



PABRA Academy in Brief:

A Demand-Led Capacity-Building Framework for the Bean Corridor Approach



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1. Background

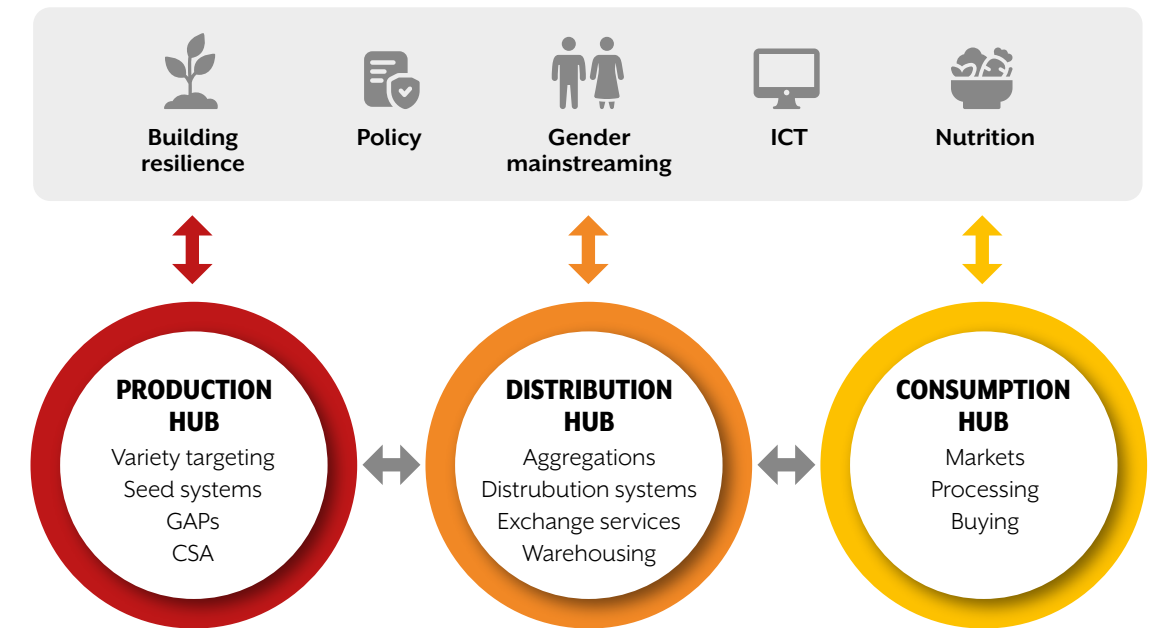
Maintaining food and nutrition security for our rapidly growing human population under likely climate change scenarios is one of the greatest challenges facing humanity. Crop production continues to be greatly curtailed by several environmental stresses: notably, drought, excessive rainfall and flooding, heat, and cold temperatures, as well as biotic constraints (notably field and postharvest pests and diseases), challenges that are expected to increase with climate change. For the world to be prepared for these new climate scenarios, it needs strong crop improvement programs that are well equipped and adaptable to respond and develop climate-resilient and nutritious market-demanded varieties. Capacity building and strengthening of crop improvement research areas that respond to this market demand are more than ever central to ensuring that this happens.

Agricultural research plays a vital role in generating agricultural technologies and fostering innovation. This includes developing improved, market-/user-demanded, high-yielding, and disease-resistant crop varieties, which in turn helps to enhance productivity, adapt to edaphic and climate change, and improve nutritional and postharvest attributes. This research also helps to develop innovative value-added and processed products, generate and analyze data that offer insights into optimizing crop management and agricultural practices, predict crop yields, and mitigate risks. Research institutions play crucial roles in disseminating findings, best practices, and innovations to stakeholders. Through training programs and outreach activities, research institutions empower partner organizations/small and medium enterprises and individual current and future scientists/practioners with the knowledge, skills, and practices needed to adopt new methodologies, skills, technologies, and innovations. Building on its experience in Africa, the Pan-Africa Bean Research Alliance (PABRA) seeks to establish the PABRA Academy to provide linkage for young scientists from national agricultural research and extension systems (NARES), PABRA members, and students from high institutions of learning to obtain hands-on experience in conducting research and working with business enterprises along the bean value chain. Subsequently, this bridge will connect academia and research on the one hand with agri-business development on the other hand, while also providing a mentorship opportunity for youth in a real agri-business work environment.

2. Demand-led corridor model

PABRA's demand-led bean research for development approach has evolved over the past two decades, with a strong client and impact focus (Rubyogo et al., 2019; PABRA, 2022). Having started from a pure crop improvement program, it evolved through participatory varietal selection, niche market breeding, value chain focus, multi-stakeholder platforms/innovation platforms, and demand-led research (DLR) to a bean corridor approach and the latest digital inclusion (PABRA, 2022). The current corridor model (**Figure 1**) is the basis of demand-led research and development efforts and it provides a framework for catalyzing synergistic and complementary investments in the bean value chain. This approach aims at intensifying production, expanding distribution and consumption, and connecting networks, partnerships, and collaboration among actors along the commodity value chain (Birachi et al., 2023). Production hubs are areas/ regions where large volumes of beans are or can be produced in response to market needs by targeting and disseminating market-demanded varieties, improving productivity and production through good agricultural practices (GAPs), developing and sustaining seed systems, and strengthening the capacity of farmer-producer units for collective marketing. Distribution hubs include product distribution or aggregation centers, while consumption hubs are the major market outlets (e.g., open markets, supermarkets, and bean grain traders) and processing units.

