



Alliance



Strengthening cassava research partnerships in Indonesia to address the emerging threats and capitalize on new opportunities

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Vision and Mission



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

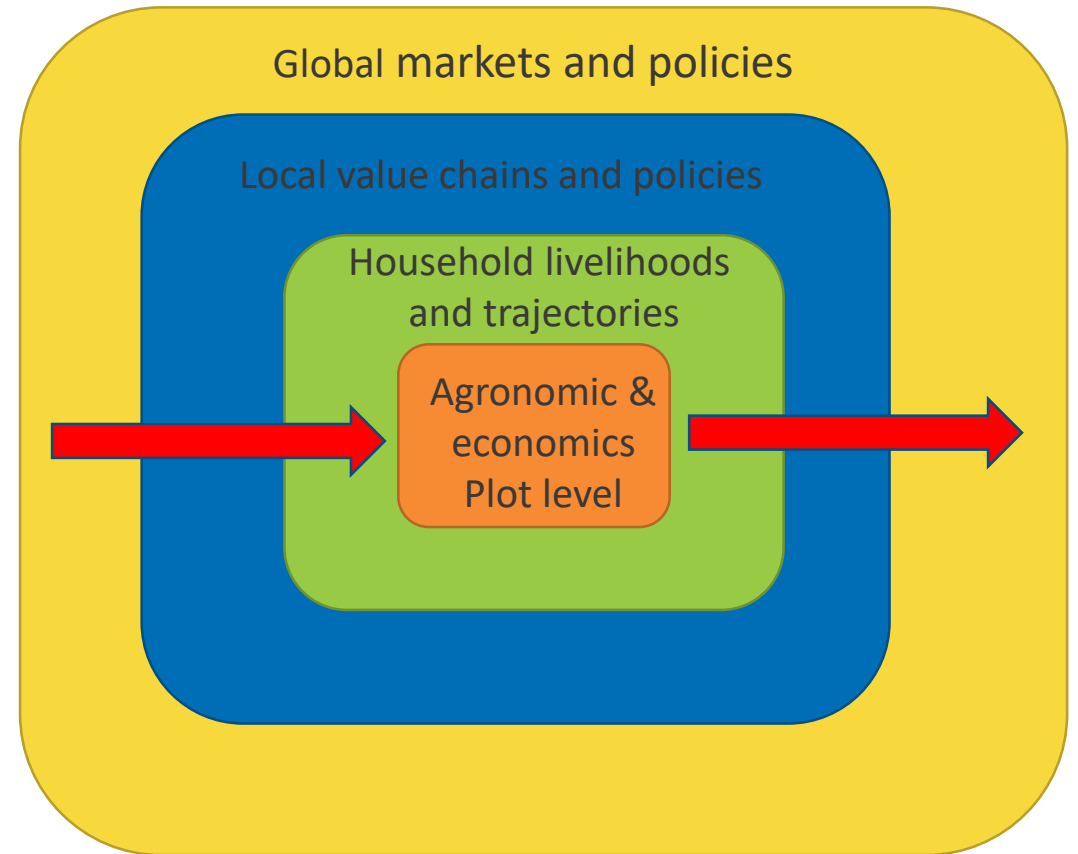
Strategic plan for the cassava program

CIAT's cassava program's ten-year (2018-2028) strategic plan set out the priorities and research areas where we will focus on to create a sustainable cassava production system through **agricultural innovations that will increase cassava production without increasing environmental pressures.**



Framework on the project

1. Global markets and external policies
2. Local value chains and domestic policies
3. Household livelihoods and trajectories
4. Field level agronomic and economic results
5. Implications for household livelihoods
6. Implications for local value chain actors



Livelihood and value chain analysis help understand the incentives for stakeholders to bring technology to farmers in different contexts



Multi-location evaluation and scaling with national & industry partners



Planning with factory staff



Trials on factory land



Agents take best varieties



Demonstration with traders



Demonstration with farmer leaders



Cassava Program's mission and objectives

Mission: Create a sustainable cassava production system through **agricultural innovations** that will increase cassava production without increasing environmental pressures.

Objectives:

1. Ensuring efficient and sustainable production of adequate volumes of cassava for **new value chains/markets** (i.e. High pVA, waxy and small-granule)
2. Alleviating poverty and increasing wealth through **agricultural innovations & unlocking new market growth**
3. Achieving **better health and nutrition** (i.e., low-GI starch) for consumers and producers and
4. Most effectively **using and conserving the natural resource** base upon which all of this depends.



Cassava program working towards a sustainable future

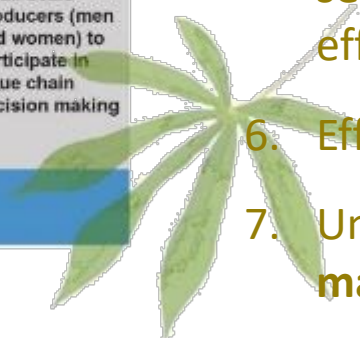
Cassava scientist contributes to the UN sustainable development goals



