

# Counting on beans

Building bean business investment and  
strengthening PABRA breeding approach





# Award winners

Pan Africa Bean Research Alliance (PABRA) receives **2019 Al Sumait Prize** for its contribution towards **food security** through bean research in Africa



*Dr. Robin Buruchara (third from right) former PABRA Director and Dr Harold Roy-Macauley, Director, Africa Rice (fourth left) together with Crown Prince of Kuwait, Amir Sheikh Nawaf Al Ahmed Al Sabah and Kuwaiti dignitaries at the ceremony.*

**PABRA shared the USD 1 million prize, which was announced in November 2019, with Africa Rice Centre.**

“This is a great honor and major source of encouragement to our partners to do more,” said Robin Buruchara, PABRA’s recently retired director, who accepted the prize at the ceremony. “This award will help us scale out and reach even more beneficiaries across Africa.”

The award ceremony which took place in Kuwait on World Pulses day—was presided over by His Highness the Emir of Kuwait, Crown Prince Sheikh Nawaf Al Ahmed Al Sabah.

Dr. Shihab Eldin, Director General of Kuwait Foundation for Advancement in Science (KFAS), announced that both Africa Rice and PABRA’s efforts have had a significant impact on achieving tangible improvements in the lives of millions of malnourished people. Additionally, their part in promoting the role of women in the agricultural sector has had a very positive effect on the sustainability of their work.

Initiated in 2013 by His Highness the Emir of Kuwait Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah, the Al-Sumait Prize for African Development is designed to reward innovative and inspiring initiatives and research by individuals or organizations that address the challenges facing the African continent. It helps advance economic and social development, human resources development, and infrastructure in Africa.

# Way forward **Counting on beans**

**Beans count** because their products deliver the following benefits:

## **1 Social inclusion and wealth creation to achieve** women and smallholder farmers' empowerment

Beans are produced mainly by smallholder farmers in Sub Saharan Africa. They offer inclusive business opportunities to various actors along the value chains particularly women who are the majority farmers and small scale traders. They use beans for food security, income to respond to households need including children's schools fees.

Bean production open business opportunities to various actors along the value chain. The versatile nature of the bean crop and its contribution to household's food income, diet, health and environmental security is remarkable. Beans are consumed in institutions such as hospitals, prisons, schools because of their nutritive value. They are consumed by both rural and urban dwellers. Though they are called "meat of the poor", they are equally consumed by the rich.

**Common beans**  
(*Phaseolus vulgaris*)  
provide dietary protein for over 200 million people in Africa, especially women and children living in rural areas and poorer urban communities.

## **2 Nutritional benefits** especially for women of reproductive age and children

Common beans are a source of food and nutrition security for over 200 million people especially women and children in rural areas and poorer urban communities in Africa. It contains protein, complex carbohydrates, vitamin B components (thiamin, folic acid and niacin) and micro-nutrients (iron, zinc). For institutions like schools and hospitals, low-income consumers in rural and urban areas, they are affordable sources of nutrients. In addition, several parts of plants are edible e.g. leaves, fresh or immature pods and dry grains.



**35 kg per person**  
Average annual bean consumption in parts of East Africa—a world highest.



### 3 Health benefits by preventing disease

Beans make an excellent source of plant based protein. They are lower in calories and saturated fat than some other protein sources, such as dairy products. Beans are rich in antioxidants that fight the effects of free radicals, which are chemicals that affect the functions in the body, from physical aging to cancer and inflammation.

Adequate folate intake is extremely important during periods of rapid growth such as pregnancy, infancy, and adolescence (FAO, 2016). Calcium and phosphorus are important in bone structure, while iron and zinc play crucial roles in maintaining the strength and elasticity of bones and joints. Beans are a diabetes superfood, meaning they are an excellent choice for people with diabetes and provide many health and nutritional benefits.

