



Strategic Use of IPRs for the Benefit of the Poor

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International Center for Tropical Agriculture

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“Protection of Intellectual Property Rights in New Plant Varieties”
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Crop productivity =

G x E x M x P

About CIAT

- A CGIAR Consortium Research Center
- Founded in 1967 near Cali, Colombia
- A staff that includes **200** scientists
- Operating in three regions:
 - Latin America and the Caribbean (based at HQ, Colombia)
 - Sub-Saharan Africa (based in Nairobi) with activities in 28 countries
 - Southeast Asia (based in Hanoi) with activities in China, Vietnam, Laos, Cambodia, and Thailand
- Current budget of US\$M **60**

Mission

To reduce ***hunger*** and ***poverty***, and improve human ***health*** in the tropics through ***research*** aimed at increasing the **eco-efficiency of agriculture**



Research-for-Development Initiatives

Rice

Climate Change &
Ecosystem Services

Bean

Tropical Soil
Management

Cassava

FUNDACIAT
Science Park
AGRONATURA

**Tropical
Forages**

Decision &
Policy Analysis

**Genetic
Resources &
Biotechnology**

Capacity Strengthening
& Knowledge
Management

Examples of Impacts

- Over 5.3 million rural households in sub-Saharan Africa have adopted **modern bean varieties** over the last 17 years, generating benefits worth nearly **US\$200 million**
- Adoption of **improved cassava varieties** in Thailand and Vietnam has nearly reached **90%**, creating benefits worth almost **\$12 billion** over the last 20 years
- Improved **forages** now cover an area estimated at **25.4 million hectares** in tropical America, generating huge benefits through improved livestock production – estimated at \$1 billion in Colombia, for example
- Nearly 60% of **Latin America's rice area** is planted to improved rice, with benefits valued at **\$860 million** from 1967 to 1995 alone



Size and Structure of Germplasm Collection at CIAT-GRU

Crop	Number of accessions		
	Held in trust	Other	Total
Cassava	6,592	2,332	8,924
Common bean	30,590	810	31,400
Forages	16,339	7,845	24,184
Total	43,321	10,987	63,504

International Public Goods

Status of *Manihot* germplasm at CIAT- GRP

Landraces **5,301**

Wild **883**

Breeding

Material (CIAT) **408**

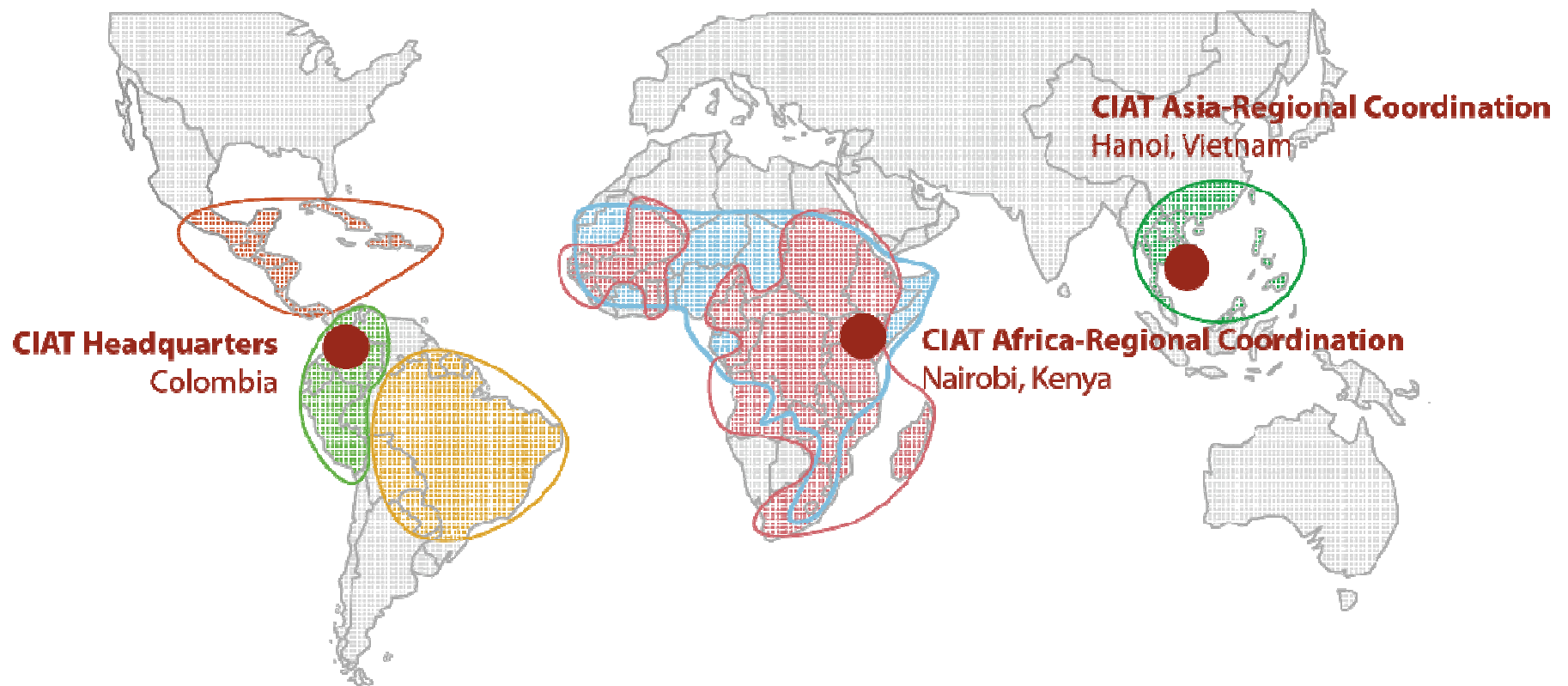
Total **6,592**



Accessions registered into the Multilateral System of the International Treaty

Source: GRP-CIAT, 2010.

CIAT's Worldwide Presence



A photograph of three women in blue shirts, likely a choir or group, with the woman in the foreground smiling. The image is partially obscured by a semi-transparent grey box containing text.

