



# Lessons from the ACIAR Cassava Value Chains and Livelihood Program

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Cassava Program Leader



# Vision and Mission

Alliance



## VISION

Food systems and landscapes that sustain the planet,  
drive prosperity and nourish people

## MISSION

We deliver research-based solutions that harness  
agricultural biodiversity and sustainably transform food  
systems to improve people's lives in a climate crisis

# Strategic engagement towards food system change



People consume diverse, nutritious and safe **foods**.



People participate in and benefit from inclusive, innovative and diversified agri-food **markets**.



People sustainably manage farms, forests and **landscapes** that are productive, resilient to climate change.



Communities and institutions sustainably use and safeguard agricultural **biodiversity**.

# ACIAR Cassava Value Chain and Livelihood Program

## Policy Brief

Sustainable Production and Marketing of Cassava in

Lao PDR

Summary by

National Agriculture Forestry and Rural Development Research Institute

Cassava Value Chain and Livelihood Program



Newby, J., D. Smith, R. Cramb, Cu Thi Le Thuy, L. Youabee, C. Sareth, S. Sophearith, C. Tanthaphone, W. Hadiutomo, Lê Việt Dũng & Nguyễn Văn Nam. 2020. Can the private sector help deliver improved technology to cassava smallholders in South East Asia? *Knowledge Management for Development Journal* 15(2): 11-30. [km4djournal.org](http://km4djournal.org)

## Can the private sector help deliver improved technology to cassava smallholders in South East Asia?

*Jonathan Newby, Dominic Smith, Rob Cramb, Cu Thi Le Thuy, Laothao Youabee, Chea Sareth, Sok Sophearith, Chanphasouk Tanthaphone Wani Hadiutomo, Lê Việt Dũng and Nguyễn Văn Nam*

The cassava sector in South East Asia is a multi-billion dollar industry, with smallholder producers connected to final consumers via complex and diverse value chains. Public sector research conducted with farmers over several decades has generated technologies with the potential to improve farmer livelihoods. However, translating these research outputs into widespread adoption by farmers, with scaling beyond intervention sites, has had mixed success. This has prompted the question whether private sector actors in the cassava industry can have a greater role in knowledge transfer. We develop a framework in which value chain characteristics, as well as the inherent characteristics of technologies and farming communities, affect the potential for scaling of research outputs and widespread adoption by farmers. We apply this framework to an analysis of six contrasting case studies in four South East Asian countries, ranging from underdeveloped value chains around small-scale processing of animal feed to highly-commercialised international value chains for starch. We find that, in particular contexts, such as when farmer adoption of a technology generates increased supply to a single processor, the processor has an incentive to invest in the extension of research outputs to farmers in its supply zone. In other contexts, however, such as when there is intense competition among processors for smallholder output or where the benefits of the technology are not immediate, there is little incentive for private sector involvement. In all cases, we find that support from a knowledge broker, such as a public sector or non-government actor with the capacity to work with farmers, is also required. Hence, the private sector is not a panacea for generating research impacts at scale.

**Keywords:** sustainable production; agricultural production; value chains; technology adoption; extension; scaling; cassava; smallholders; South East Asia; Cambodia; Indonesia; Laos; Vietnam

## ACIAR Cassava Value Chain and Livelihood Program

Cambodia Laos Vietnam Indonesia

News and Information on cassava, value chains and livelihoods across South East Asia

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## ACIAR Cassava Value Chain and Livelihood Program

Private group · 1.2K members



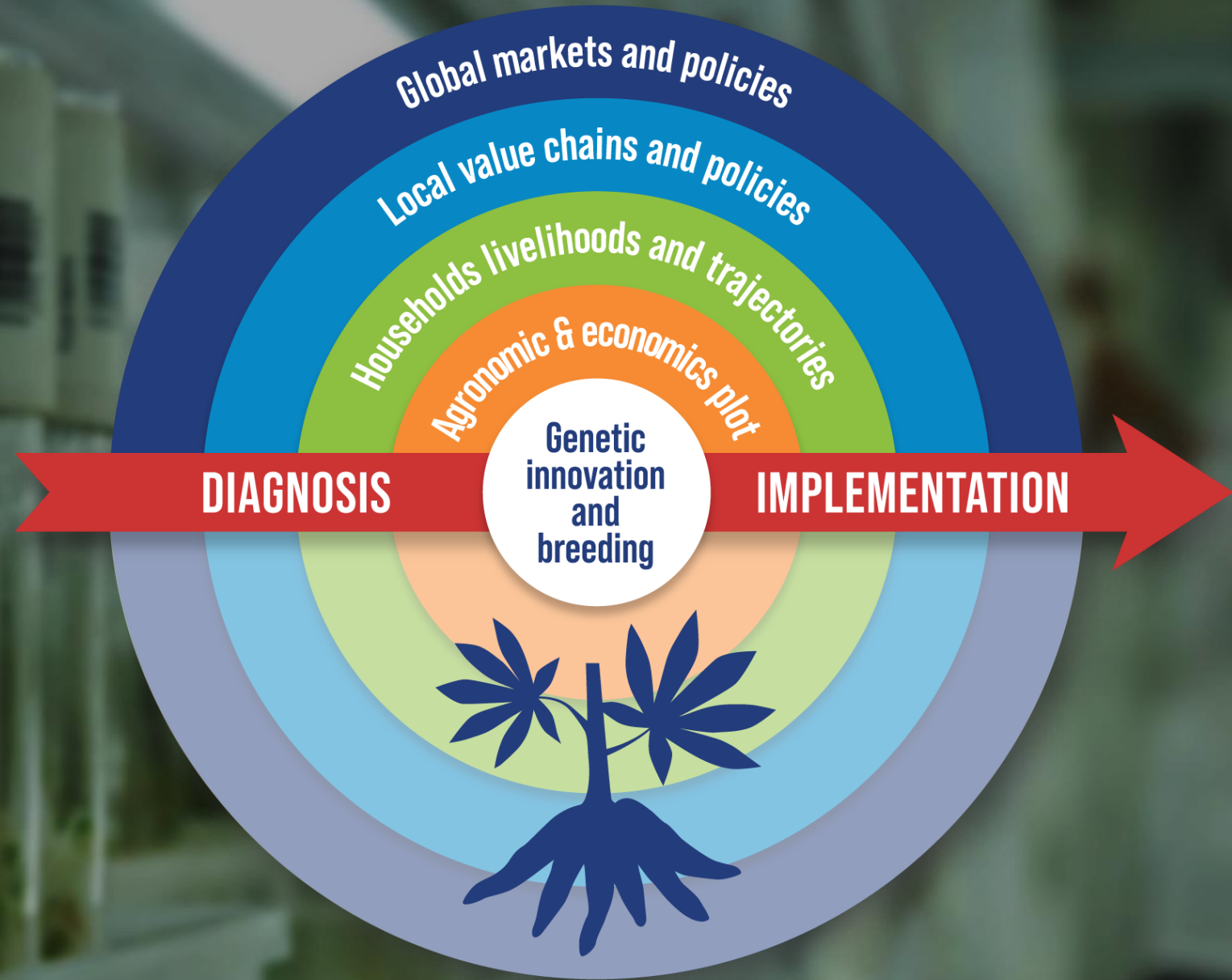
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As a program we work with partners and stakeholder across scales to:

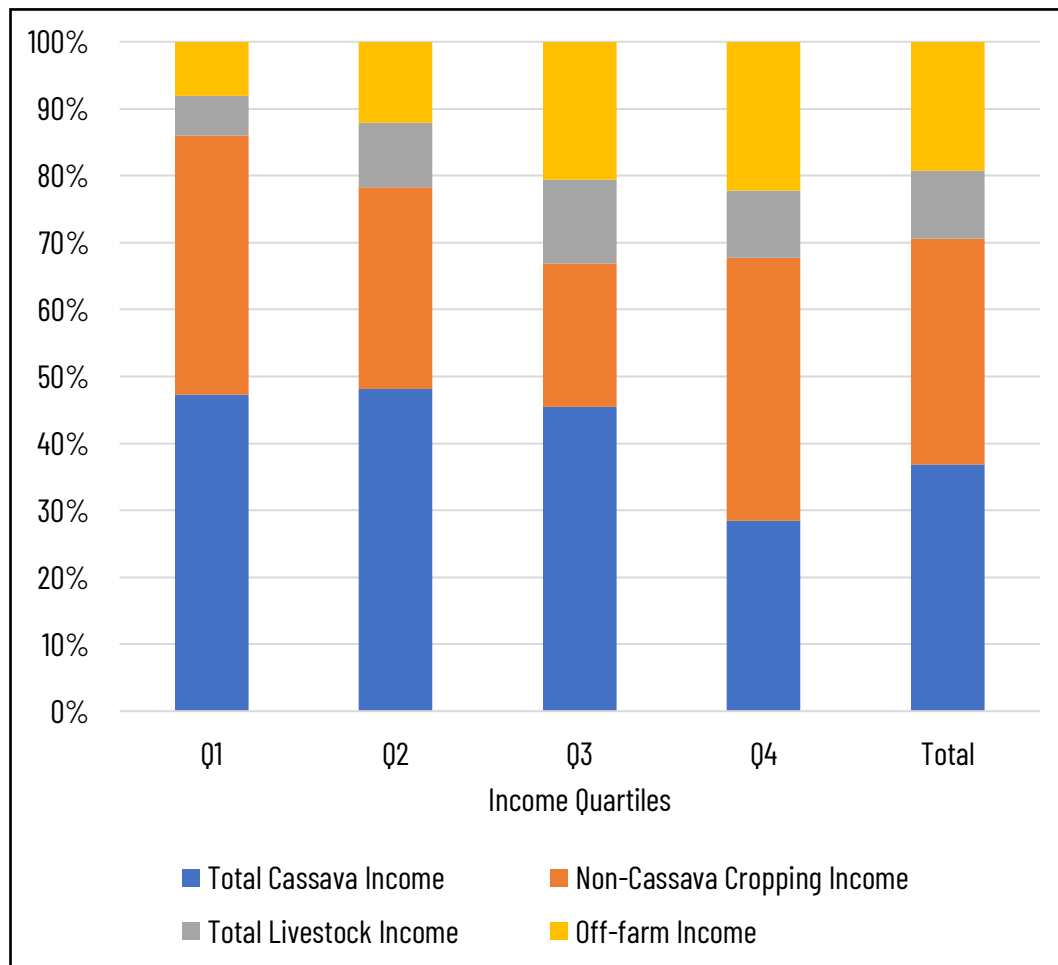
Understand the demand, drivers & trajectories of the cassava sector

