

International Centre for Tropical Agriculture (CIAT)- Uganda Office



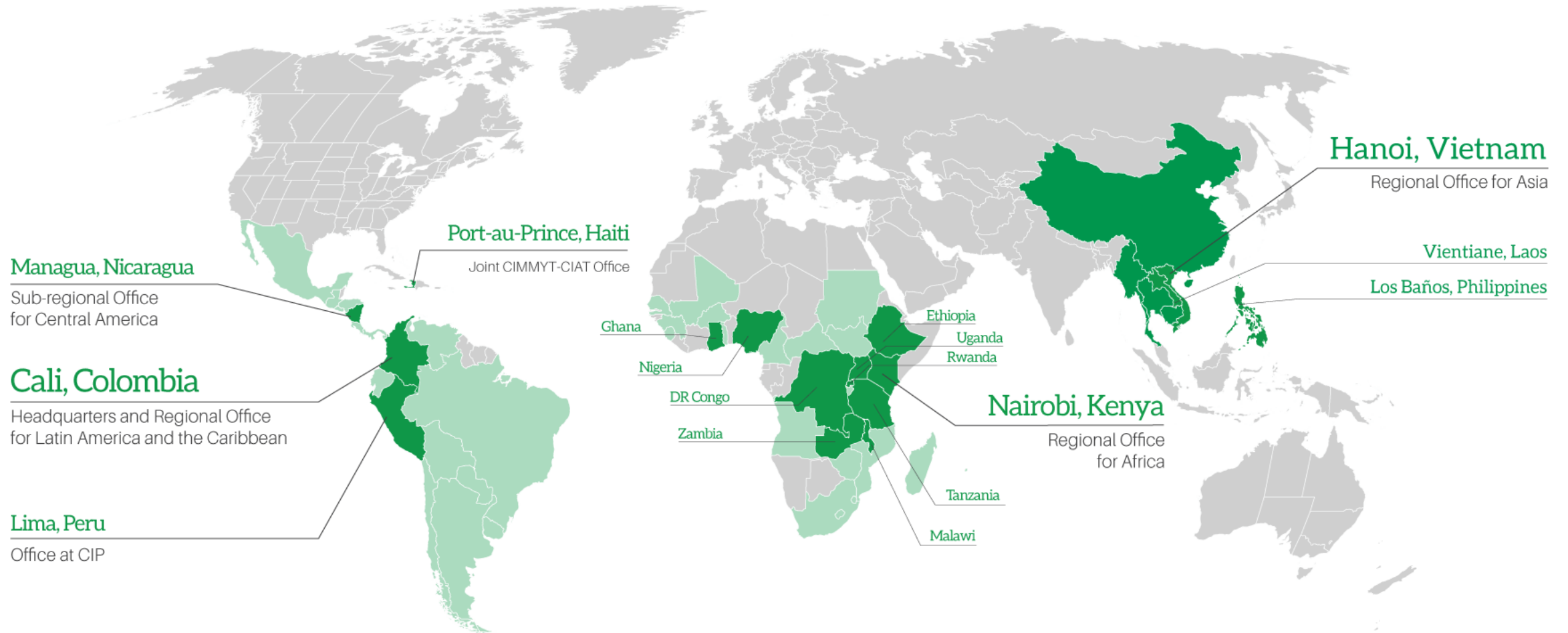
Presentation during Bioversity visit to CIAT- KAMPALA

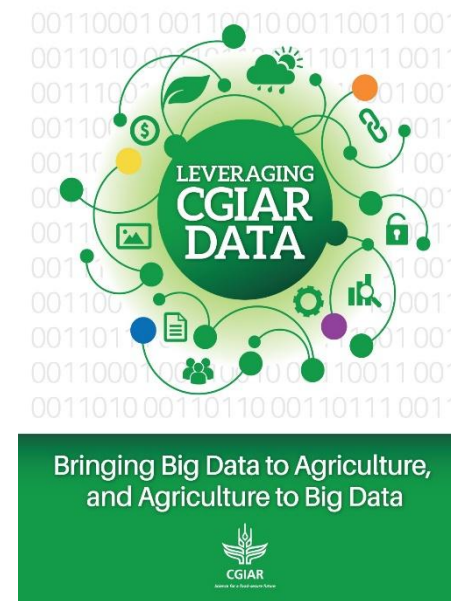
Clare Mukankusi Bean Breeder & CIAT
Country Director 19th April, 2018



CIAT AROUND THE WORLD

We work in 53 countries from 21 offices





RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



Our vision, a sustainable food future



CIAT in Africa Roadmap 2017-2020

Four themes for impact



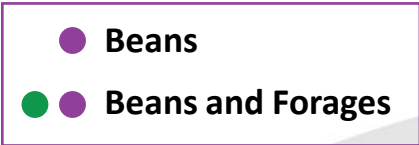
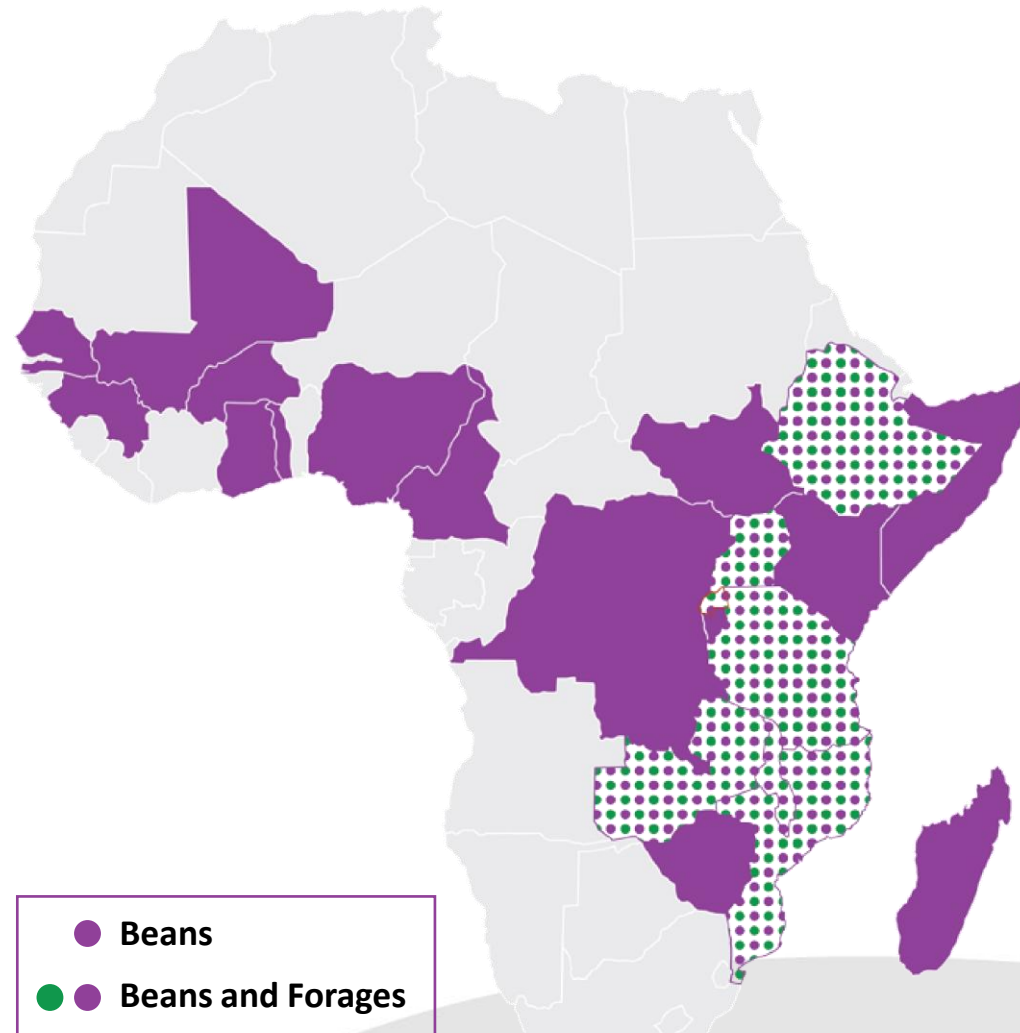
Our vision, a sustainable food future