IP Principles

In general, we produce
international public goods

- Dissemination of results and products = **prevent illegal appropriation.**
- IP protection only to **facilitate transfer or protection from third party misappropriation.**
- Funds obtained: used to continue its mission/vision

Message

- Research outcomes are **international public goods**
- IP protection only to **facilitate transfer or protection from third party misappropriation.**
- Outcomes are mainly **pre-breeding materials** that will distributed via **sMTA**

Why and How – in Case of Forage

- Plant breeding is long and expensive

BUT

- Plant varieties can be easily and quickly reproduced



- ❖ Compensation for **investment** in breeding new varieties and incentive
- ❖ **Incentive** to create/breed new and better varieties

Plant Breeding is Long and Expensive

Genetic improvement in *Brachiaria* for resistance to spittlebug nymphs



Resistant

Intermediate

Susceptible



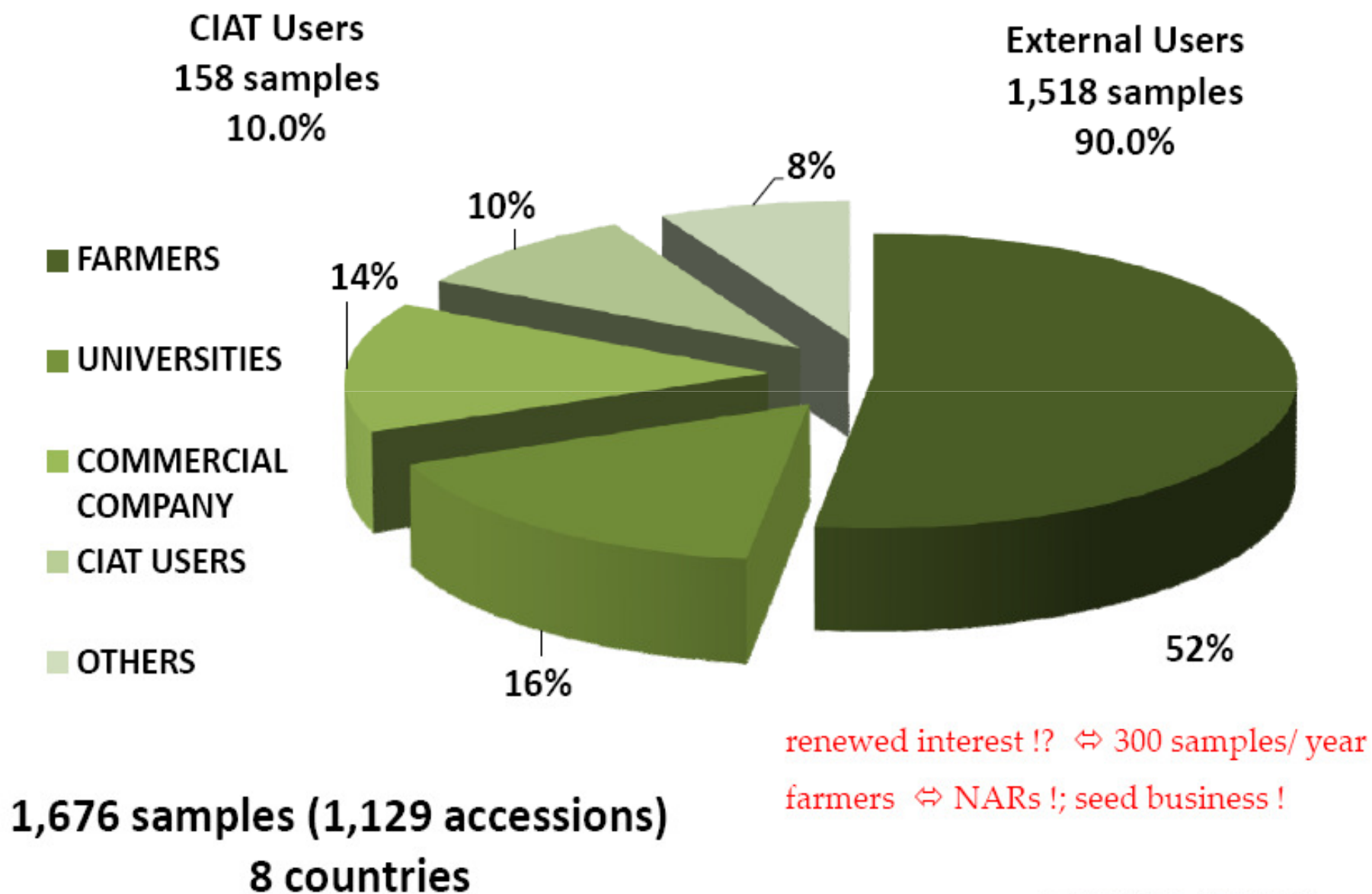
Resistant

Intermediate

Susceptible

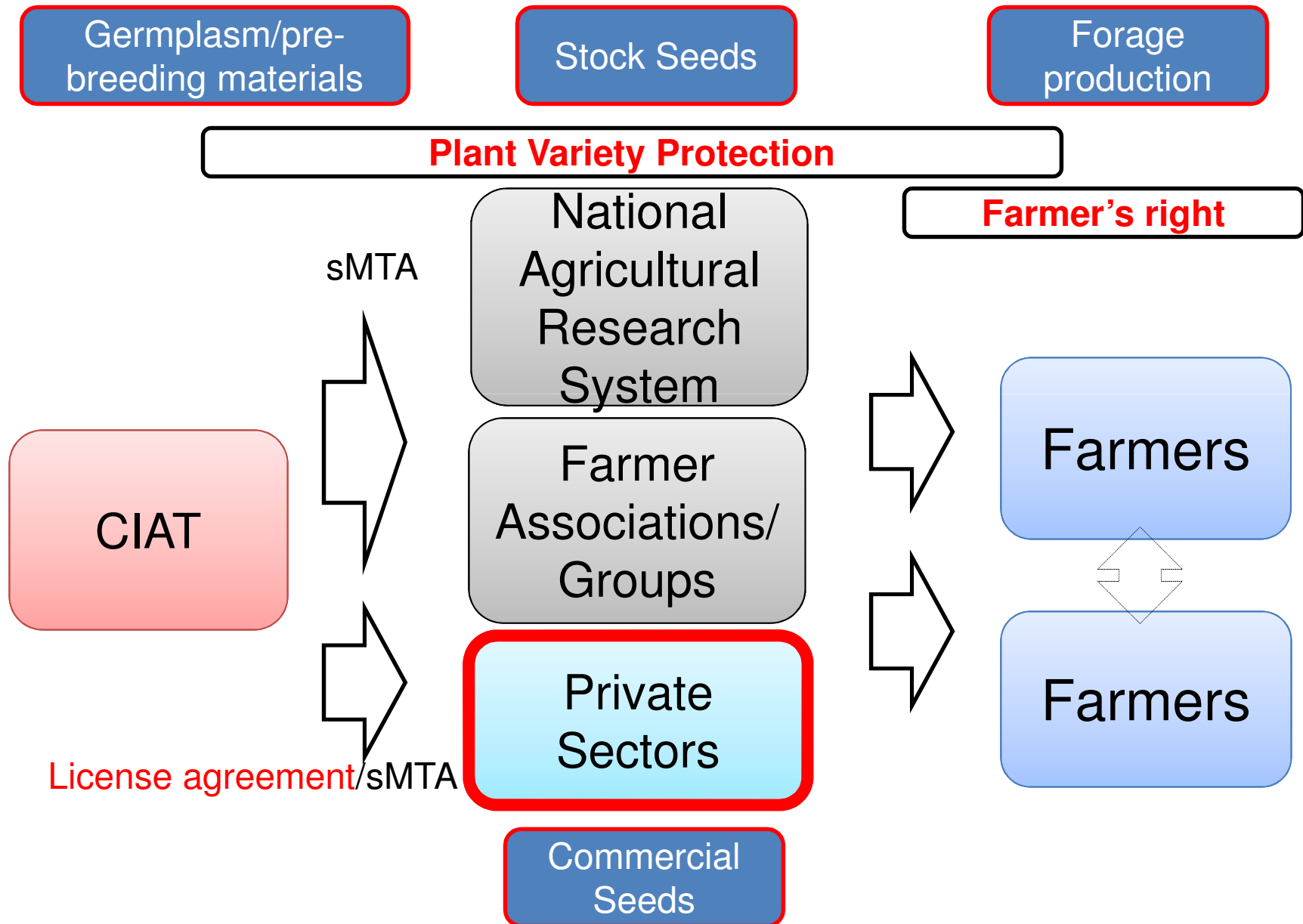
Forage germplasm

Distribution of Tropical Forage Germplasm from CIAT in 2011

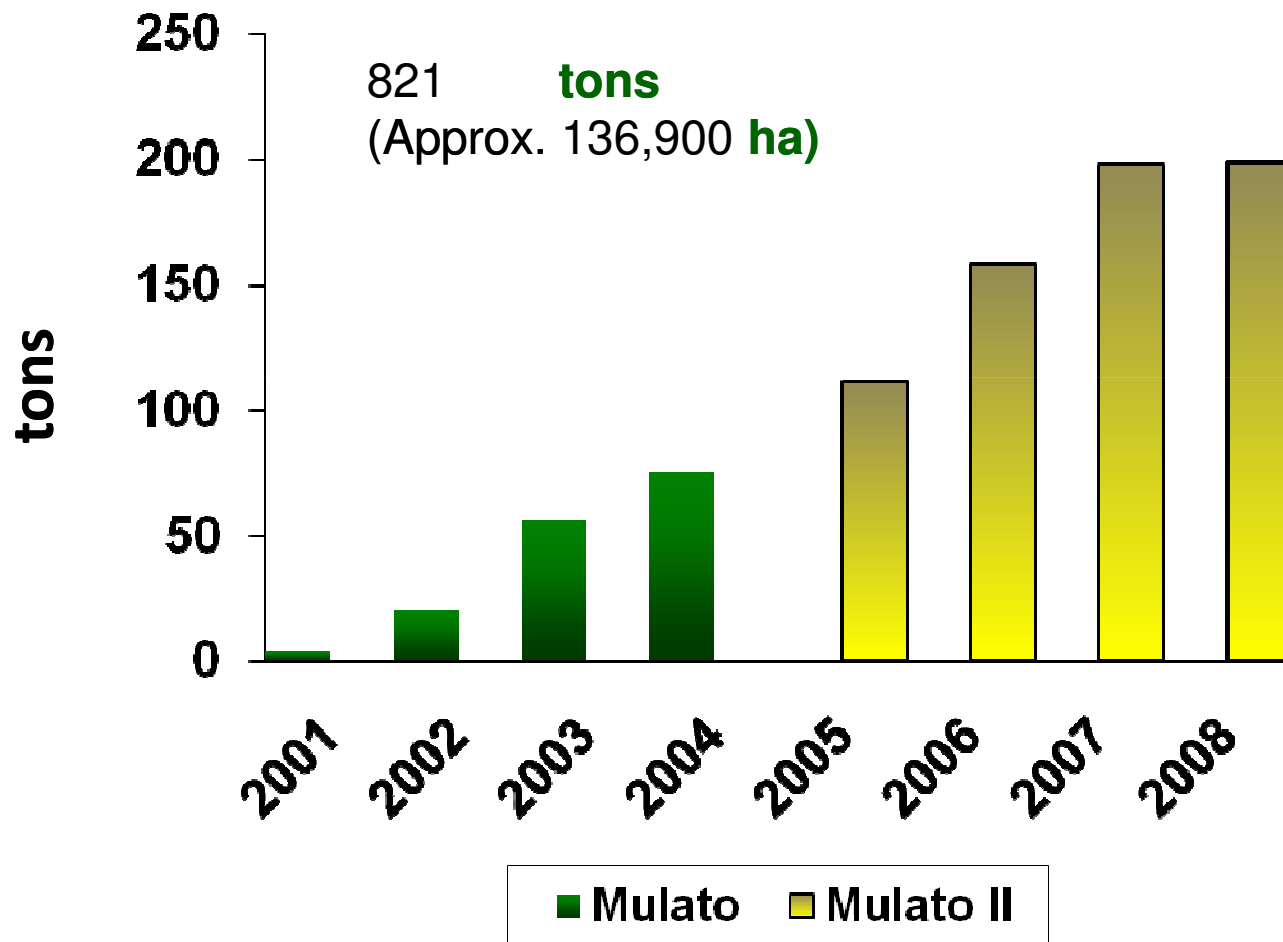


source: CIAT- GRP, 2012

Actual Channels of Forage Seeds



Total Seed Sales (tons) per Year for the Brachiaria Hybrids, Mulato and Mulato II



