



## **CGIAR Research Program on Roots, Tubers and Bananas:**

### ***Planning for greater impact 2***

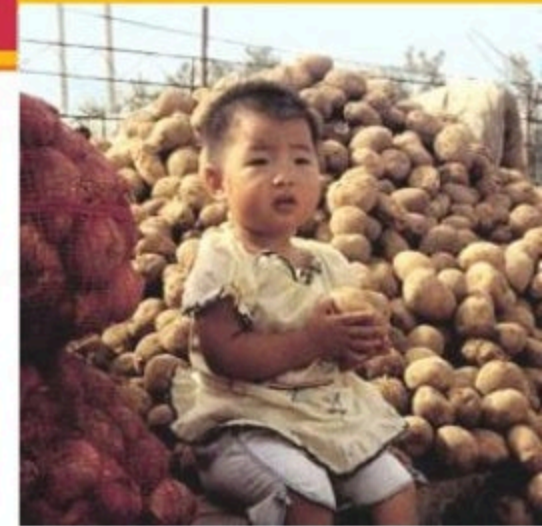


**Research  
Program on  
Roots, Tubers  
and Bananas**

**CGIAR Consortium Office  
Montpellier June 2013**

# Content

- RTB Value Added
- Results based management
- Strategic objectives and flagships
- M&E
- Engaging partners and stakeholders
- Workplan and budget scenario
- RTB business case





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## **RTB – Value added**

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## RTB “value added”



**To do together what we cannot do separately**

- **Increased scale**
- **Greater capacity**
- **Exploit synergies: genuine “win-wins” eg *similarities in seed systems and post harvest management***



## **Cross-crop/center projects: 2012-13**

### **Examples**

**Omics platform**

**Planning banana Improvement**

**Managing diseases causing degeneration of planting material**

**Combating white fly**

**Alliance banana bunchy top virus in Sub-Saharan Africa**

**Risk assessment & surveillance critical pests and diseases**

**Modelling RTB-seed systems**

**Identifying and quantifying yield gaps**

**Capacity strengthening: A needs assessment**

**Implementing RTB gender strategy**

**Partnerships and knowledge sharing**

## **Gender mainstreaming:**

- **Gender-responsive priority assessment**
- **Integration of gender research**
- **Strategic gender research**
- **Gender-responsive partnerships**
- **Communications/KS around gender**
- **Capacity strengthening for gender outcomes**
- **Indicators for M&E**



# Priority assessment: best bets for research

## Six Major Steps of the RTB Priority Assessment Exercise

1

Agro-ecologies  
and targeting

- Online production atlas (each crop)
- Target areas defined and located
- Feedback on approach/results

2

Constraints  
analysis

- Synthesis of the major constraints
- Expert survey results
- Online survey
- Feedback on constraints

3

Identify matching  
research options

- Survey results
- Final list of research options for analysis
- Online survey
- Feedback on list of options

4

Quantify model  
parameters

- Annotated impact study bibliography
- Quant. parameters
- Estimate of and comments on parameters

5

Estimate research  
impacts

- Impact estimate of research options (several scenarios)
- Feedback on preliminary model results

6

Communication  
of findings

- Final RTB report, (online) newsletter, journal paper(s)
- Feedback on study approach and process

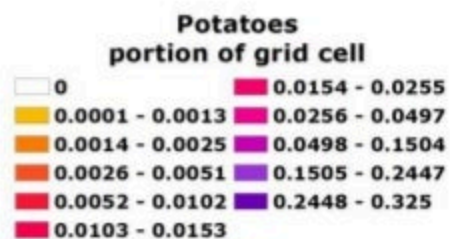
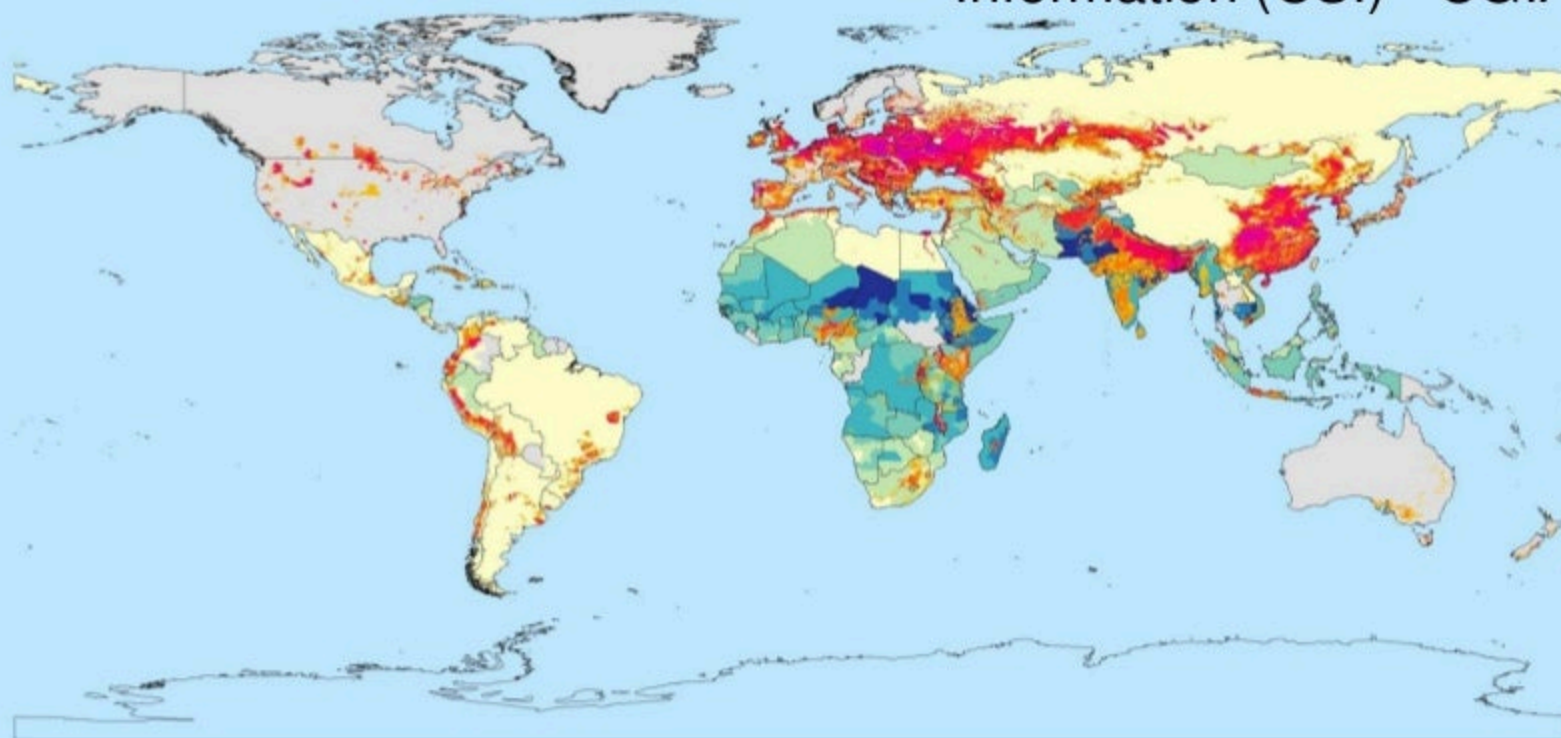
STAKEHOLDER ENGAGEMENT AND COMMUNICATION

