## Bean Research and Development in Tanzania (including bean biofortification).

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#### BNFB Inception meeting March 16-18<sup>th</sup>, 2016 Kibo Hotel; Arusha Tanzania









International Center for Tropical Agriculture Since 1967 Science to cultivate change

## What PABRA Is?

 A consortium of 3 bean networks + CIAT + Donors

**Goal**: Improved nutrition and health, gender equality, food security, incomes and natural resource base for sustainable livelihoods of resource poor women and men farmers



## **PABRA** members



### Situation and Importance of Bean Crop in Tanzania

#### Bean use

- Major food/nutrition and income security crop particularly important to women.
- Per capita bean consumption is 19.3kg, contributing 16.9% protein and 7.3% calorie in human nutrition.
- In Tanzania, beans account for 71% of leguminous protein in diets and 75% of areas under legumes
- Over 75% of rural households in Tanzania depend on beans for daily subsistence (Xavery *et al.*, 2006; Kalyebara and Buruchara, 2008)
- Animal feed (crop residues)
- Agro-ecosystems health

#### Major bean growing areas



#### Role of Tanzania in region bean market/bean food supply



## Yield and production trend

- Cultivated on over 1,3 million hectares, up from 672,000 in 2000.
- Main bean growing areas are in the north (around Arusha), the Great Lakes region and the Southern Highlands. (Ronner and Giller- 2013)



Figure 1. Tanzanian production of dry beans, 2000-2013

#### Trend in common bean production and demand (MT),

1991-2020 Source: Computed from FAO data accessed at <u>www.FAOSTAT.org</u> in 2011



## Beans in Food basket





Beans from a mere subsistence to an industrial and high value and industrial crop/diverse products









#### *Constraints: diseases and pest/abiotic*



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## Status of Bean Biofortificationgenotypes

	XRF		ICP	
Entry	Fe	Zn	Fe	Zn
JESCA	81.7	32.7	62.7	34.3
ROBA 1	75.8	29.3	56.3	32.9
MLB 456 (High Fe check)	74.7	39.9	62.3	34.4
DECELAYA 1 (Low Fe check)			49.3	30.0
DOR500 (Low Fe check)				
	61.5	30.1		

# Release varieties and their characteristics



- Bush
- Wider adaptation (high to low) and diseases/pest tolerant
- Yield : 1.5-2.0 tons/ha
- Early maturing (60-65 days) drought tolerant,
- Marketable as Kablanketi



- Yield: 1.5-2.5 tons/ha
- Fast cooking /high palatability – including leaves
- Wider adaptation
- Highly preferred for households – not market





- Mid Altitude Climber (MAC)
- Climber with wider AE adaptation ( high and low AEZs (northern, SH and Lake zones)
- Early maturing climber (87days)
- High yielding (3-4 tons/ha)
- High marketability (red mottled) and palatability/fast cooking and large seed
- Disease and pest tolerant
  - ALS, Leaf rust, BCMV
- Possible release date: 2017



- Climber with wider AE adaptation (high and low AEZs (northern, SH and Lake zones)
- High yielding (2-3 tons/ha)
- Early maturing climber (90 days)
- High marketability (red mottled) and palatability/fast cooking-Kabulanketi
- Disease and pest tolerant
  - ALS, Leaf rust, BCMV
- Possible release date: 2017

#### **RWR 2245**



- Bush
- Low and medium altitude (87 days to maturity)
- High yield and adapted to low soil fertility (1.5-2.5 tons/ha)
- High marketability (RM), large, cook faster and highly palatable

# Integrated Seed System for wider impact using Improved Bean Varieties

Breeder seeds (NARS)

## Basic Seed

2 (ASA/Private seed producers )

## 3 Certified seeds

(large and small packs) using market and non market channels

## Farmers

Quality seeds by local seed producers (individual or groups – supported by Development partners (GOs, NGOs-CBOs etc)

Farmers

Majority of farmers live below the poverty line
 Limited purchasing power for inputs



## **Developing : Small Packs**

- Get biofortified varieties to farmers
  (80g 250g 500g, 1 kg, 2 kg, 5 kg)
- Test and uncover demand
  - Varieties
  - Seed
- Expand market for certified



Seed Companies , Tanzania, Uganda

## Major activities

- Iron-bean specific strategy for Tanzania developed
- Strengthened national bean platform and 3 functional biofortified bean sub-platforms established and linked (1 per target region)
- National seed agencies, the private sector and farmer/ women/youth groups involved in large scale production of seeds of the biofortified crops

## Major activities (continued)

- At least 25 tons of basic and certified iron rich seed produced per year by seed companies and their contract farmers
- At least 2 more biofortified bean varieties fast tracked for official release
- Study on effectiveness and sustainability of the three models of seed production systems: Government-led, Commercial/Private Sectorled and Community-led conducted

## Major activities (continued)

- Biofortification included as a key criteria/element (special trait) for release of beans in Tanzania
- At least 500,000 households growing biofortified beans in Tanzania

## Demo plot and agro dealers viewing on google earth



# ASA agro-dealership penetration and supportive bean demos