Forage germplasm

Strategic Use of IPRs for Forage Research

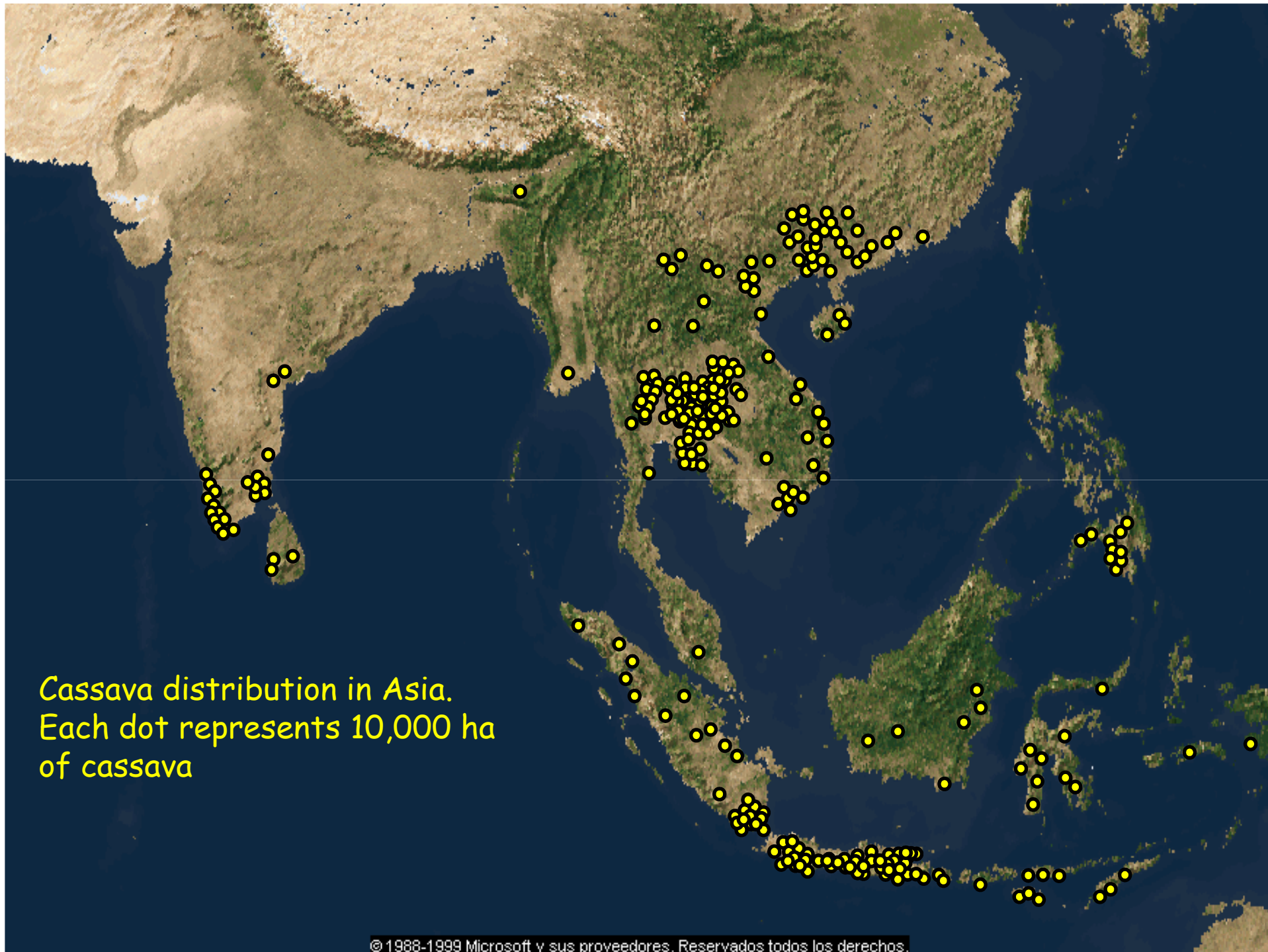


Message

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- Plant breeding is **long and expensive** – continues research investment needed
 - Importance of **Public-Private Partnership** – new technology and good quality seeds for farmers
 - **Strategic use of IPRs** for our mission- recovery of the investments and incentive

Global Food Security Challenges

- Population growth and persistent food crisis
- Looming climate changes
- **Emerging of new pest and disease**
- Urbanization

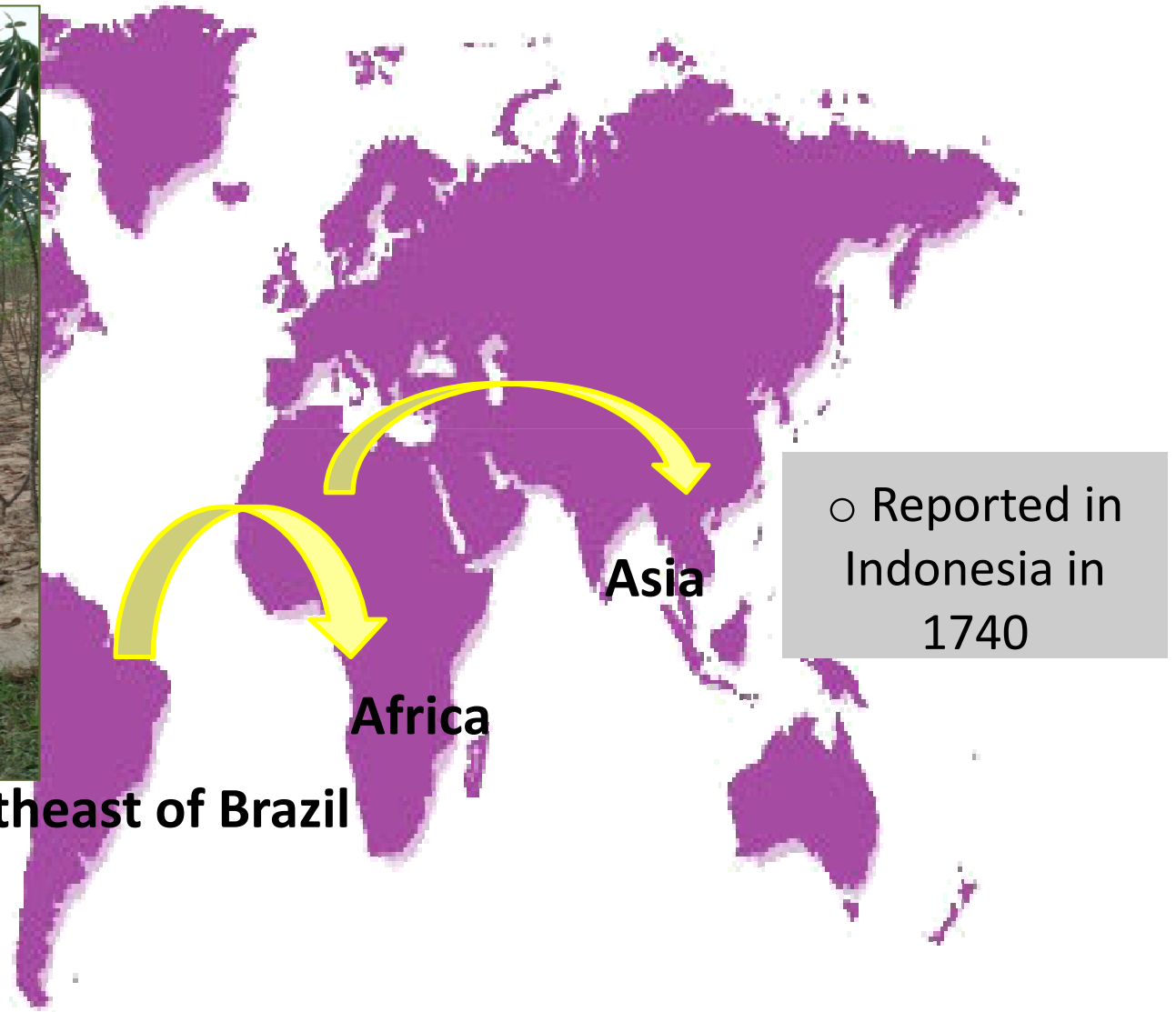


Cassava distribution in Asia.
Each dot represents 10,000 ha
of cassava

Cassava, a vegetatively-propagated crop from Latin America



Northeast of Brazil



Cassava for Food Security and Income Generation

- ~8 million farmers grown cassava in Asia
- ~4 million ha
- > US\$3 billion / year in Greater Mekong Subregion
- Major impact on the livelihoods of the poor



