Novel Bean Varieties Reach Millions of African Farmers

Neil Palmer

There is a growing demand for seed of new bean varieties in villages all over Africa with thousands of farmers yearning for more. Small-scale farmers, mostly women, dotted in villages across the 24 countries of the Pan-Africa Bean Research Alliance (PABRA) network, are participating in a unique innovative approach to broaden the availability of bean seed to as many farmers as possible.

PABRA IMPACTS

Pan-Africa Bean Research Alliance

www.pabra.org

Reports on bean research and developments in countries in sub-Saharan Africa 2003-2008

This work takes place through the national Research and Development R&D programs that make up the Pan-Africa Bean Research Alliance (PABRA). The alliance encompasses the Eastern and Central Africa Bean Research Network (ECABREN), the Southern Africa Bean Research Network (SABRN), and the West and Central Africa Bean Research Network (WECABREN).

Mrs. Aidah Abia, Chairperson of Balla Women and Youth Bean Seed Producers in northern Uganda, testifies that growing beans for seed has changed her life. She emphasized that her income increased from the sale of beans allowing her to send children to school, meet medical expenses, and purchase household items such as paraffin and soap.

Common beans (*Phaseolus vulgaris* L.) are an important crop for food, cash, and agroecosystems improvement in many countries in eastern, central, and southern Africa. The crop is mainly grown by small-scale farmers with limited access to agricultural inputs.

Louise Sperling

Beans are critical for enhancing nutrition among rural and urban families.

Thousands of farmers across Africa have embraced the growing of new bean varieties, both as a source of food and income. The increasing popularity of beans has created a huge demand for seeds.

Mr. and Mrs. Etyak Benedict (pictured) of Momot Atwero Beans Seed Producers' Association in Uganda were happy with the benefits they derived from the sale of bean seeds as a group. They started putting an iron roofed permanent house to replace the grass-thatched house they have lived in for years.

The problem

In most parts of Africa, farmers are quite often unable to access seed of new bean varieties developed and released by scientists. Without getting access to these seeds, farmers cannot benefit from new variety developments.

Although for several decades, the release of new bean varieties has been ongoing at regular intervals, farmers have had less access to these varieties than would be desired. Farmers can increase their bean harvest using better new and improved varieties. However the new bean varieties translate into increased yields on-farm only if farmers obtain access to desired seed.

The failure of farmers to obtain this seed in time (or at all) has remained a persistent challenge. Conventional models of legume seed delivery in Africa are centralized with national agricultural research systems (NARS). Even when working closely with their extension systems, they are often slow and have limited farmer outreach.

This predominant model is straightforward: NARS stand at the top of a set of linear and vertical relationships. They work to develop successful beans and, after variety release, produce an initial supply of breeder and foundation seed. Government seed parastatals and sometimes a few commercial seed companies then take over subsequent production of certified seed to sell directly to select customers, who are mainly governmental and non-governmental organizations (NGOs) who then distribute the new materials through developmental and occasionally relief programs.

This formal bean seed sector approach in Africa has faced a series of constraints which affect the volume, geographic scope, and social reach of its distribution. The private seed industry has not found the bean seed business lucrative as once farmers get new germplasm, they tend to replant the new crop from their own harvests for many seasons, instead of purchasing seed anew from certified sources. Also, contrary to popular belief, once the varieties are on-farm, they do not move swiftly by themselves, either to other farmers or to other regions.

Farmers need bean seeds from beyond their farm stocks, so that they can access new varieties. Dubbed 'the poor man's meat', it is widely acknowledged that beans are the ideal protein substitute for the poor, particularly in the countryside and amongst the urban poor. Beans bring a smile to many faces across the continent. They give strength to adults and provide vital food to nurture children especially those less than 5 years of age. For the pregnant woman, beans can be a critical source of nourishment for the mother and unborn baby, throughout the 9 months of pregnancy.

In addition to nourishing the family, beans make a great contribution to healthy soils, through replenishing nitrogen into soil through their nitrogen-fixing function.

Finally, beans—mostly grown by women—provide a reliable source of income to support rural livelihoods, and given their short cycle, are ideal in shortening families' food and cash gaps. But that is not all. Beans are also increasingly seen as an alternative source of foreign currency for many African governments.