Theme 1

Leveraging markets through improved productivity and competitiveness

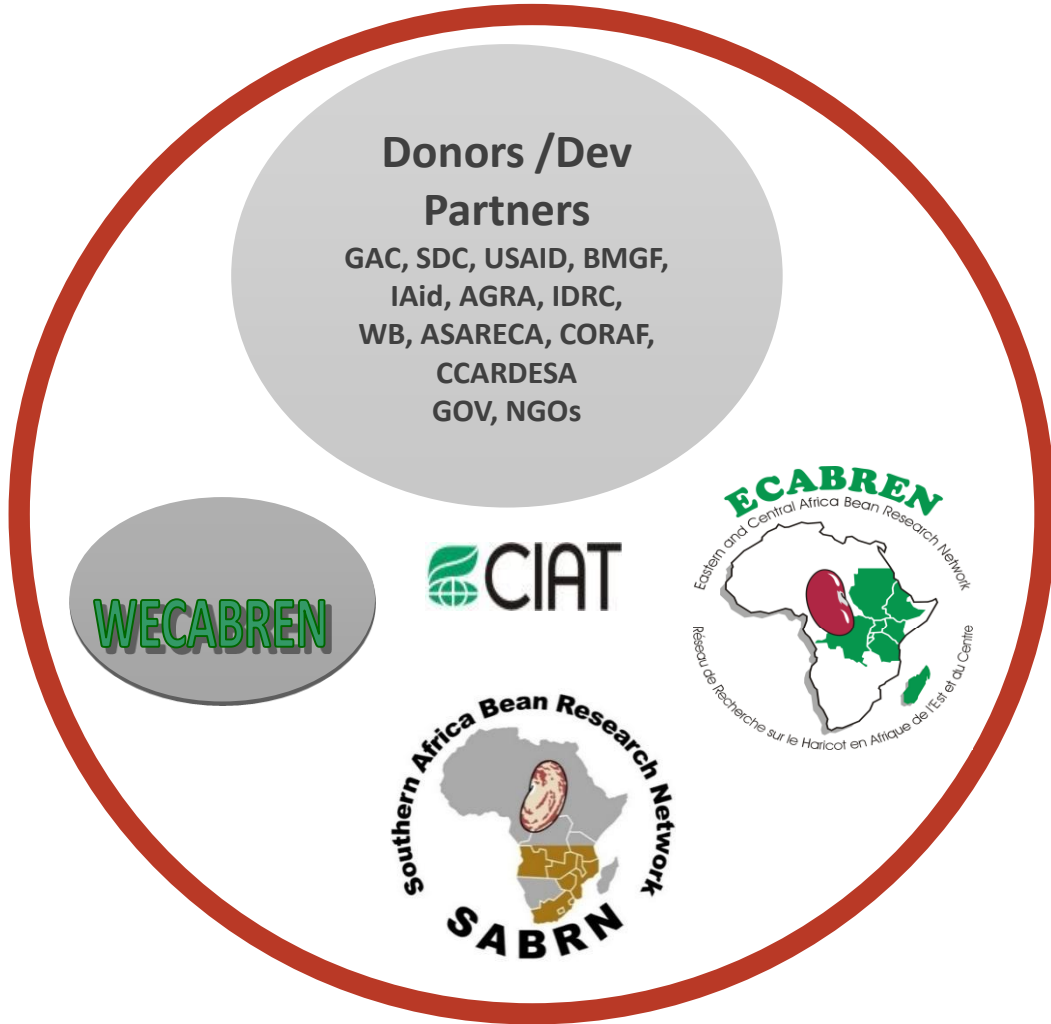
- Strong value chains for beans & forage seeds
- Improving quality, productivity & availability of seed
- Empowering farmers to access information & credit
- Improved beans and forage seeds for more resilient communities



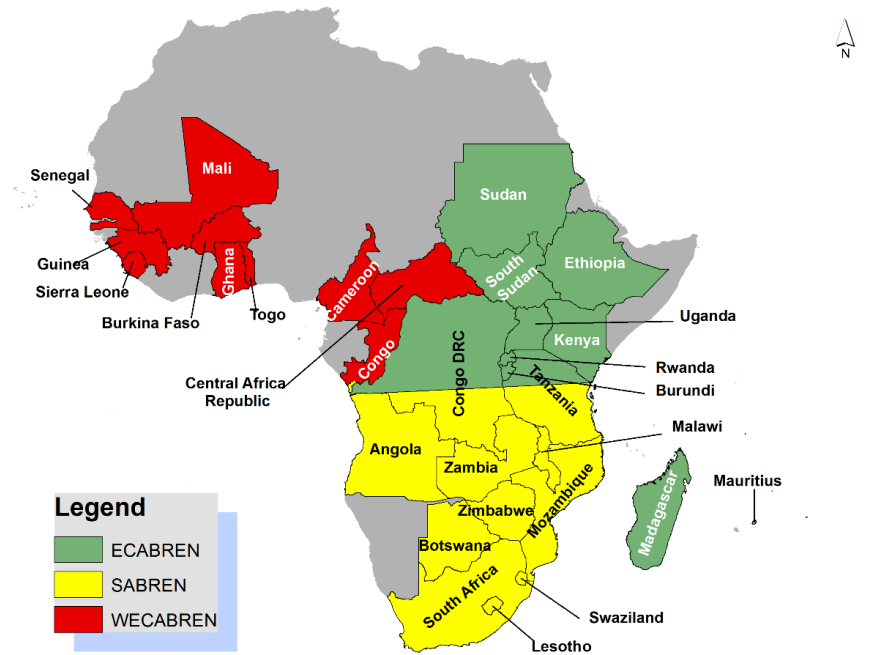
Our vision is a sustainable food future



PABRA Partnerships Platform



PAN-AFRICA BEAN RESEARCH ALLIANCE (PABRA) MEMBER COUNTRIES (30)