Figure 1. The bean corridor model



Demand-led research has introduced the principles of impact-oriented research and incorporating market-driven thinking into breeding and seed system programs and has been gaining traction across Africa. For instance, DLR has stimulated innovation, empowered breeders to move beyond their current norms, catalyzed their connectivity and relationships with value chain players, and created opportunities for their new varieties to achieve greater awareness and adoption. DLR also offers practitioners a new way with higher chances of success to achieve their ultimate goal: creating improved varieties that are

highly sought after by farmers and other value chain actors and that make a difference for African farmers' livelihoods and food security for their families and communities, and ultimately catalyze vibrant bean value chains that contribute to inclusive economic growth. DLR principles are applicable to research programs on any crop or livestock commodity and sold through any value chain or market (see Table 1). DLR, through the PABRA Academy, will transform these corridor issues and capacity gaps into research projects for both PABRA members' (Alliance and NARES) and learners' research projects.

Table 1. Alignment of capacity-building framework (issues, actors, gaps, etc.) with demand-led commodity corridor approach (hubs, activities, actors)

Hubs	Production hub →			Aggregation hub →	Consumption hub →	
	Variety development	Seed supply system	Demand-led grain production system	Market-driven product demand	Processing	Retailing
Process/ activities	<ul style="list-style-type: none">Identification of demanded traits and defined breeding objectivesPopulation improvement and exchange of advanced linesMulti-location testing, release, and licensing of new varietiesVariety targeting	<ul style="list-style-type: none">Seed system design, development, and promotionEarly-generation seed productionCommercial seed production/supply	<ul style="list-style-type: none">Early-generation seed productionCommercial seed production/supplyGrain productionDevelopment and promotion of good agricultural practices (GAPs)	<ul style="list-style-type: none">Grain aggregation	<ul style="list-style-type: none">Development and processing of bean-based products (e.g., precooked, composite flour)Packaging for supermarkets and other outlets/marketsCertificationsFinancingInvesting	<ul style="list-style-type: none">Grain marketing (national and export)Consumption
Issues	<ul style="list-style-type: none">Low productivity and productionPoor quality of inputsLack of market-based productionLow knowledge on GAPsLow collective actionInappropriate seed system modelsDrudgeryOld varieties being used			<ul style="list-style-type: none">Low and scattered volumesLack of or poor storage infrastructurePoor postharvest handlingPoor transport infrastructure	<ul style="list-style-type: none">Low knowledge on technologies and productsLack of equipmentPoor packagingInsufficient branding and low promotionPoor quality control and lack of certifications	<ul style="list-style-type: none">Lack of structured marketsPoor market informationHigh transport costsLack of credit facilities
Actors (individuals, groups, institutions)	<ul style="list-style-type: none">Researchers (NARIs, IARCs, universities)Private sectorEnd-usersPolicymakersRegulatory agenciesCommunity organizationsCommunity seed producersFarmer groupsSeed companiesNGOsAgro-dealers/input suppliers		<ul style="list-style-type: none">Farmers (individual and groups)Input servicesResearchers (NARES, IARCs, universities)PolicymakersNGOsMechanization services (hubs)Seed companiesFertilizer companiesAgro-dealersProducer cooperativesSoil fertility advisoriesDigital agro-input suppliers (agritechs)Digital extension and agro-climate advisoriesAgri-businesses (farms employing women and youth)	<ul style="list-style-type: none">Off-takersTransportersTradersGrain aggregators (SMEs and cooperatives)Government agenciesNARIsThresher manufacturers/suppliersCrop insurance service agentsDigital payment servicesLogistics for grainFinanciers and investors	<ul style="list-style-type: none">Off-takersMarketersProcessors	<ul style="list-style-type: none">TradersNARIsLocal and exportNutrition communications; product delivery logistics; user-client targeting supermarket/retail outlets; institutional consumers: school feeding, hospitals, others

Hubs	Production hub →			Aggregation hub →	Consumption hub →	
Capacity gaps	Variety development	Seed supply system	Demand-led grain production system	Market-driven product demand	Processing	Retailing
	<ul style="list-style-type: none">NARIs exhibit variable breeding capacityCollaborative capacities for breeding initiatives varyPublic breeding programs and pipelines are intricateLimited collaboration, sharing, and information exchange in breedingInsufficient adoption of innovative techniques and approachesLimited adaptability and reorientation to new conceptsVaried and limited capacities in sustainable seed system approachesLimited awareness and policies regarding seed regulations		<ul style="list-style-type: none">Lack or limited knowledge of GAPsLimited supportive policies for input supply or services			
	<ul style="list-style-type: none">Limited focus on some capacity aspects for private sector.					
	<ul style="list-style-type: none">Certain aspects of value chains (e.g., business training, product development, and variety release for commercialization) ignored.					
	<ul style="list-style-type: none">Inadequate policy advocacy for scaling up and out of technologyNeglect of capacity strengthening for various actors along the value chainInsufficient skills beyond technical expertise for the corridor approachLimited knowledge, tools, and skills in gender-related aspectsExperienced researchers or value chain actors approaching retirement or already retired or transitioning into administrative roles					
Product	<ul style="list-style-type: none">Released varietiesSeed classes (breeder, foundation, certified, commercial, quality declared seed (QDS) – certified and semi-certified			<ul style="list-style-type: none">Grain for sale	<ul style="list-style-type: none">Grain for saleValue-added and processed productsNutrition products	