For all these reasons, the demand for bean seed of new varieties is high throughout the various African countries, but not enough seed is reaching farming families.

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Development of wider impact program to solve the problem

In 2003, PABRA initiated an explicit strategy called the Wider Impact Program (WIP). This novel strategy was developed in recognition of the potential benefit of the spread and use of the new bean varieties, through wider access to these seeds across the African continent.

This novel strategy was also rooted in several kinds of research advances. Work on bean seed quality showed that varied types of on-farm seed production models were capable of producing acceptable seed. Analysis of seed flows concluded that farmer-to-farmer exchange, in itself, was insufficient for moving seed (it proved slow and limited in geographic and social reach). And seed market analysis indicated high demand for new varieties, but a need to develop outreach strategies more geared to poorer farmer means.

So getting the right variety into farmers' hands is no easy task, and requires understanding of how farmers acquire seeds through a 'seed system'. Seed systems operations involve different activities, ranging from the initial identification of farmers' variety preferences; to seed production and post-harvest management; to marketing/supply of preferred varieties; to information exchange about varieties; to building the skills of partners all along the production and delivery sequence. These operations cannot be carried out by a single organization.

Studies throughout the 1990s had also identified a number of actors already involved in seed-related activities across African regions. These included those in the entire local seed system, from which farmers' source over 90% of their seed, as well as a hefty group of NGOs, community-based organizations (CBOs),

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Sales of beans provide quick income, including for women.

and farmers' organizations who were involved in seed production for varying periods.

Hence the WIP aimed to catalyze and coordinate efforts of different kinds of seed chain actors. The new strategy moved away from the standard approach which puts the onus of production and delivery on centralized NARS, government extension systems, and formal seed suppliers and towards a collaboration which builds on varied organizational strengths. In order to provide farmers with seed at their locality, initial stocks of high quality seed need to be further multiplied and delivered through a decentralized system. It is here that unconventional partners came into the picture and played special yet critical roles. The partners include NGOs, traders, and decentralized seed producers as well as researchers and farmers at the grassroots.

At its beginning, in 2003, the WIP set a target of reaching 2 million households by the end of 2008 (translating to an estimated 10 million people). "Recent assessments show that 7.12 million households were reached with new varieties in the 5-year period. This translates to over 35 million people," write PABRA researchers Jean-Claude Rubyogo and Louise Sperling.

Leveraging partner strengths and defining complementarities

The WIP was built on a strong partnership philosophy. But it was not starting from scratch; rather, it was building on efforts that were already ongoing. To leverage on partners' complementary skills, the program went through processes of analyzing each type of partner's strengths and weaknesses, and then sharpening their respective roles toward an integrated set of production and delivery activities.

Non-governmental organizations, CBOs, farmers organizations (FOs), and church groups signaled that they often have close contacts with farmers and, in widely dispersed zones, they bring with them a legacy of trust as well as experience in local level organization and facilitation. International NGOs reported their wide geographical spread of action, including in marginal, resource-poor areas.

Researchers, on the other hand, felt they had the skill sets to train in subject matter of improved bean pre- and post-harvest management, disease identification and control, and agroenterprise development. Traders had the edge on local, regional, and international market intelligence.

As partners worked together, the definition of their select responsibilities became clearer, as well as more complementary. For instance, the production of breeder and foundation seed became the near sole responsibility of NARS. Seed parastatals and seed companies, in turn, took the lead in supplying commercial seeds of the widely-adapted popular varieties.

Decentralized production in actual target zones became the chief activity of locally-based producers, often supported by organizations such as public extension, NGOs, or FOs. The regional research networks took on the technical backstopping and much of the training and skill building in areas where the national partners had less experience. Empowering and training partner organizations' staff was the cornerstone of widening PABRA's reach. This collaborative arrangement has succeeded not only because multiple organizations see advantage in working together, but also because it makes smart use of the skills and financial resources of each particular partner.