Our vision, a sustainable food future





Governance Structures

**PABRA
Steering Committee**

**Funding Partners:
(e.g. GAC, SDC,
SFGA, BMGF), SROs**

- National level (coordination of actors and efforts)
- Sub-regional level (3 networks – SC)
- Pan Africa level (PABRA SC)
- CIAT is a partner and overall facilitator (referee and player)
- Transparency
- Ownership of program by partners
- Empower partners to take decisions and responsibilities
- Donor participation at annual PABRA Steering Committee level

**ECABREN Steering
Committee
(ASARECA)**

National Bean
Programs

**SABRN Steering
Committee
(CCARDESA)**

National Bean
Programs

**WECABREN
Steering Committee
(CORAF/WECARD)**

National Bean
Programs

CIAT

Thematic
Leaders and
Technical Teams

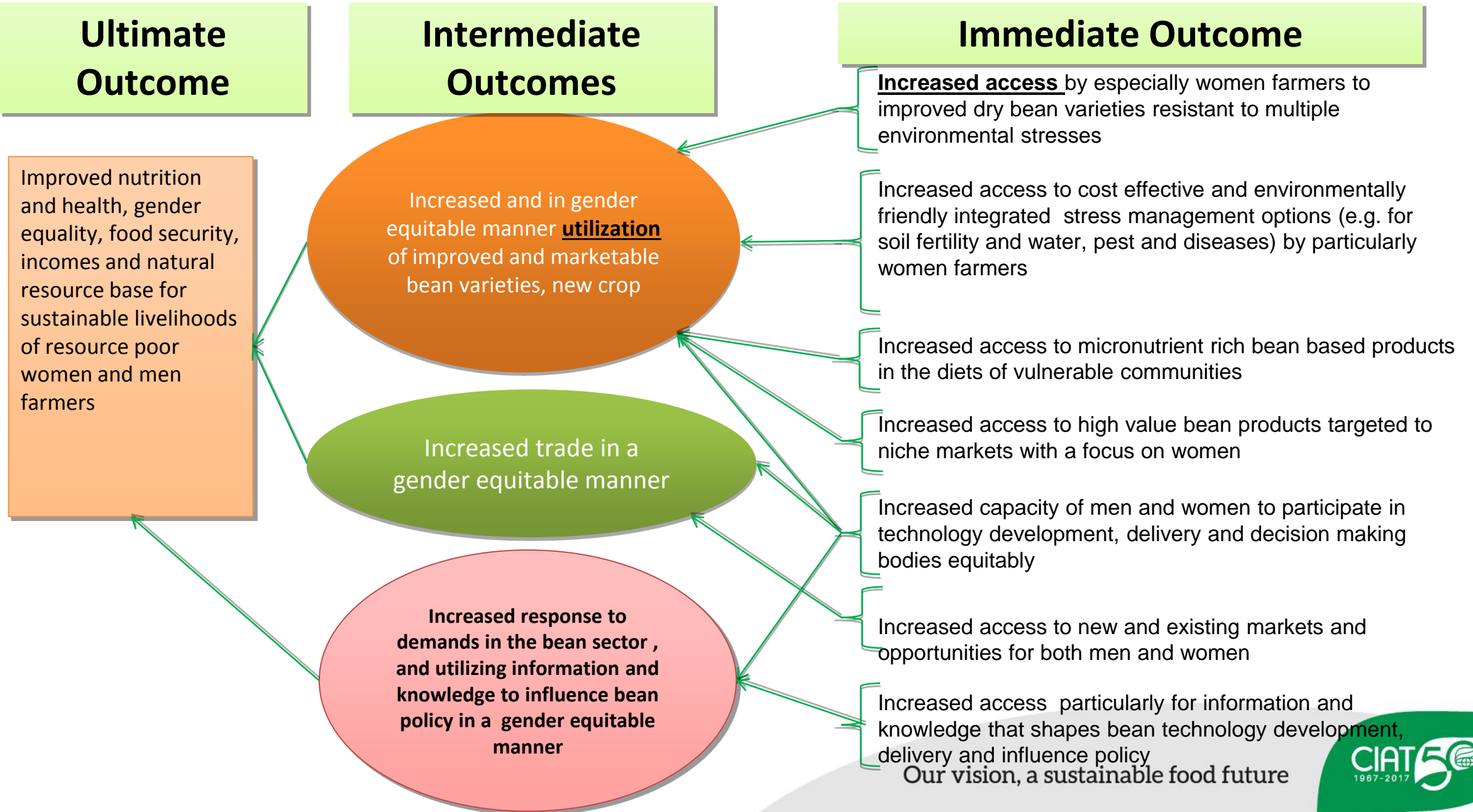
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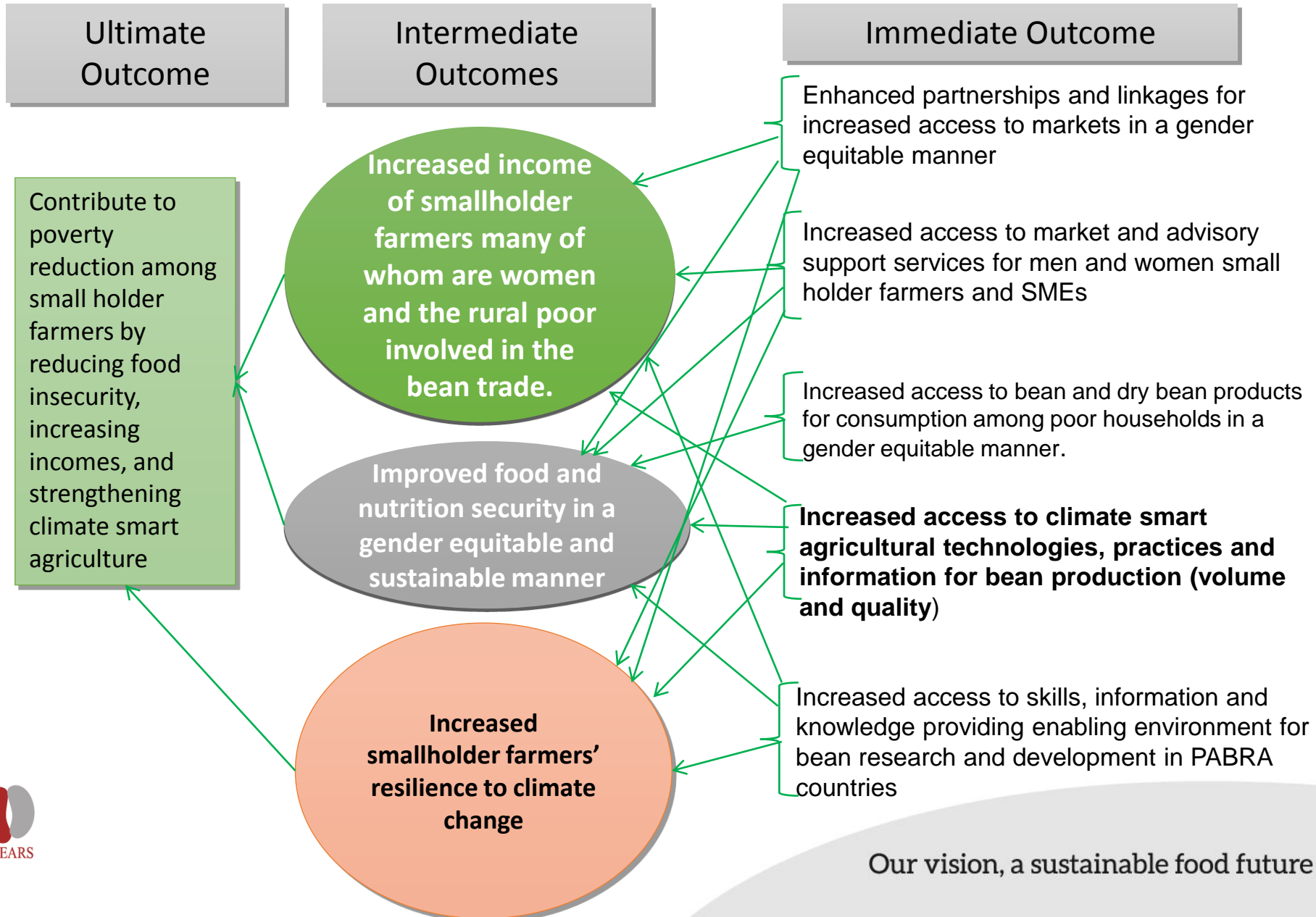
PABRA Framework