3. Alignment of PABRA projects with the demand-led corridor model and food system

PABRA's research projects and programs are nested and well aligned with the concept and the framework of the demand-led corridor approach. Through its partnerships, coordination, and facilitation role, PABRA is enabling the re-organization of NARES and institutions to better identify and prioritize research needs. This is done by facilitating breeders' and other crop scientists' engagements with other value chain actors (**Table 1**) with insights into production constraints and needs and preferences of beneficiaries (farmers, agri-business, and consumers) to identify traits that can be incorporated into breeding product profiles, interventions, and investments to achieve impact. For example, the Accelerated Breeding and SeedEqual Initiatives of the One CGIAR are well aligned to contribute to PABRA's bean demand-led corridor approach.

An example of demand-led research is the Australian Centre for International Agricultural Research (ACIAR)-supported ongoing project on breeding for Rapid Cooking and Biofortification (RCBP), which is a collaborative project between the University of Western Australia, Alliance of Bioversity International and CIAT (ABC)-PABRA, and the national bean programs of six East African countries (Kenya, Tanzania, Burundi, Rwanda, Uganda, and Ethiopia). The goal is to decrease the cooking time in common bean by at least 30% and increase the content of iron by 15% and zinc by 10% by introducing, using, and training the project partners (Alliance and participating countries) on a new crop breeding technology (BRIO) and data analysis. This new technology is based on a new rapid breeding process (BRIO, <https://bit.ly/42smpfK>) developed in Australia in oilseed rape and for which world-leading rates of genetic gain for grain yield and quality were achieved (Cowling et al., 2023).

Some other national and regional projects and programs are Accelerated Varietal Improvement and Seed Systems in Africa (AVISA) and Modernizing of Beans from Gene Bank to Farmers, etc., facilitated and supported by ABC-PABRA. By virtue of its extensive network of research and development partners, ABC-

PABRA is well positioned to harness contributions and exploit the opportunities offered by new genetic and non-genetic innovations for the benefit of its network members and partners.

4. Rationale

In the past two decades, PABRA, in collaboration with several partners, has invested in and facilitated capacity building in several areas and disciplines aimed at empowering stakeholders of the demand-led corridor approach with increased knowledge and skills to address constraints in technology development, dissemination, and use. Over this period, PABRA and CIAT have been directly involved in training about 4,000 national research partners, 100 postgraduates, and more than 23,000 smallholder farmers to ensure the effective use of innovations and improve participants' ability to address context-specific challenges. Capacity-building topics covered encompassed breeding, integrated crop management, mitigation against climate change, markets, nutrition, seed systems, gender, monitoring, and evaluation. Because of the need to respond to several constraints and needs, breeding maintained stronger capacity-building initiatives aimed at developing a critical mass of expertise, skills, resources, and equipment. Initial emphasis focused on breeding for biotic (disease and insect) resistance, yield enhancement, tolerance of/adaptation to abiotic (drought, soil quality [low/high]) constraints, and nutritional attributes. More recently, the focus has expanded to integrate consumer-demanded traits (seed size and shape, color, cooking time). Gender-sensitive participatory varietal evaluation has been crucial for identifying user-preferred traits.

4.1. NARES capacity-building gaps and development of succession plans

Past capacity-building efforts have benefited a diverse range of individuals, including students, researchers, extension practitioners, breeders, technicians, and various stakeholders, in the bean value chain. However, significant capacity gaps and concerns remain, particularly among bean researchers, for supporting value chain actors:

- Variations in human resource capacity among NARES crop improvement programs, necessitating continued capacity building, particularly of the weaker NARES.
- Limited number of integrated crop management scientists (agronomists, soil scientists, climate researchers) and their limited capacity.
- Variation in capacity to adapt certain collaborative crop improvement initiatives (under different projects).
- Public plant breeding pipelines are complex and involve multiple players with different accountabilities and priorities.
- Limited sharing of promising lines, new varieties, and new integrated crop management innovations, thus making weak countries unable to exploit and benefit from collaboration with strong ones.
- Several trained and experienced researchers (and/or other value chain actors) have taken up administrative or non-research roles, are due for retirement, have retired, or have died. This is coupled with no career path for young scientists or support staff.
- The rapidly increasing new knowledge, advanced techniques and methods, and organizational and collaborative approaches have not been widely used due to inadequate training packages and poor delivery mechanisms.
- Limited reorientation to adapt to new concepts and approaches such as commodity corridor approaches, etc.
- Limited knowledge, tools, and skills in certain areas (e.g., gender).
- Lack of adequate financial resources for training programs, infrastructure, and research projects, thus hindering the development of research capacity in agriculture.

- Limited opportunities for researchers to collaborate, share knowledge, and access international expertise.
- Poor linkages for technology transfer to farmers, agri-businesses, and users at large.