Cassava Program in Asia

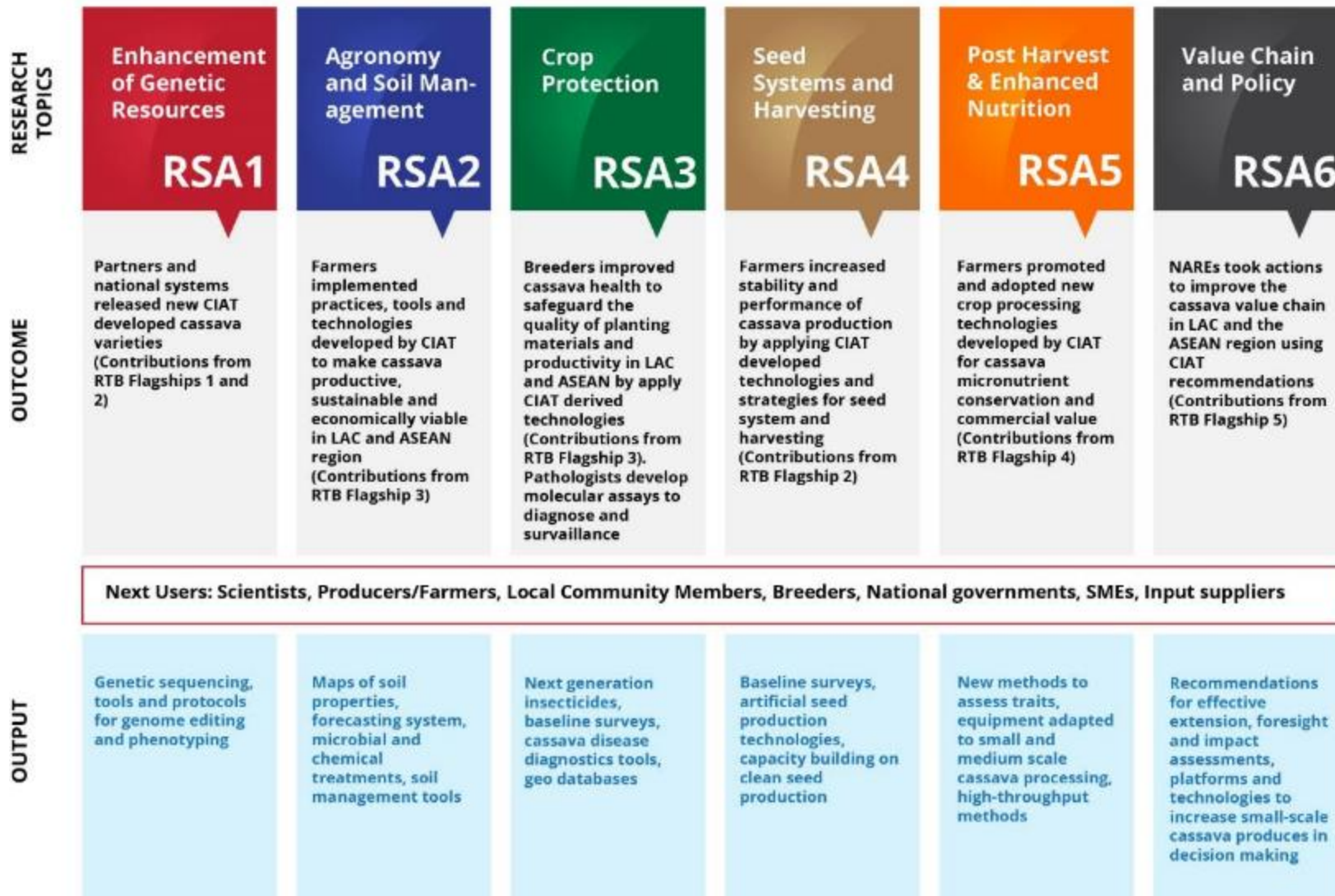


1. Aggressively introduce **700+** LAC germplasm for screening **CWB** and **CMD**
2. Map **cassava varieties** to production areas in Cambodia, Laos and Myanmar
3. Lead breeding efforts to **develop high starch productive varieties** with CMD and CWB resistance
4. Establish a **Pest and Disease surveillance** system for rapid response to potential outbreaks (i.e. PestDisPlace)
5. Develop a robust and sustainable **cassava seed system** to secure access to cost effective clean planting materials
6. Effective **plant nutrition** scheme
7. Understanding **cassava value chains** and **markets**



Cassava Program Impact Pathway

Impact statement: Productive, resilient and ecologically sustainable food systems that encourage healthy diets



5,690 accession in the cassava genebank + 465 wild relatives from 28 countries

CASSAVA BREEDING AT CIAT

Enhancement of Genetic Resources
RSA1

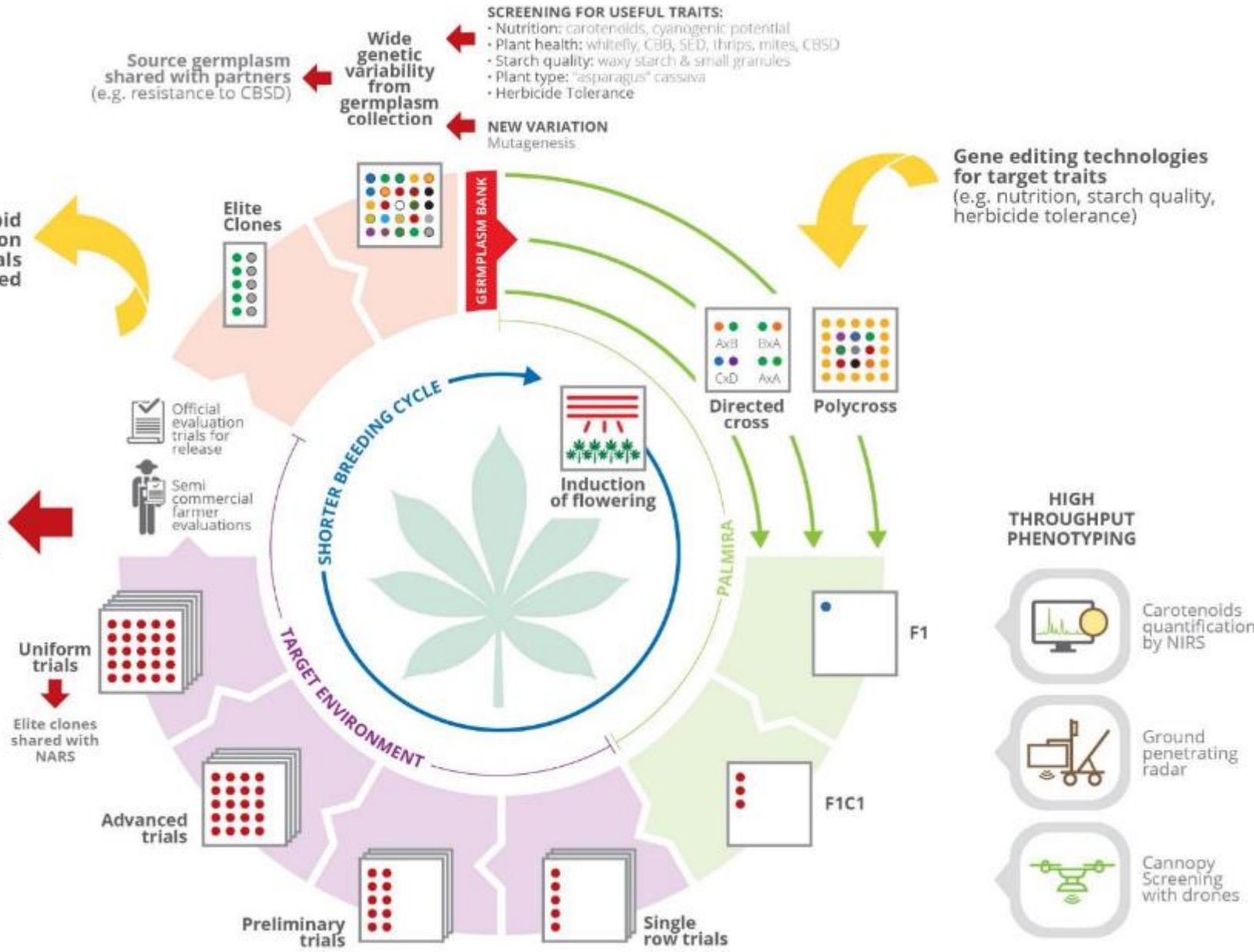
Partners and national systems released new CIAT developed cassava varieties (Contributions from RTB Flagships 1 and 2)

- TABLE CONSUMPTION**
- Low cyanogenic potential
 - High carotenoids
 - Mid- to high dry matter
 - Easy cooking
 - Acceptable root yield
- INDUSTRIAL USES**
- High fresh root yield
 - High/stable dry matter
 - Erect plant architecture
 - Fast sprouting
 - Special starches

Genetic sequencing, tools and protocols for genome editing and phenotyping

Rapid multiplication of materials to be released

Main targets regarding end-users



Cassava varieties that will launch cassava as commodity



Explore related solutions

Clean and simple, Simplified

Flours

Savory





Our vision, a sustainable food future

1997-2017



Poor management of planting material

“The corner of prosperity”



Additional diversity and sources of resistance coming

CIAT transferring and additional clones for screening, breeding and distribution into the region





Visit to Lam Dong to establish crossing nursery and induction of flowering using red lights.