- 5-Yr regional agenda and priorities
- Comprehensive and covers all/most aspect of bean value chain
- Aligned to national, sub-regional and CAADP priorities
- Basis for planning and execution of collective programmes and activities
- Commonly used in all countries although doing different and relevant activities
- Provide space and entry point for actors or donors to integrate and contribute components at any point/stage
- Integrates projects:
 - Funded through CIAT relevant to beans
- Factors in kind and other partner contributions

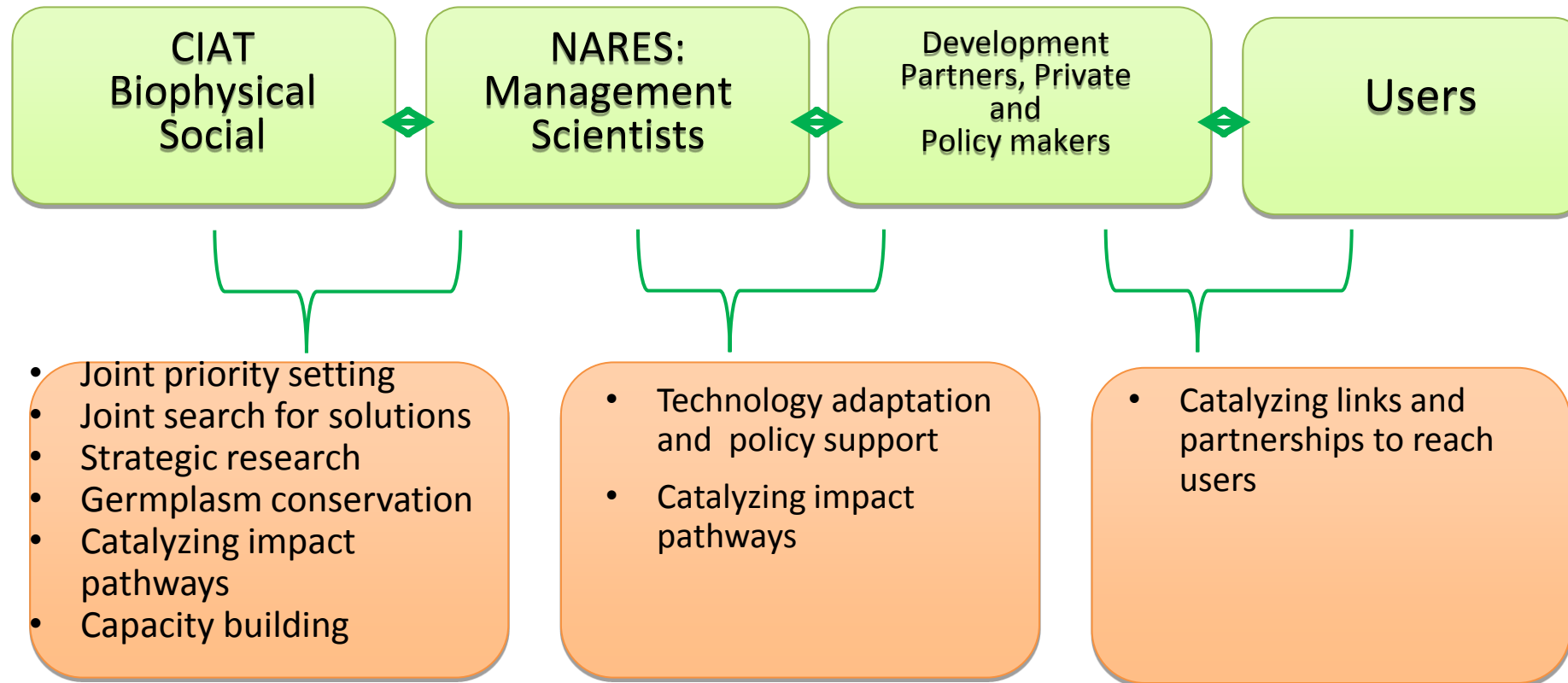
Partnership and Implementation Framework (SDC Support 2015 -2019)



