

Reaching the Last Mile: PABRA's Experience

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Introduction

Beans, an important food crop in east, central and southern Africa, are increasingly becoming a cash crop with farmers keen to invest in production inputs, including quality seed of improved varieties. Informal sources continue to supply the bulk of the seed (about 95%) used in bean production. In Uganda, for example, informal sources provide seed for 89% of the farmers (ISSD, 2014). With no single solution, farmers use diverse ways to access (buy) bean seed. For each channel of choice, there is a major reason (Sperling and McGuire, 2010), advantages and disadvantages that may be related to quality (Almekinders and Louwaars, 1999), and geographical coverage (Rubyogo et al. 2010). The Pan Africa Bean Research Alliance (PABRA) partners have spearheaded efforts to improve access by farmers of quality bean seed, by catalyzing innovative approaches and exploiting synergies of various actors and sources (formal and informal) to ensure seed reaches the end users. This article highlights cases that illustrate multiple approaches or strategies that PABRA supports to enhance farmers' access to bean seed.

A. Farmer access to certified seed (new and popular varieties)

Seed companies are still a limited direct source of bean seed to small scale farmers. However, those that market bean seed sell a large part of seed consignment to NGOs or Government seed operations. This is because this tends to be costly and/or is sold in large package (50kg) sizes, or not easily accessible to small scale farmers, due to limited seed distribution network of this type of seed. Targeted bean seed marketing approaches using small packs (one kg and less) is an innovation to overcome the above challenges. Initiated in Kenya in collaboration with private companies under the Tropical Legume II project, the approach has used various sale strategies e.g. agro-dealers, open market and seed fairs/agricultural shows to enhance access, affordability and efficiency by (1) allowing farmers to test multiple varieties at minimal risk; (2) allowing vulnerable but viable farmers - including women and the poor - to purchase quality seed of the varieties of their choices; (3) allowing seed companies to create demand widely and quickly; (4) allowing companies to penetrate lower income farmers. In Kenya some companies are now packing at least 10% of the seed in 1kg or 500g. Through PABRA, the approach has been expanded to other countries (Uganda, Tanzania, Ethiopia, Zimbabwe, Burundi, Malawi) enabling farmers to access seed.

Another approach used to support purchase and use of certified seed is the engagement with the private sector to catalyze demand creation. Tools used include supporting agro-input suppliers led demonstrations, training of lead farmers, local extension and agro-dealers and multiple information tools /channels on bean varieties and complementary improved agronomic practices. This has shown that farmers are willing to pay for seed. Zimbabwe's relatively advanced seed industry largely relies on formal system (10 seed companies) to supply seed for most field crops including common beans. Certified seed is purchased and distributed through outlets that include supermarkets and ordinary rural grocery stores. One of the challenges is to increase the efficiency in the supply e.g. how to aggregate seed demand.

B. Farmers' access to seed through agro-dealer networks

Certified seed marketing and distribution takes place through limited numbers of officially recognized seed outlets, on a cash basis and hence have limited spatial reach. For instance, in Mozambique, Rohrbach et al. (2001) reported an average of less than one agro-dealer shop selling seed per district. Some districts had no seed retail store and an average ratio of one shop to more than 40,000 farmers (World Bank, 2006). Several other countries face similar seed production and distribution challenges. For instance, in 2013, the supply of certified seed in Tanzania was less than 5% of annual national bean seed requirement (Centre for Development Innovation, 2010). Prior to 2015, the larger proportion of certified bean seed was supplied by the public Agricultural Seed Agency (ASA) through sales to public organizations and NGOs. ASA had a limited distribution network and bean seed supply through agro-dealership was almost non-existent, yet bean is increasingly becoming a commercial crop in the major production areas.