## Cassava expert survey: top 10 constraints

	Mean score
Improving distribution elite planting materials	4.26
Improving shelf life cassava roots	4.23
Cassava brown streak disease	4.21
Cassava mosaic disease	4.19
Small scale processing human consumption (e.g. gari)	4.14
Developing industrial applications (flour and starch)	4.13
Breeding for high yield	4.08
Improving technologies farmer based planting materials	4.05
Phenotypic/molecular screening high-value traits	4.04
White flies	4.04
.....	
Low temperature/winter hardiness ( <i>lowest ranked</i> )	2.60



Consortium for Spatial  
Information (CSI) - CGIAR





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# **Results based management - RBM**





## **Results based management (RBM)**

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- **Optimize R&D outcomes - enhance value for money**
- **Clearly agreed accountability at different levels**
- **All actors ensure processes, products & services contribute to shared results**
- **Flexible and iterative**
- **RTB to pilot RBM in 2014**

## RTB IDOs

IDO	Indicator
Improved productivity in small-holder RTB cropping systems (SLO 1, 2 and 4)	<ul style="list-style-type: none"><li>• Change farm yield by income group</li><li>• Changes in cropping system and yield gaps (maps)</li></ul>
Increased and stable access to food commodities by rural & urban poor	<ul style="list-style-type: none"><li>• Change in mean and variance calorific gap</li><li>• Increase in aggregate supply</li></ul>
Increased and more gender-equitable income for poor participants in RTB value chains (SLO 2, 3)	<ul style="list-style-type: none"><li>• % Change in farmer revenue from improved RTB varieties</li><li>• % changes in RTB product income gender differentiated</li></ul>

## RTB IDOs

IDO	Indicator
Increased consumption of safe & nutritious foods by poor esp. nutritionally vulnerable women & children (SLO 2, 3)	<ul style="list-style-type: none"><li>• % contribution of RTB to micro-nutrient needs of vulnerable populations (pregnant/lactating women + under 3s)</li></ul>
Minimized adverse environmental effects of increased RTB production, processing and intensification (SLO 4)	<ul style="list-style-type: none"><li>• Changes in Environmental Footprint Index</li></ul>
Improved ecosystem services for enhanced food system stability & sustaining novel genetic diversity for future use	<ul style="list-style-type: none"><li>• Total number of LR cultivars preserved in and ex situ per hotspot</li></ul>
Enabling policy environment for devpt. & use of pro-poor & gender inclusive technology (SLO1, 2, 3 and 4)	<ul style="list-style-type: none"><li>• # of policy changes relevant to RTB technologies and consumption</li></ul>