Given these gaps, there is a need to review strategies and develop frameworks for capacity building that respond to the needs of crop management teams at individual, institutional, and systems levels to respond to emerging farmer and consumer bean demands and to improve the natural resource base. Multi-stakeholder platforms (MSPs) in crop commodity corridors are ideal platforms for identifying and refining specific capacity needs and addressing them (Rubyogo et al., 2019).

5. Capacity-building framework aligned with demand-led corridor model

With the introduction and strengthening of the commodity corridor approach, the hubs are foci in areas of intensive activities by actors in identifying capacity needs (**Table 1**). The commodity corridor model not only provides a framework for systematically implementing research and development efforts, but it also offers a basis for understanding the roles of value chain actors at each hub, identifying capacity needs, and formulating strategies to meet these needs.

In response to some of the already identified capacity-building gaps, this initiative is intended to develop a comprehensive capacity-building framework (CBF). The CBF is aligned with the corridor approach and seeks to identify and address key capacity-building gaps among the actors and institutions at the three corridor hubs, and that correspond to key activities and processes along the bean value chain. The alignment of this CBF and the corridor approach (**Table 1**) is key, because it allows for better identification of training needs of both actors and sectors along the value chain. The efficiency within and among the hubs is significantly influenced by the performance and capacities of the actors in tackling the problems and challenges identified across the value chain.

Given that research and development are aligned with a market-led corridor approach, varietal development (breeding) and integrated crop management remain the primary drivers to enhance smallholders' production capacity and fulfill market demand. Moreover, the comprehensive framework for capacity building will focus on key stakeholders in the bean value chain, encompassing researchers, technicians, scaling actors, and those involved in value addition. This strategy will emphasize individual, institutional, and systemic approaches, incorporating a mix of training, collaboration, access to resources, and networking opportunities.

6. Goal

To strengthen the capacities of PABRA (and non-PABRA) partners (individual, institutional, and system levels) by improving stakeholders' skills and engagements, strengthening institutional frameworks, and implementing demand-led research programs and corridor approaches successfully and sustainably.



7. General objectives

To empower crop management researchers, students doing their research projects, interns attached to agri-enterprises, and other stakeholders with the knowledge, skills, and tools necessary for developing and delivering research products that meet market demand, enhance sustainable productivity and production, and address the needs of both farmers and consumers.

7.1. Specific objectives

7.1.1. To enhance technical expertise, skills, and knowledge of persons involved in demand-led breeding, and in fostering stakeholder engagement

The primary focus will be on providing degree training (postgraduate level), along with offering internships, to a new generation of researchers and student breeders. The objective is to enhance their practical knowledge and skills significantly while they are working with value chain actors or industry actors. Attention will also be given to non-degree training, incorporating mentorship and internship from seasoned scientists, including those on the verge of retirement and attached to industry. This mentorship and internship will also include value chain themes that have historically received limited training emphasis (e.g., sustainable integrated crop management, demand-led research). Other key themes to be addressed encompass gender mainstreaming and empowerment. The interns will be mentored in areas of their interest and by organizations undertaking research and business in the intern's respective area of interest.

PABRA countries exhibit diverse individual and institutional capacities, highlighting gaps within crop research areas. Therefore, there is a compelling need to augment their technical expertise, knowledge, and skills. This is essential for consistently meeting the varietal and complementary technology needs of farmers and consumers. The training initiatives will cover emerging breeding methodologies, such as those developed under BRIO and other PABRA projects. This includes comprehensive instruction on trait identification and evaluations, genetic and data analysis, and effective management practices.

Furthermore, the training program will extend to stakeholder analysis, gender-sensitive participatory approaches, and value chain methodologies (e.g.,

DLR). It will also emphasize facilitating communication among the various actors in the bean sector landscape. The experiences gained from recent projects, encompassing new technologies and methods, will be shared with other countries to foster a collaborative learning environment. As part of the overarching strategy for strengthening individual and institutional capacities, the following considerations will be reflected on:

- Group non-degree training for breeding teams will be carried out in a decentralized manner to allow more people to be reached. This will be achieved using the training-of-trainers (nationally) approach.
- Specific beneficiary categories (e.g., technicians), both individuals and groups in breeding and crop management teams, will be targeted to improve their skills and knowledge on themes or issues that will improve their contributions.
- Degree-granting initiatives for young scientists will focus on postgraduate scholars and internships. To be cost effective, students will be registered in local or regional universities with options for short internships or attachments at foreign universities, advanced research institutes, or private-sector establishments. In the latter, a student might be registered at a university but addressing a specific practical bottleneck affecting a private-sector partner.
- Mentorship will be one of the central approaches that will be used through technical backstopping of scientists and technicians in key breeding and crop management areas. ABC-PABRA will facilitate career growth and succession plans that ensure a seamless transition of leadership (research and partnership management), and that maintain continuity in R&D.
- Consideration will also be given to aspects that in the past have received little or no attention, particularly in the private sector (e.g., training in business incubation and mentorship, product development, release of varieties for commercialization, and product discontinuation).
- The private sector will be leveraged to not only participate in but also support relevant training programs.
- Opportunities will be explored to leverage other projects or donors to establish basic breeding infrastructure, particularly in methodologies to select for certain traits (e.g., taste, etc.).