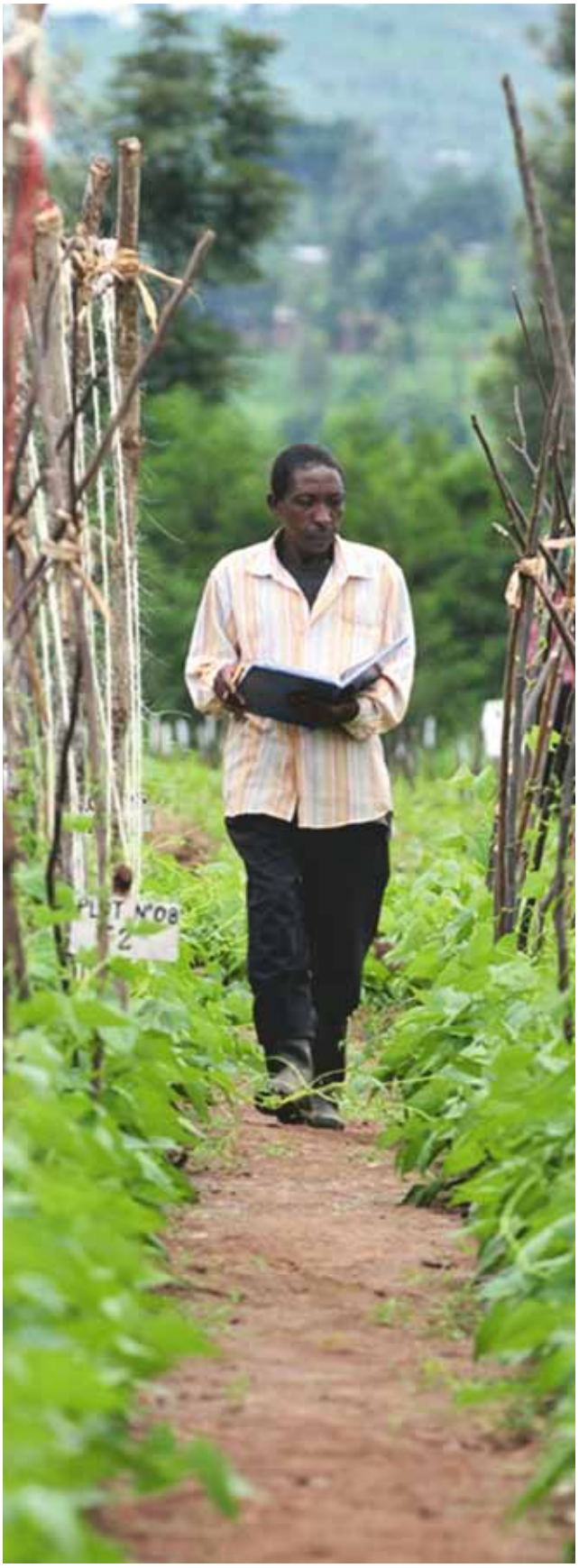
Platform development

These initiatives have also paved the way to the formation of platforms which encourage partners to share responsibility and information on bean commodity sub-sector, as well as on other innovations. For instance, in Madagascar, members of these platforms meet at the beginning and end of each season to plan and evaluate progress. They assess the partnership cohesion, discuss relative motivation of partners, clarify expectations among partners present, and identify any additional partners or skills which may be required.

As the platforms have evolved, they have sometimes transformed from NARS-led platforms to ones managed by other partners, such as with the NGO-led platform in Ethiopia or the grain exporters' associations taking the lead in Malawi and Madagascar. Partly as a result of these shifts, non-traditional partners have also joined the platforms, e.g. health-related organizations dealing with improved nutrition for vulnerable groups.

Critical factors leading to partnership success

Joint reflection among seed chain actors, within countries and across regions, has identified factors



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Climbing bean trials in Rwanda

critical for the success of the WIP partnership. Central to the partnership has been technical evidence that the new varieties are high-performing and, in some cases, can open lucrative markets. All varieties on offer have been extensively tested with end-users, for agroecological adaptation, for consumer preference, and for market potential. In terms of the factors for successful partnership processes, the initial drive of the NARS has been the pivotal issue. This has meant their willingness to engage partners, release varieties, avail foundation seeds and related information, and respond to specific variety demands (especially from the private sector).

For ongoing success, the NARS have had to respond to evolving felt needs of partners, and work to keep the partnerships dynamic. Within the WIP, NARS roles have basically expanded, from serving as technical experts, to working also as facilitators among diverse groups along the seed chain. Keeping up-to-date on field developments has also been a WIP prerequisite.