Identify major soil fertility problems

Agronomy
and Soil Man-
agement

RSA2

Farmers implemented practices, tools and technologies developed by CIAT to make cassava productive, sustainable and economically viable in LAC and ASEAN region (Contributions from RTB Flagship 3)

Maps of soil properties, forecasting system, microbial and chemical treatments, soil management tools



K deficiency in Kampong Cham, Cambodia



P deficiency in Xieng Khouang, Laos

Cassava witches broom disease in fertiliser trials and variety evaluations in Paklai, Xayabouli Province



Without fertiliser



KU50

Rayong11

Working in a broad range of agroecological zones

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International Center for Tropical Agriculture
Since 1967 *Science to cultivate change*



1 Communication of surveillance results using public platforms help us engage with stakeholders and collectively track and monitor for emergent diseases on real time

1 During disease, infectious molecules from the pathogen (often carried by insect vectors) are propagated and interact with plant defense molecules

Crop Protection RSA3

Breeders improved cassava health to safeguard the quality of planting materials and productivity in LAC and ASEAN by apply CIAT derived technologies (Contributions from RTB Flagship 3). Pathologists develop molecular assays to diagnose and surveillance

1 Key activities in our group includes the use of those kits to verify the health status of our collections, support preemptive breeding and routine field surveillance

1 Combining sequence information with the biology of the pathogen improve our understanding of disease emergence and help us design better diagnostic kits (ELISA, PCR, LAMP, RCA)

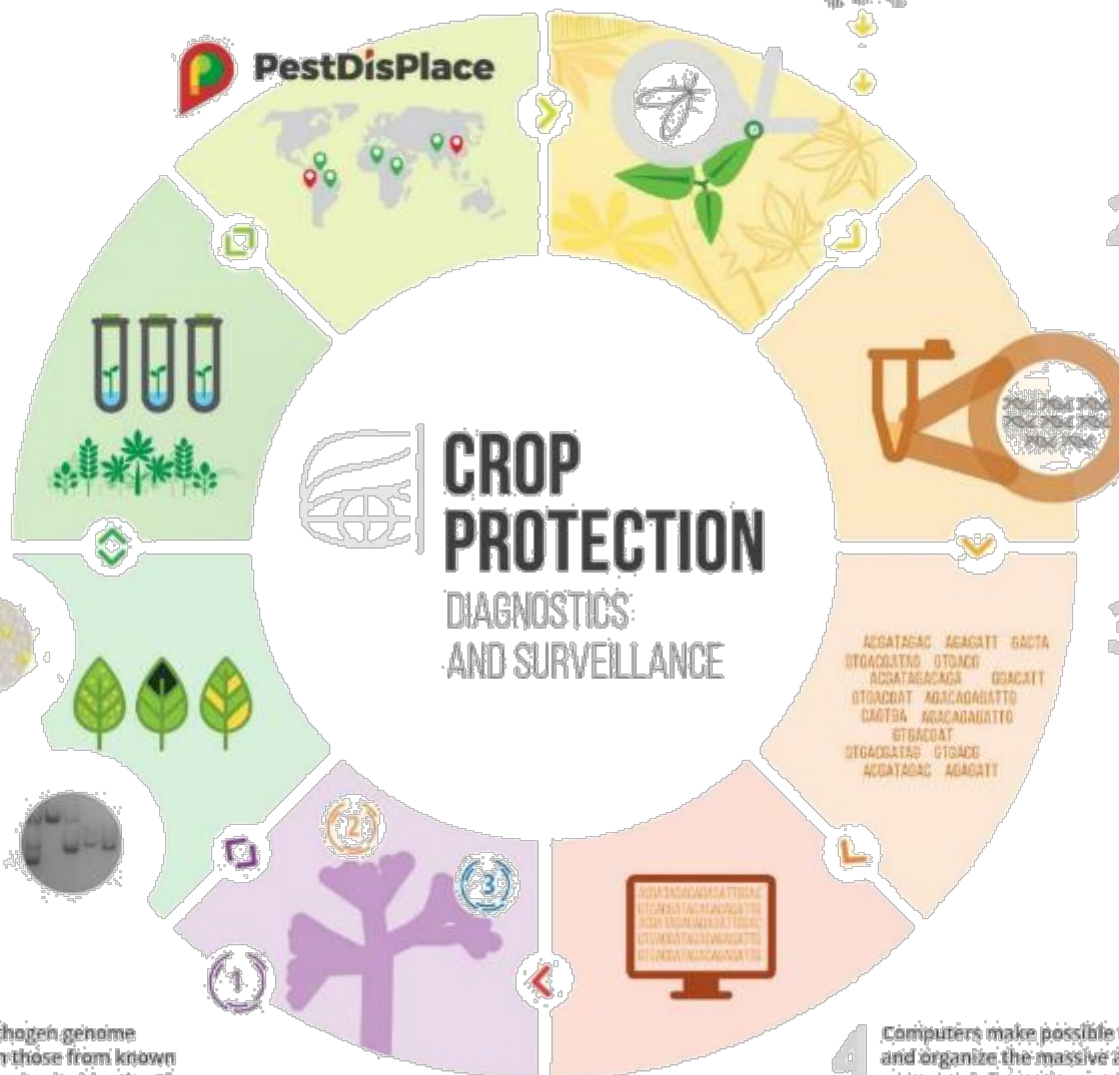
Next generation insecticides, baseline surveys, cassava disease diagnostics tools, geo databases

1 Comparing pathogen genome sequences with those from known relatives, determine its identity. If there are no known relatives reported, it will show as a new branch in the phylogenetic tree

1 Computers make possible to assemble and organize the massive amount of sequence information contained in RNA, to reconstruct the genome of the pathogen.

1 We collect samples and purify such molecules from both the host and the pathogen. Of all of them, the Ribonucleic Acid (RNA) is our favorite

1 Using novel sequencing technologies we can identify the sequence of millions of RNA molecules overnight, including those that encode the identity of the pathogen



For more info



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Protection

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CASSAVA

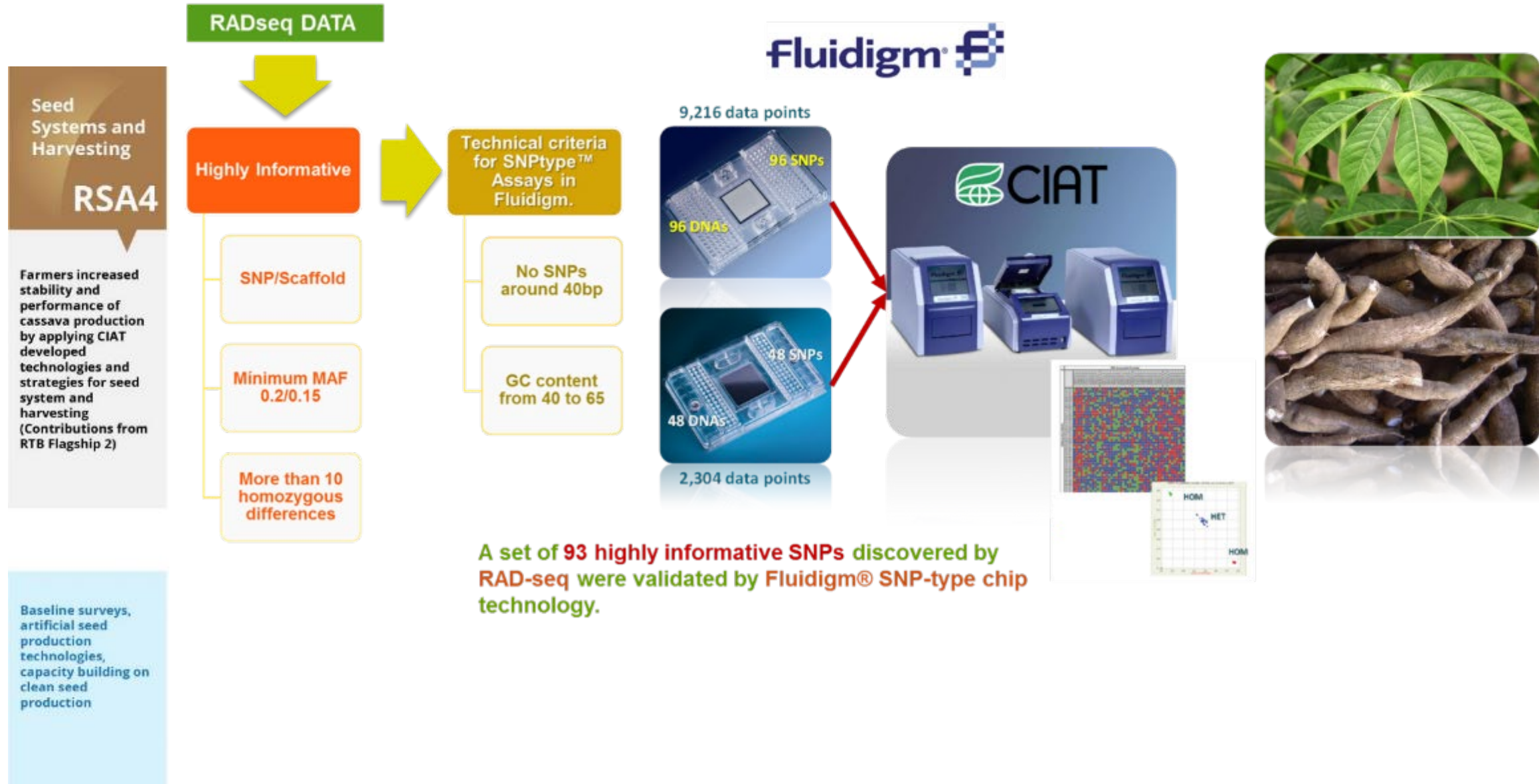
South East Asia.