7.1.2. To scale up technologies and processes that accelerate, optimize, and enhance the efficiency of breeding teams and other corridor activities

The objective is to scale up breeding technologies and processes that accelerate, optimize, and improve the efficiency of breeding within partner breeding programs, such as BRIO. This also involves using data management tools such as BMS or EBS, employing marker-assisted selection protocols, implementing the DLR approach, and using toolkits (e.g., product profiles and gender-responsive product profile tools). Updated or customized tools will be shared for broader use.

Special efforts will be undertaken to promote and facilitate knowledge sharing, continuous learning, innovation, and collaboration among breeding teams and other stakeholders. This will encompass training in knowledge management, data sharing, and the dissemination of new technologies.

7.1.3. To build and strengthen collaborative/ partnership arrangements for efficient demand-led crop improvement and management operations based on multi-stakeholder platforms.

PABRA, in collaboration with partners, will facilitate multi-stakeholder platforms (MSPs) to share and scale up achievements and lessons learned. MSP stakeholders will continuously be engaged to identify individual and institutional performance gaps and address them through a range of capacity-building interventions. These platforms serve as efficient demand-led crop improvement and management operational units involving stakeholders across the value chain, using innovative communication tools. Using MSPs, new modules on entrepreneurship, business management, and seed systems will be developed and scaled up. Collaboration and networking among stakeholders in varietal development and crop management will encourage knowledge sharing among scientists, farmers, and the public and private sectors, among others, in the bean value chain. PABRA partner countries will be supported in building capacity for partnership and networking among stakeholders.

Technical teams will provide ongoing support for the development and implementation of methods, tools, and approaches for enhanced stakeholder engagement. The capacity of MSP members will emphasize institutional aspects, such as market

development, access to finance, monitoring and evaluation, and program management. Continuous engagement with MSP stakeholders will identify and address individual and institutional performance gaps through various capacity-building interventions.

A key focus of this initiative is on enhancing management and leadership skills for coordinated activities among stakeholders in any one MSP. The objective is to improve leadership and management skills, encompassing strategic planning, decision-making, project management, team leadership, and conflict resolution – critical attributes for individuals in leadership positions.

7.1.4. To enhance the expertise of bean scientists in various integrated crop management practices for improved bean production, productivity, and food and nutrition security among smallholder farmers aligned with the growing market demand

The bean corridors consist of three key hubs: production, distribution, and consumption. These hubs are defined as networks concentrating agricultural activities connecting various partners along commodity value chains. Production hubs within the corridor are characterized by substantial bean production volumes. Targeted investments and interventions in the production hubs address market supply for demanded varieties and development of sustainable seed systems. Additional and equally important initiatives include enhancing productivity through climate-smart and good agricultural practices and strengthening farmer-producer units for collective aggregation and marketing. These activities aim to facilitate bean production, encourage sound farming practices, and deliver tradable volumes of market-demanded varieties for food security, nutrition, and the well-being of smallholder farmers.

This objective aims to build the capacity of scientists through degree and mentorship programs in integrated crop management, covering climate-smart practices, crop and soil health, water management, pest and disease management, and postharvest practices. This strategy will equip scientists with the knowledge and skills to sustainably address the challenges that limit productivity and production. Expanding capacity building for bean scientists in integrated crop management aims to create resilient agricultural systems meeting diverse community needs. The focus is on enhancing bean production,

productivity, and postharvest quality among smallholder farmers, aligning with the growing market demand for diverse, high-quality produce. This approach maximizes synergies between genetics and crop management, allowing scientists to guide farmers in optimizing resource use, minimizing environmental impact, and ensuring long-term productivity.

8. Centers of excellence as a focus

Centers of excellence (CoE) nodes typically refer to specific locations or institutions serving as hubs of expertise, research, and excellence in a particular field. These nodes are renowned for their specialized knowledge, resources, and capabilities, making them pivotal centers for innovation, research, and training.

CoE nodes offer an effective strategy for training and capacity building across various actors in the bean value chain. Aligned with identified capacity needs in hubs along the bean value chain (Table 1), existing or newly established CoEs can be integral components of the capacity-building framework. Potential CoE nodes might focus on advanced research methodologies, innovations, and technologies related to breeding, pest management, agri-business support, etc. For example, PABRA has designated some regional research centers, namely, Chitedzei (Malawi), Arusha (Tanzania), and Kawanda (Uganda), as CoEs dedicated to providing hands-on training for researchers and technicians on breeding methodologies, crop management, and technical aspects. Alternatively, CoEs can be established in collaboration with universities and other advanced research institutions, as exemplified by the Excellence in Breeding (EiB) platform, or integrated in existing ones. Other CoEs that could be considered under the CBF include those focusing on training scaling actors (on business planning, scaling bean production and marketing), organizing networking events (that bring together stakeholders from different parts of the bean value chain) and information resource centers (providing up-to-date information, research findings, and best practices), and using digital platforms to offer webinars and online courses, reach a broad audience, and facilitate continuous learning.