Against this background, a CIAT –PABRA led partnership established in 2015 bringing together CIAT/PABRA, ASA, and Tanzania Agricultural Research Institute (TARI) Selian and AGRA through the Scaling Seeds and Technologies Partnership (SSTP-USAID) project, aimed at testing the approach of offering farmers opportunities to access and purchase quality seed of highly marketable bean varieties through agro-dealer networks. The approach was tested in 10 districts of northern Tanzania. Through this initiative, one public (ASA) and two private (Meru Agro and BEULA) seed companies obtained basic seeds from the Tanzania national bean research programmes (Selian and TARI Uyole) and produced certified seed of four varieties [Lyamungu 85, Lyamungu 90 released in 1985 and 1990 respectively, Jesca (purple and released in 2008) and Njano Uyole (yellow and released in 2009)]. In 2015 the companies sold 30 tons while 100 tons and 187 tons of quality seed (certified and treated) were produced and marketed, through village based agro-dealers (see *Figure 1*) in small and affordable size packs in 2016 and 2017, respectively. These being highly popular and marketable (locally and to Kenya) varieties, farmers tend to sell most of their harvested grain, but initially were buying *seed* during the planting season particularly from the grain market. The project aimed at demonstrating the opportunities of replacing the seed sourced from the grain market by the certified seed sourced through the agro-dealer shop networks. A result, the agro-dealer shops became closer to farming communities are increasingly important in the supply of seed and other complementary inputs by increasing farmer access point shortened the distances to seed access points (to less than 2km) (*Figure 1*).

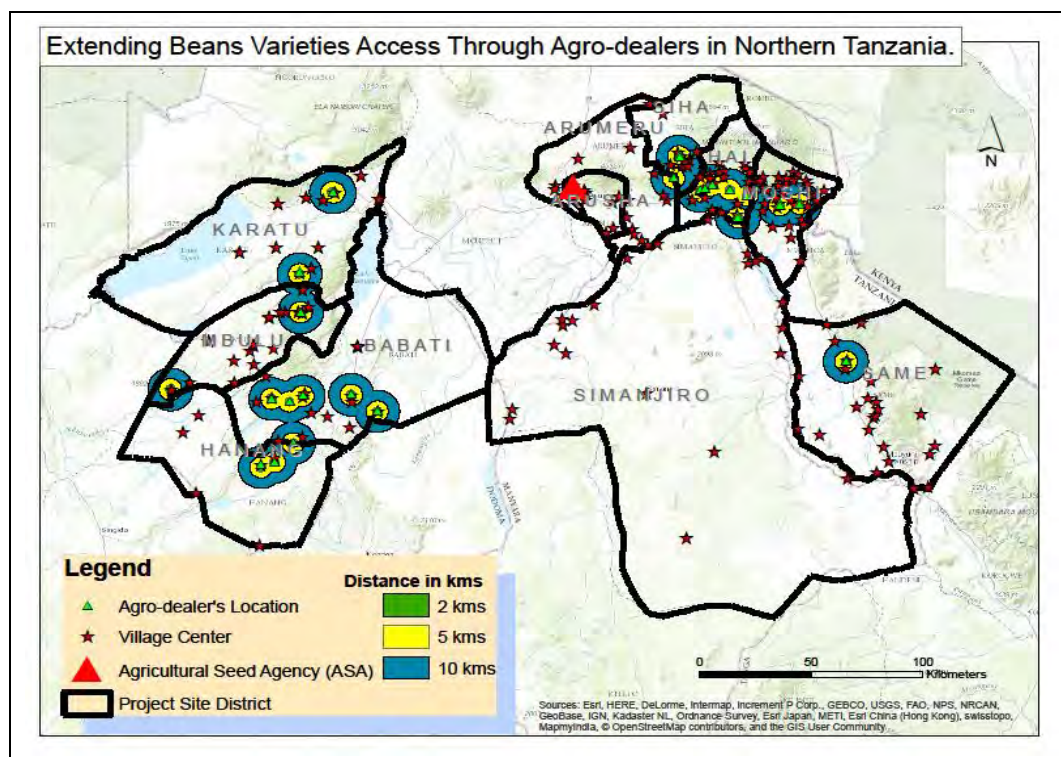


Figure 1: Agro-dealer networks bring bean certified seed closer to farmers in northern Tanzania.