Incentives to adopt and scale innovations in different contexts

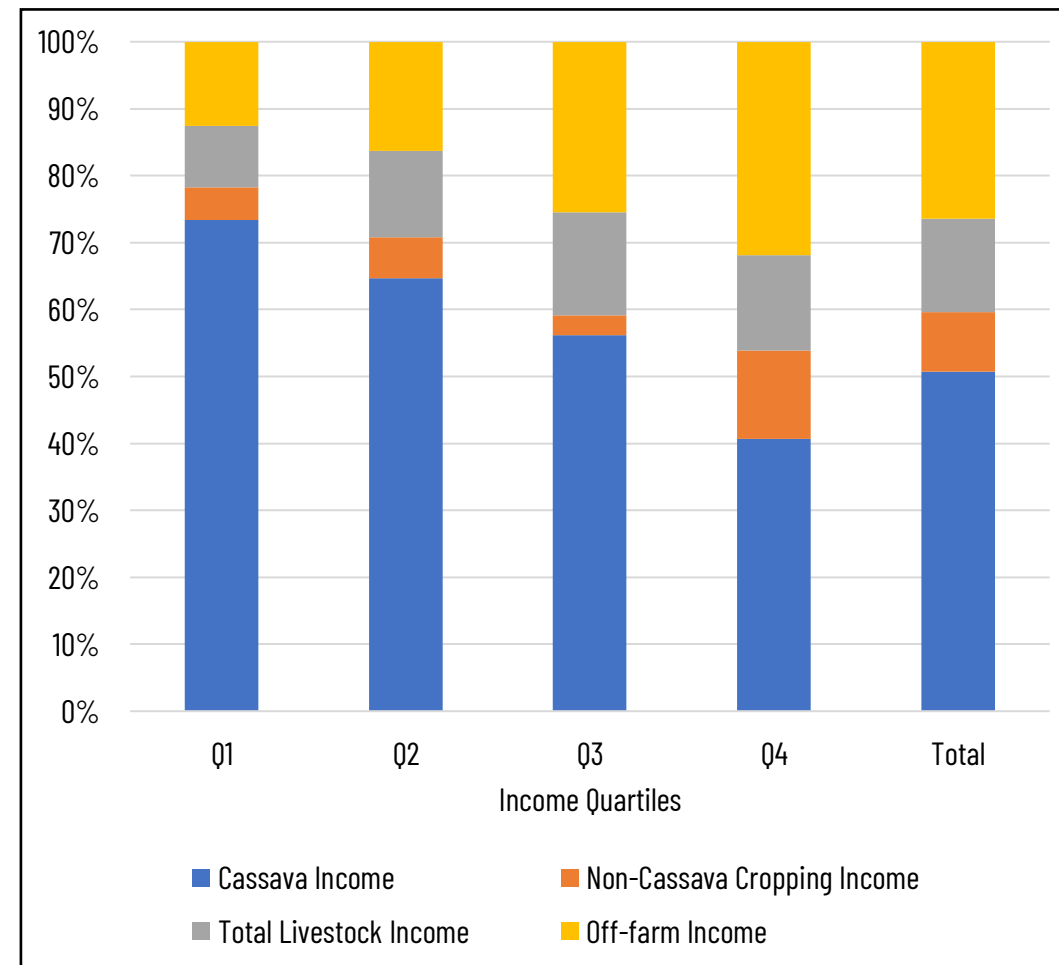


# Contribution to rural livelihoods, especially the poorest households

## Total income



## Cash income



# Connecting to value chains that drive both productivity and sustainability - improve the image of cassava production

## The Cassava-Boom Undermining a Leading Conservation Program

21 April 2023 10:12 AM | Jack Brook | Khuon Narim



A migrant laborer sprays fertilizer on someone else's cassava fields in the forest by Prey Veng village in March 2023. (CamboJA/Jack Brook)



Preah Vihear Province — Sam Sak stands amidst a landscape of cleared earth, surrounded by cassava stems planted like flags to claim their place inside the Kulen Promtep Wildlife

PAPER EDITION • TODAY'S PAPER

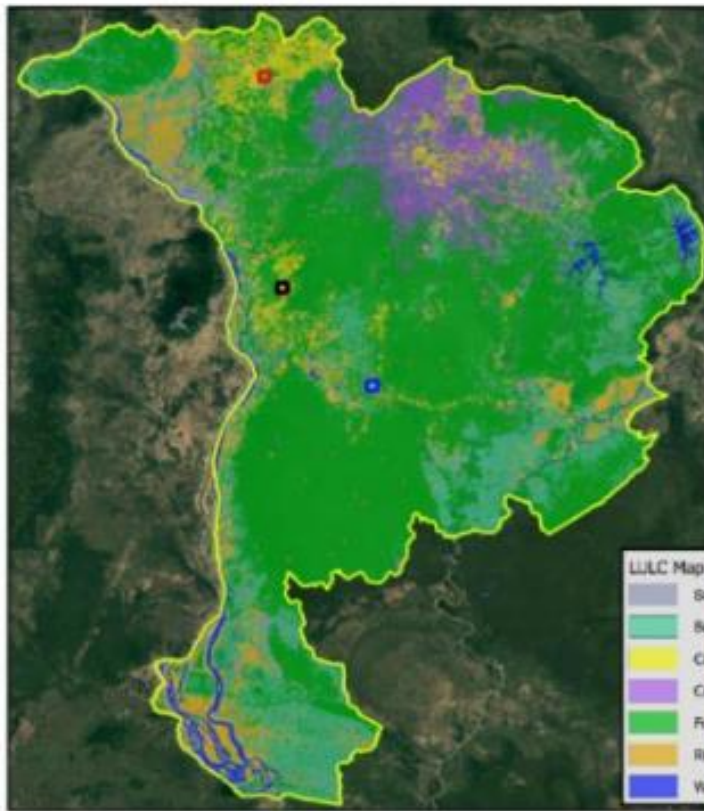
## Cassava push leaves bitter taste in Kalimantan rainforest



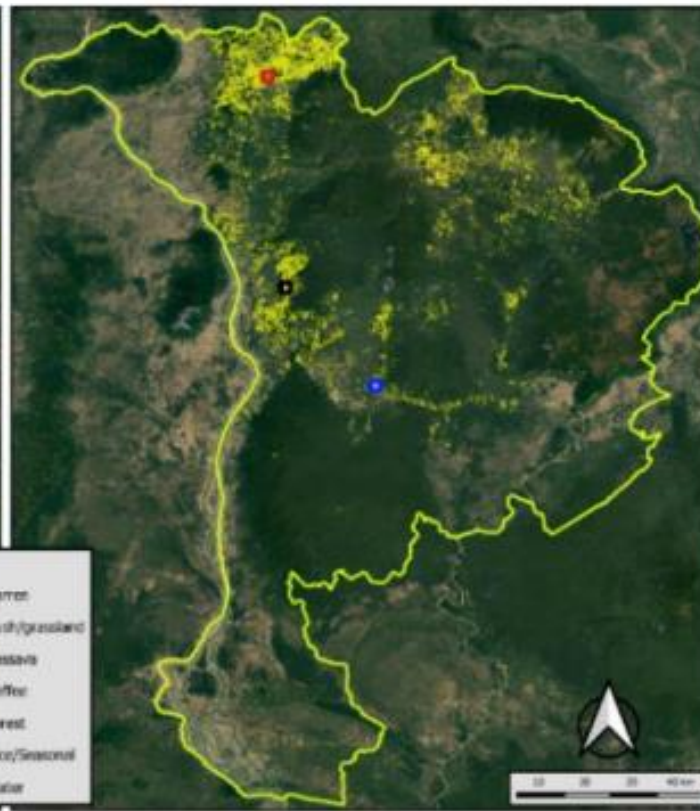
A worker uses a tractor to plow land designated for the food estate program in Tewat Baru, Gunung Mas regency, Central Kalimantan, on March 6, 2021. (Antara/Makna Zaezar)