[EXPLORE](#)



Monitoring the Emergence, Occurrence and Global Distribution of Pests and Diseases

Cassava SNP-type chip for variety identification

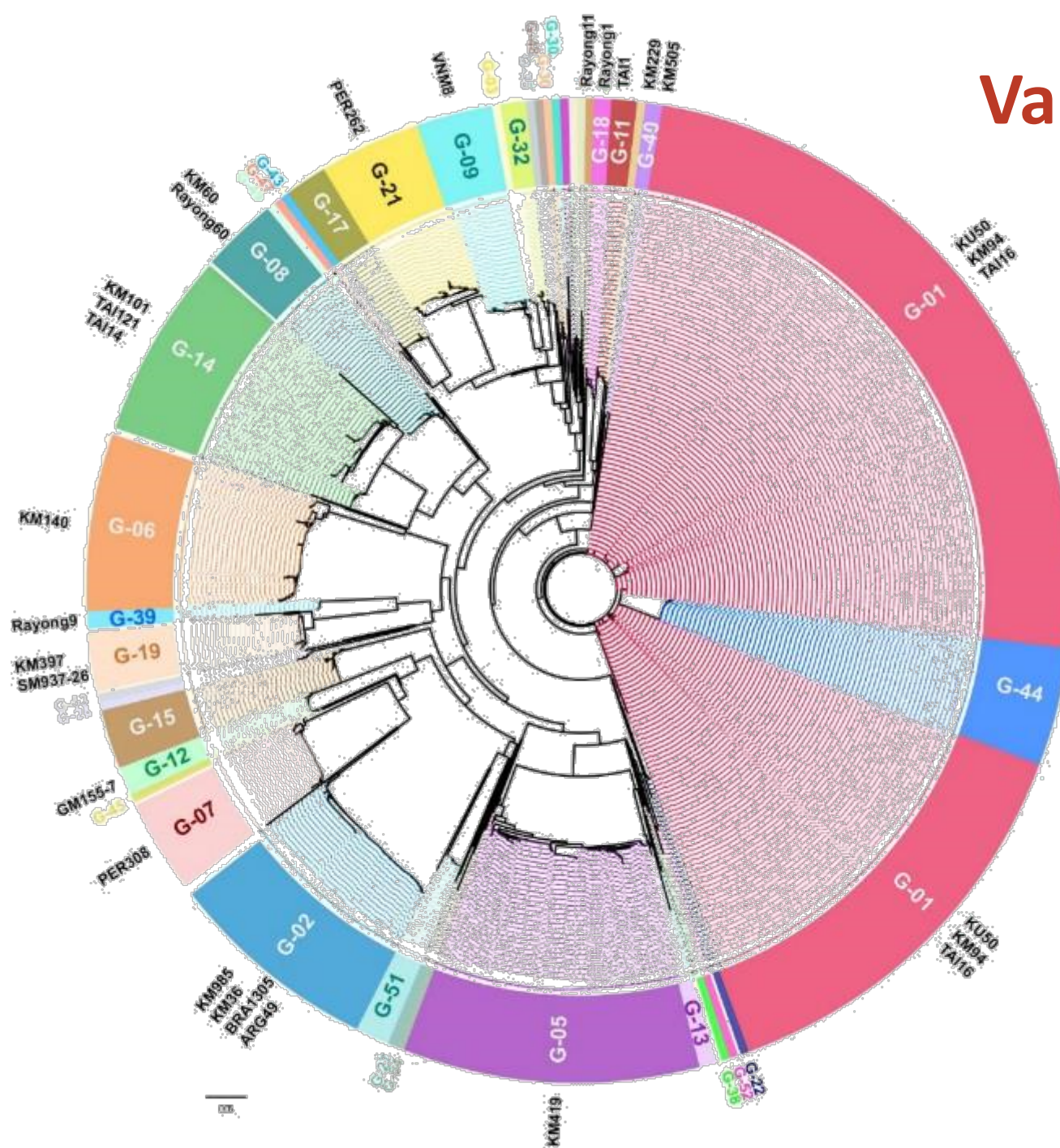


Variety identification

Seed Systems and Harvesting RSA4

Farmers increased stability and performance of cassava production by applying CIAT developed technologies and strategies for seed system and harvesting (Contributions from RTB Flagship 2)

Baseline surveys, artificial seed production technologies, capacity building on clean seed production



