain in PNG
- Postharvest losses along cocoa value chain
- Capturing postharvest losses
- Interventions to reduce postharvest losses
- Further challenges despite interventions
- The Way Forward

# FAQ

Where on earth is Papua New Guinea???



# Introduction: Cocoa in the world



- What cocoa means to **the world**



- What cocoa means to **PNG**





# Coconut in the world



- What coconuts mean to **the world**



- What coconuts mean to **PNG**



# Introduction: the postharvest gap



The contrast between:

- chocolate manufacturers in Europe to the humble cocoa farmer in PNG
- Madonna and Rihanna's new found love of coconut water in a bottle to the humble thirsty pacific islander sipping coconut water straight from a young coconut or the copra producer slaving away in the sweltering PNG heat

paints the simple picture of the 2 industries' **postharvest gaps and challenges in PNG and the pacific region.**

# Background – Cocoa/Coconut Industries



- Cocoa and Coconut industries are placed 3<sup>rd</sup> & 4<sup>th</sup> in value and share of major agricultural export industries which contribute to the our national economy from export of **dried cocoa beans, copra, crude copra oil and copra meal** to overseas traders (e.g. buyers, processors and manufacturers)
- From 2001–2009, cocoa and coconut products also contributed about 1.5% and 0.7%, respectively to GDP of PNG
- However, the small magnitude of contributions to GDP does not indicate the true significant political, social and economic role both cocoa and coconut industries play in PNG. An estimated 470 000 households out of 6 million people in PNG depend on these 2 industries to sustain and supplement their subsistence livelihoods

# Background – Cocoa/Coconut Industries



1980

- After 1980, PNG government decided to make major industries responsible for their research needs previously undertaken by the national Department of Agriculture & Livestock (DAL). The Cocoa Board of PNG established the **Cocoa Industry Company** in 1981.

1986

- Name changed to **PNG Cocoa & Coconut Research Institute (PNGCCRI)**, with Cocoa Board and Copra Marketing Board (CMB) as equal shareholders

2003

- **PNGCCIL** was established by the merger of PNGCCRI and PNG Cocoa & Coconut Extension Agency (PNGCCEA) with both industry boards (CMB is now known as Kokonas Industry Koporesin (KIK)) remaining as equal shareholders

- Both the Cocoa Board of PNG and the KIK are respective regulatory bodies in the two industries who issue licenses to interested parties to process and export cocoa and coconut products