# Flagship product



# Flagship evolves driven by search for market share

 **The iPhone evolution** \* Based on iPhone 5's rumored specs 

intomobile



iPhone



iPhone 3G



iPhone 3GS



iPhone 4



iPhone 5



Processor

412 MHz  
ARM 11

412 MHz  
ARM 11

600 MHz  
ARM Cortex A8

 **A4**  
1 GHz

 **A5**  
1 GHz  
dual-core

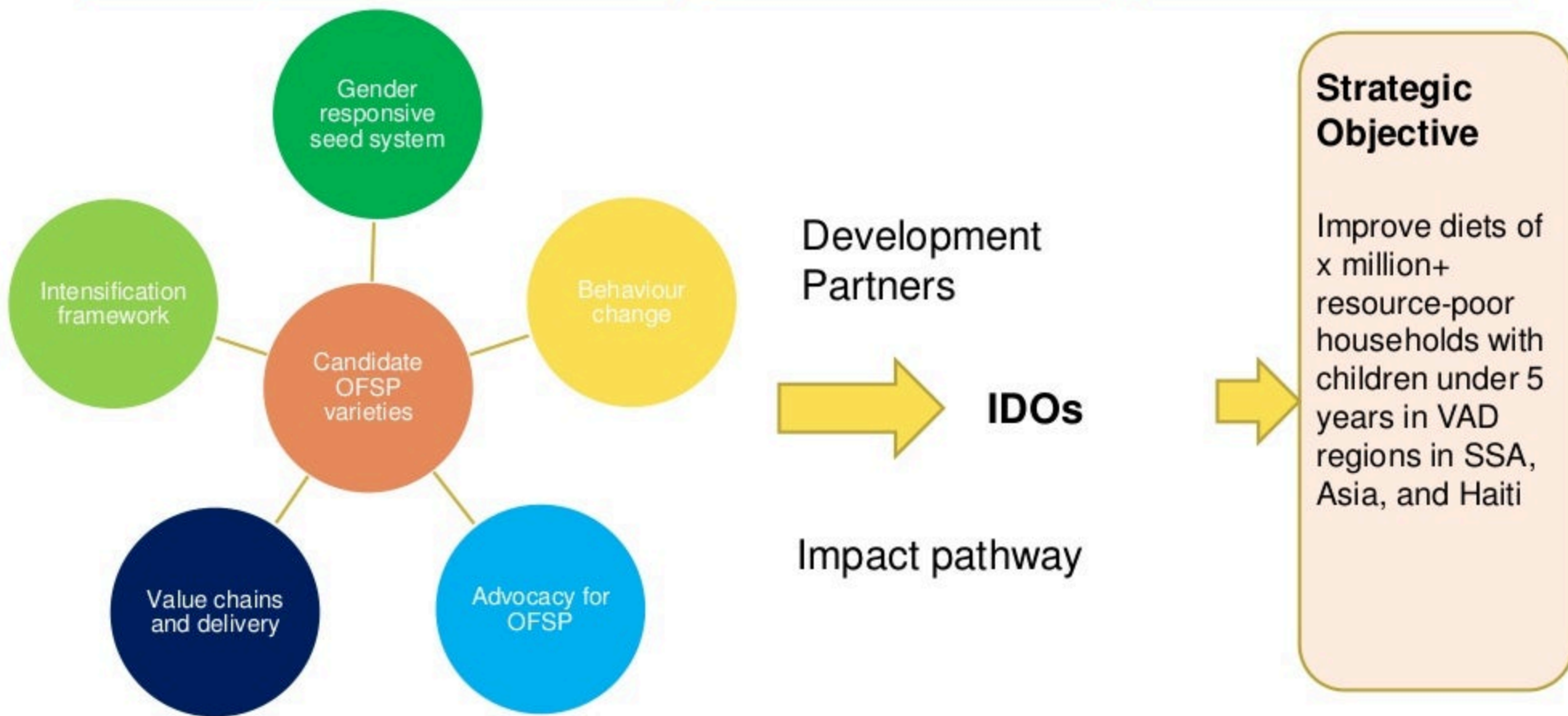




## Flagships – Types & Examples

- **Delivery flagships (near market-ready “scalable” technologies):**
  - Small and medium scale processing targeting rural women
  - Providing nutrient rich food
  - Managing and containing diseases
  - Functioning RTB seed systems (value chains)
- **Discovery flagships (mid-long term options):**
  - Next generation breeding for genetic gain
  - Game changing traits
- **Cross cutting (learning/support):**
  - Learning for post harvest and value addition
  - Development Store (outcome support, gender training)

# Delivery flagship: Combating vitamin A deficiency with resilient, nutritious orange-fleshed sweetpotato



## Research products



Candidate OFSP varieties

Guidelines for implementation of gender-responsive vine multiplication

Demand creation and behaviour change strategy

Value chains and delivery framework

Advocacy strategy to promote OFSP and food based approaches

Sustainable intensification framework, including dual purpose use for SP

## Research outcomes

### Next Users

NARS release and promote well adapted consumer preferred OFSP varieties

Women and men vine multipliers sustainably provide OFSP vines and extension advice

Community health workers organize sensitization campaigns on importance of Vitamin A and benefits of OFSP

Value chain actors explore new market options for OFSP

Advocacy NGOs organize events with policy makers on food-based approaches to nutritional security and role of OFSP

NARS promote technology options for diversifying use of SP as fresh and processed feed product

## First level development outcomes

### End Users

Women and men sustainably adopt OFSP varieties for home consumption and sale

Pregnant and lactating women have improved knowledge of Vitamin A and benefits of OFSP and want to access vines

Women and men expand OFSP production and enter into more equitable market relationships

Policy makers have improved awareness of Vitamin A deficiency and food based approaches using OFSP

Women and men sustainably intensify production systems with dual purpose use of SP

## Intermediate development outcomes

Pregnant and lactating women increase consumption of OFSP and other Vitamin A rich foods

Women and men benefit from increased income through sales of OFSP and related products