Food



Feed



Fuel



Industrial uses

New Disease in Vietnam

- Cassava witches'-broom disease -

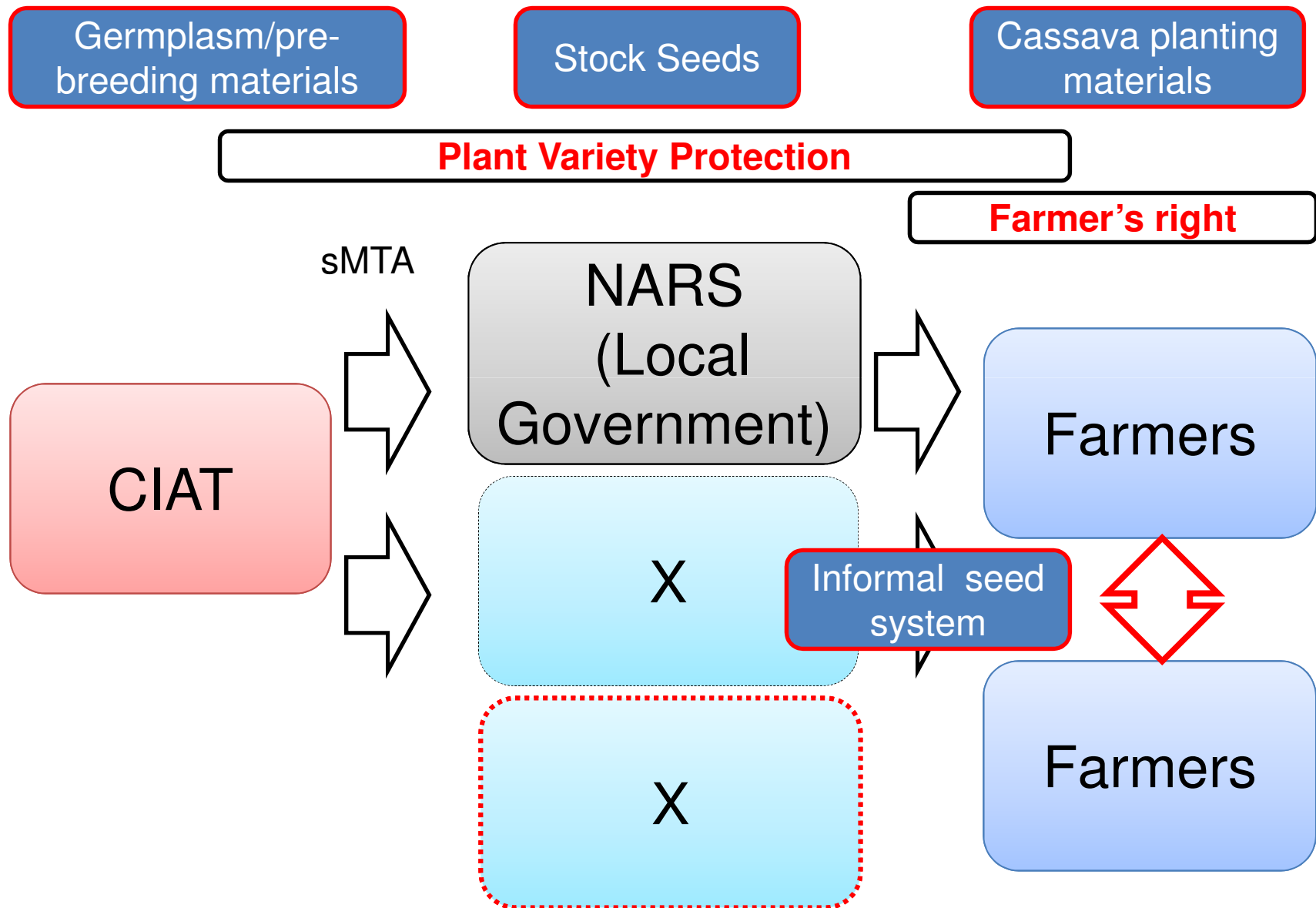


- Bacterial disease
- Vector not identified
- Quang Ngai Province in 2008
- Affected >60,000 ha in 2010
- Reduced 10-15% in yield and 25-30% in starch

★ *CaWB-affected provinces*

Dr. TX Hoat, Plant Protection Research Institute (PPRI) VAAS

Actual Channels of Cassava Planting Materials



Cassava Brown Streak Disease in Africa

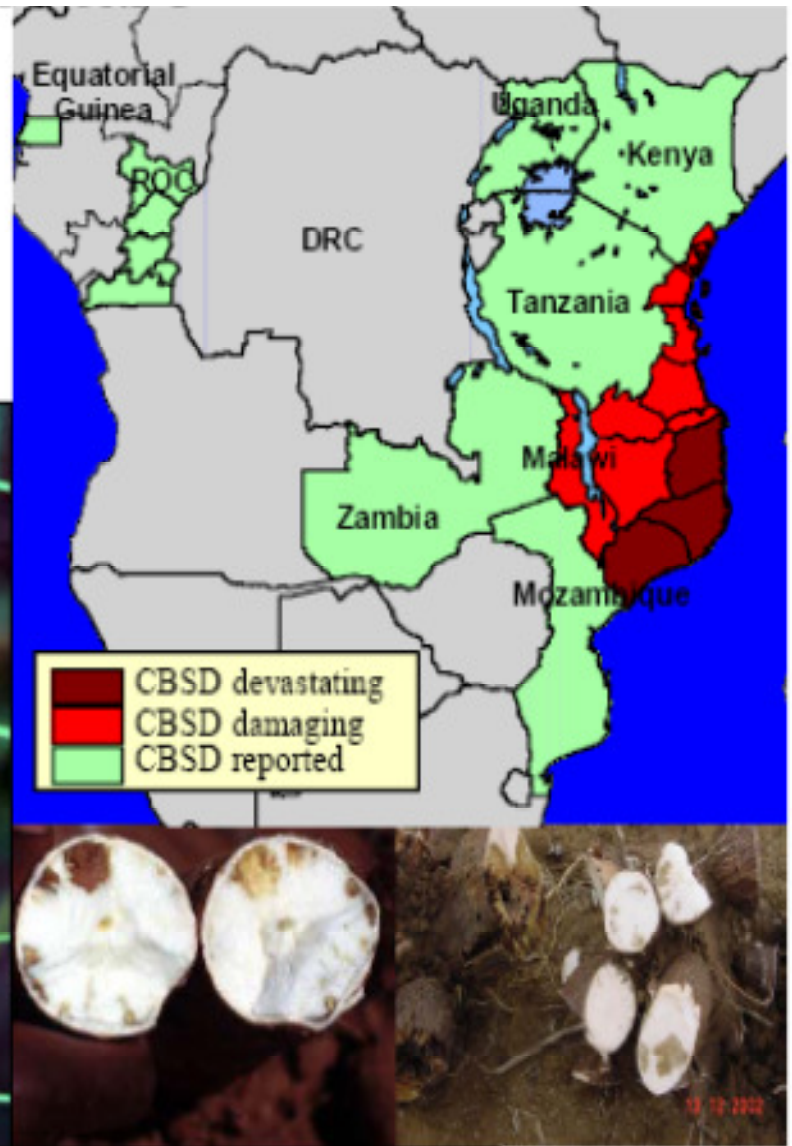
- ▶ Yield losses: Tanzania: 49 – 74%
Mozambique: 40%
- ▶ Economic loss: in excess of USD 16.5 million
- ▶ Vector not yet identified



Leaves: chlorosis
– bottom leaves



Stems: brown streaks



Roots: dry necrotic rot
– most damaging

Solution for new challenge in cassava production ?