# The case of cocoa industry



**COCOA BOARD OF PNG (Cocoa Act)**

**FUNDING FOR  
RESEARCH &  
EXTENSION LEVY  
REMITTED TO PNGCCIL**

**PNGCCIL**

**MANAGEMENT  
& RESEARCH  
LEVI COLLECTED  
BASED ON  
CONTRACT**

**COCOA FARMERS,  
TRADERS/EXPORTERS**

**COCOA BOARD FIELD  
SERVICES DIVISION**

**POSTHARVEST PROCESSING BY COCOA FARMERS,  
TRADERS/EXPORTERS**



# Cocoa postharvest processing: the basics



## 1. Harvesting



## 2. Pod breaking



## 3. Fermenting



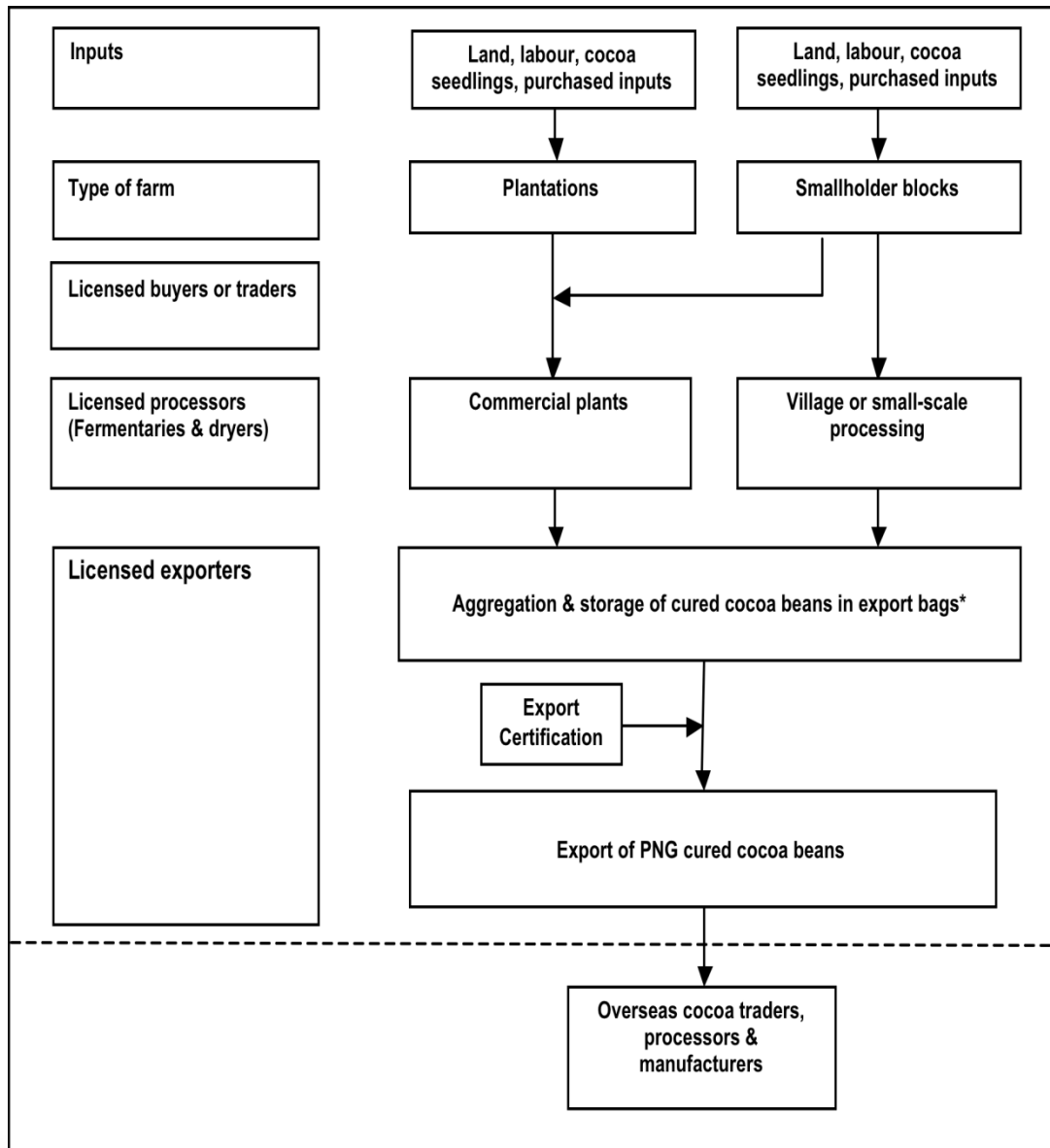
## 5. Sorting/bagging



## 4. Drying



# The cocoa value chain in PNG



← Wet  
bean buyer

← Dry  
bean buyer





# Postharvest losses along value chain

1. Plantations / Smallholder blocks: During harvesting maximum 50% lost to CPB

- Cemented beans and immature pods from CPB



# Postharvest losses along value chain



## 2. Licensed Buyer or Trader: Further estimated 10% loss

- losses from CPB-cemented beans not removed previously during harvest before fermentation
- Losses from over-fermenting after pod-breaking (& market access challenges)





# Postharvest losses along value chain



## 3. Licensed Processors: Estimated 2% loss

- High moisture content from case hardening entrapping moisture in beans (high drying temperatures without resting)
- Low drying temperatures causing further over-fermentation
- Nibs from sorting process