Ministries of Ag and Health change policies to promote food-based approaches to nutrition, including use of OFSP



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## **Strategic objectives and flagships**



## Strategic objectives and delivery flagships:

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- **Combating vitamin A deficiency with resilient, nutritious orange-fleshed sweetpotato**
- **Raising incomes and improving the health and safety at small and medium cassava production centers**
- **Improving the livelihoods of producers through recovery and containment of banana bunchy top disease**
- **Improving livelihoods of potato farmers in Africa by breaking the seed bottleneck**



## **Combating vitamin A deficiency with resilient, nutritious orange-fleshed sweetpotato**

### **Theory of change**

- ***Targets women as primary carers of under 3s***
- ***Nutrition education & behaviour change drive adoption***
- ***Strong marketing concept: “Eat orange”***



Reaching caregivers  
and *influencers*





## **IDOs: resilient, nutritious orange-fleshed sweetpotato varieties**

### **Increased and more gender-equitable income**

15 million resource poor HH increase their crop income by 15% with 50% involving benefits to women

### **Increased consumption of safe and nutritious foods**

15 million resource poor HH increase diet diversity score by 20%

50% under 5s consume OFSP twice a week





## **Small and medium cassava production centers, especially for rural women**

### **Theory of change**

- ***Value chain driver technological change***
- ***Women leading role small scale cassava enterprises***
- ***Gender disaggregated preferences for quality traits speeds adoption***
- ***Significant health benefits eg improved gari fryers***
- ***Gender equity with technological innovation***

# Oyo, Nigeria, gari producers



# Mechanized gari production: implications for gender equity?





## Recovery and containment of banana bunchy top disease

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### Theory of change

- ***Empower farmers to manage disease in affected areas and deal with threat***
- ***Access to clean planting materials***
- ***Community based phytosanitary system***
- ***Increase awareness of BTB threat at international, regional national, and local levels***

## IDO: recovery and containment BBTD

Improved productivity	Increased and more gender-equitable income	Increased and stable access to food commodities
<ul style="list-style-type: none"><li>● 106,000 households (HH) produce 20t/year commercial Cavendish from 1 ha recovered from BBTD</li><li>● 120,000 HH produce 5t/year from 5 ha</li></ul>	HH recovering banana production from BBTD, 50% achieve a 20% increase in women's income and 80% income increase	120,000 HH recover more nutrient rich diets from banana



## Breaking the potato seed bottleneck

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### Theory of change

- *Private sector highest quality seed (Kisimo Farms)*
- *Private-public partnerships*
- *Upgrade value chain, create businesses*
- *Women entrepreneurs best seed multipliers!*
- *Reduce cost quality seed, expand availability*

## **IDOs: breaking the seed bottleneck**

<b>Improved productivity</b>	<b>Increased and more gender-equitable income</b>
350, 000 smallholder beneficiaries increasing yields by 70%	Network of 2,500 decentralized seed multipliers established, achieving a profit of \$1500/ha /year

## Delivery flagships: stages for scaling up

	Stage 1: Assembly	Stage 2: Pilot	Stage 3: Scaling out	Stage 4: Massive scaling
<b>Scale of impact</b>	<b>Client oriented research</b>	<b>&lt;10,000 beneficiaries</b>	<b>&lt;100,000 beneficiaries</b>	<b>1–10 million beneficiaries</b>
<b>RTB role</b>	<b>Lead</b>	<b>Lead</b>	<b>Coordinate</b>	<b>Convene</b>
<b>Research emphasis</b>	<b>***</b>	<b>***</b>	<b>**</b>	<b>*</b>
<b>Outcome emphasis</b>	<b>*</b>	<b>**</b>	<b>***</b>	<b>***</b>



## Delivery flagships: stages for scaling up

Flagship	2015–2017	2018–2020	2021–2023
Recovery, containment, quarantine BBTD	Stage 2	Stage 2	Stage 3
Improved technology cassava processing	Stage 2	Stage 3	Stage 3
3G approach potato seed multiplication	Stage 2	Stage 2	Stage 3
Resilient, nutritious OFSP varieties	Stage 3	Stage 3	Stage 4
New flagship graduated from discovery	Discovery	Stage 1	Stage 1