Rice

Staple food crop

Seed propagation/Good seed system

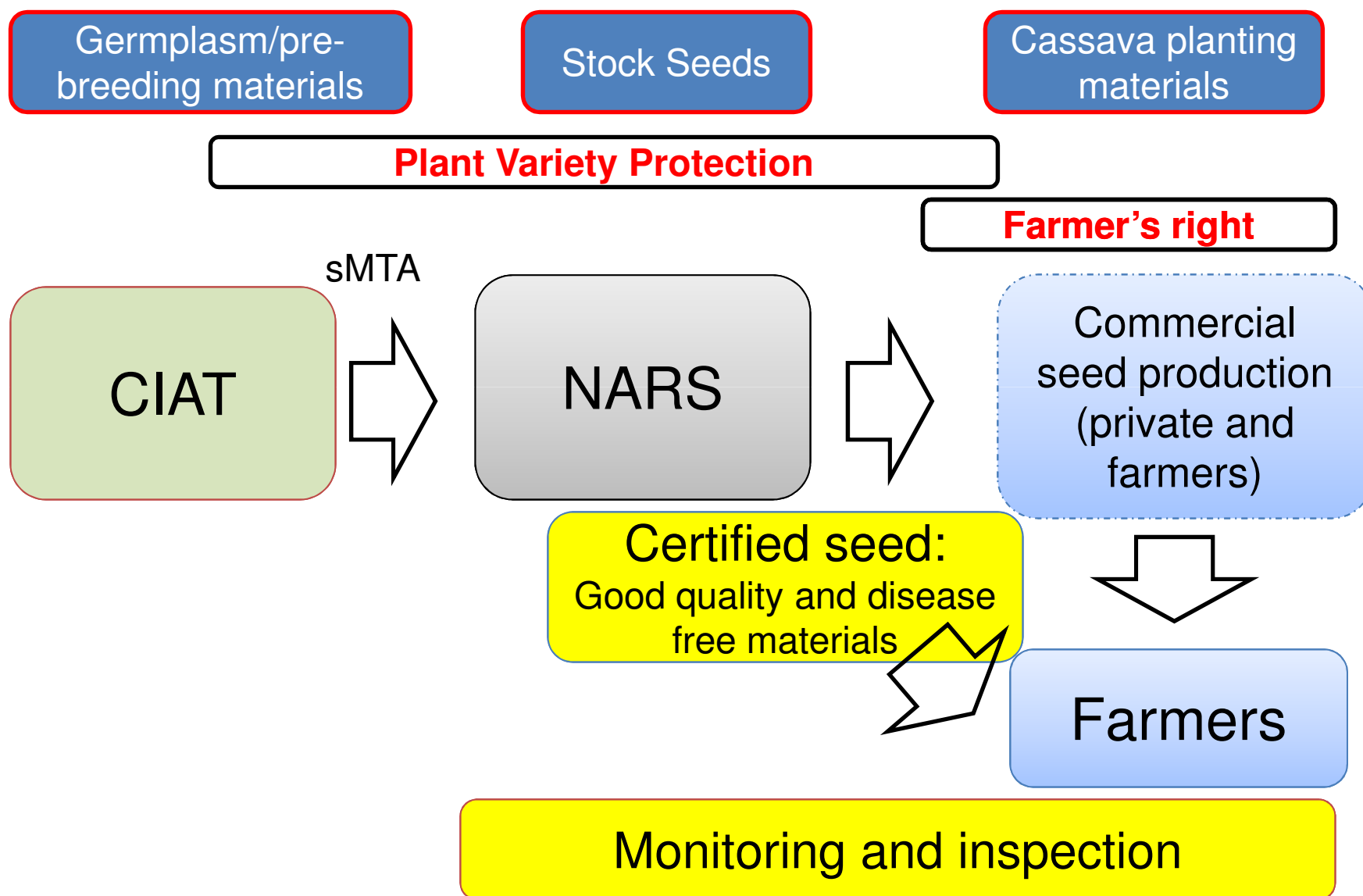
Vs

Cassava

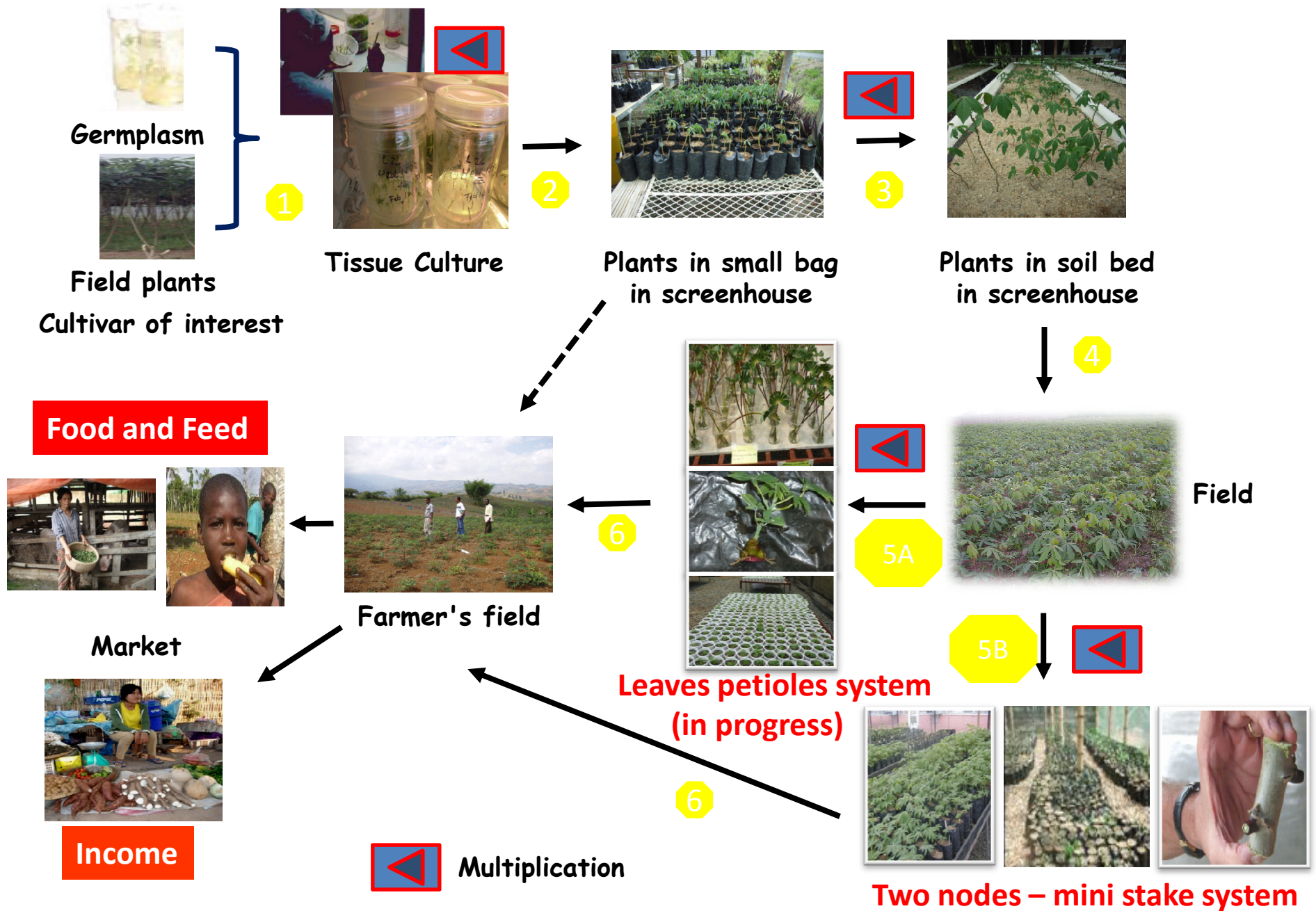
Minor but food security crops for the poor