In terms of other prime factors, the commitment of Ministries of Agriculture and other senior policy makers to principles of shared and decentralized responsibility, focused towards the single goal of impact, has also been essential. Readiness from all partners to want to bridge gaps and share skills, for instance, between researchers and industry, has been important.

Finally, having large numbers of potential decentralized partners on the ground, ready to take up site-specific work, has meant that some locations have been poised to engage in WIP approaches.

Moving towards wider impact results

Within a modest couple of years, the WIP has had important achievements which serve as milestones in its quest to reach millions of farmers.

Multiplying partnerships within and across countries

The program has catalyzed a significant number of complementary partnerships. Many of these have been solidified via formal Memoranda of Understanding (MoU) which stipulate time-bound objectives, describe resources on offer to carry out work, and outline processes for joint decision making.

By the end of 2006, the program had stimulated some 436 partnerships developed in several countries in PABRA. Ethiopia deserves special mention. By 2006,

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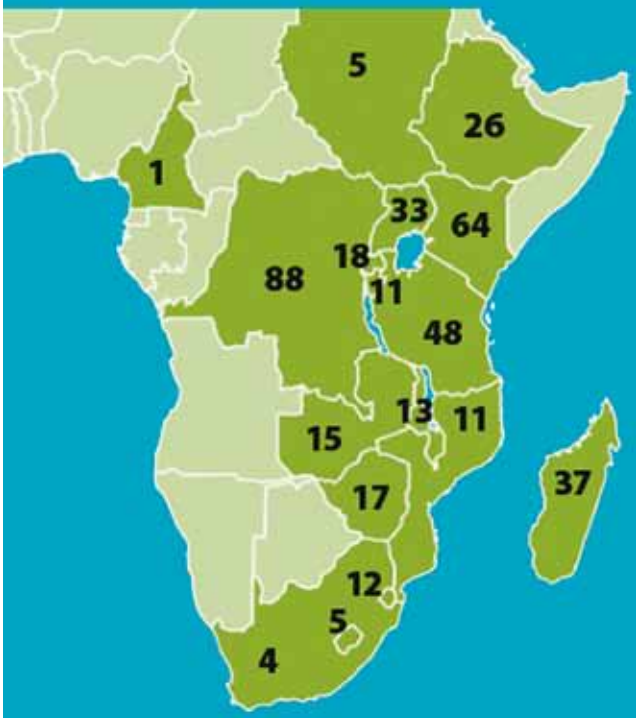
Over 35 million people have accesed new bean varieties in 3 years.



Wider impact and boosting national trade: number of PABRA country partners involved in seed supply as of 2006.

the Ethiopian Institute of Agricultural Research (EIAR) alone had partnered with 26 organizations directly and 130 indirectly. Jointly the partnership produced seed to cover 60% (9,446 tons) of the national seed requirement and to supply 14 varieties. These results are up from 0.8% supply of national requirements, limited to three varieties and were achieved in 3 years.

Partnerships have expanded in most countries in which the bean networks operate, with the approach accelerating because of the pre-existing research alliance. In Ethiopia, Kenya, Rwanda, Malawi, Tanzania, Burundi, Madagascar and Democratic Republic of Congo, the partnerships have evolved beyond the original membership to include local and export bean traders. Farmers in several of these countries are increasingly organizing to produce key varieties for specific markets (sometimes facilitated by NGOs, CBOs, FOs, GOs, or traders), and in an interesting feedback loop, NARS are becoming more efficient at releasing market-demanded new bean varieties and in making initial stocks available.

For example, the Uyole Research Institute, in Southern Tanzania, now takes only 2 years to test and release preferred bean varieties sent from other PABRA countries, versus the 7 years previously required. Having noted progress, including in some logistically challenging regions, the PABRA network is now carefully monitoring and learning from shifts in partners' activities. For instance, in some cases, progress has been quickly made due to links with emergency aid organizations. Since some of these relief agencies come and go, their effectiveness as partners may be concentrated to short-time periods.

Widening and reaching farming households

The WIP has also greatly scaled up seed production and dissemination—on the ground. Again, 7.12 million households, over 35 million people, were reached in a modest 5 years (2003-2008) in all network countries. This figure is considerably more optimistic than the original network goal of reaching 2 million households in the same period.