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9. Institutional arrangements

The configuration of institutions plays a vital role among stakeholders, influencing how their collaborations contribute to the development and reinforcement of research and capacity within individuals and organizations engaged in the bean value chain. Research institutions, collaborating with universities and businesses, contribute by conducting studies, developing innovative technologies, and offering training programs to address the challenges in the bean value chain. Training programs, workshops, and capacity-building initiatives can be organized in alignment with the latest research and industry trends. Universities make a significant contribution by providing specialized

academic programs covering technical areas, agri-business management, policy integration and sustainable practices, and fostering innovation and entrepreneurship. Private-sector involvement is essential for scaling up successful initiatives, with businesses collaborating to implement innovative solutions and provide practical training. The private sector can also play a pivotal role in offering on-the-job training, mentorship programs, and internship opportunities. Through active engagement with stakeholders along the bean value chain, businesses contribute to the practical skill development of individuals, aligning their competencies with industry needs. The synergy among these entities ensures the seamless integration of research findings into education and the practical application of knowledge, forming a successful capacity-building strategy for beans or other crop value chains.

10. Funding strategy for the capacity-building framework

The CBF is intentionally designed to align with the demand-led corridor approach, deriving its structure and principles from the latter. Along the bean value chain, technical or operational issues are identified (see **Table 1**) that demand attention from value chain actors. The resolution of some of these issues necessitates the enhancement of actors' capabilities. For instance, the market might demand a new bean variety with a specific trait, presenting a challenge for breeders and other actors. If a capacity gap exists among value chain actors, particularly breeders, it becomes essential to provide training to enable them to address the problem. Therefore, problems stemming from activities and processes along the value chain are addressed by the relevant value chain actors. However, in instances when capacity gaps exist among these actors, it becomes imperative to integrate capacity-building components into proposals and projects, thus underscoring the significance of the CBF.

10.1. Seed fund for capacity building

In 2020, ABC-PABRA, jointly with the International Center on Rice Research and Development in Africa (AfricaRice), was awarded the 2019 Al-Sumait Prize in recognition of their contribution to African development. The award, which offered a cash prize of USD 1 million (split equally between the two institutions), was designed to reward innovative and inspiring initiatives and research that addressed the challenges facing the African continent. It recognized PABRA's efforts, significant impacts, and achieving tangible improvements in the lives of millions of malnourished and underfed people. PABRA also won the Africa Food Prize 2023 in recognition of PABRA's exceptional leadership in the development of numerous bean varieties that improve farm productivity and profitability and meet increasing consumer demand. The prize carried a cash prize of USD 100,000. In accepting these awards, PABRA has dedicated prize money totaling USD 600,000 to serve as seed money to catalyze a capacity-building strategy and address the specific training needs of the new generation of young PABRA researchers. As a catalytic fund, endeavors will be made to harness additional resources for capacity building facilitated under the CBF.

For example, the training grant process that has been developed for the seed fund (**Annexes 1 to 3**) will be adapted to various models of fund leveraging, potentially associated with projects managed by PABRA and the Alliance of Bioversity International and CIAT. However, exceptions might arise in leveraging models in which a scholarship provider might directly or indirectly support successful applicants.

10.2. Fund leveraging options for capacity building

Effective capacity building is vital for agricultural research and development actors to address the evolving challenges and opportunities within the bean value chain. The funding models for capacity building along the bean value chain involve a strategic and collaborative approach to secure financial resources, thus enhancing the skills, knowledge, and capabilities of various actors and institutions. These funding models exhibit variations in sources, mechanisms, and purposes, necessitating alignment with specific goals and objectives. Organizations (e.g., PABRA, NARES, etc.) and individuals seeking funding should carefully consider available options, tailoring proposals to meet the criteria and priorities of funding sources or donors.

Among the available options are:

- Funding generated through collaborative efforts on project initiatives and partnerships with organizations such as CGIAR, engaging diverse stakeholders. Numerous ongoing PABRA projects fall within this category, and upcoming initiatives will specifically highlight the integration of important capacity-building components.
- Financial support or sponsorship from private companies, foundations, and philanthropic organizations to bolster research and capacity building, particularly in domains related to innovation and technology adoption.
- Financial support from NGOs for capacity-building initiatives targeting community organizations.
- Grant allocation by national governments to support research and development projects aimed at generating technologies, innovations, and strengthening of the agricultural sector. Some governments also provide subsidies and incentives for agricultural development that can be used.

- International development agencies, including the World Bank, United Nations, and regional development banks, might have bilateral or multilateral initiatives that provide funding for agricultural research and training programs.
- Grants provided by philanthropic foundations with a focus on agriculture, sustainable development, and education, including foundations associated with agri-businesses and corporations interested in social responsibility and community development.
- Collaboration with educational institutions, such as universities, which might have funding mechanisms for projects aligned with their research and educational objectives. These partnerships could engage students in applied research and capacity-building projects, potentially leveraging funds from educational institutions.
- Grants specifically designated for projects focusing on capacity building, training, and skill enhancement.
- Grants or funds provided by research-oriented organizations or institutions that support innovation focused on the development and implementation of innovative technologies. This includes collaboration between universities and other organizations.
- Research and innovation funds established by some countries specifically to support agricultural research and technological advancements.
- Funding support for start-ups from venture capital and angel investments for businesses spinning out of research and innovations.

The PABRA catalytic fund will be open to partnership and other contributions in cash or in kind to expand its capacity. A competent committee composed of representatives of stakeholders and partners will be constituted to manage the resources and allocate the scholarships.