Vegetative propagation/Poor seed system

Importance of National PVP Systems at the Regional Level



Cassava Seed System – Disease Free Materials



Capacity Building for Cassava Seed System in the Region

MAFF

Ministry of Agriculture, Forestry and Fisheries



Agricultural Genetics Institute
under VAAS, Hanoi Vietnam



Capacity building for seed system, 2012

Message

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- Farmers are smart but needs **incentive** – good quality and disease free materials
 - **Regional efforts to establish cassava seed system** to prevent disease spreading
 - Importance of **PVP at national and regional levels**

How does This translate into a Better Quality of Life?



then.....a new cassava house.....
firsta new cassava motorcycle.....

Source: Reinhardt Howeler, CIAT

Acknowledgement

Daniel Debouck, Head of Genetic Resource Unit

Maria Virginia Jaramillo Navarro, CIAT IP manager

Michael Peters, Forage Program Leader

John Milles, Forage breeder

Roosevelt Escobar, cassava seed system

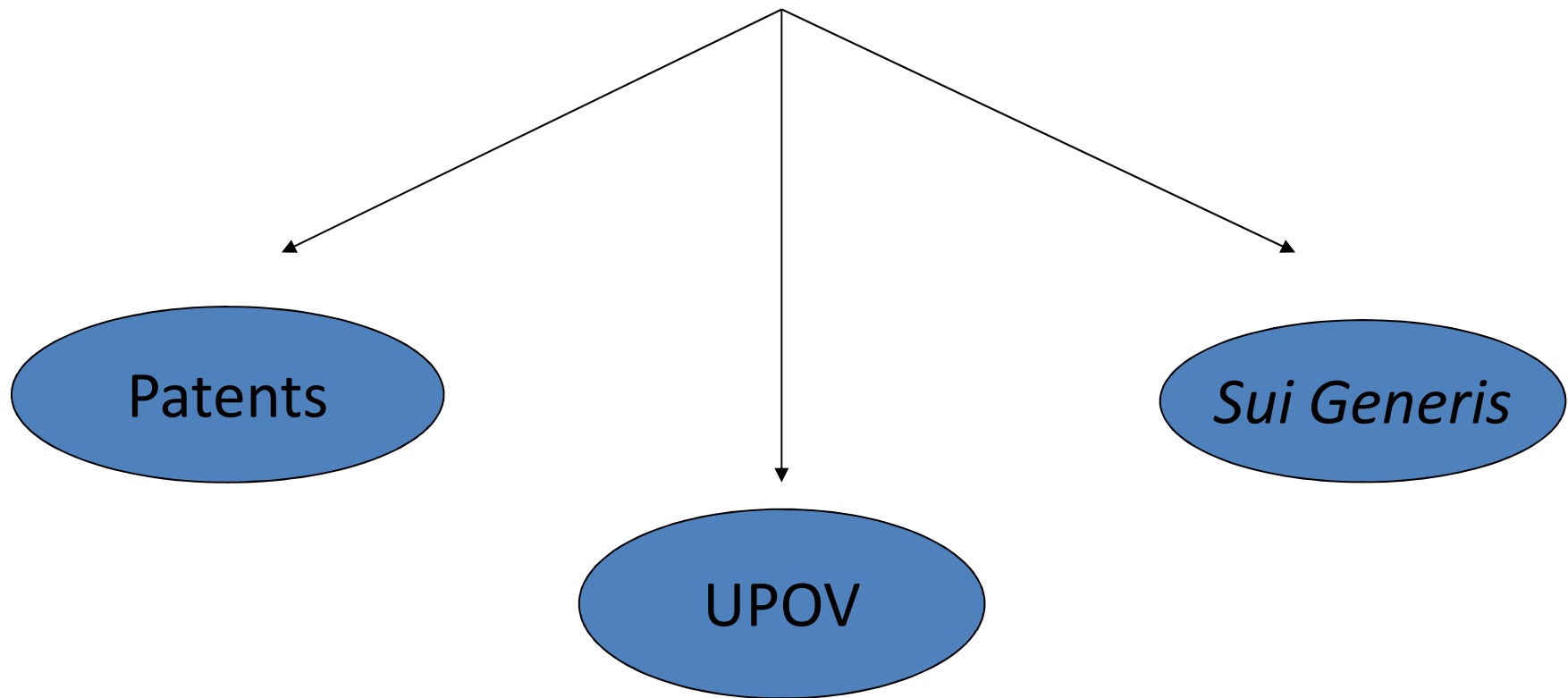
Joe Tohme, Agrobiodiversity Research Area Director