### 4 Employment opportunities along value chain, especially for youth and women

Rapid urbanization is driving a growing demand for bean based processed food. This offers opportunities for employment and entrepreneurship in both large and small-scale industries and could be an attractive sector for rural and urban youth. Common beans are a source of income and provide business and employment opportunity to various actors along the value chain, especially for youth and women. They offer farmers high returns on investments; require less labor and external inputs compared to other crops. Reinvesting income from beans into the farm operations raises overall farm productivity and growth.

### 5 Environment Sustainability –less fertilizer use; sustainable agricultural systems

Nitrogen is the most important element limiting crop production in the tropics. Their early maturing crop (60-100 days) make them a climate smart crop and can be easily intercropped with other crops. Bean serves as a key component in intensifying production in smallholder farmer systems. Its ability to fix nitrogen also means that it can encourage much-needed, even longer term improvements in soil fertility (Buruchara et al, 2011).



There are several ways of adding value to beans such as processing, –canned and precooked beans, bean based flours, etc Processed bean products are a convenient alternative in the food market since they are easy to prepared compared to dry beans, which take longer to cooking.



## 6 **Industrialization**—processing value added bean products e.g. canned and precooked beans

Alternative bean based products are meeting the growing consumers' demands. Processing tend to develop value added products e.g. differentiated products/market types or processed beans e.g. canned and precooked beans. Processing beans brings benefits such as the increase in product value and greater profitability for farmers and food manufacturers. Whether it is bean flour, bean snacks, precooked or canned beans, processed bean products are a convenient alternative in the food market since they are more easily prepared compared to dry beans.

## 7 **Trade/foreign earning through national/regional export**

–expanding domestic, regional and international markets

Common bean is an important component of the production systems in eastern and southern Africa. Although largely grown for subsistence, mainly by women, approximately 40 percent of production is marketed (Katungi et al., 2009). Common beans are the most exported pulses in Tanzania contributing to 62% of all Tanzanian pulse exports (URT, 2016).

Common beans from Tanzania are mainly exported in and beyond Africa. The country also exports beans to neighboring countries like Kenya, Uganda, Rwanda, Burundi, DR Congo, Zambia. Common bean is an important crop mainly for smallholder farmers in Tanzania, for home consumption and cash income. In 2018, the white pea bean exports from Ethiopia was valued at more than US\$ 184 million.



Ethiopia exports common bean to Kenya, Pakistan, India, Somalia, Germany, South Africa, Belgium and Turkey. Exports within Africa covers 20% of all export of common beans in Ethiopia.

Export  
earning  
of USD **184M** in 2018  
compared to only USD 8M in 2008.

**95%**

of smallholder farmers cultivate  
common beans in Ethiopia



## Experiences from participating countries

### Ethiopia

Local consumption of beans in Ethiopia currently ranges between 40 to 60%. Smallholder farmers comprise 95% of all producers. Based on the ecological zones of Ethiopia, bean breeders within the Ethiopia Institute for Agricultural Research and other partners have decided to focus on bush bean varieties because most of production areas in Ethiopia have moisture stress whilst climbin bean varieties grown in the highland areas are mostly for domestic consumption.

Ethiopia exports common bean to Kenya, Pakistan, India, Somalia, Germany, South Africa, Belgium and Turkey. Exports within Africa covers 20% of all export of common beans in Ethiopia. Currently, white pea beans are traded in the Ethiopia Commodity Exchange, the only national platform with eight regional platforms comprising of different value chain actors giving room for discussion on how to enhance bean business both locally and internationally. Currently there about five value chains of common beans found in Ethiopia;

1	R&D →	Farmer →	ECX →	Exporters	
2	R&D →	Farmer →	Licensed → Aggregators	ECX →	Exporters
3	R&D →	Farmer →	Unions →	ECX →	Exporters
4	R&D →	Farmer →	Coop →	ECX →	Exporters

#### Existing challenges

- 1 Limited access to quality improved bean varieties and slow replacement of old varieties.
- 2 Limited access to postharvest management technologies affordable to smallholder farmers
- 3 Limited and well-organized market information and dissemination system
- 4 Low yield per hectare
- 5 Scattered smallholder farmers making mechanization difficulty.