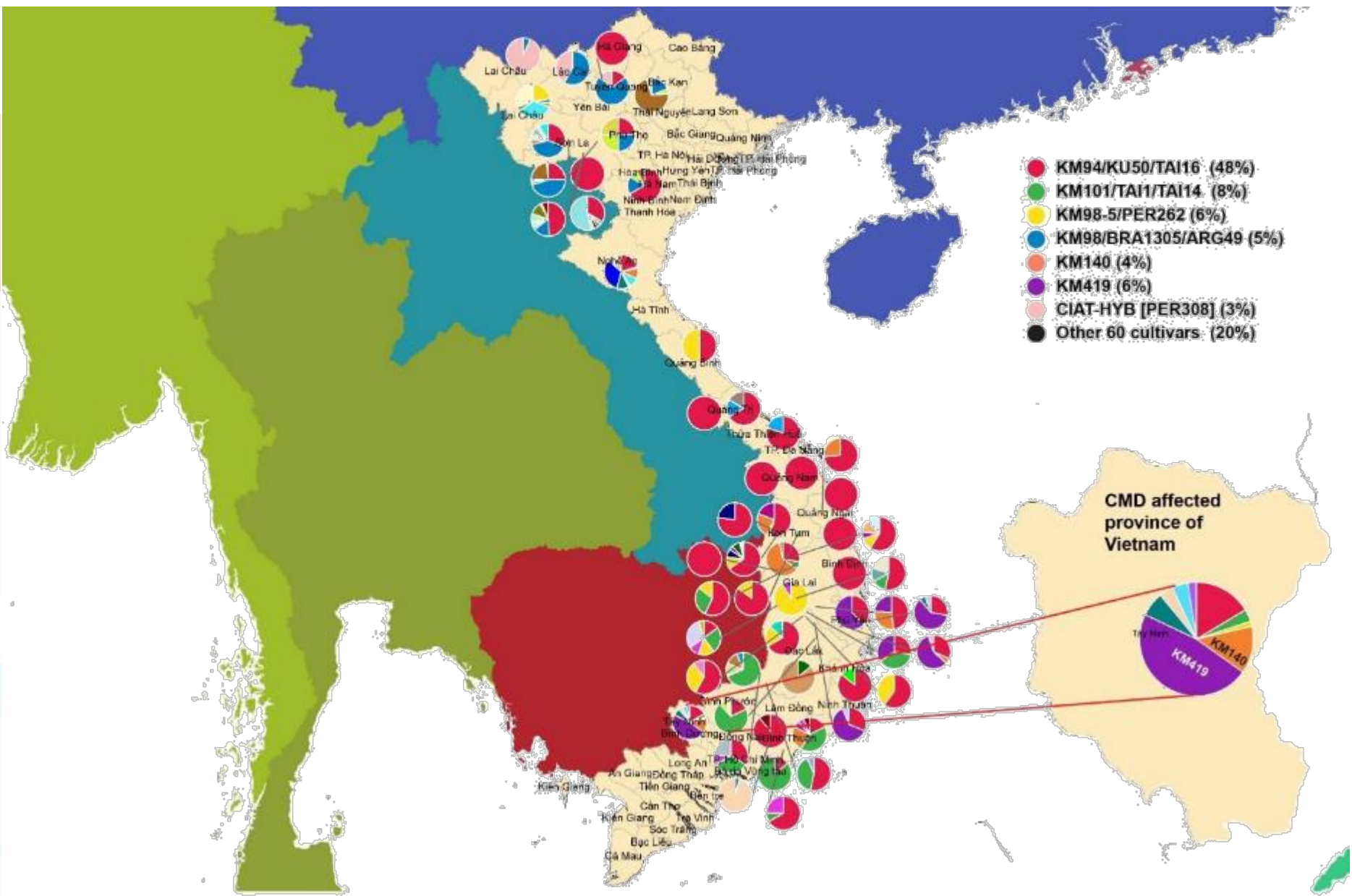
Variety identification

Seed Systems and Harvesting

RSA4

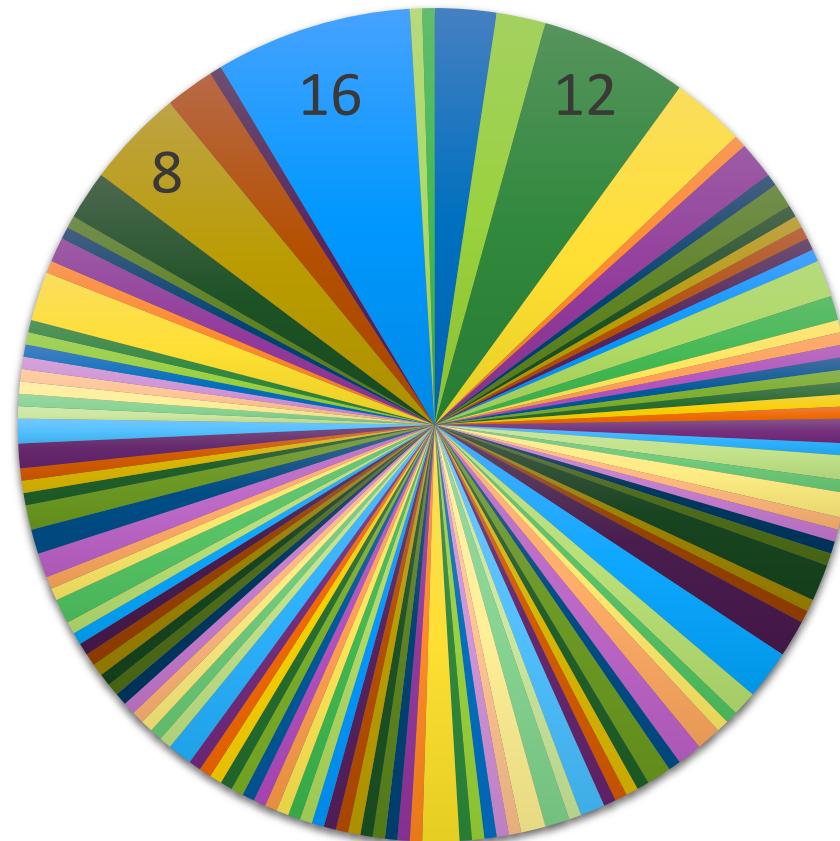
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Variety identification

- 254 accessions from Indonesia in the gene bank at CIAT
- Large level of potential duplication
- 123 unique using SNP identification



Seed
Systems and
Harvesting

RSA4

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Baseline surveys, artificial seed production technologies, capacity building on clean seed production

Including large volumes of planting material moving around the region

Seed
Systems and
Harvesting

RSA4

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FANTASTIC IN THE ABSENCE OF PEST AND DISEASE





MGCL Molecular Genetics and Tissue Culture Laboratory

CIAT'S CASSAVA SEED SYSTEM APPROACH



Seed Systems and Harvesting

RSA4

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Baseline surveys, artificial seed production technologies, capacity building on clean seed production

- 1 Implementation of relevant technologies for different scales
 - Industrial level
 - Small farmer associations
- 2 Simplified protocol to achieve low-cost design with adaptable equipment.
- 3 High throughput platform to integrate with multiple crops.



Millions of clean planting materials available for smallholder farmers

NAFRI – Rapid multiplication tunnel construction



Planting tunnels with KU50 and germination







POSTHARVEST QUALITY LABORATORY

Post Harvest & Enhanced Nutrition

RSA5

Farmers promoted and adopted new crop processing technologies developed by CIAT for cassava micronutrient conservation and commercial value (Contributions from RTB Flagship 4)

New methods to assess traits, equipment adapted to small and medium scale cassava processing, high-throughput methods