# Ongoing expansion is not a long-term solution for the industry – sustainable sourcing will become increasingly important.

a) LULC Map in Champassak, Laos




b) Cassava - None Cassava Mapping





**Biodiversity:**  
deforestation-free products on the EU market

18 November 2021  
#EUGreenDeal



*"Trees and forests are true allies in the fight against the climate and biodiversity crises. Trees purify our air, cool our cities, and take up CO2. We need to be their allies too. Our deforestation regulation answers citizens' calls to minimize the European contribution to deforestation and to promote sustainable consumption."*

Frans **Timmermans**, Executive Vice-President for the European Green Deal




*"We must protect biodiversity and fight climate change not only in the EU, but globally, and our consumption should not contribute to global deforestation which is a major cause of biodiversity loss and greenhouse gas emissions. Thus we present the most ambitious legislative measure ever put forward by any country anywhere in the world to curb deforestation and forest degradation and to help us tackle the twin crises of global warming and biodiversity loss."*

Virginijus **Sinkevičius**, Commissioner for the Environment, Oceans and Fisheries

Consumption of beef, palm oil, soy beans, wood, cocoa and coffee in the European Union drives deforestation and forest degradation across the world. The European Union aims to stop this by no longer allowing deforestation-related commodities and products on the market.


European citizens supported EU action to tackle deforestation and forest degradation with **1.2 million responses** to a public consultation.

Deforestation and forest degradation are important drivers of global warming and biodiversity loss. **23% of greenhouse gas emissions** come from agriculture, forestry and other land uses.



**The new deforestation Regulation will:**

*Guarantee to EU citizens that the listed products they buy use and consume do not contribute to global deforestation and forest degradation.*




*Reduce carbon emissions to the atmosphere due to EU consumption and production of the relevant commodities by at least 32 million metric tons a year. This would save at least € 3.2 billion annually and enhance the contribution of forests to tackle climate change.*



*Address illegal deforestation and forest degradation, as well as any deforestation due to agricultural expansion caused by the production of the commodities.*



**CLARIA®**  
Functional Clean Label Starch



CLARIA® Functional Clean-Label Starches empower manufacturers to meet increased consumer demand for cleaner labels enabling formulations with similar functionality to a modified food starch.

INTRODUCTION    DOWNLOADS    APPLICATION    HOW WE APPLY IT


### Introduction to CLARIA® Functional Clean-Label Starch

Also known as  
**Clean-label starch, functional clean label starch, starch**


CLARIA® Functional Clean-Label Starches labels simply as starch yet perform similarly to modified starches.

Tate & Lyle's line of CLARIA® Functional Clean-Label Starches empowers manufacturers to meet increased consumer demand for cleaner labels enabling formulations with similar functionality to a modified food starch. Globally, consumers are demanding convenience, great tasting foods that have recognisable ingredients on the label. In fact, one-in-four new products today is launched with "cleaner-label" claims. All CLARIA® Functional Clean-label Starch products are certified as non-GMO.

At Tate & Lyle, our texturants range now offers a comprehensive array of Non-GMO offerings for all regions, providing our customers with choices to fit their needs. Our **non-GMO ingredients** offer the same functionality as their traditional counterparts without compromising on taste or texture, meaning you can offer your consumers everything they're looking for in the foods and beverages they love.

Ingredion Trends Challenges Applications Ingredients Innovate




Ingredients > Starches > **Functional Native Starch**

## Clean up labels with functional native starch

Our portfolio of more than 25 NOVATION® clean label starches lets you formulate on-trend, clean label products rich in texture and taste, across a broad range of applications

As the pioneer in clean label ingredients, we offer the broadest range of speciality clean label starch solutions and formulation expertise available. Having identified the clean label trend in its infancy and helped turn the trend into a way of life for food manufacturers, we know all there is to know about clean label.

As consumers grow ever-more health conscious, clean labels are becoming increasingly important to them. People want to know exactly what's going into their food. That's why you need simple recipes, with ingredients they recognise and trust.



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Food & Beverage - North America

## Sweeteners

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- Polyol Sweeteners +
- Specialty Sweeteners +
- Sugar +
- Zero Calorie Sweeteners
- Tapioca Syrups
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## Non-GMO\* Tapioca Syrup

A label-friendly swap for corn syrup

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Home > Products & Services > Food and Beverage Solutions > Starches > Tapioca Starch Ingredients


## Tapioca Starch Ingredients

Clean delicious taste and texture with a gluten-free, non-GMO starch



### Tapioca Starch

Tapioca starches from ADM deliver great taste and texture that's also on trend—and satisfies consumer demand for clean label offerings. Non-GMO and gluten-free, our tapioca starches offer all the functionality to deliver superior texture, plus a clean, neutral flavor profile for the ultimate consumer-pleasing taste in your products, especially in applications where the flavor of a traditional starch is not desirable.



FOOD NON-FOOD

## New Product Highlights

Explore our new product highlights with highest performance to catch up food & beverage trends and advance your products to the next level

- D-PERSE® CAP** – the shortcut to transform oil-based ingredient to powder
- Deliver clean label yogurt to health lovers with **Natura® Y808**
- Serving the favorable soup & sauce texture with **GENIGEL® M78**
- KREATION® N-BIND** - an excellent binding ability for plant-based meat

## OUR CUSTOMER BENEFIT PLATFORMS


- CLEAN & ORGANIC**
- HEALTH & NUTRITION**
- CONVENIENCE**
- FUNCTIONAL SOLUTION**
- SUSTAINABILITY**

OFFERINGS

- DELIVERING SIMPLE & NATURAL INGREDIENT SOLUTIONS WITH BETTER PERFORMANCE AND FRIENDLY LABEL.
- DELIVERING ON-TREND SOLUTIONS TO ADDRESS GROWING HEALTH AND NUTRITION TRENDS.
- ENCOMPASSING QUICK SOLUTIONS FOR MORE CONVENIENCE.
- PROVIDING BETTER INGREDIENTS FOR PRODUCT PERFORMANCE AND IMPROVEMENT, ESPECIALLY IN YIELD, PROCESSABILITY AND COSTING.
- CREATING VALUES TO WASTE AND BY-PRODUCTS EMBEDED WITH CORPORATE SOCIAL RESPONSIBILITY ON THE ENVIRONMENTAL CONSERVATION.