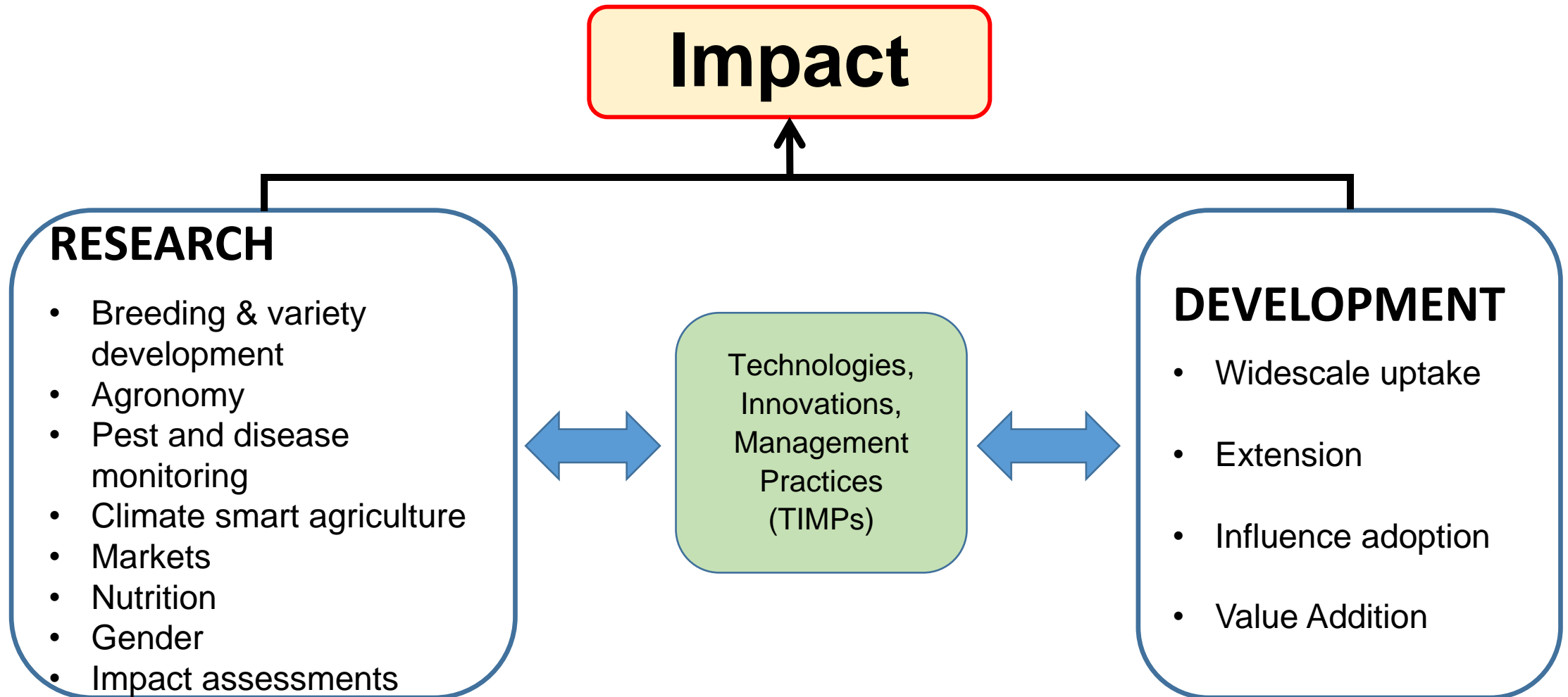
Improving Bean Productivity And Markets In Africa (Implementation Framework - 2016-2022)



Roles Of Partners A Long The Value Chain (From Lab To Market /Mouth)



Link Research for Development and Impact



CIAT / PABRA – Facilitates the link and analyses it

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PABRA Partnership Principles

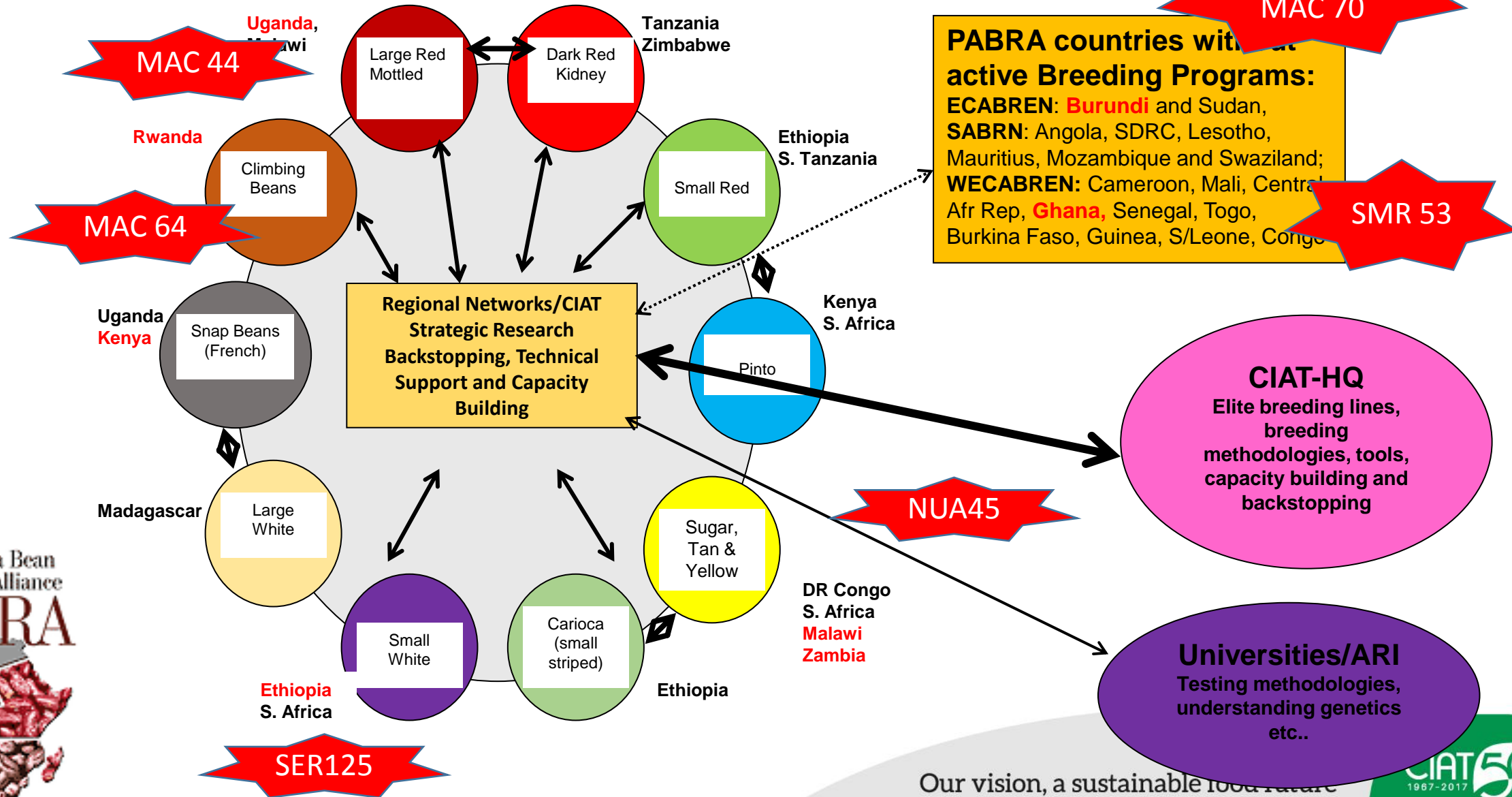
- To enhance synergy and efficiency
- Building social capital
- Partnership and leveraging comparative advantages of partners
- Strengthen national ownership of programs
- Take advantage of other potential / common actors (seed companies, NGOs)
- Build on NARS bean programs and existing partner networks.
- Linkages with other big initiatives (several seed companies and donor supported)
- Shared responsibility among PABRA members