Thank you for your attention

Supplemental information

Different Systems of Plant Variety Protection



Farmers' Rights and Traditional Knowledge

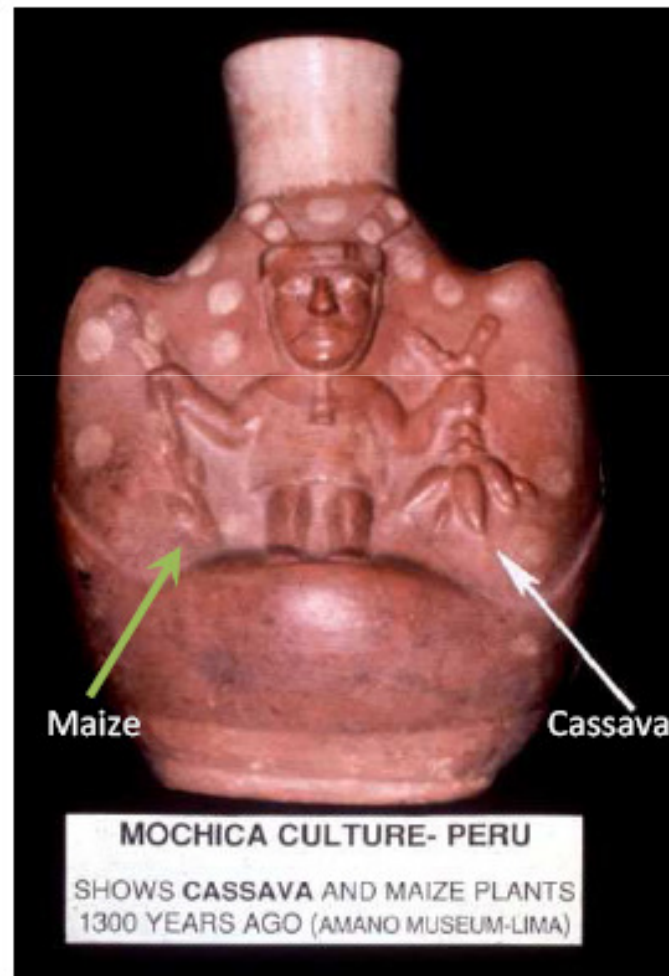
Developing countries fear an international system of plant variety protection may endanger their local varieties and expose agriculturists to increased competition from professional breeding corporations

Unfavorable results observed in countries that have provided Plant Breeders' Rights

The prices of seeds have often tended to push upwards, research activities appear to have become concentrated on a few crops and private R&D expenditure does not appear to have been spurred as expected

- India and Thailand – law requires farmer participation in the decision-making activities
- Plant Varieties Protection Act of Singapore (2004) – requires a description of “the origin and breeding of the plant variety concerned”

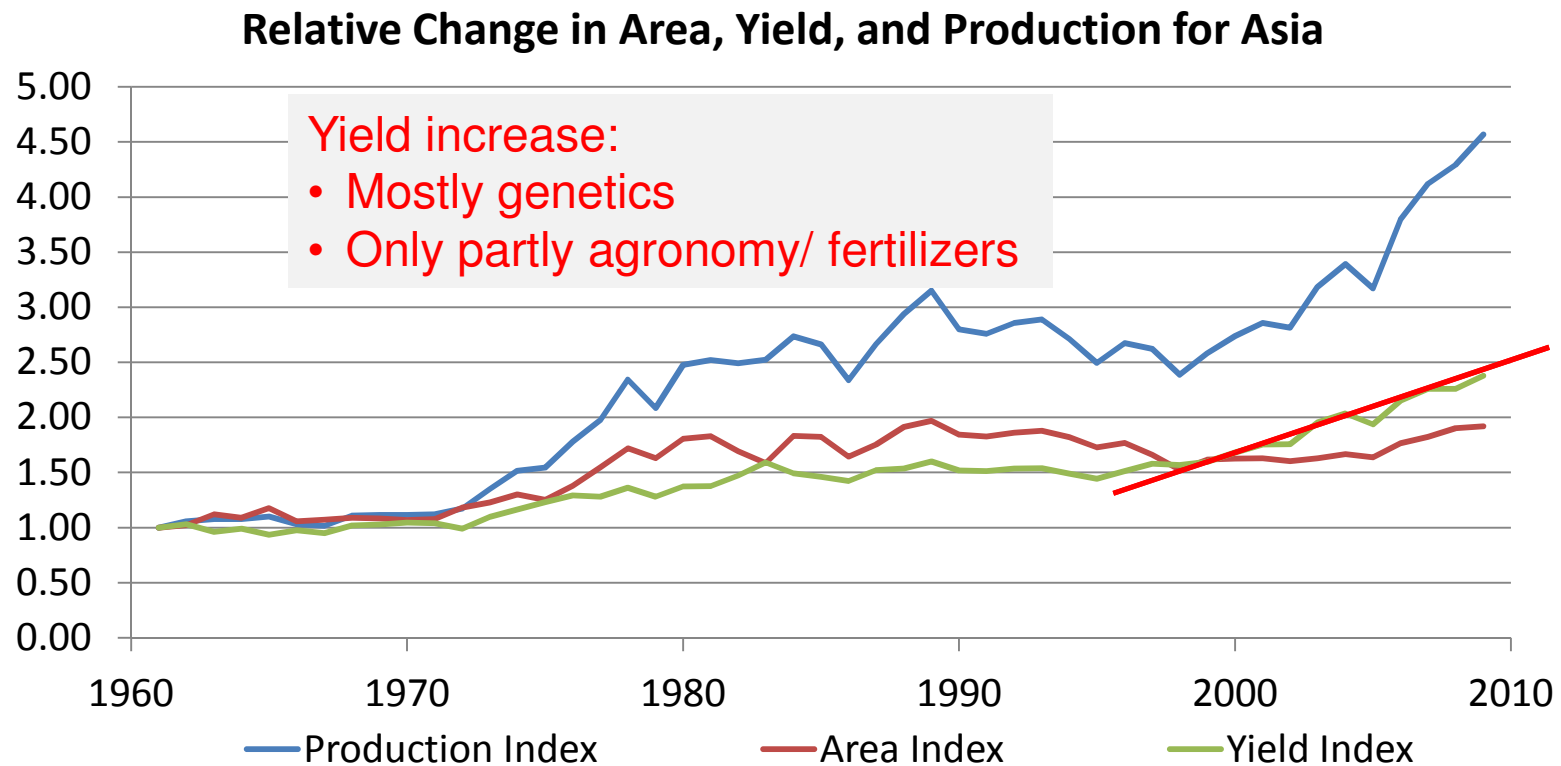
Cassava: Gift from the Americas to the World



Increased Production

Influence of new varieties?

- High and stable yields and high starch content
 - Major impact on the growth of cassava production in SE Asia
 - ↑ starch yield per ha



Global Production of Cassava

2008	Million t	% Global Production	
Nigeria	44.6	19.2	
Brazil	26.7	11.5	
Thailand	25.2	10.8	
Indonesia	21.6	9.3	51%
DR Congo	15.0	6.5	
Ghana	11.4	4.9	
Angola	10.1	4.3	
Vietnam	9.4	4.0	
India	9.1	3.9	
Tanzania	6.6	2.8	
Uganda	5.1	2.2	
Mozambique	5.0	2.2	
China	4.4	1.9	
Cambodia	3.7	1.6	85%



Data source: FAOSTAT

Asia = 31.5%

Cassava in Cambodia

- **Cambodia**

- Extremely rapid expansion of area of production – and yield
- Mealybug is a major threat
- Good examples of returns on good agronomy
- Expansion by smallholders and large concessions



Cambodian farmers: net profit ~ US\$ 2,000 per ha