#### Possible solution

- 1 Engagement of stakeholders such as seed companies and cooperatives to support seed system
- 2 Creating awareness of the existing postharvest management measures
- 3 Agricultural commercialization (cluster production and supply an example being supporting cooperatives and unions to play their roles effectively
- 4 Linking producers to processors
- 5 Enhancing enabling environment to enhance traceability which will help to minimize risks for traders
- 6 Developing a model in which exporters will be linked directly to farmers to access required information.



Total grain production in Ethiopia  
more than doubled to

**543,984** tonnes  
in 2017 from only 222,700 in 2007.





## Burundi

Promotion of bush and climbing beans in Burundi is done concurrently. The main driver for adoption of climbing beans in Burundi is the shortage of land as well as productivity nature.

Existing partnerships include;

- Farmers' association and cooperatives (seed production).
- Bean processors (Totahara, Rengereza Ubuzima and Tubehoneza who are operating in different areas of Burundi)
- Research and Extension personnel as well as NGOs, for example World Vision help in the dissemination of research results
- Research and input suppliers (PICS, fertilizers, chemicals).
- Grain and traders (aggregation and trading of grain beans).
- Research and media (radio and TVs).

### Bean value chain

The ideal value chain should have: Pre basic—basic—certified—grain—traders—processors but within the current outlook, basic seed is sold to traders (pre basic—basic—trader) or certified seed sold to traders as grains). For processors the ideal value chain should have processors accessing grains from producers however, current source of beans is from local market challenging the quality of the final product.

### Existing challenges

- 1 Presence of well-defined seed system which is not implemented
- 2 Absence of seed companies for wider production and marketing
- 3 Lack of reliable aggregators
- 4 Lack of conducive policy for cross border trade of common beans as well—less priority crop
- 5 Weak linkage between different actors of the value chain.