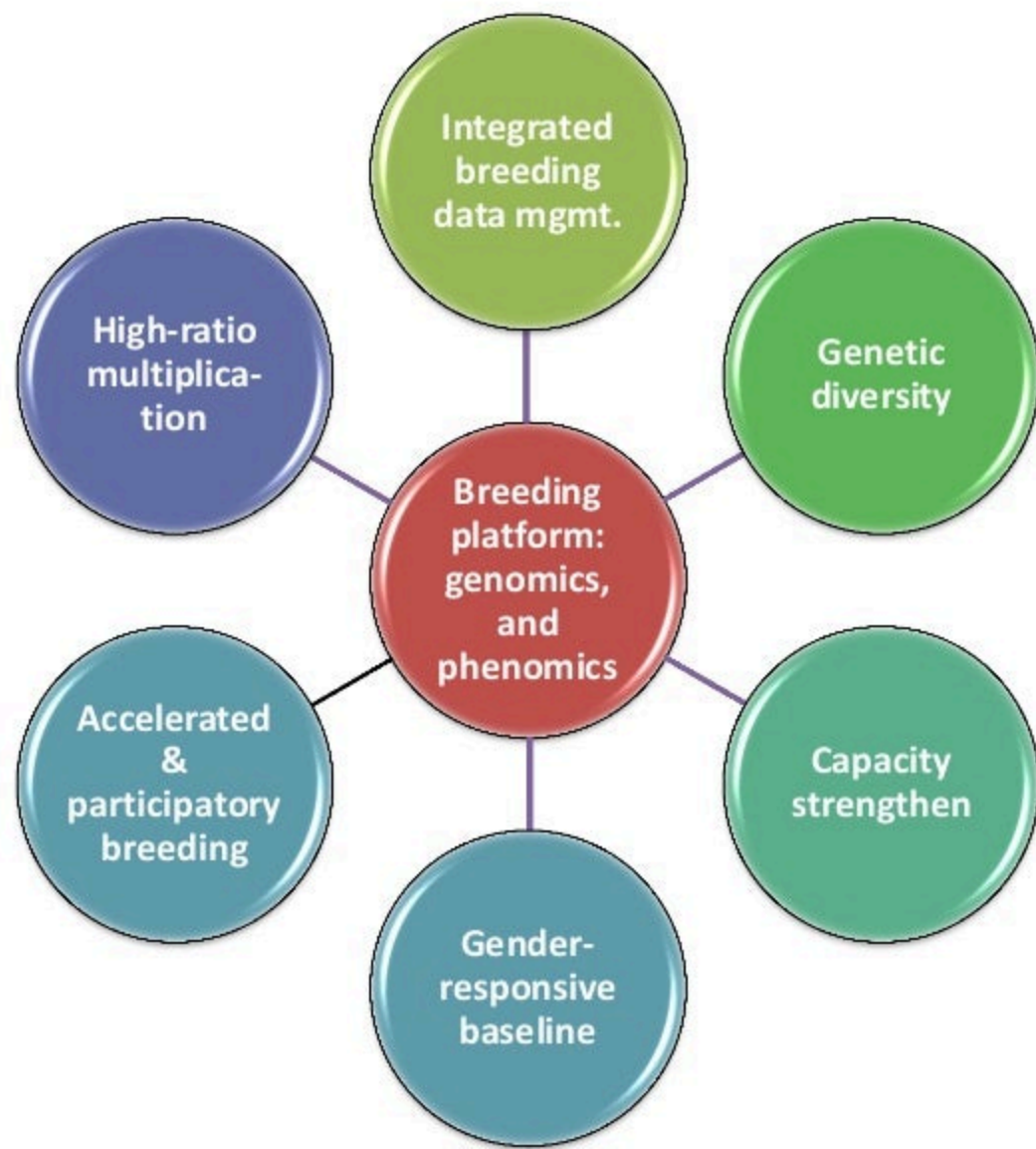


## **Discovery flagships**

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- **Next generation breeding for genetic gain**
- **Game changing traits/solutions (GMO)**
- **Global network of RTB in-situ conservation monitoring sites**