# Postharvest losses along value chain

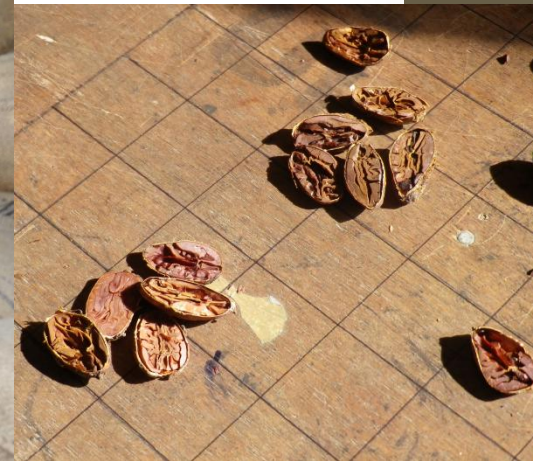


## 4. Licensed Exporter: Further 2% loss

**A chain is only as strong as its weakest link**

Smoke taint on beans from faulty kiln-dryers (10% premium fine/flavour loss)

High moisture from inadequate drying results in further losses from mouldy beans rejected by buyers



# Capturing postharvest losses



| Value chain                      | Postharvest losses  | How losses are tracked  |
|----------------------------------|---|---|
| Plantations / Smallholder blocks | <ul style="list-style-type: none"> <li>50% of pods containing beans can be lost to CPB</li> <li>CPB infestation is due to poor farm management (sanitation)</li> </ul>  | <ul style="list-style-type: none"> <li>Assumed loss from decrease in annual production collected by Cocoa Board from Export volumes recorded in delivery note</li> </ul>  |
| Licensed Buyer or Trader         | <ul style="list-style-type: none"> <li>10% losses from CPB-cemented beans not removed before fermentation (from research)</li> <li>Losses from over-fermenting (&amp; market access challenges) Lack of knowledge on importance of proper fermentation</li> </ul>                                     | <ul style="list-style-type: none"> <li>Losses not directly tracked at this level by industry. Estimate was collected during provincial visits from traders</li> <li>Pressure to meet fermentry volumes specified in contract results in blending of good and bad quality beans sold to dry bean dealer / exporter</li> </ul>  |
| Licensed Processors              | <ul style="list-style-type: none"> <li>High moisture content from case hardening entrapping moisture in beans (high drying temperatures without resting)</li> <li>Low drying temperatures causing further over-fermentation</li> <li>Lack of knowledge regarding importance of slow drying</li> </ul> | <ul style="list-style-type: none"> <li>% losses not recorded by the industry but discussed with processors during provincial visits</li> </ul>  |
| . Licensed Exporter              | <ul style="list-style-type: none"> <li>[10% loss due to smoke taint on beans from faulty kiln-dryers – ICCO fine/flavour status loss]</li> <li>High moisture from inadequate drying results in further losses from mouldy beans rejected by buyers</li> </ul>   | <ul style="list-style-type: none"> <li>% of total volume sold as non-FAQ obtained from exporters delivery note supplied to Cocoa Board (not effective)</li> <li>% lost as rejected beans detected by exporters' assessors obtained from exporter</li> <li>Exporter advises % loss of contracted volume reported by buyers' due to mouldy beans by overseas buyer</li> </ul> |

# Interventions to reduce postharvest losses



## COCOA BOARD:

### ❖ Quality Control System

- Postharvest processing is strictly defined and controlled by PNG Cocoa Board
- All fermentries (cocoa dryers and fermenting boxes) are registered and inspected annually
- Traceability of cocoa is down to all fermentries as fermentry codes are given during registration which has to be printed on bag upon bagging
- Exporter surveillance and Joint Final inspection conducted with our quarantine authority NAQIA for phytosanitary certification
- Only one export quality standard for cocoa is maintained - Fair Average Quality (FAQ)
- New World Bank project focussing on addressing production issues at farm level





# Interventions to reduce postharvest losses cont.



## PNGCCIL:

### ❖ Cocoa Research Development & Extension

- Programs in PNGCCIL: Cocoa Productivity Improvement; Information & Communication needs of industry; Scaling and Sustainable Production; Postharvest & Marketing System; Enabling Environment
- RD&E special funding and efforts to address CPB which is the main contributing factor to challenges in postharvest processing and losses
- PNCCIL not directly involved in World Bank project to technical knowledge for all project partners