It is important to acknowledge that the availability of funding from these sources varies by region and depends on donor and country priorities. To maximize resources for capacity building, it is imperative to explore and engage with relevant organizations, governments, aid agencies, and the private sector to identify new and innovative opportunities.





Annex 1: Guidelines for capacity development in the Pan-Africa Bean Research Alliance

Rationale

The Pan-Africa Bean Research Alliance (PABRA) is collaborating with several partners to invest in and facilitate capacity building in several areas aimed at empowering stakeholders in the demand-led corridor approach (**Bean commodity corridors scaling up production and market expansion for smallholders in Sub-Saharan Africa – <https://allbiociat.org/3Ruodi5>**). Capacity building increases knowledge and skills to address emerging constraints in technology development, dissemination, and use, particularly in the face of climate change and emerging consumer demand. PABRA will strengthen the interdisciplinary and integrative research areas around common beans as a way of addressing these constraints. The major areas for capacity development span breeding, seed systems, crop protection (pathology and entomology), crop agronomy (soils and crop nutrition), nutrition, market development, gender/inclusion, and socioeconomics. This capacity-building initiative aims at developing a critical and effective mass of expertise, skills, resources, and infrastructure.

Objectives

To empower crop improvement researchers and other stakeholders with the innovative knowledge, skills, and tools necessary for optimizing development, delivery, and use of bean varieties and complementary technologies/innovations that meet market needs and demand, enhance sustainable productivity and production, and address the needs of farmers, consumers, and other value chain actors.

Capacity-building gaps

- Variations in human resource capacity among national agricultural research and extension system (NARES) breeding programs (focus will also be given to nutrition-sensitive breeding), necessitating continued capacity building, particularly of the weaker NARES.
- Limited numbers of integrated crop management scientists and their capacity.
- Variation in capacity to adapt research technologies (under different projects).
- Limited capacity of young scientists/technicians and inadequate succession plans.

As part of the all-embracing strategy for strengthening individual and institutional capacity, the following will be considered:

- Short-term training courses in skills such as proposal development, leadership, and technical areas such as breeding, agronomy, pathology, socioeconomics, gender, nutrition, etc.
- Long-term training, including full-time MSc and PhD training.
- Research funding for MSc and PhD students who have completed course work.
- Postdoctoral opportunities for PhD students who have completed their studies.

Priority (focus areas) for capacity building

This will focus on the PABRA demand-led corridor model and food system approach (**Bean commodity corridors scaling up production and market expansion for smallholders in Sub-Saharan Africa – <https://allbiociat.org/3Ruodi5>**).

In the bean corridor approach, the bean value chain efforts are aligned and focus on enhancing the efficiency of the three interlinked hubs: production, distribution, and consumption. Production hubs are defined sites or regions where large volumes of beans are or can be produced in response to market needs by targeting and disseminating market-demanded varieties, improving productivity and production through good agricultural practices (GAPs), developing and sustaining seed systems, and strengthening the capacity of farmer-producer units for collective marketing. Distribution hubs include product distribution centers, aggregation centers, warehouses, storage points, or commodity exchanges for distributing beans to consumers. Consumption hubs are also major market outlets and processing units, supermarkets, and bean dealers. The bean corridor approach is implemented through multi-stakeholder platforms (MSPs).

Modality/guideline for supporting PABRA capacity building

1. Eligibility criteria
 - Countries with weak bean research programs due to inadequate skills and knowledge among their bean researchers.
 - Fair regional network representation.
 - Candidates: young mid-career researchers with well-defined career development and

succession plans designed to facilitate a smooth transition in both research and leadership roles.

- The study focus themes should align with the demand-led corridor approach or framework.

2. Process of awarding training grant or scholarship
3. Transparency
4. Application process
5. Selection/approval committees or panels

Note: Please see the detailed capacity development proposal for MSc and PhD students and visiting scientists.

PABRA Capacity Development Proposal Template: Studentships (MSc, PhD)

Application prerequisites:

- Applicants must be from a PABRA network partner organization.
- Applicants should have a letter of admission/acceptance from a recognized MSc or PhD program in an African university.
- MSc/PhD dissertation should focus on the following:
 - PABRA focal crops – beans and other legumes
 - PABRA thematic area as identified by actors of a multi-stakeholder platform along the bean value chain, encompassing breeding, genetics, crop protection, agronomy and soil fertility, seed systems, agronomy, climate change, socioeconomics, markets, gender research, and nutrition.
 - Food technology and food science, etc.
- Applicants must be willing to present and defend their proposals (in English, Portuguese, or French as per the lingua franca of the host university) to the core selection committee on a competitive basis.
- Applicants should preferably be not more than 40 to 45 years old for MSc and PhD students, respectively.
- Priority will be given to existing national bean program researchers.