Through this initiative, 12.1 and 20.4 tons of seeds were produced by ASA in 2015 and 2016 and reached 845 and 5,654 farmers respectively (*Table 1*). The volume of seed sold by seed companies through agro-dealer network has increased and the latter offers linkages between farmers and seed companies.

Table 1: Number of farmers reached with bean seed through agro-dealers network in northern Tanzania

Year	Varieties		Certified seed (t)			Farmers Reached		
	No.	Name	Seed company	Produced	Sold	Male	Female	Total
2015	4	Jesca, Lyamungu 90, Njano Uyole, Lyamungu 85	ASA	37.2	12.1	323	522	845
2016	3	Jesca, Lyamungu 90, Njano Uyole	ASA, BEULA, Agr0-Meru	143				5,654

C. Farmers accessing seed through links to contracting arrangements (with private sector or NGOs).

PABRA has supported decentralized individual seed enterprises or farmer group seed producers across many PABRA member countries whose seed policy/laws support or accommodate Quality Declared Seed (QDS) grade. Produced seed is supplied through farmer to farmer (local small demand) or in bulk when

bought by development organizations. Through this approach, some of the farmer seed producer groups have graduated to become small and medium seed companies. In addition, QDS production sites are used as demonstration sites to create demand for quality seed and create market opportunities for certified seed. A significant feature of this approach is establishing access points of quality and affordable seed closer to farmers. A continuous linkage with research/breeding programmes is also ensured. We illustrate PABRA's support to this approach by examples in the southern highlands of Tanzania, Burundi and Uganda.

C1. Southern Highlands of Tanzania: The Tanzania Agricultural Research Institute Uyole (TARI-Uyole) has released several varieties of diverse bean types (reds, purple, cream, yellow and sugar) that are on demand and grown in the Southern Highlands Zone of Tanzania. Seed of these varieties have been made available to farmers through the Agricultural Seed Agency (ASA) and two seed companies. However, these two outlets have not been able to offer a wide coverage and reach to rural farmers. In absence of affordable and sources of seed which are closer to the farmer, the latter opts to use farm saved seed or from grain markets. In 2014, Raphael Group Limited (RGL) (a consortium consisted of grain a trader/exporter, micro finance bank and Agri Experience Seed Company) opened opportunities for farmers by marketing the sugar bean variety Uyole 03 and generated demand of grain. The market offered opportunities for farmers to be organized to produce grain for RGL and in turn required access to quality seed. To fast track the process the consortium contracted predominantly women farmers groups to produce seed quality declared seed (QDS) using certified seed from ARI Uyole. PABRA partners through TARI Uyole and district extension teams offered technical expertise to QDS producing groups that included, training on pre- and post-harvest seed management, backstopping and provision of resource manuals on seed quality management particularly of diseases and pests. To increase farm-level productivity and raise sufficient grain volumes of Uyole 03, RGL advanced farmers with inputs (e.g. seed and fertilizer) and recovered seed cost and other inputs from farmers' sales of grain to the company. Production of QDS in districts (Mbeya, Mbozi, Ileje and Rungwe districts of the Southern Highlands (*Figure 2*) in which RGL's contract grain producers are located contributes in easing access of seed to grain growers. The partnerships in the Southern Highlands of Tanzania has demonstrated multiple and mutual benefits: increased numbers of farmers accessing quality seed of Uyole 03, increased farm yields, and a steady supply of beans for the markets continue running the business.

QDS Production and sale in Southern Highlands of Tanzania under Raphael Group Ltd between 2014-2016

Year	Seed produced/sold (tons)	Number of farmers accessing seed as input credit
2014	26.9	3,362
2015	35.8	4,475
2016	33.9	4,242
Total	96.6	12,079