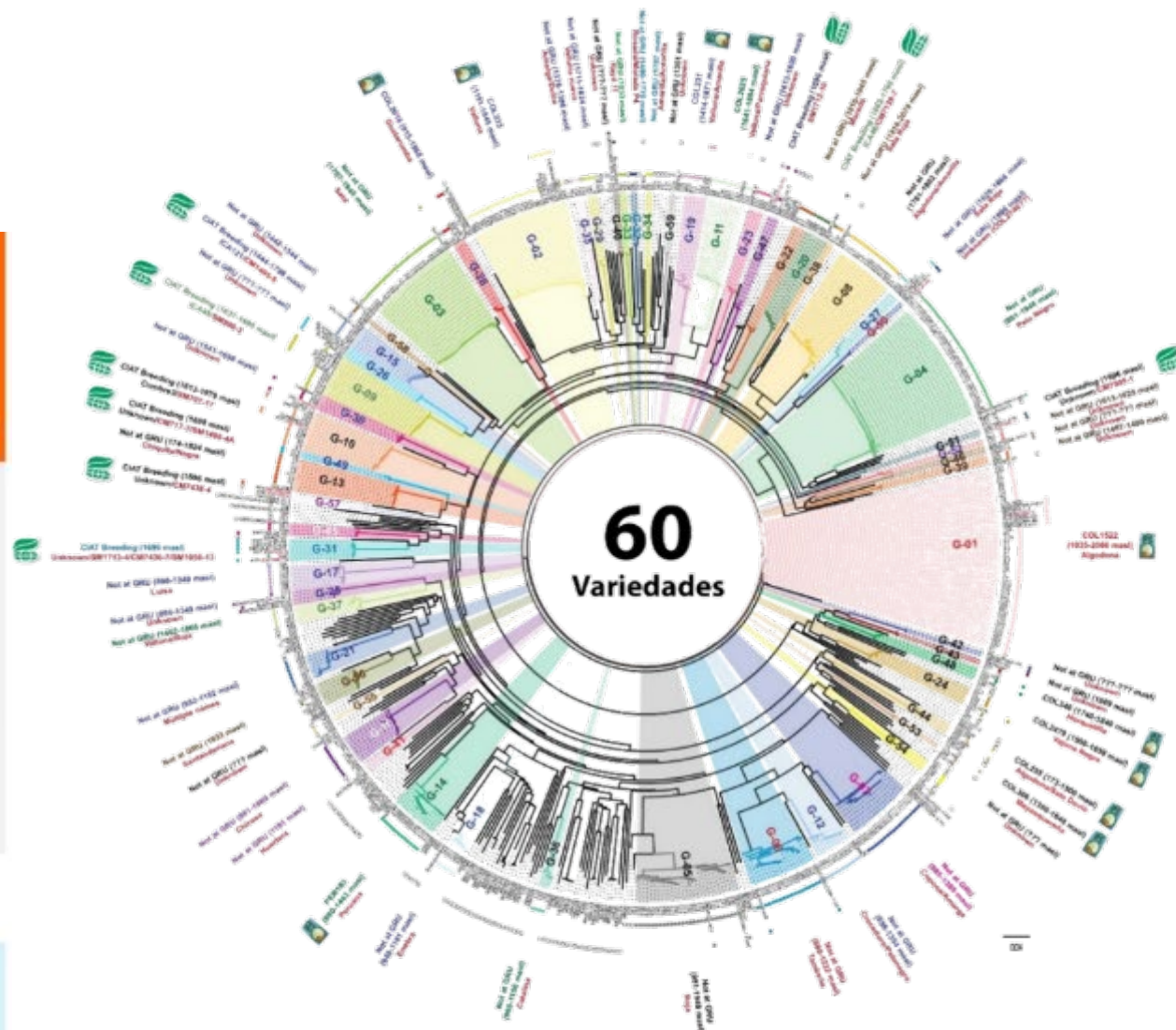


Post Harvest & Enhanced Nutrition

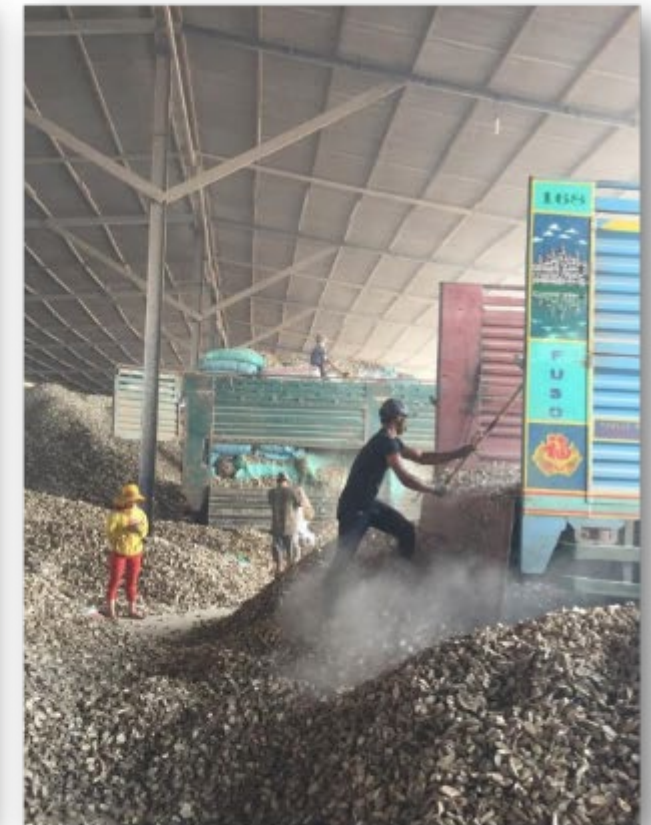
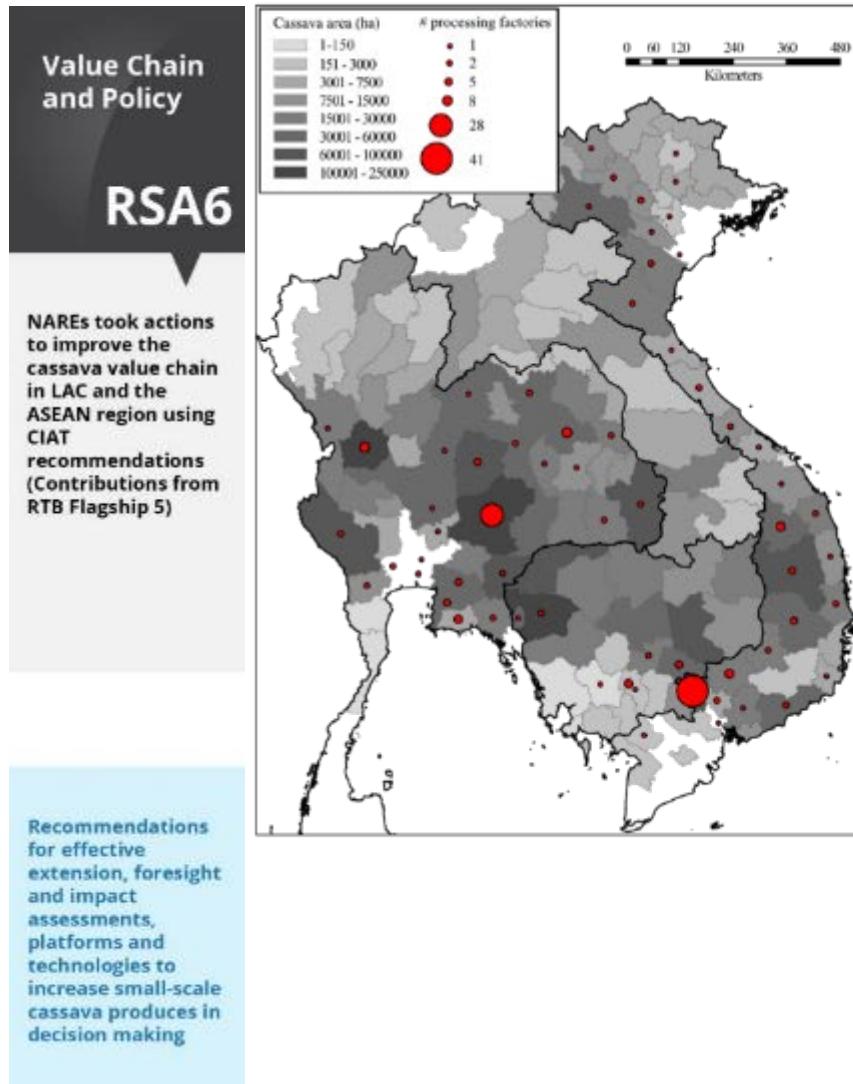
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The regional value chain for cassava products involves large amounts of cross border trade