Partnership in bean variety development: Division of responsibility based on comparative advantage and national interest

MAC 44,
MAC 70

PABRA countries with active Breeding Programs:
ECABREN: Burundi and Sudan,
SABRN: Angola, SDRC, Lesotho, Mauritius, Mozambique and Swaziland;
WECABREN: Cameroon, Mali, Central Afr Rep, Ghana, Senegal, Togo, Burkina Faso, Guinea, S/Leone, Congo

SMR 53

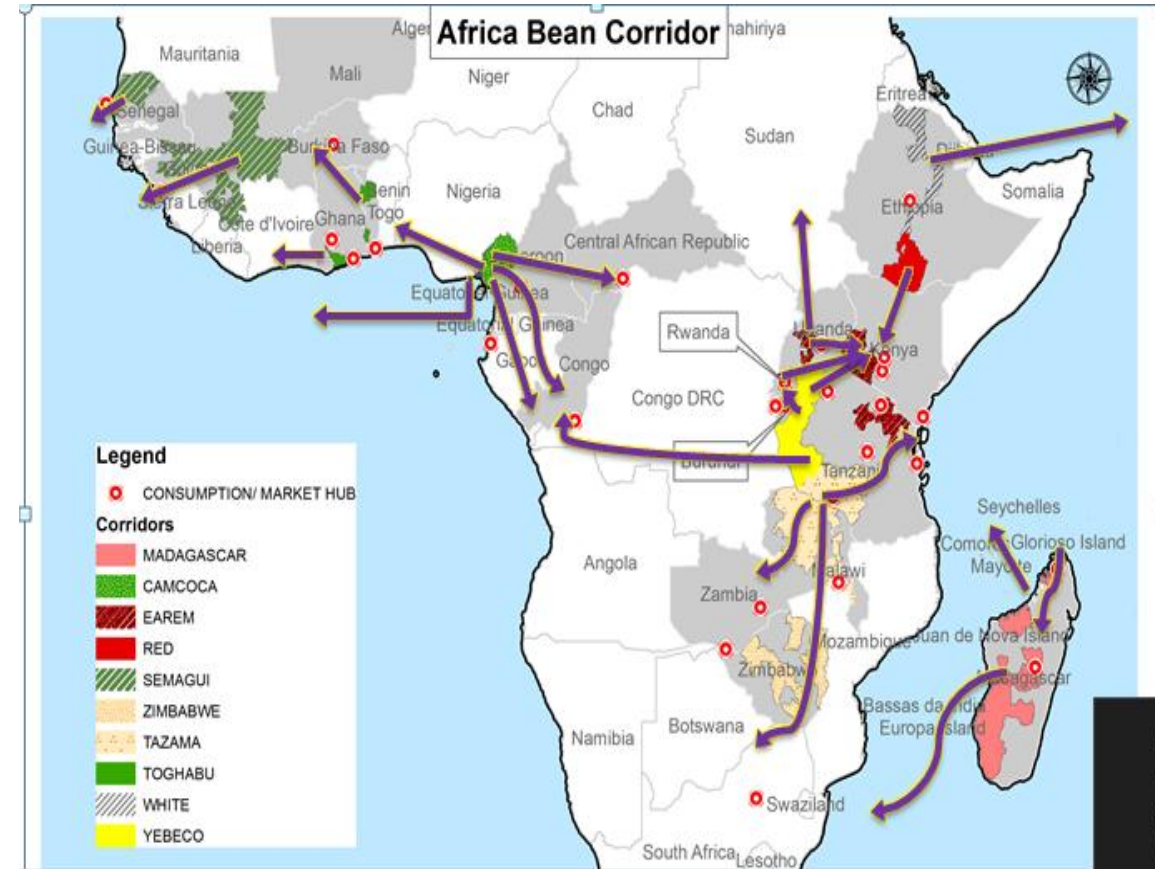


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Commodity Corridor Approach

- The Commodity Corridor Approach continuous to concretized
- Major bean corridors in Africa have been mapped
- Corridor Approach forming the core of PABRA work
- The Approach continues to receive a lot of interest from various partners, e.g. AfDB, WB, FAO
- The Approach can be applied beyond beans



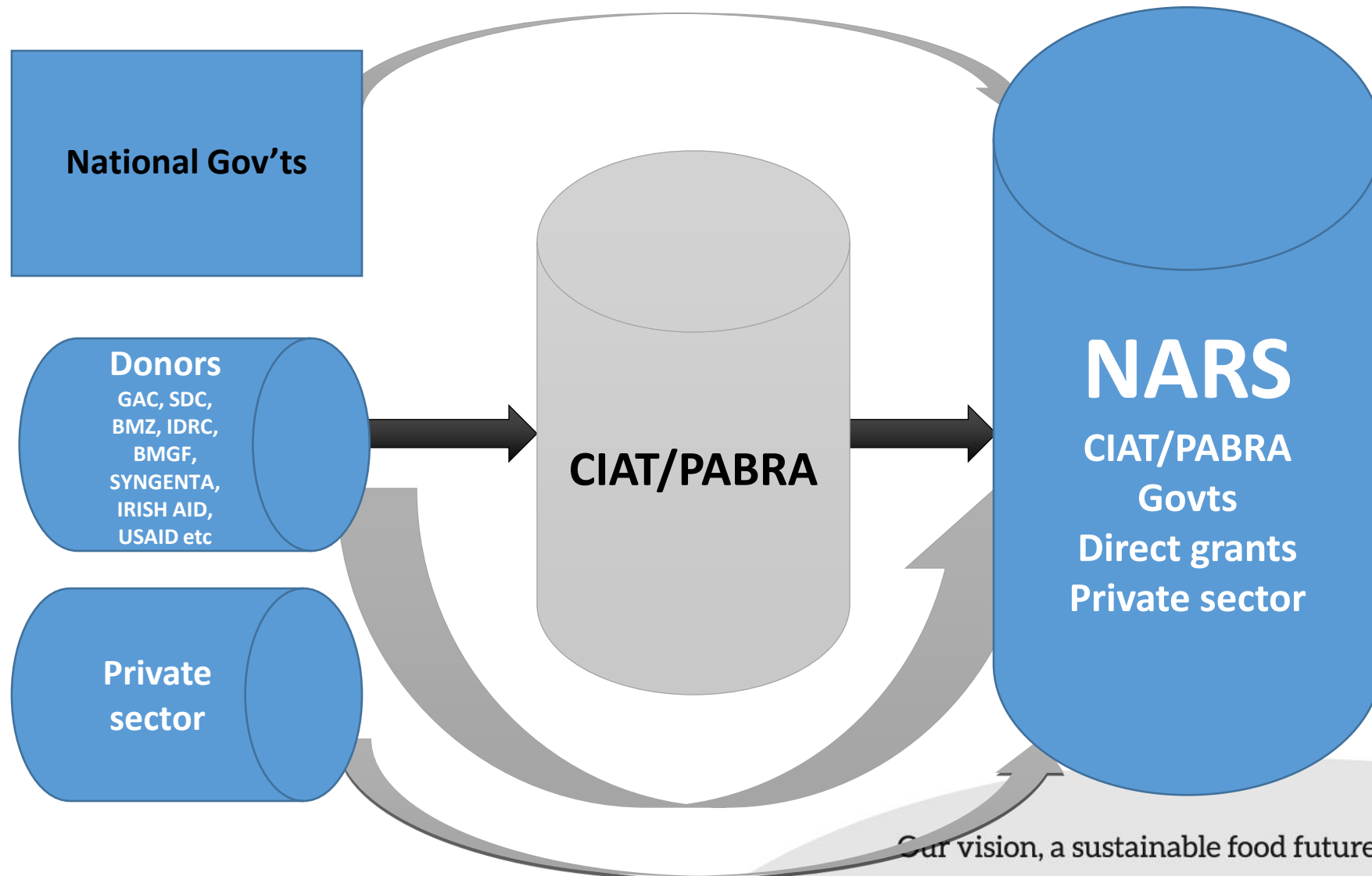
TYPES OF INTERVENTIONS WITHIN THE BEAN CORRIDOR HUBS