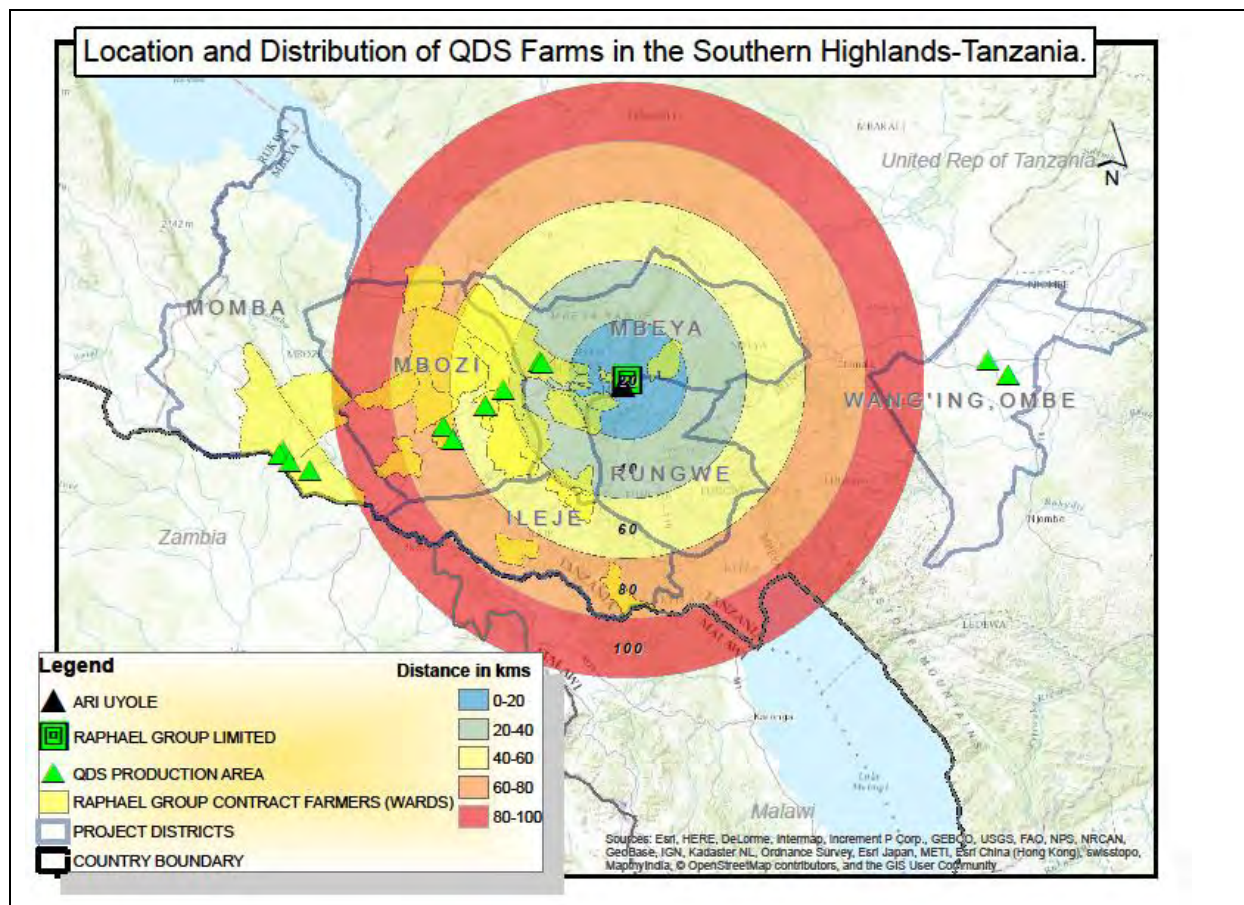


Figure 2: Location of QDS producers and contract growers for Raphael Group Limited in SH Tanzania

C2. Burundi: The commercial private seed (companies) sector is non-existent. Seed production is mostly undertaken by farmer groups, independently or affiliated to some non-governmental organizations (NGOs). Key players include ADECA, ADISCO, CRS, World Vision and COPROSEBU. This support focuses on organized groups for ease mobilization of inputs such as seed and training. One approach used is providing initial seed to farmers (groups) which after a cycle of multiplication, is sold by farmers to other farmers in local grain markets and seed fairs, etc. (Figure 3). PABRA, through the national bean research program (ISABU), supports production of early generation seed and offers training in seed production. Following the adoption of the quality declared seed notion in Burundi, some NGOs are supporting QDS production. However, there is an emerging entrepreneurial spirit in seed production involving several individual entrepreneurs who are producing an average of 10 tons per year. Again, in the absence of seed companies, the use of QDS does provide alternative source of better quality seed and availability closer to farmers. This is important particularly in a country where bean production is almost all consumed or sold, and farmers must buy seed for planning.