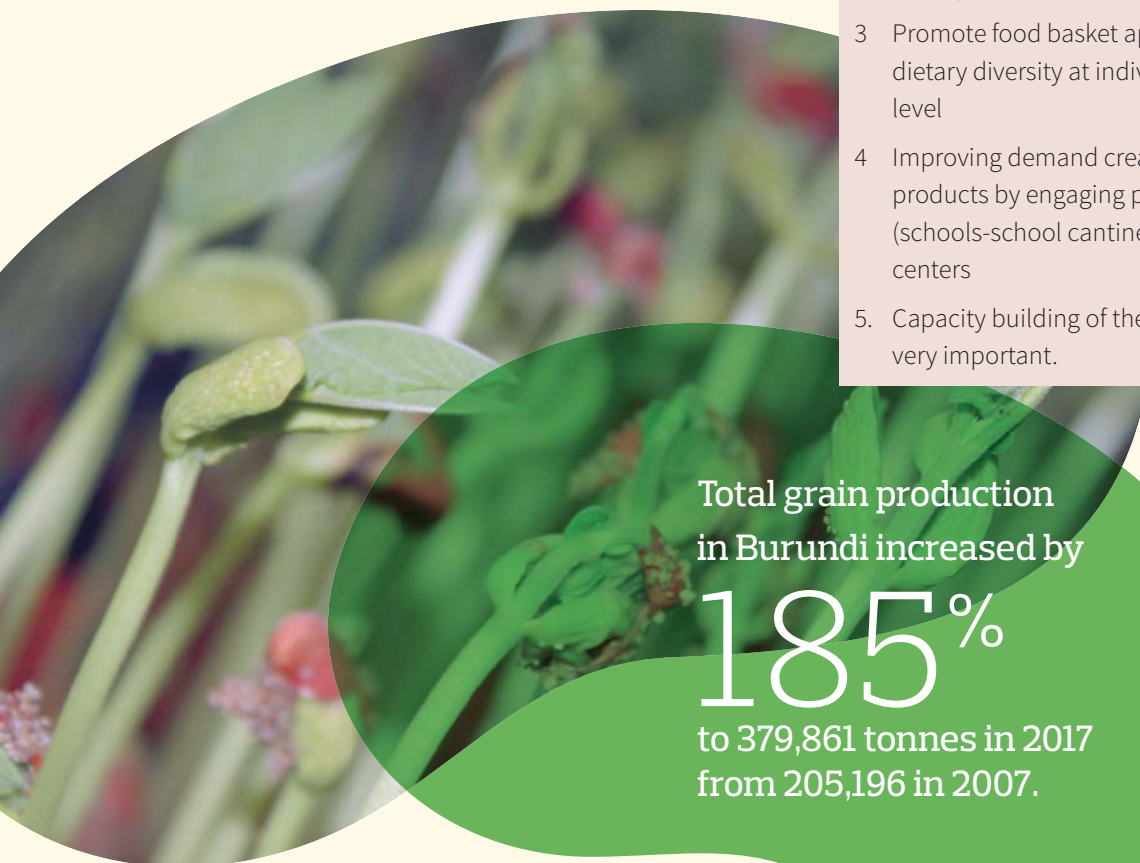
### Proposed solutions

- 1 Promoting utilization of bio-fortified beans varieties for home consumption and marketing
- 2 Promotion of beans and bean based product consumption through innovative marketing strategies
- 3 Promote food basket approaches that enhance dietary diversity at individual and household level
- 4 Improving demand creation of bean based products by engaging public institutions (schools-school canteens, prisons) and nutrition centers
5. Capacity building of the different stakeholders is very important.

Total grain production  
in Burundi increased by

185%

to 379,861 tonnes in 2017  
from 205,196 in 2007.







Total grain production  
in Tanzania increased by  
**30%**  
to 1.14m tonnes in 2017  
in ten years

## Tanzania

Currently 15 out of 41 released varieties have been adopted by farmers. Demanded classes include red mottled, yellow, sugar bean and red kidney. Area under bean production is estimated to be 1.2 million ha with 38% exported to other countries. Existing value chains include;

- |   |          |   |                |   |             |   |                               |   |              |
|---|----------|---|----------------|---|-------------|---|-------------------------------|---|--------------|
| 1 | Research | → | Farmers        | → | Aggregators | → | Exporters                     | → | Local trader |
| 2 | Research | → | Seed Companies | → | Farmers     | → | Exporters                     | → | Local trader |
| 3 | Research | → | Seed Companies | → | Farmers     | → | Small Aggregators (middlemen) | → | Exporters    |
| 4 | Research | → | Farmers        | → | Consumers   |   |                               |   |              |

### Existing challenges

- 1 Access to improved quality seed varieties
- 2 Insufficient volumes for trading
- 3 Lack of information on marketing
- 4 Lack of policy support—common bean is not regarded as priority crop
- 5 Weak linkage between value chain actors under bean sub-sector
- 6 Unconducive weather and absence of crop insurance.

### Proposed solution

- 1 Demand led breeding is now practiced by the breeding program
- 2 Increase in number of crosses in breeding program to tackle bean production constraints (RCIH-Kawanda)
- 3 Increase in bean trade—bean corridor approach
- 4 Increase in export demand leading to more jobs
- 5 Increase in processors—meet health challenges in the country
- 6 More women engaging in bean production and business (labor saving technologies)
- 7 Increase in collaborations between partners in the bean value chain.

## Uganda

Uganda has made good progress over the past five years on production and use of improved bean seed. Currently 27% of beans produced in Uganda are exported to Kenya. Although policy makers perceive common bean as a less priority crop, several other efforts are geared towards identifying partners to support commercialization of beans in Uganda. Uganda's National Agriculture Research Organization (NARO) undertook a caning experiment of some varieties which showed positive results. Precooking experiments on seven others varieties in the absence of additives showed successful results. Major bean market classes included red mottled, yellow, sugar beans and red bean.