PRODUCTS

- ORGANIC TAPIOCA STARCH
- ORGANIC TAPIOCA SWEETENER
- ORGANIC RICE STARCH
- ORGANIC WAXY RICE STARCH & FLOUR
- ORGANIC WAXY RICE STARCH & FLOUR
- WAXY TAPIOCA STARCH
- CASSAVA FLOUR
- RICE STARCH & FLOUR
- SOYBEY POTATO FLOUR
- KUJOU STARCH
- TARO FLOUR
- SAGO STARCH
- ARROWROOT STARCH
- GLUTEN FREE RANGE, RANGY MIX, BUTTER, ESCAROTS & COATING
- PREMIX - STARCH & FLOUR
- TAPIOCA PEARL
- RICE TEE-CEL
- DRACK
- MODIFIED STARCH FOR FOOD & BEVERAGE PRODUCTS
- FERTILIZERS
- ANIMAL GROWTH PROMOTER
- THE MOST PLASTIC STARCH FOR BIOPLASTIC



THAI WAH

CLEAN & ORGANIC

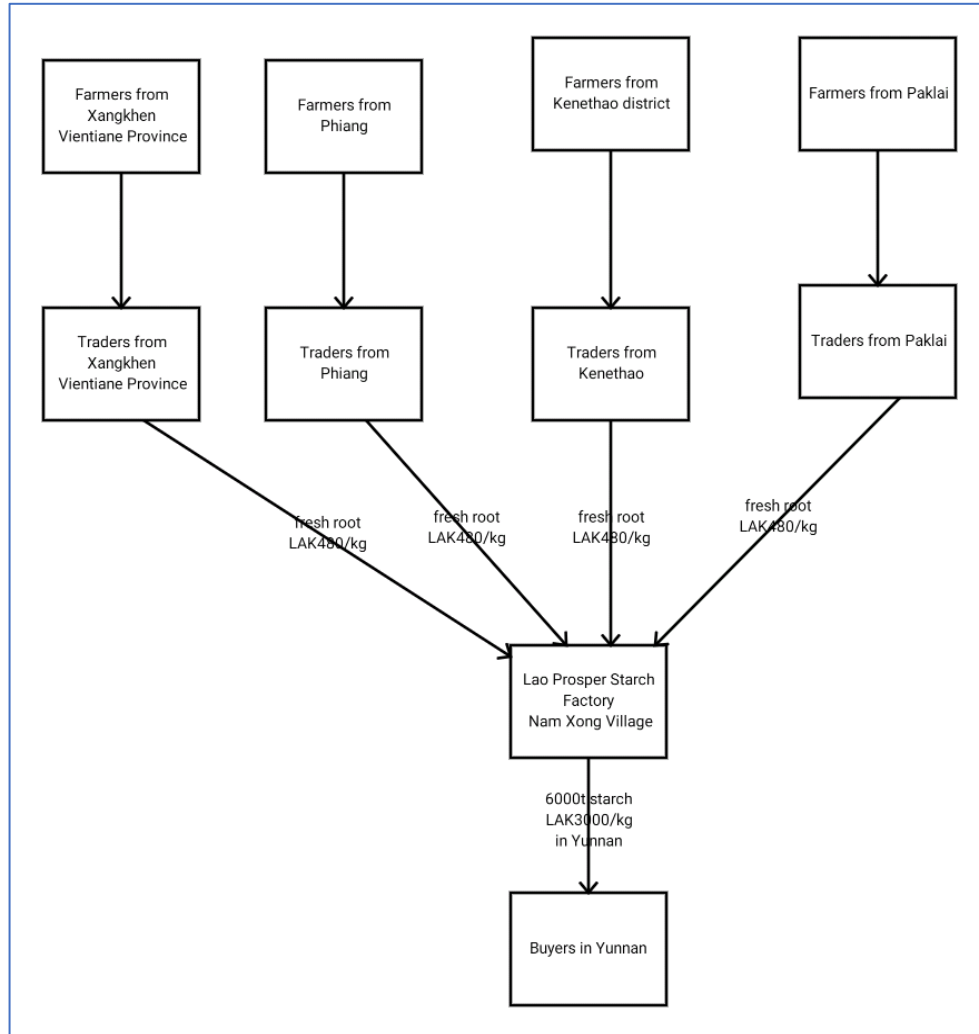
HEALTH & NUTRITION

CONVENIENCE

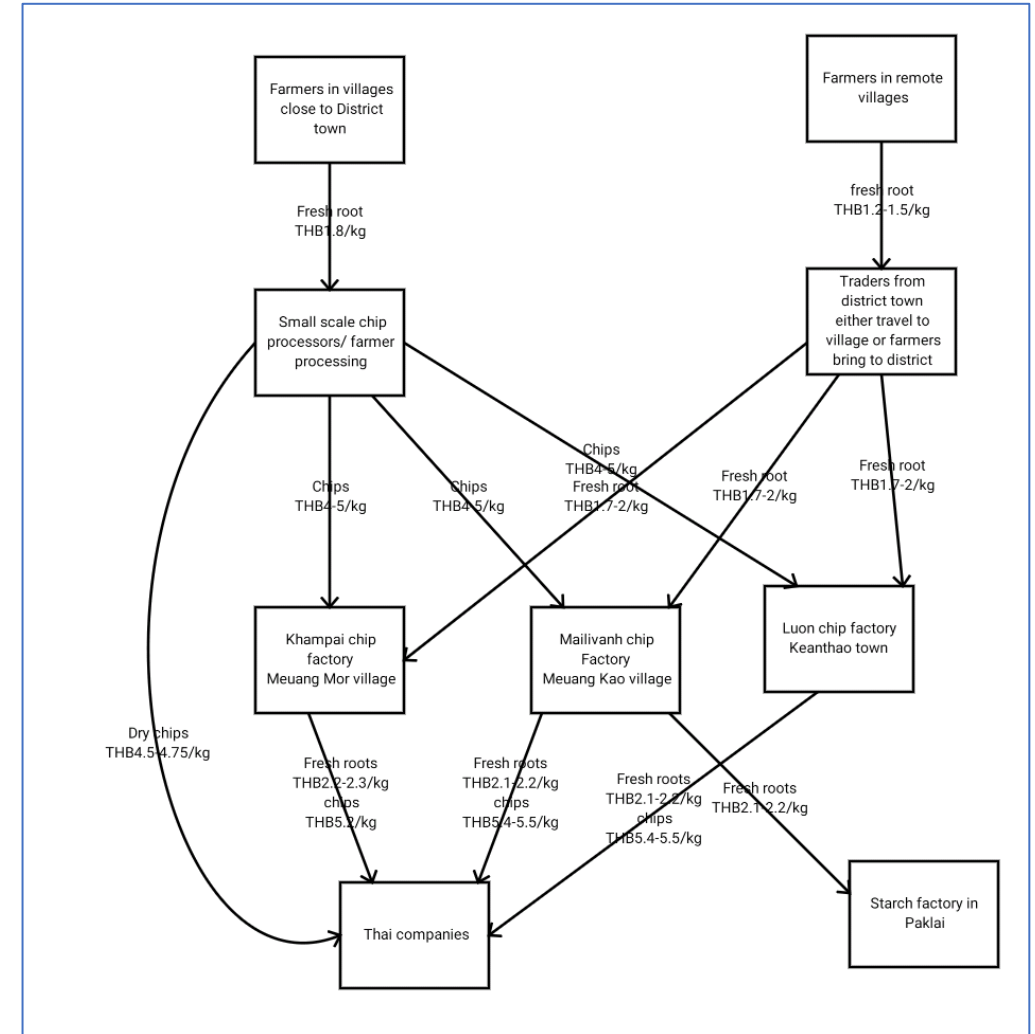
FUNCTIONAL SOLUTION