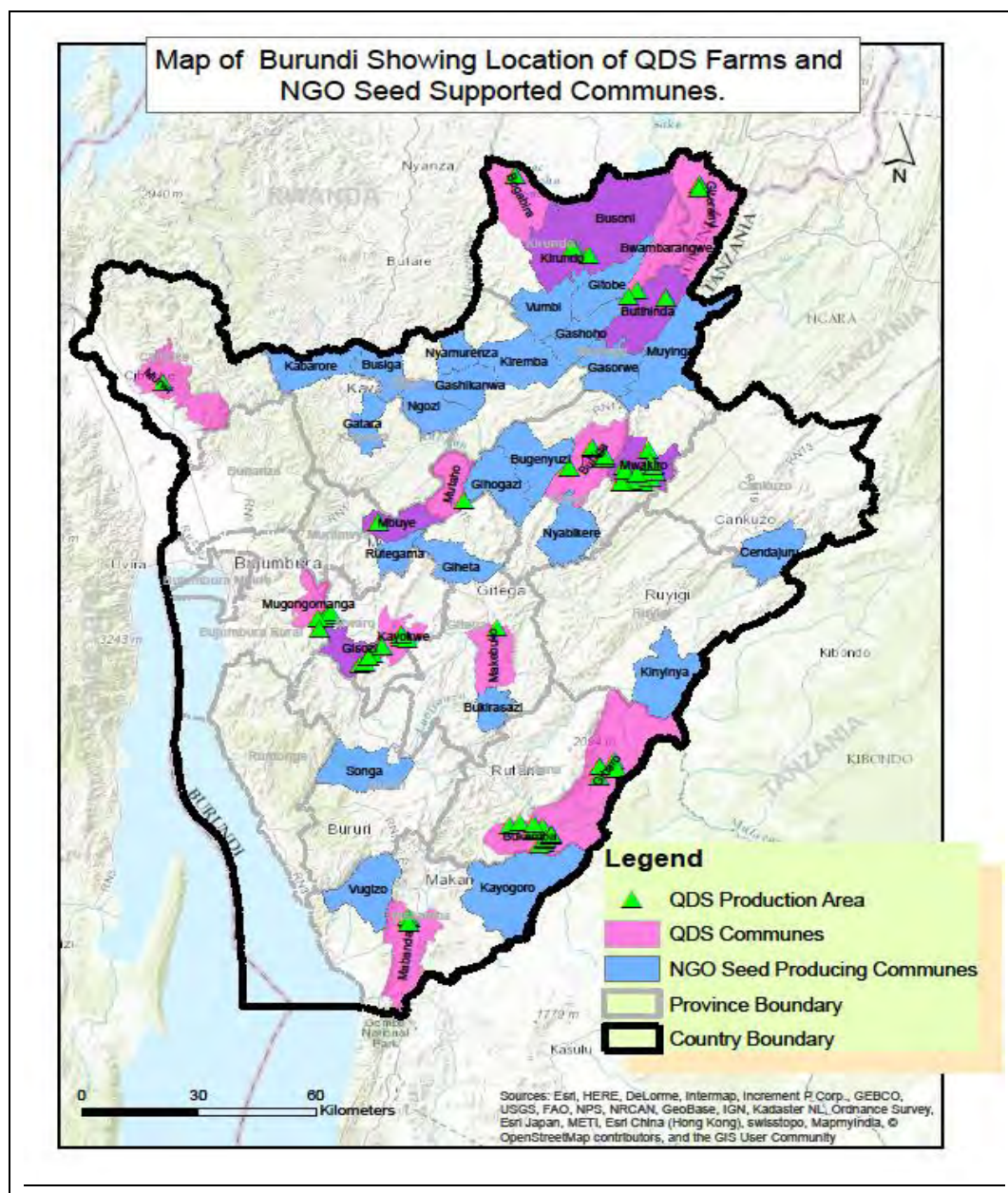


Figure 3: Community and QDS seed production in Burundi

The two options, certified and QDS widened the farmers' choices for source of planting material. The combination of the systems has enabled more than 80,000 farmers to access varieties of the common bean between 2012 and 2015 (Table 2).

Table 2: Bean seed production and reach in Burundi: 2012-2015

Seed Class	Seed production (t)					Number of farmers reached
	2012	2013	2014	2015	Total	
Certified Seed	5.2	12.8	2.7	2.4	23.1	11,621
QDS	9.0	4.6	12.2	111.0	136.8	68,453
Total	14.3	17.4	15.0	113.5	160,2	80,074

C3. Uganda: Bean seed demand coupled with limited production from private companies provides an opportunity to enhance local seed production. For example, in Uganda, use of seed from agro-dealers or seed companies is still very low (5 % - ISSD, 2014), justifying the need for alternative sources of quality seed. PABRA has supported the use of diverse approaches including decentralized individual seed enterprises or farmer group seed producers across many PABRA member countries whose seed policy/laws support or accommodate quality declared seed (QDS) grade. Six out of 60 private seed companies in Uganda produce common bean seed. Produced seed is supplied through farmer to farmer (local small demand) or in bulk when bought by development organizations. In Uganda, PABRA has partnered with several stakeholders to support decentralization of seed production including QDS in several districts of Uganda (*Figure 4*). Through this approach, some of the farmer groups have formed small and medium companies such as CEDO and SHUPO. Both of these companies produce more than 200 tons of certified bean seed every year.

CEDO sold more than 100t of certified bean seed per season in 2016 through 13 agro-dealer shops in Masaka District and other districts. In addition, QDS production sites are used as demonstration sites to create demand for quality seed and create opportunity for certified seed supplied by seed companies. In this case, QDS is used as a stepping stone towards the use of certified seed and create business opportunities for seed entrepreneurs (decentralized and seed companies). The combination produced 28,814 t of quality seed of bean in four years (*Table 3*).

Table 3: Certified and QDS production (t) for the period 2012-2015 in Uganda

Seed Class	Seed production (t)				
	2012	2013	2014	2015	Total
QDS		81.7	138.5	89.0	309.2
Certified Seed	5,378.0	7,662.5	6,672.1	8,793.1	28,505.7
Total	5,378.0	7,744.2	6,810.6	8,882.1	28,814.9