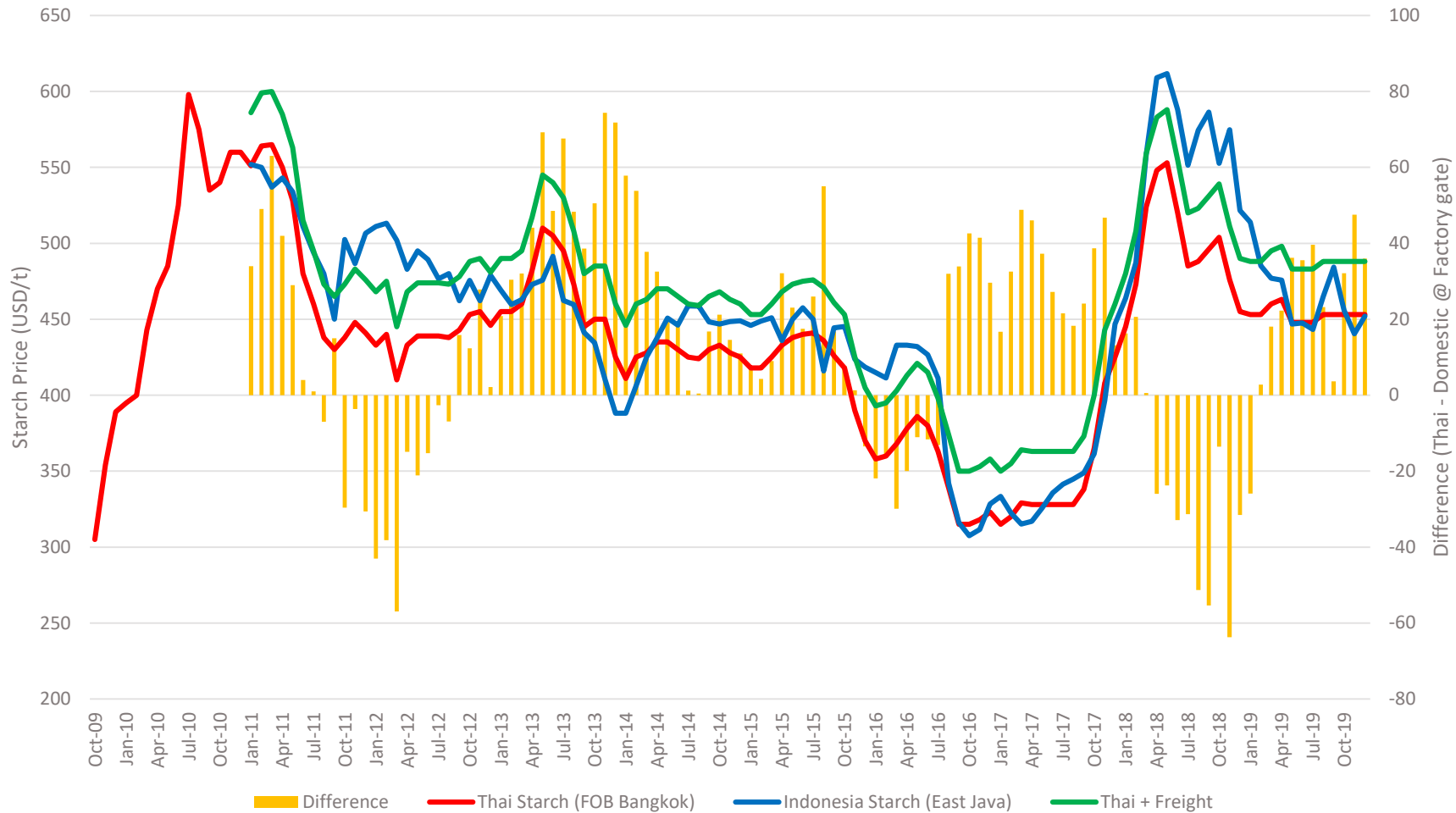
Market outlook: Difference between Thai and Indonesian starch price

Value Chain and Policy

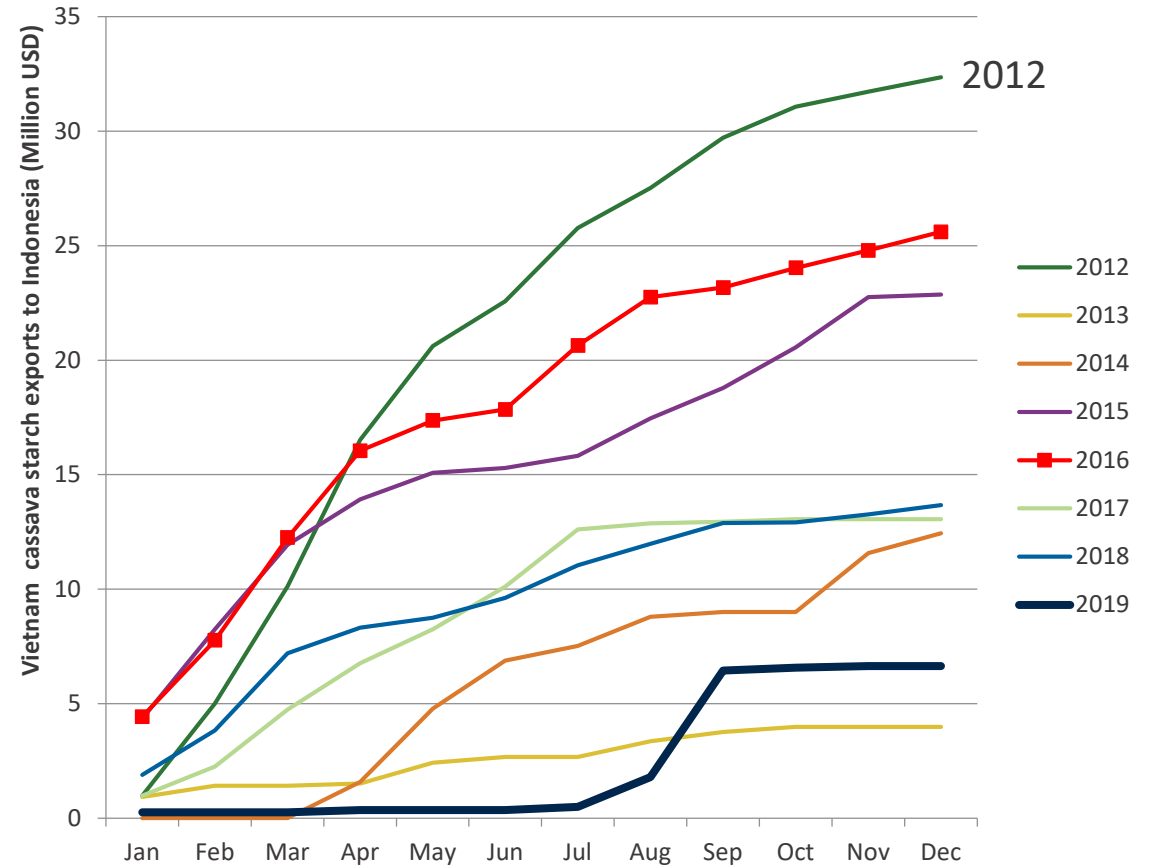
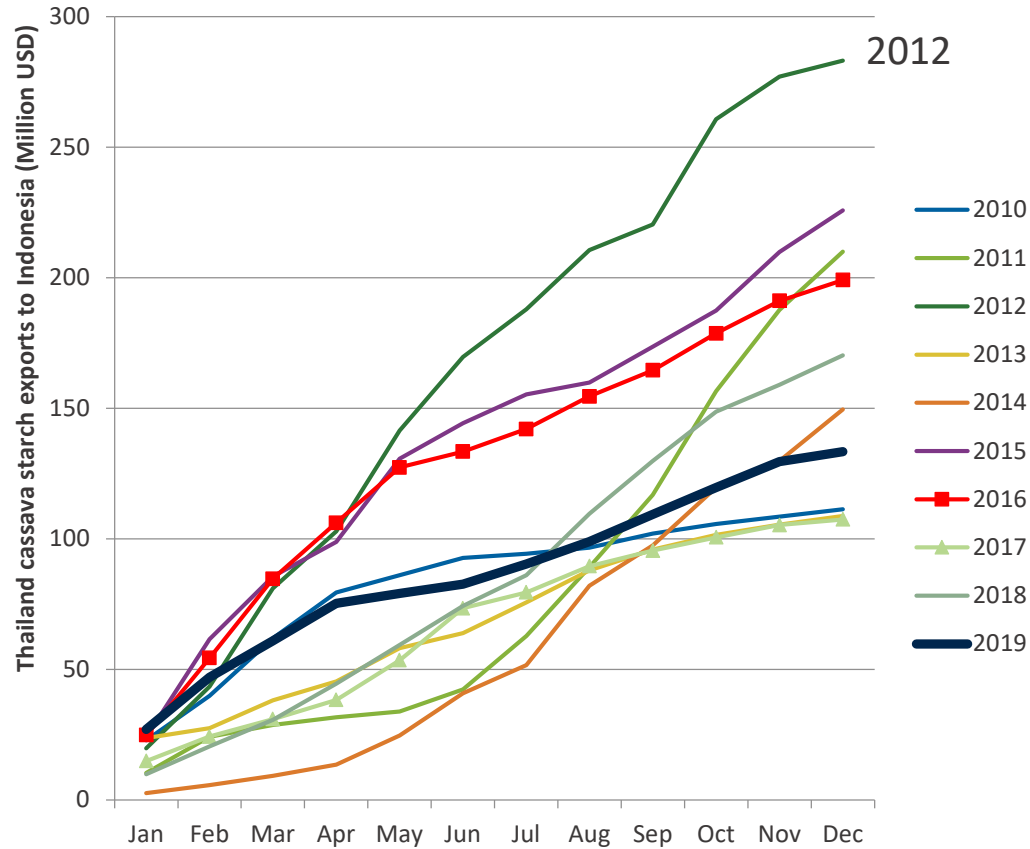
RSA6