Scoring criteria	
Criteria	Score
The application is justified and supported by the employer (NARI) and the leader of the national bean program (based on career development and succession plans). Inclusivity and diversity should be considered; for instance, 50% must be women.	Out of 10
There is a compelling country justification (prioritization) to strengthen capacity in the thematic area of study.	Out of 10
There is compelling evidence that the students will return to their host institute, build local capacity, and serve their institute for 5 years after completing MSc or PhD studies.	Out of 10
The proposed thesis focuses on addressing crucial capacity gaps in relation to issues along the bean value chain or specific thematic research areas and explores novel approaches that can significantly contribute to PABRA's crop improvement activities.	Out of 20
The research thesis is aligned to the national/regional demand-led corridor approach, and the research component is embedded in ongoing activities.	Out of 20
There is a strong likelihood that the studentship will lead to high-quality publications (at least one for MSc and two for PhD).	Out of 10
There is a strong and realistic workplan and budget, showing a high likelihood of completion within the standard timeframe for the degree in question (two years for MSc and three years for PhD).	Out of 10
The application supports the development of women scientists (50% women candidates should be considered). Women are encouraged to apply.	Out of 10
Total	100

PABRA studentship application proposal	
Research Proposal Title: [Replace this text with project title]	
Name of applicant:	
Organization:	
Type of application:	MSc or PhD
Crop(s):	
Technical area of focus:	
University:	
Letter of admission/acceptance from university (attach):	

Selection/approval committees or panels

Selection committees for training grants will operate at three levels: national, regional, and pan-Africa. Like sub-projects, the review and selection of proposed recipients will be conducted by the national bean program team and approved by the NARES leadership (DG or director). Candidates recommended by the national selection process will undergo review, consideration, and approval by the network committee and the identified candidates will apply to the PABRA scholarship selection committee. **Its composition comprises (i) three network chair-people (elected by network members), (ii) representatives of the PABRA scholarship program funders/supporters, (iii) two representatives of PABRA theme leaders**

(peer-selected), and (iv) PABRA director. The committee will elect its chairperson. Decisions of the committee, including the identification of suitable applicants, are made by consensus. Throughout the assessment stages, fair and comprehensive review processes should be employed based on established criteria (see above). The selection process and its results will be documented and records kept for any consultation and reference.

The PABRA scholarship initiative will start immediately after the PABRA scholarship selection committee is established. The committee will meet twice a year to review and decide on the applications. Decisions will be documented and communicated to the PABRA SC members, including the initiative funders, the applicants, and PABRA members.

Awards

The disbursement of awards should have a clear outline specifying how and when scholarship funds will be distributed, whether as a lump sum, per semester, or annually based on institutional practices. Results from the process will be communicated to all applicants in a timely and respectful manner. Feedback should be provided to unsuccessful candidates whenever possible.

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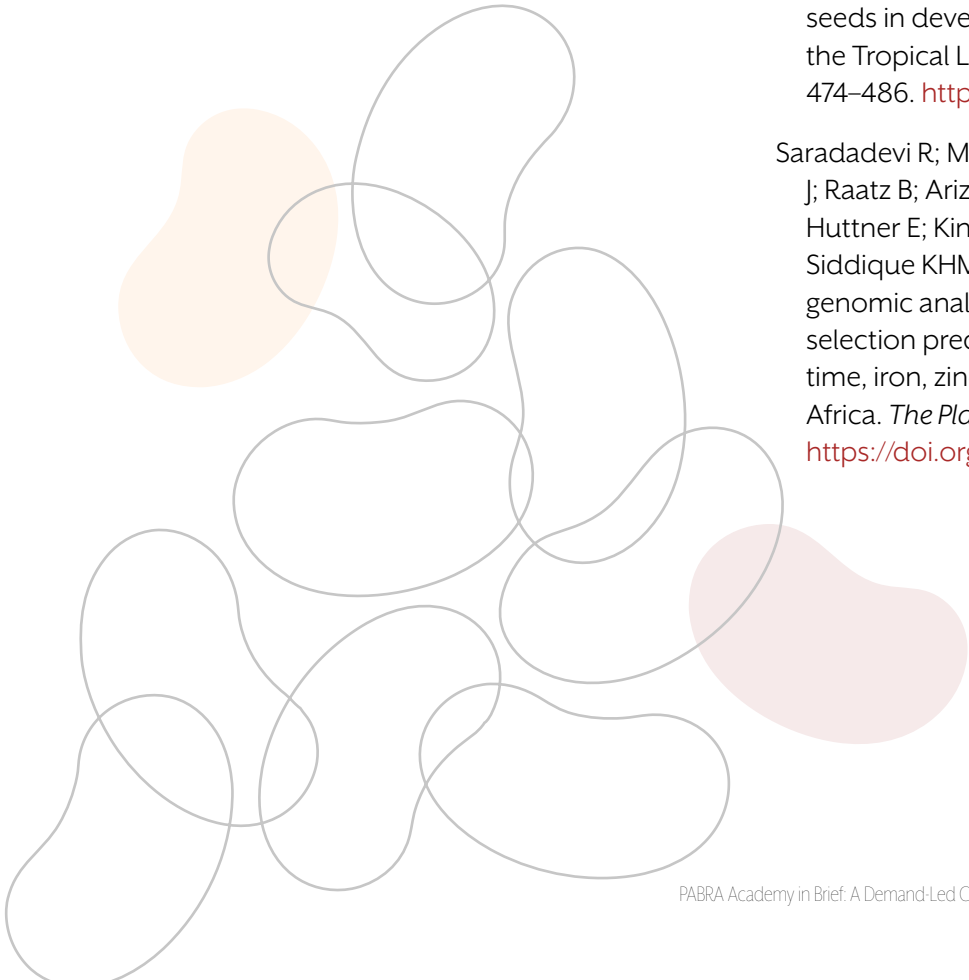
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