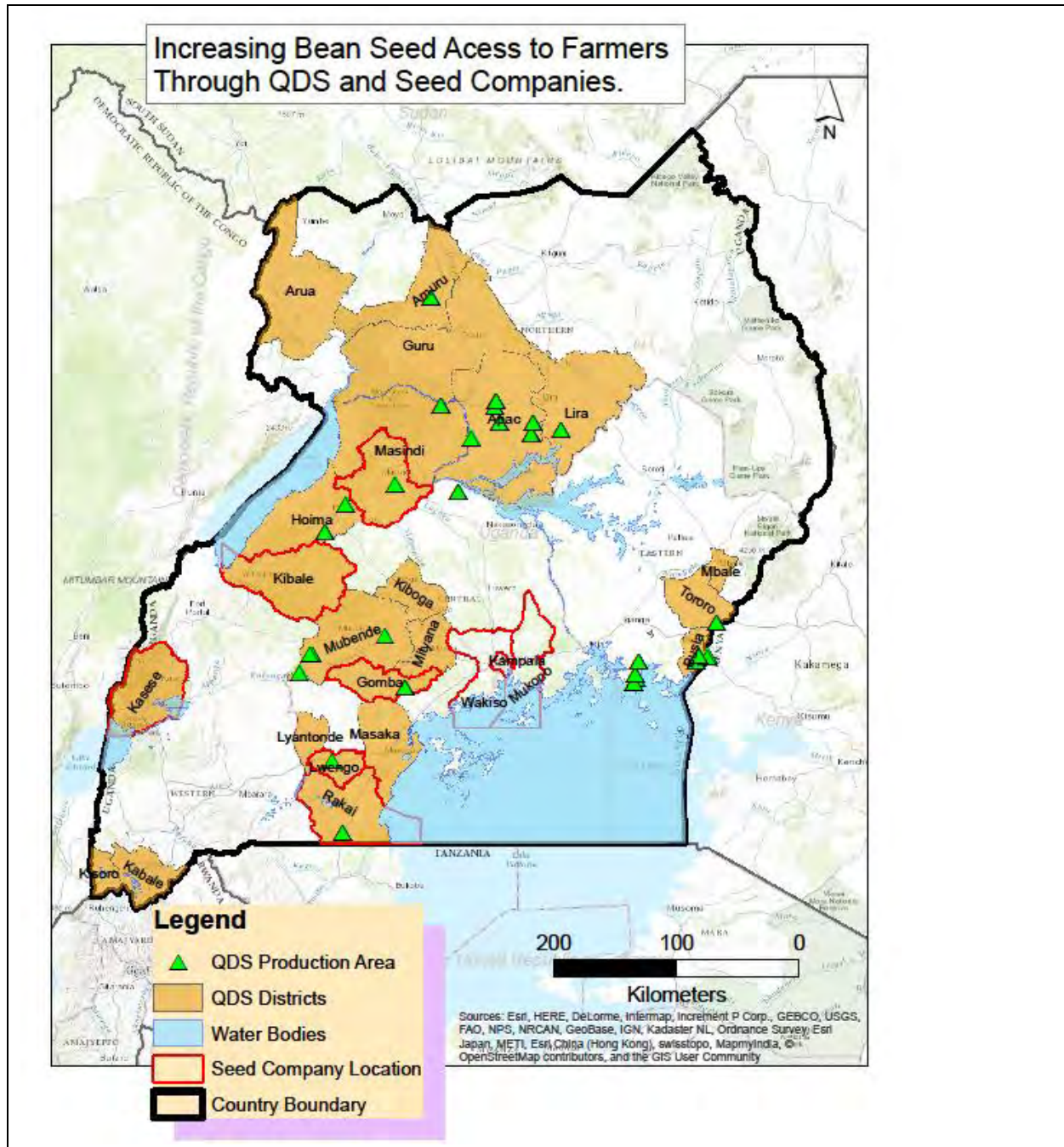


Figure 4: Location of seed companies and QDS producers in Uganda

D. Access of seed from community seed producers.

Homabay county in Kenya is a bean producing area where, beans have been considered a “woman’s crop in a man’s land”, hence to an extent compromising productivity. In 2007, Kenya Agricultural and Livestock Research Organization (KALRO) and PABRA partners working with Caritas Kenya, introduced new varieties and management approaches. Farmers selected three varieties through participatory methods, but certified seed of these varieties was unavailable due to lack of interest by traders and agro-dealers and no distribution networks. To address this constraint, Caritas facilitated the

establishment of local seed production by acquiring 10 kilos of each of the three varieties (KATB1, KATB9 and KATX56) from KALRO. The seed was multiplied with 30 farmers using a principle where each member gets seed, multiplies and gives back to the community an amount of seed equal to the amount borrowed for further distribution to other members. This increased the reach every season while farmers retained the rest of the grain.

Over the years, farmers have managed to build stock of seed, and Caritas has supported capacity building, infrastructure, and group dynamics and seed fairs, whereas PABRA supports training bean and seed production and management. Other actors included microfinance institution. The community has bulk storage facilities for long term centralized storage of seed, quality control and selling point. Members selling on their own can only sell at lower prices, and not as seed.