## Next generation breeding for genetic gain



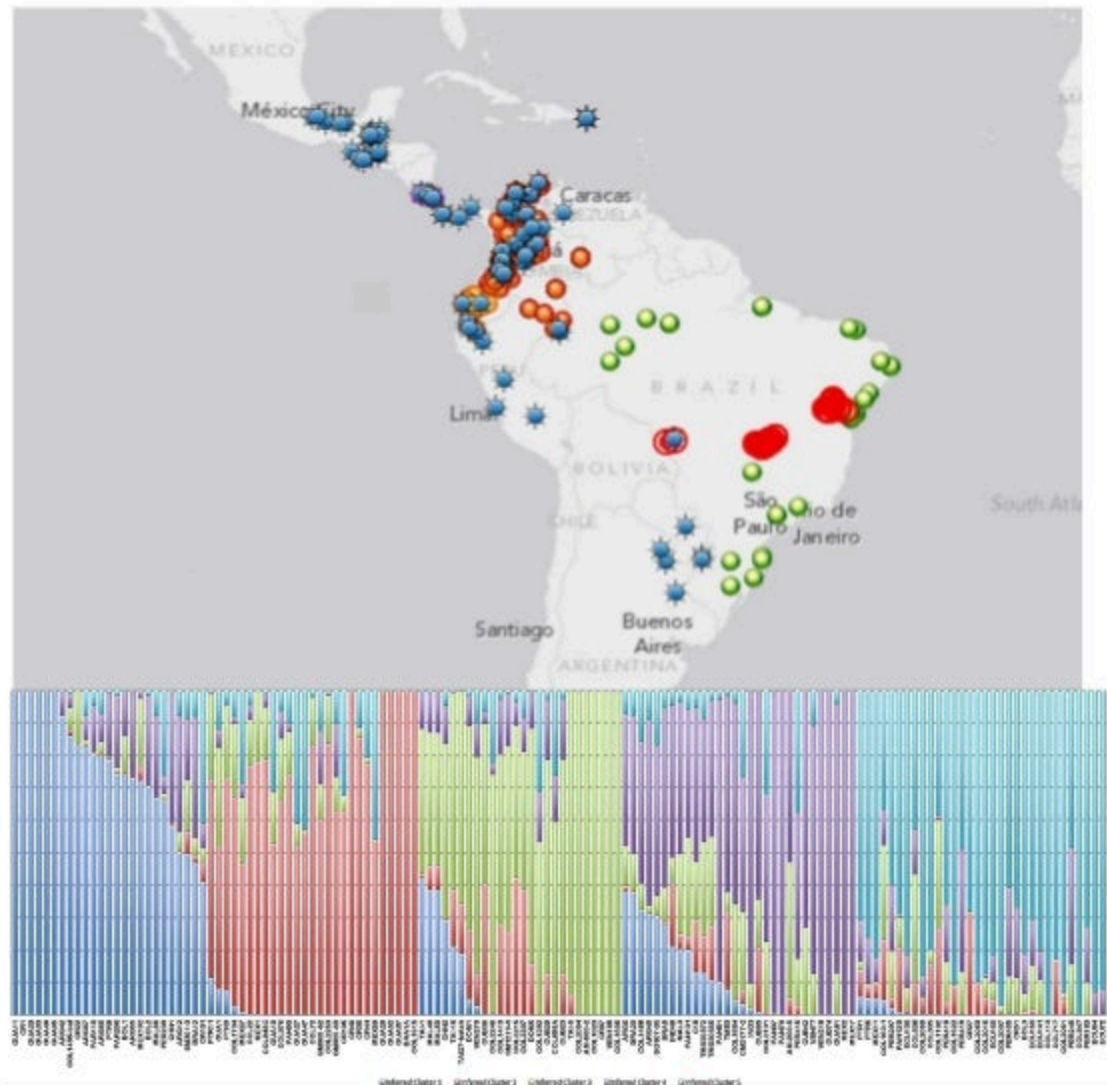
### Theory of change

- ***Accelerating genetic gain through use of molecular tools and high throughput phenotyping***
- ***User feedback to increase adoptability***
- ***Shared platforms for genotyping and metabolomics increases efficiency***

# Global Cassava Genome Initiative

5000 Cassava genotypes from CIAT and IITA to be sequenced

Pilot in 2013 on 180 landraces frequently used in CIAT's breeding program



## Next generation breeding: metrics

	<b>Target environment</b>	<b>Target Trait</b>	<b>Current level of trait</b>	<b>Target level 2023</b>
<b>Cassava</b>	Asia West and Central Africa	Yield, starch content High pro-vitamin A (>15 ug/g B-carotenes) high DM, poundable with low CNP	Medium-high (25%) 1/3 target level of beta-carotenoids. Dry matter content less than 30%	High (32%) Target > 2% increase in carotenoids content and dry matter content per year
<b>Potato</b>	Subtropical Lowlands	Earliness Virus resistance Heat tolerance User preference	Average maturity period >85 days and susceptible to viruses	Combined resistance PVY PVX and PLRV 70-day maturity in 40% popn.
<b>Sweet Potato</b>	Tropical & Sub-tropical lowlands	Yield & earliness SPVD resistance	8t /ha 120 days < 1% in breeding pop.	9.6 t/ha 100 days 10% in breeding pop.
<b>Yams</b>	West Africa	High yield and DM anthracnose + nematode resistance	Average yield below 10 t/ha.	Yield above 30 t/ha. + resistance to anthracnose and viruses



## **Cross-cutting flagships (learning and support)**

- **Framework for analysing & intervening in RTB seed systems**
- **Value adding through improved post-harvest and risk management**
- **Development store**

## Sharing knowledge, building capacity and fostering advocacy for enhanced impact



### Theory of change

- ***Enhancing client orientation***
- ***Building capacity for feedback on uptake***
- ***Engaging public & private policy makers***



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## **M&E – planning**

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## M&E

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- Tracking range of indicators
  - *IDO: delivery flagships*
  - *Research milestones: discovery flagships*
  - *Changes next users: cross-cutting flagships*
- Baseline and counterfactuals?
- RTB wide system linking Program Management and partners
- Capacity development to measure outcomes with gender disaggregation
- Measuring development outcomes research function eg econometrics for price change
- Co-development of theory of change and accountability framework: outcome mapping and participatory impact pathway analysis