Total grain production  
in Uganda increased  
more than two-fold to **1M**  
tonnes.

Major issues include;

- Production of improved seed
- Distribution of quality seeds of improved varieties

A good number of farmers do purchase grains of poor quality from local market, sort them out then plant the remaining. A situation in which the price of good quality seed of improved varieties would be cheaper as compared to the price of grains would spur the purchase of good quality seed. Platforms for stakeholders have been established to strengthen the common bean value chain in Uganda.

A good number of farmers  
do purchase grains of poor  
quality from local market,  
sort them out then plant  
the remaining.



### Existing challenges

- 1 Slow uptake of new released varieties
- 2 Limited number of reliable off takers
- 3 Limited documentation on information on value chain actors
- 4 Limited volumes produced by small scale farmers
- 5 High production costs and limited access to mechanization opportunities
- 6 Lack of government investment which would have streamlined the value chain.

### Proposed solution

- 1 Involvement of policy makers in understanding the process and helping in the advocacy on beans as an important crop
- 2 Building the capacity building of value chain actors
- 3 Establishing data base for common beans
- 4 Promoting technologies that will reduce production cost
- 5 Lobbying for policy reform and investment
- 6 Strengthening the partnership between NARO and universities to support lobbying for policy reform.





# 27%

of produced bean in Uganda is exported to Kenya. Platforms for stakeholders have been established to strengthen the common bean value chain in Uganda.



# Outline for business case

## Build the business case of moving Agricultural Technology to markets:

Ten components to consider when making a business case

### 1 Problem definition/market opportunity

- Demand—identify client needs
- Market and trade analysis
- Gender analysis

### 2 Proposed solutions

- The technology package
- Gender responsive value chain analysis—current and future
- Theory of change/pathway to delivery

### 3 Technology description

- Proof of concept of new technology (evidence/data)
- Product(s) description

### 4 Scaling up of technology and pathways for delivery

- Target countries and ecologies
- Impact pathways
- What does the market want? quality seed, etc.

### 5 Ecosystem mapping of technologies and geographies (county and region specific)

- First level
- Level of investment
- Return for investment
- Sources of resources for investment

### 6 Benefits and evidence analysis

- Economic
- Gender
- Nutrition
- Environmental

### 7 Partnerships for delivery along value change and country

- Public partners—national, regional, international
- Private partners—SMEs
- Civil society and community organizations, and farmer groups

### 8 Investments

- Level of investments—cost
- Return on investment
- Sources of investment

### 9 Strategy and stage plan

- Milestones
- Timelines
- Deliverables

### 10 Process and partners to develop business case (who, when, where, including convening)

- Country and technology package specific
- Systems Analysis in order to move to appropriate markets with the right partners





# Evidence base to underpin business case

- What data is available now, and where?
- Does current data need to be analysed in different ways? (see IFPRI analytical tools and PABRA market corridors and value chains)
- Can one/more business cases be made with existing data?
- What new data needs to be collected? Where? By whom?
- Does current data need to be analysed in different ways? (see IFPRI analytical tools and PABRA market corridors and value chains)
- Expected business cases may be designed specific to target:
  - Country—national level e.g. Tanzania; Uganda; Ethiopia; Burundi, etc.
  - Does current data need to be analysed in different ways? (see IFPRI analytical tools and PABRA market corridors and value chains)
  - Market corridors/value chain—identified market corridors by PABRA
  - Product profiling—e.g. white pea bean in Ethiopia; sugar snap beans in Southern Africa etc.
  - Nutrition—Biofortified beans e.g. High Iron and zinc beans etc.



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Despite the production constraints, the yield of common beans in East Africa has increased significantly (from 560 kg/ha in 2003 to

**980** kg/ha in 2016).





## Donors and partners



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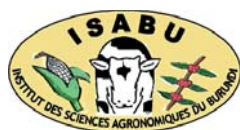


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