The Ministry of Agriculture local office inspects storage facilities and tests for germination of seed before members can sell to others. After approval from the Ministry of Agriculture, farmers sell seed at US\$0.60/kg compared to US\$2.50 - 3.00/kg of certified seed. This seed production scheme seems sustainable among the farmers as they have not had to seek new injection of seed. Meanwhile, the groups have received seed of a variety that was released in 2016 to initiate a new cycle of seed multiplication and grain production. Through this scheme, more than 20 t of community seed has been produced by nearly 1000 farmers, the majority of whom are women (*Figure 5*). In addition to seed access, farmers have also been able to access loans from micro-finance institutions such as Kenya Women Finance Trust, which have enabled some farmers to purchase more land and increase the area under common bean.

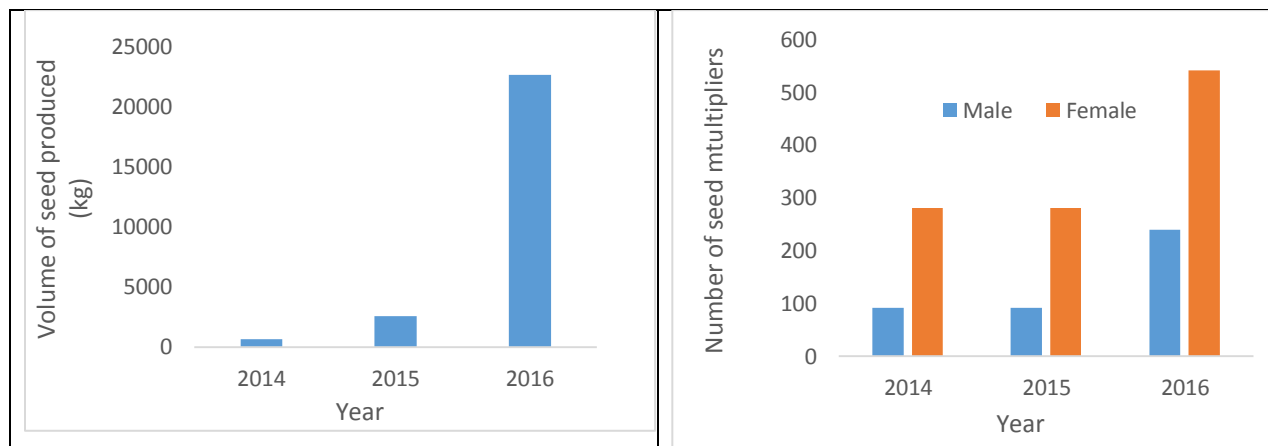


Figure 5: Increase in the volume of farmers' seed (left) and number of seed multipliers in Homa bay

What has been KEY to expanding reach

- Availability of highly preferred varieties which pull farmers to pay in cash for seed of new or highly marketable varieties
- Identification of farmer preferred varieties helped seed companies to focus on these few but highly preferred /marketable varieties. This was done through the agro-dealer-based demonstrations
- Multi-channel variety demand creation led by the seed suppliers rather than NARS/ CIAT-PABRA

- Building the skills and knowledge of seed companies and agro-dealers in bean seed business management helped them to increase knowledge and confidence in bean crop since they were mainly comfortable with maize.
- Engaging and building the NARS' skills in areas of partnership building/network helped them to strengthen their relationship with private companies and understanding how to respond to seed demand
- Coordinating and formalizing collaboration between all key public and private organizations for multiple and complementary seed channels to respond to various farmers' bean seed needs
- QDS is at least 15 % cheaper than certified seed in Uganda and Tanzania
- Through use of agro-dealers, access to seed was made easy by a 70% reduction in the distance travelled to purchase, in some instances to less than 2km in Tanzania
- QDS production and dissemination moved seed sources to farmers
- Approaching seed system with entrepreneurial and value chain mindsets
- Exploiting the role of research to support design of a client-oriented seed systems, and testing and facilitating scaling up of viable and "bankable" approaches
- Increased investment by different stakeholders geared for utilization of research products
- Catalyzing the role of PABRA through multi-stakeholder strategic approaches

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