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## Collaboration CRPs

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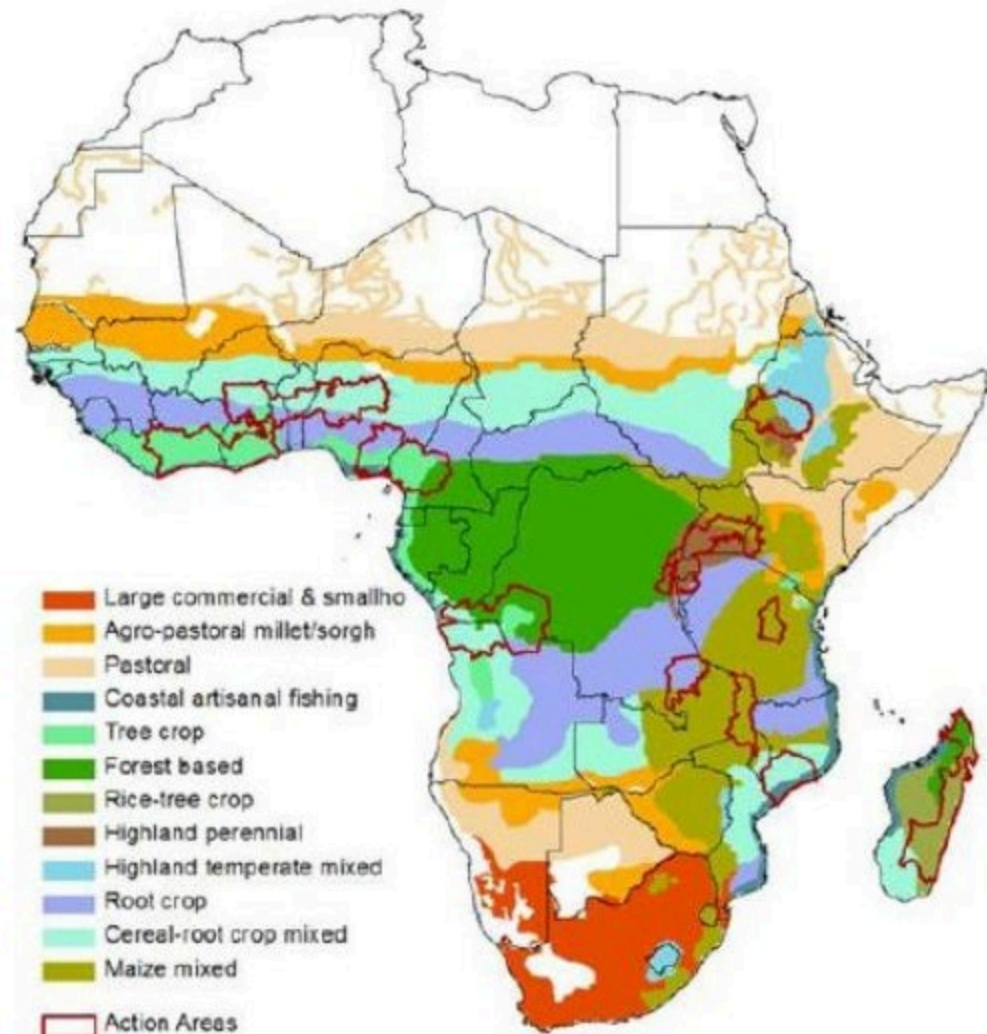
# Collaboration with systems CRPs

## Humidtropics

### Action areas

Large overlap  
with RTB  
“hotspots”

### Shared research sites



## Linkage mechanisms systems CRPs

1. Joint priority assessment
2. Co-construction impact pathways
3. Learning alliances across innovation platforms
4. Joint action research on partnerships



## Collaboration CRPs: eg A4NH

	A4NH	RTB
<b>Breeding /germplasm development</b>	High-throughput diagnostics for vitamins and minerals	<ul style="list-style-type: none"> <li>Breeding program</li> <li>Uses high through put diagnostics</li> </ul>
<b>Nutritional efficacy and bioavailability studies</b>	Primary responsibility	No role
<b>Delivery and Evidence / Advocacy</b>	Nutrition evidence and public delivery	Contribute evidence
<b>Value chain coordination, food processing, industry</b>	<ul style="list-style-type: none"> <li>Focus incentives and arrangements (including gender)</li> <li>Joint processing and foods.</li> </ul>	<ul style="list-style-type: none"> <li>Lead value chain actors, focus on gender with commercialization.</li> <li>Joint processing and foods.</li> </ul>
<b>Assessing nutrition and health outcomes</b>	Primary responsibility	Supporting role

## Collaboration genebanks CRP

1. Gap analysis: what's missing?
2. Linking Ex situ to In situ
3. Genotyping & evaluation platforms
4. Safe movement germplasm guidelines
5. Data management, inc. breeding populations





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## Engaging partners and stakeholders

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## **Engage and align with regional and subregional organizations**

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- 1. Active involvement CAADP**
- 2. Engaging with Asareca, Coraf and Ccardesa for priority assessment**
- 3. Consortium Office and IICA in Latin America**



Area of CRS	RTB Program
Development partner networks: 45 countries, 1.5 million farm households	Partnerships
Seed assessment methodologies	Seed systems
Market-based transfer mechanisms for farm inputs	Seed systems
Local seed enterprise development	Seed systems
Market-engagement skills	Value chain
Community volunteer and fee-for-service extension models	Value chain
Gender-responsive development programming	All

## 7 key areas for collaboration

Area of NRI research and capacity building	RTB Program
Market scoping (important for short term and long term interventions)	All
Applied experience in making value chains work	Value chain
Gender	All
Food safety approaches specifically designed for SMEs	Postharvest technologies Value Chain
Retention and degradation of pro-vitamin A	Postharvest & value chain
Technologies in drying (and possibly peeling)	Postharvest technologies Value chain
Understanding consumer	Consumer Postharvest technologies
Capacity building – MSc in Food Safety and Quality Management, Postharvest physiology courses	Postharvest technologies

## RTB collaboration - French partnership

Theme	Activity
<b>Genetic Resources</b>	New markers in banana and yam Characterization of potential novel BSV integrants,
<b>Varieties with Higher Yield and Added Value</b>	Opportunities for NGS – Musa A genome sequence Breeding strategies disease resistance Broad and durable resistance in cassava
<b>Priority Pests and Diseases</b>	Detecting and controlling bacterial diseases International training course for banana viruses diagnosis
<b>Cropping systems</b>	Spatial organization multi-specific cropping systems with plantain
<b>Seed systems</b>	Pest and disease free planting
<b>Postharvest Technologies</b>	Integrating post-harvest quality, consumer preference, equipment and value chain in case studies

The background of the slide is a close-up photograph of green cassava leaves. Numerous small, white, oval-shaped insects, known as whiteflies, are scattered across the surface of the leaves, particularly concentrated on the veins. The lighting is bright, highlighting the texture of the leaves and the delicate structure of the whiteflies.