Strengthening Private sector- led partnerships

- Partnerships expanded in the following areas:
 - Input access- Syngenta, Yara,
 - Integrated pest and disease management- Real IPM
 - Private Sector: Corridor Approach
 - Seed production
 - Processors
 - Traders - ICT and Ag- MasterCard Innovation Lab
 - Post harvest handling- GrainPro
 - Product development- Lasting Solutions, Nutreal, Azuri, Farm Fresh
 - AFEX Commodities Exchange Limited, Nigeria - initial discussion

Direct And Indirect PABRA Funding



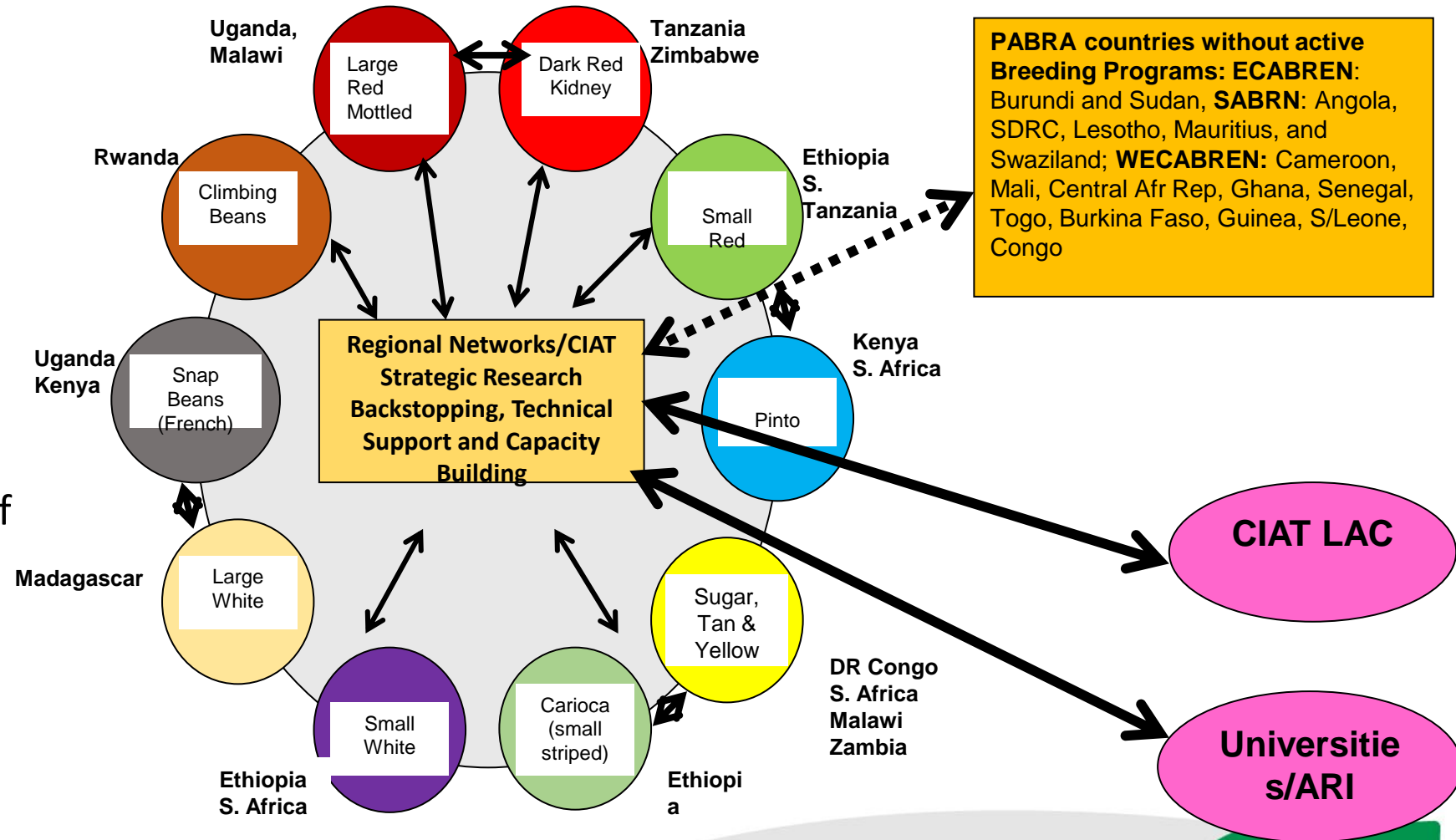
CIAT Uganda Bean Program Staffing

- Three IRS (Plant breeder, Agricultural economist/impact assessment, M&E specialist)
- **Research Support Staff** : **Research Associates**: Plant pathologists 1, Plant breeder; 1, Agricultural economist; 1, Database officer; 1); **Research Assistants** (Molecular biologist; 1); **Technical Assistants** (Plant pathology/plant breeding; 6); **Casual laborers** >20 (wages)
- **Support staff**; Human Resources, Executive secretary, Finance officer, Accountant, Drivers (3), Lab cleaner, Security guard
- **PABRA**: Nutritionist (Nairobi), Market specialist (Rwanda), Agronomist (Nairobi), Seed system specialist (Tanzania); Gender specialist (Nairobi), Gender specialist, Climate change specialist, Project Officer, KM and Communication, breeders (Malawi and Ghana)
- **CIAT Global**: Molecular Genetist/Breeder (Andean breeding program), Senior Breeder (Meso American breeding program), Physiologist, Plant Pathologist

BREEDING APPROACH

Shared breeding responsibilities under PABRA:

- CIAT Headquarter breeding program in Colombia
- Regional breeding programs of ECABREN and SABRN
- National bean programs responsible for different types of beans
- Various universities and advanced research institutes (ARIs).