SUSTAINABILITY

# Structure of the value chain varies between sites and is dynamic impacting entry points and incentives for PPP

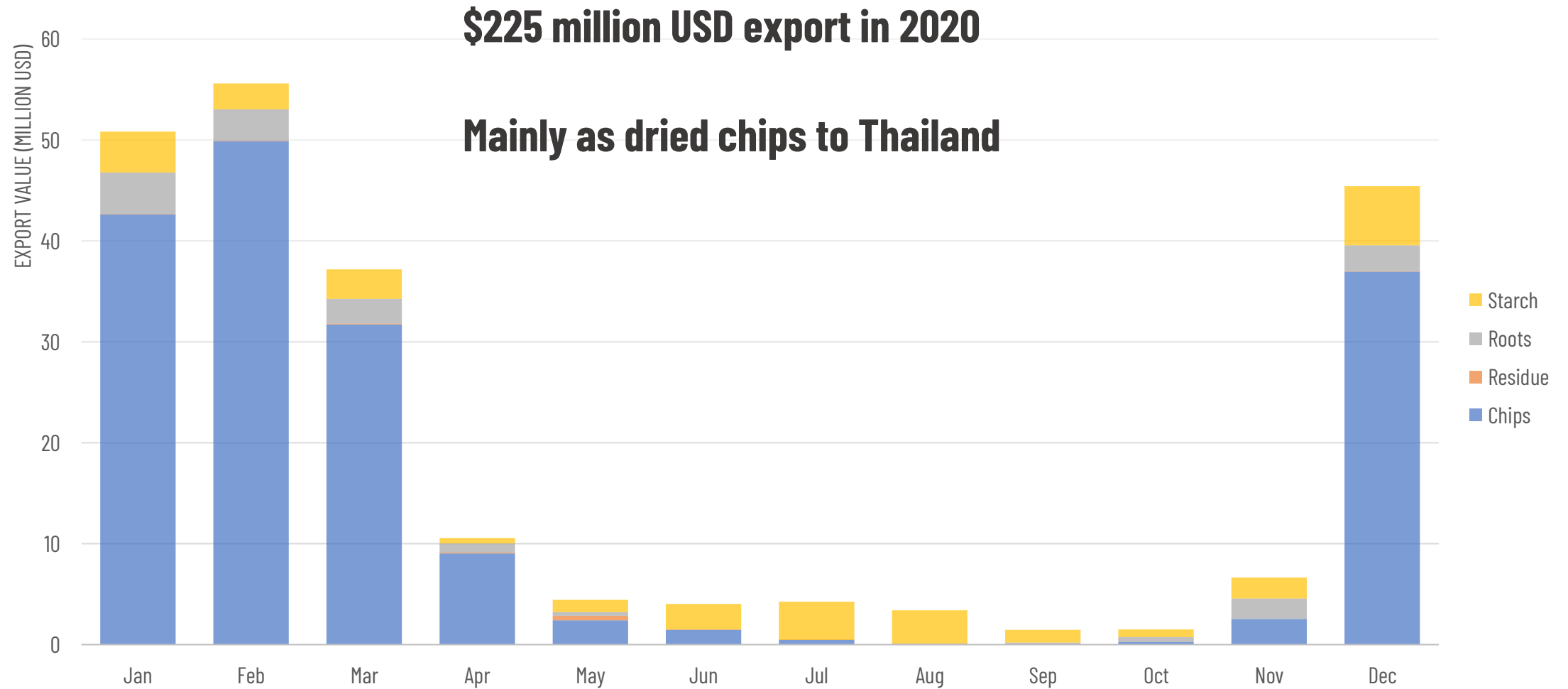


**Paklai, Xayabouli**



**Kenthao, Xayabouli**

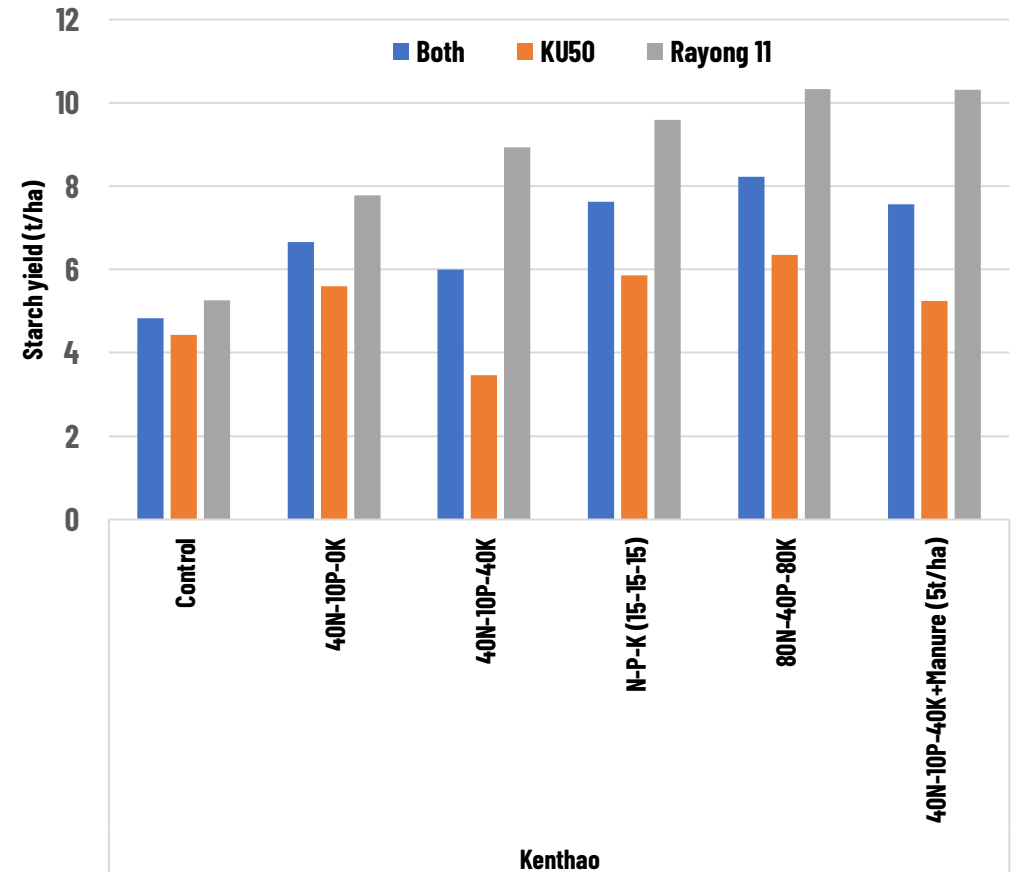
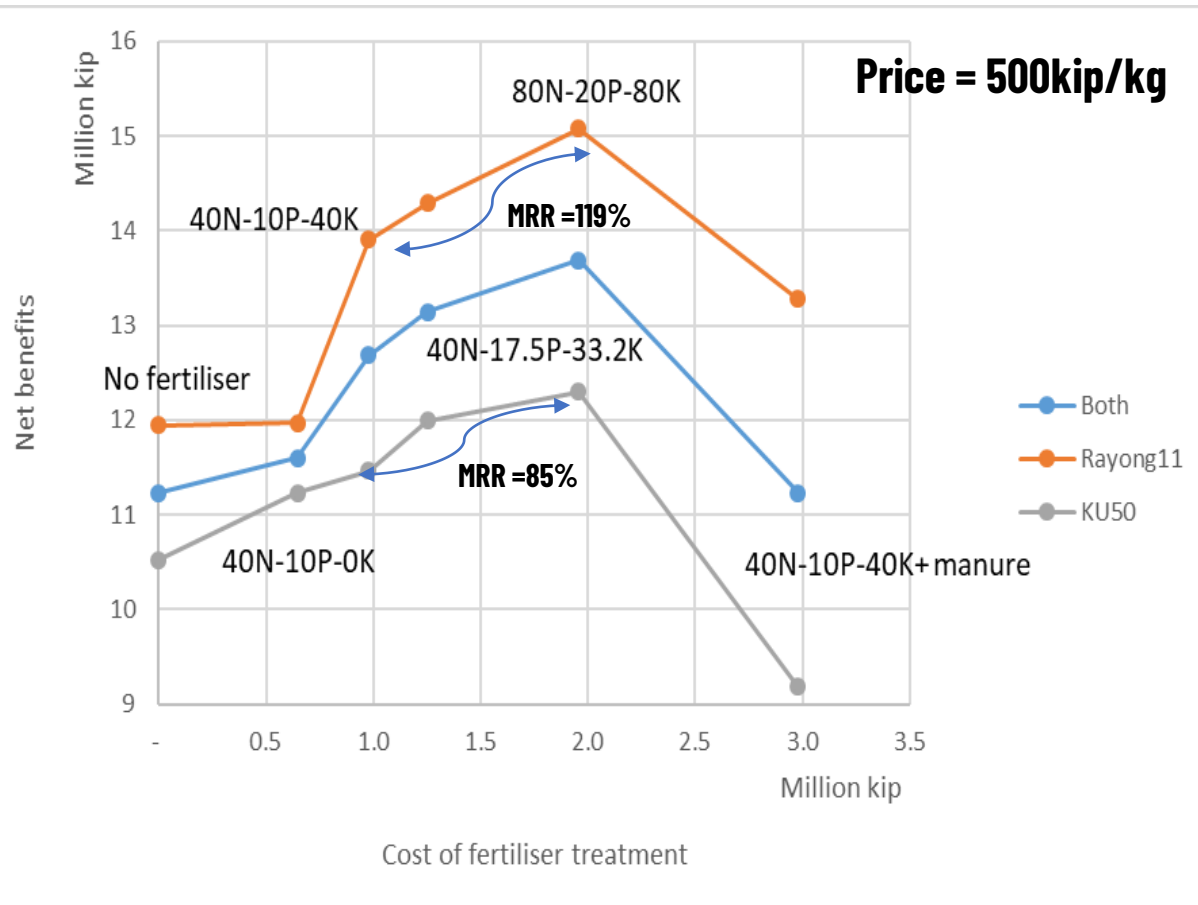
# Laos monthly export value in 2020