These data are also conservative. The amount of seed exchanged among farmers and sold in local markets has not been reported and these secondary diffusions are likely to constitute a significant share of the seed produced.

Note that NARS have previously released bean varieties without putting in place tracking mechanisms that indicate their degree of uptake. PABRA's monitoring and evaluation systems now allows for continuing quantitative data collection to assess speed and extent of outreach. The information also helps network partners evaluate their relative effectiveness within the overall network seed supply chains. The 2003-2008 results will serve as benchmarks for future network assessments.

Again, a modest case citation serves to ground the more global results. The Ethiopian Bean Research Program estimates that more than one million households countrywide gained access to new bean varieties between 2004 and 2007. Amazingly, in Ethiopia, about this same period, the export of white pea bean reached a value at US$60 millions (2006). This was also partly due to leaps in the supply of new bean varieties and seed, coupled with more organized market chain development geared toward foreign business.

Engaging with multiple, diverse partners also helped to reach remote and poor Ethiopian farmers, many of whom had not had access to new bean varieties before this intervention. Some of the partners involved, such as the Melkassa Agricultural Research Center, Catholic Relief Services, Self-Help Development International, and the Amhara Agricultural Research Institute, attributed the impacts achieved to targeting the resource poor rather than the model farmers in traditional bean growing areas like the Central Rift Valley. The impacts were also attributed to introduction of bean varieties to areas where bean production had stopped or where it had never fully developed, such as the Amhara region.

Conclusions

The WIP arrangement has been successful because diverse and multiple organizations see advantage in working together, with such a group also making good use of the skills and financial resources of each partner. This allows them to focus on what they know best.

Members of the bean networks have forged important partnerships with a wide range of organizations. Some partnerships are with formal channels, as is the case with the Ethiopian Seed Enterprise or with commercial enterprises like Leldet in Kenya. Others are with NGOs, who have considerable financial resources and a wide geographical spread. Further, some partners who might normally be considered to be non-seed actors (such as tobacco companies and women's health centers) have also engaged in seed transactions, as their clients and employees can benefit from enhanced access to new varieties.

The results of scaling up seed dissemination and outreach and of using the WIP strategy can be reflected in:

- The large numbers of farmers reached in a short time.
- The diverse and large number of partners engaged in seed supply (with many providing service in local zones).
- The novel partnerships organization—in new division of labor—geared for impact-oriented seed production and delivery.
- The fast spread of the WIP model to 10+ countries because of bean network setup.
- The gains farmers themselves reap, via direct production hikes as well as via profits from becoming seed producers and sellers.
- The gains that national economies exhibit through scaled up bean production and sale, are exemplified by successes in Ethiopia, Kenya, Uganda, and Southern Tanzania.

Looking to the future

Within a modest couple of years, the WIP has made substantial progress in a quest to reach millions of families with seed of new bean varieties. Despite these considerable achievements, PABRA and its partner networks would like to reach even more millions of farming households.

The Pan-Africa Bean Research Alliance is proud of its accomplishments, but not complacent. If activities are to be scaled out further, there is need to understand better the multiple reasons for the first string of successes.

The research component of the WIP has began to compare the costs of varied seed production modes, the cost and benefits of different delivery channels, as well as monitoring seed health along the production and delivery chain.

Partnerships are also receiving the much needed scrutiny. One of the key network challenges for the coming seasons will be to understand how to maintain

viability of partners and the following questions are being asked:

- What incentives are needed to maintain seed supply and delivery?
- What do partners need to be able to scale out quickly?
- What elements can guide key partnerships into profitable seed related enterprises?

The goal in the WIP goes well beyond seed production and delivery. The networks aim to identify and implement creative, sustainable, profitable, and equitable ways to help smallholder farmer households gain access to seed of improved bean varieties—no matter where they live or what their economic means.

Established in 1996, the Pan-Africa Bean Research Alliance (PABRA) is a consortium of African regional bean networks: the Eastern and Central Africa Bean Research Network (ECABREN), the Southern Africa Bean Research Network (SABRN), and the West and Central Africa Bean Research Network (WECABREN). They are made up of national agricultural research systems (NARS) in a total of 24 sub-Saharan Africa countries, an international research organization (the International Center for Tropical Agriculture, CIAT), and a number of donor organizations. For more information, contact:

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