NAREs took actions to improve the cassava value chain in LAC and the ASEAN region using CIAT recommendations (Contributions from RTB Flagship 5)

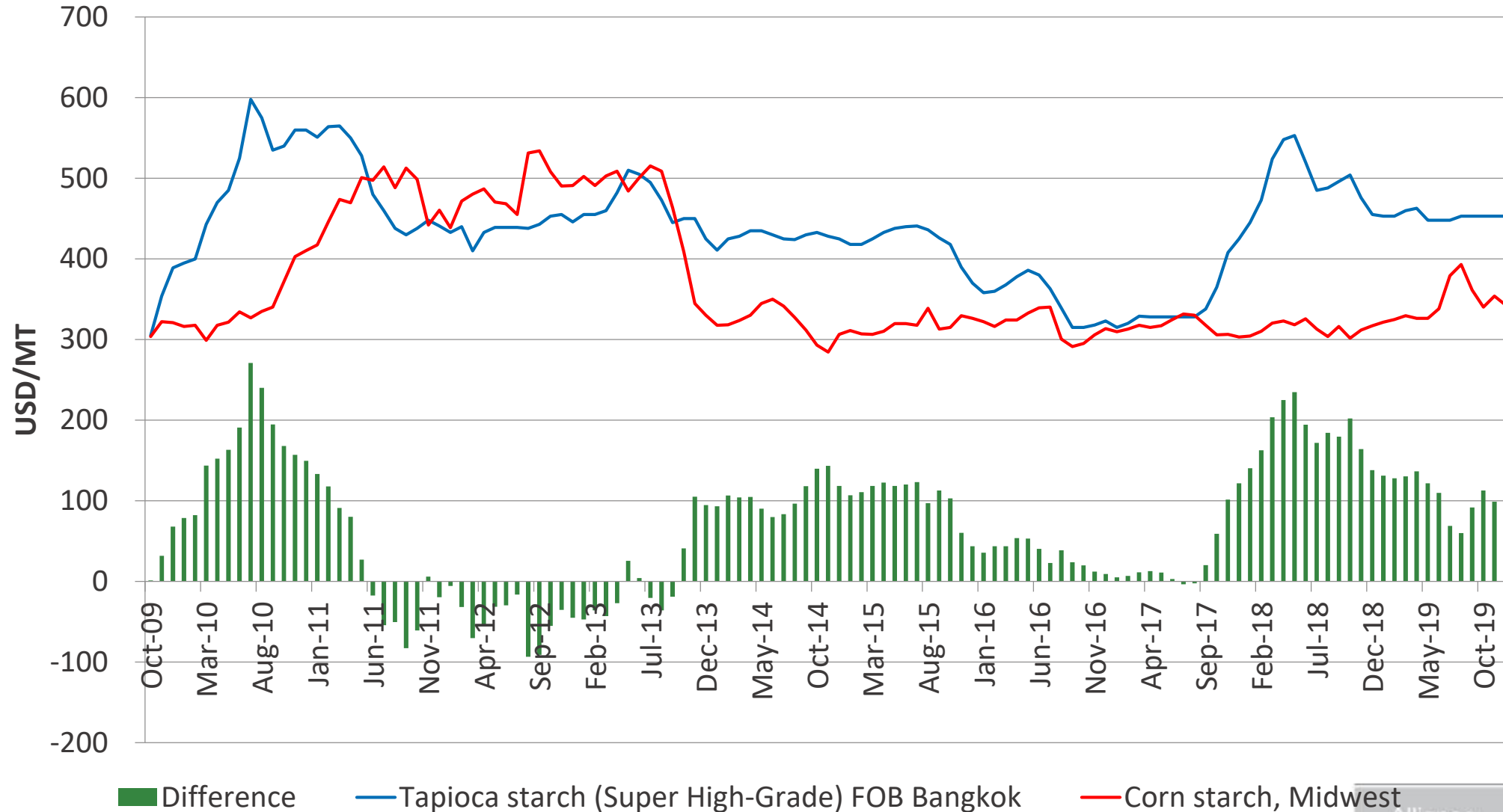
Recommendations for effective extension, foresight and impact assessments, platforms and technologies to increase small-scale cassava produces in decision making



Thailand and Vietnam starch exports to Indonesia



Tapioca starch versus maize starch



■ Difference

— Tapioca starch (Super High-Grade) FOB Bangkok

— Corn starch, Midwest

Alliance



Working across different value chains: food, small-scale processing, large scale industrial processing

Value Chain
and Policy

RSA6

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Recommendations for effective extension, foresight and impact assessments, platforms and technologies to increase small-scale cassava produces in decision making



Cassava Program in Asia



ACIAR Cassava Value Chain and Livelihood Program

Join the conversation at : <https://www.facebook.com/groups/1462662477369426/>

Project website : <http://cassavavaluechains.net/>





Australian Government
 Australian Centre for
 International Agricultural Research



RESEARCH
 PROGRAM ON
 Roots, Tubers
 and Bananas

Establishing sustainable solutions to cassava disease in mainland Southeast Asia

<https://cassavadiseasesolutionsasia.net/>

<https://www.facebook.com/groups/2394808117512232/>



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Thank you!



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