CIAT Uganda Breeding Activities

- Targets seven grain market classes:
 - Red mottled,
 - Small reds
 - Large reds
 - Small whites (navy)
 - Large whites
 - Sugar beans
 - Yellow beans

Market class	Countries where the bean types are of high or moderate importance
A1. Red Mottled	UG, KE, DRC, TZ, SU, MD, BU, ET, RW
All. Reds	
Alla. Large Red Kidneys	TZ, KE, RW, MD, ET, BU, UG, DRC
Allb. Small and Medium Reds	ET, KE, TZ, RW, DRC
III. Browns	
IIIa. Yellow	BU, DRC, RW, TZ, KE, UG, MD
IIIb. Brown	BR, DRC, RW, TZ, KE, MD
IIIc. Tan/Khaki	TZ, DRC, RW, UG, RW
IV. Cream	
IV a. Pinto	KE, UG, MD
IV b. Sugars	UG, DRC, ET, KE, RW and BU
IV c. Carioaca	KE, TZ, DRC, and MD
V. White seeded	
Va. Navy (Cam, DRC)	ET, RW, KE, CAM, DRC, and MD
Vb. Large white kidney	MD, DRC, ET, RW, CM and TZ
VI. Mixed Colours/others	
Vla. Purples/ Mwezimoja types	TZ, KE and MD
Vlb. Blacks	DRC, UG, KE, TZ, SU and MD

Breeding Priorities: Multiple Trait Breeding Approach

Resilience/cross cutting

- Drought tolerance
- Low Soil fertility tolerance
- Resistance to existing and emerging pests and diseases

Biofortification

- High minerals content (Iron and Zinc), protein content & quality

Consumer traits

- Canning quality
- Snap bean quality
- Precooked quality
- Premium priced/demanded grain types
- Cooking time

Must have traits

- Productivity (high yield)
- Consumer preferences (e.g. acceptable grain type and growth habit)



Trait Discovery

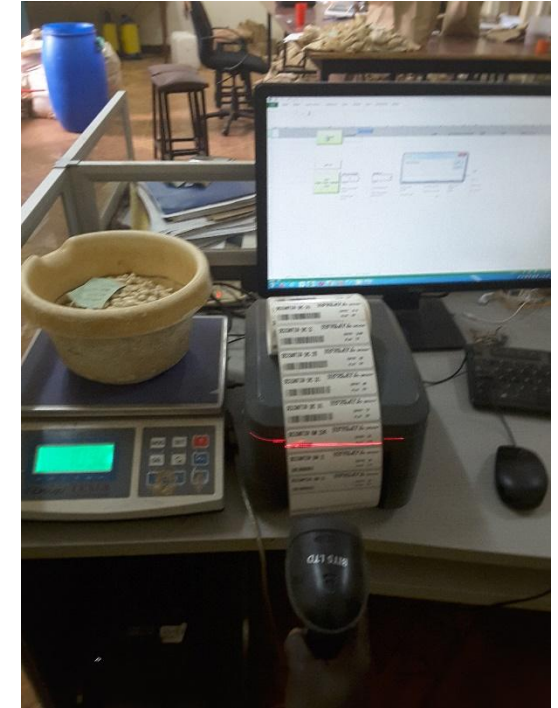
- Identification of new sources of traits (studying genetic mechanisms of trait inheritance)
 - Key diseases (anthracnose, common bacterial blight, bean common mosaic virus, root rots; Fusarium, Sclerotium, Rhizoctonia and Pythium,
 - Major field pests (Bean stem maggot)
 - Fast cooking time
 - Canning quality
 - Drought tolerance (natural environment)
- Molecular breeding
 - Identification of new markers tagging identified resistance
 - Diversity studies (Pathology and breeding)
 - Marker assisted selection (selection of parents)
 - DNA fingerprinting-Sample preparation (LGC)
 - GBS-DNA extraction and shipping (Elshire's lab, Cornell, IGSS)

Breeding Pipelines

- Bush and climbing bean breeding lines for drought tolerance and high mineral content
- Bush and climbing bean breeding lines with heat and/or drought tolerance
- Bush and climbing bean breeding lines for insect pest and disease resistance

Research Facilities And Capacities

- Seed Storage: well organized cold store (160 SQMT) with stable temperature (15°C) and humidity capable of maintaining viability for more than 2 years
- Three mesh houses with about 500 SQMT
- Fields
- Cooking time platform
- Canning platform
- Pathology and biotechnology lab
- Labels and barcodes are used for seed produced in 2014.
- Accurate seed inventory information exists in BMS



Support to NARS

- Germplasm
- M and E support
- Impact assessment
- Capacity building (hands on training and post graduate studentship)
- Project collaboration
- Backstopping

Nurseries distributed from CIAT-Kawanda Gene bank 2017/2018

1. Drought lines: Zimbabwe, Rwanda, Tanzania, Congo, Ethiopia, NaCCRI, Senegal.
2. Yellow Bean Collection: Karen Cichy (MSU)
3. TL3 reference finger printing set (230) : Tim Porch (Puerto Rico)
4. Nutritional lines : Zimbabwe, Rwanda, Tanzania, Congo, Ethiopia, NaCCRI, Senegal.
5. DNA finger printing Panel: IGSS/ BECA Kenya
6. KFRR nursery to NaCCRI.
7. Nutritional Climbers: SARI, MARI, ARI-Uyole. KARLO Kenya
8. NUA lines to Ethiopia.
9. Bruchid resistance populations: Ethiopia Tigist.
10. Drought, and low soil fertility lines: Ghana
11. Heat stress tolerance lines: Ethiopia, Ghana, Tanzania, NaCCRI
12. CBB, Nutritional, drought Populations to MSU.

Nurseries received at the CIAT-Kawanda Gene bank 2017/2018;

1. Rust differentials from University of Embu Kenya
2. Nutritional, drought, heat, ALS nurseries from Cali Colombia.
3. SNAP Bean panel from Oregon state university.



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Since 1967 Science to cultivate change

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