# Baseline: Almost zero adoption of fertiliser in project sites in Lao PDR (Xayabouli and Bolikhamxai)

	Bolikhan	Kenthao	Paklai	Viengthong	Total
<b>Do you apply organic fertiliser to your cassava?</b>	1.1%	0.0%	0.0%	0.0%	0.3%
<b>Do you apply inorganic fertiliser to your cassava?</b>	1.1%	0.0%	0.0%	0.0%	0.3%
<b>Do you understand what the NPK values mean on the fertiliser you apply?</b>	1.1%	1.1%	1.1%	0.0%	0.8%
<b>Have you ever seen a fertiliser trial on cassava?</b>	6.7%	4.4%	3.3%	3.3%	4.4%

# Kenthao District example of marginal rate of return (MRR)



# Economic results of demonstrations

District	Paklai	Kenthao	Bolikan	Viengthong
<b>Yield without fertiliser (t/ha)</b>	27.8	24.8	12.3	26.4
<b>Yield with fertiliser (t/ha)</b>	37.2	36.8	21.1	29.7
<b>Difference (t/ha)</b>	9.5	12.0	8.8	3.3
<b>Current price (kip/kg)</b>	540	540	540	500
<b>Cost fertiliser (kip/ha)</b>	1,320,000	1,320,000	1,320,000	1,320,000
<b>Current cassava root price</b>				
<b>Marginal Net Benefits (kip/ha)</b>	3,785,333	5,140,667	3,428,240	313,796
<b>MRR (%)</b>	286.8%	389.4%	259.7%	23.8%
<b>Low cassava root price: 300 kip per ton</b>				
<b>Marginal Net Benefits (kip/ha)</b>	1,516,296	2,269,259	1,317,911	- 339,722
<b>MRR (%)</b>	114.9%	171.9%	99.8%	-25.7%

# Impact of cassava returns

	Without fertiliser	With fertiliser
<b>Material costs (A)</b>	1,600,000	2,920,000
<b>Labour costs (B)</b>	6,420,000	6,660,000
<b>Total costs (A+B = C)</b>	8,020,000	9,580,000
<b>Revenue (D)</b>	16,114,691	21,598,198
<b>Net returns (D-C)</b>	8,094,691	12,018,198
<b>Net returns to household resource (D-A = E)</b>	14,514,691	18,678,198
<b>Labour days (F)</b>	152	158
<b>Net returns per labour day (E/F)</b>	95,491	118,216
<b>Low price scenario</b>		
<b>Revenue</b>	8,335,185	11,171,481
<b>Net returns</b>	315,185	1,591,481
<b>Net returns to household resource</b>	6,735,185	8,251,481
<b>Labour days</b>	152	158
<b>Net returns per labour day</b>	44,310	52,225



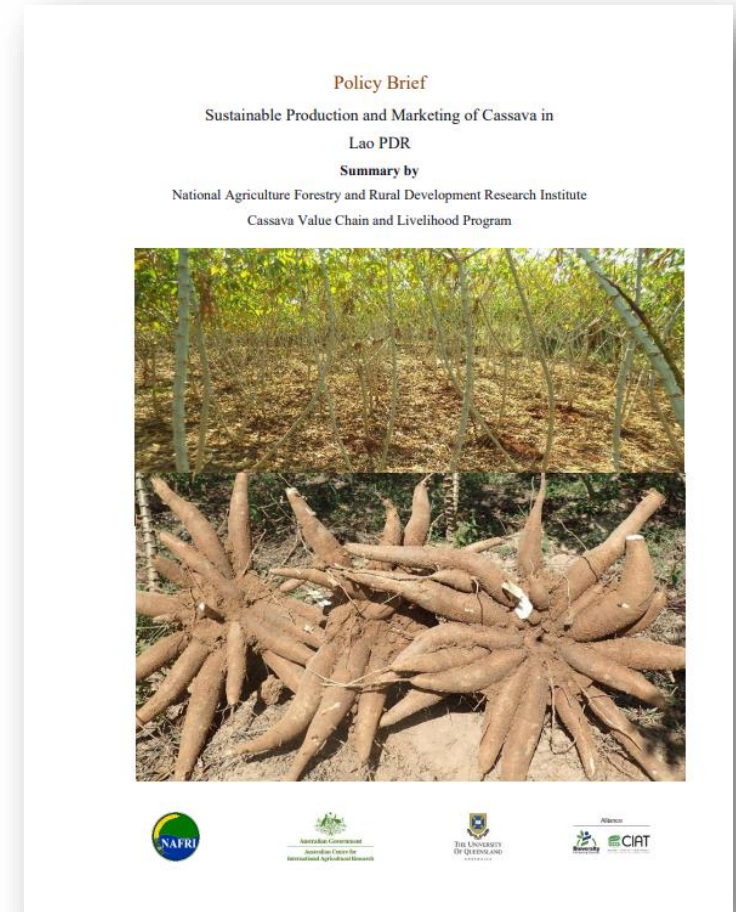
# Investment in research on sustainable cassava systems meeting farmer needs

- Research showed that conservation technologies that have been developed and promoted in the past (including intercropping and grass strips) have not been widely adopted and farmers continue to express a lack of interest once the additional labour requirements become apparent.
- This is common to many sectors with livestock forage systems such as cut-and-carry becoming increasingly unpopular with farmers who now prefer to establish pastures for grazing.
- It is critical that new technologies are developed that address both the sustainability concerns and farmers interests. This is likely to include exploration of rotational systems, the role of mechanisation, and forage-livestock integration.
- This work needs to be conducted both on-station and on-farm and should engage a multidisciplinary team of physical and social scientists



# Conclusion in Policy Brief

- To improve soil health intercropping and contour grass strips were trials in several locations. Farmers lacked interest in continuing to trials these practices due to poor performance and additional labour requirements.
- Similarly, industry was least interested in engaging with these practices given the lags and uncertainty over any benefits they may accrue. These trials did not continue.
- New systems to improve soil health need to be developed with farmers that provide a stronger incentive for adoption and the importance of sustainability highlight to factories who have invested in a particular supply zone.





**Don't continue to push the failures of the past  
unless the context has changed!**



# Thanks!

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