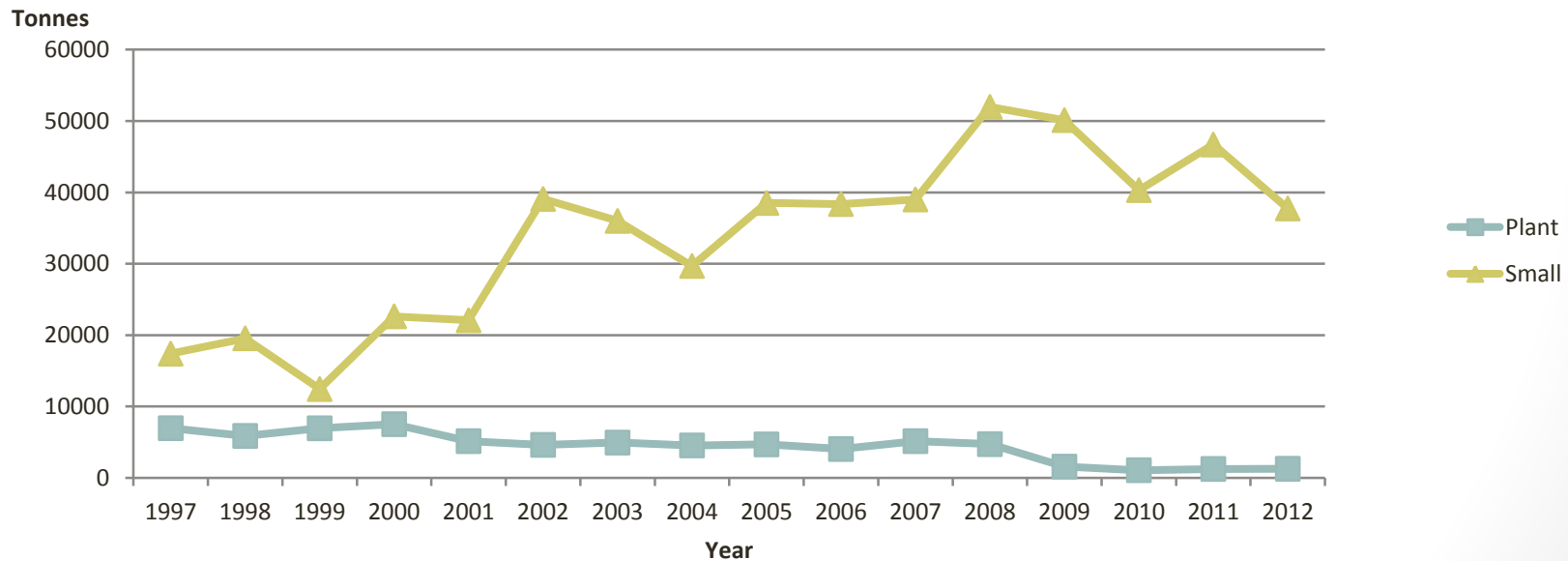


# Further challenges despite interventions



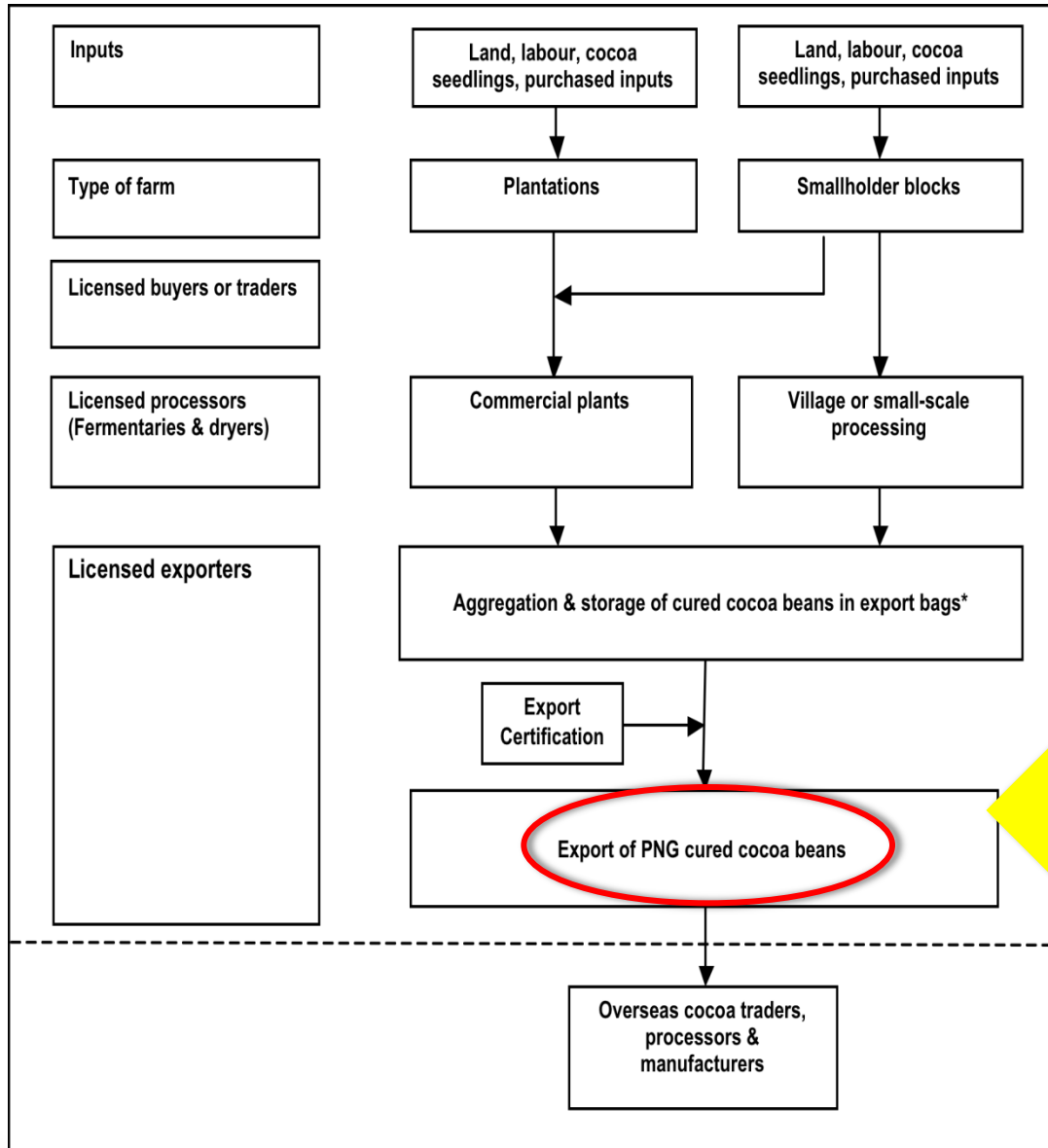
## 1. True production at the farm and plantation level is not captured by industry

Smallholder and Plantation Production Trends: 1997-2012



Source: Cocoa Board of PNG

# Further challenges despite interventions



**Export production is assumed to be 33% of wet bean or total crop production = wet bean:dry bean conversion rate = 0% postharvest loss!**



# Further challenges despite interventions

2. Lack of M&E along value chain despite establishing a traceability mechanism (funding and capacity challenges)
3. Cocoa Act restricting innovative players to address losses in volume (sizes of fermentries & dryers pose challenge for low volumes after 50% loss)
4. RD&E funding constraints limiting research into technologies and extension efforts to reduce postharvest losses
5. Lack of collaboration amongst value chain actors to capture postharvest losses and corrective measures
6. Lack of market information in the industry to develop industry
7. Database of value chain actors in Cocoa Board incomplete or non-existent for some, therefore production data is not collected & true value of loss detected

# The Way Forward



- Apart from addressing the challenges mentioned earlier, Cocoa Board needs to strategize to reinforce its core function as a regulatory and policy player
- Improvements to dialogue and collection of important data from value chain actors
- Draw from lessons in this meeting to inform the industry

# THANK YOU