# **Cassava Whiteflies**

**Global Cassava  
Partnership  
for the  
21<sup>st</sup> Century**

**GCP21**

**Declaring War on Cassava Viruses in  
Africa**

***Bellagio, Italy – May 6-10, 2013***



## **Action research on partnership**

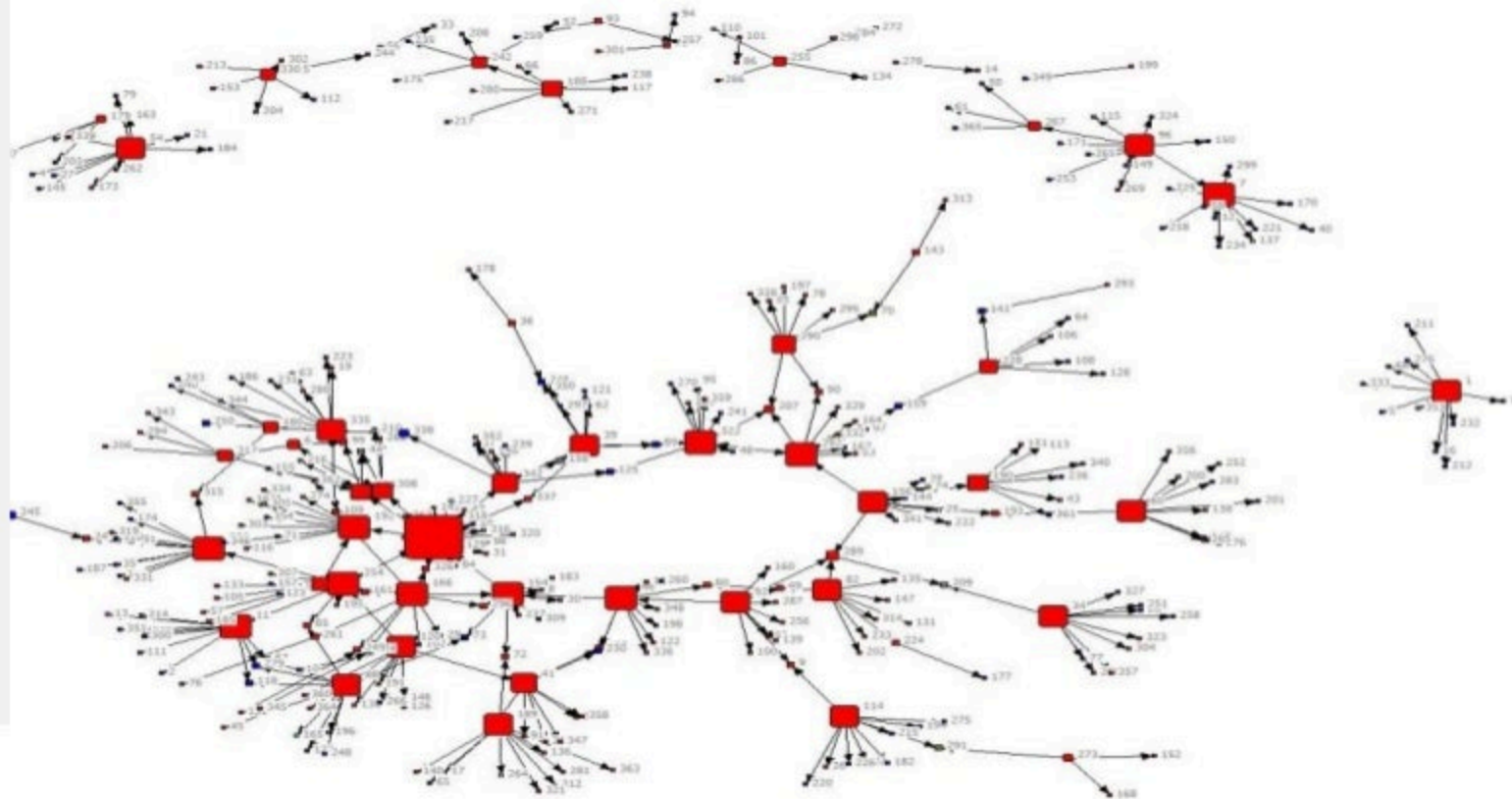
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- 1. Innovation platforms with multiple partners:  
how do they work?**
- 2. How to manage PPPs?**
- 3. How are scientists and others actually  
partnering along impact pathways?**
  - *Network mapping*
  - *Partnership health check up*

# Partnership action research (ILAC)

## RTB actor network maps

### Node colours by type of organization



■ CG-CG, CG-ARI  
Other colors= other  
orgs

Node size set by degree  
centrality



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## **Workplan and budget scenario**

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## Delivery flagships: stages for scaling up

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## RTB Budget Scenario



Increasing budget with transition of delivery flagships with increasing share for development partners and outcome facilitation



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## **RTB business case**

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## The RTB business case

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A collaborative agenda with partners and stakeholders:

- Priority assessment: respond to global trends, development challenges and opportunities
- Co-construct flagships, with impact pathways, to maximize outcome for investment
- Co-construct RTB-specific IDOs
- Improve indicators
- Balanced portfolio: *quick wins*, medium and longer term research
- Develop and implement comprehensive RBM

