

**EAST AND CENTRAL AFRICA BEAN RESEARCH NETWORK
(ECABREN) PRIORITY SETTING MISSION**

*Outcomes of ECABREN Stakeholders Workshop and Steering Committee
Meetings, May-July, 2003*

FINAL REPORT

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Abbreviations and Acronyms

AHI	African Highlands Initiative
ASARECA	Association for Strengthening Agricultural Research in East and Central Africa
BAPPA	Beyond Agricultural Production to Poverty Alleviation
BARNESA	Banana Research Network in Eastern and Southern Africa
BILFA	Bean Improvement for Low Fertility Soils in Africa
CCF	Consolidated Conceptual Framework (of ASARECA)
CD	Committee of Directors (of ASARECA)
CIAT	Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture)
CIDA	Canadian International Development Agency
CIG	Common Interest Group
CORAF/WECARD	West and Central African Council for Agricultural Research and Development
CORNET	Coffee Research Network
CRS	Catholic Relief Services
DRC	Democratic Republic of Congo
EABRN	Eastern Africa Bean Research Network
EARRNET	Eastern Africa Root Crops Research Network
ECABREN	Eastern and Central Africa Bean Research Network
ECAPAPA	Eastern and Central Africa Program for Agricultural Policy Analysis
ECAMAW	Eastern and Central Africa Maize and Wheat Research Network
FAO	Food and Agriculture Organization
FANR	Food, Agriculture and Natural Resources Secretariat of the SADC (formerly SACCAR)
FARA	Forum for Agricultural Research in Africa
FRG	Farmer Research Group
HIV/AIDS	Human Immuno-deficiency Virus/ Acquired Immuno-Deficiency Syndrome
IDM	Integrated Disease Management
INM	Integrated Nutrient Management
IPM	Integrated Pest Management
ISAR	Institut des Sciences Agronomiques du Rwanda
NARES	National Agricultural Research and Extension Systems
NARI	National Agricultural Research Institute
NARS	National Agricultural Research System
NEPAD	New Partnership for African Development

NGO	Non-Governmental Organization
NPT	National Performance Trials
NRM	Natural Resource Management
PPB	Participatory Plant Breeding
PABRA	Pan African Bean Research Alliance
PRAPACE	Programme Régional d'Amélioration de la Pomme de Terre et de la Patate Douce en Afrique Centrale et de l'Est
PRIAM	Participatory Research for Improved Agroecosystem Management
PS	Priority Setting
PSC	Priority Setting Committee
R4D	Research for Development
RAIN	Regional Agricultural Information Network
REDSO	Regional Economic Development Support Office
RESAPAC	Réseau pour l'Amélioration du Haricot dans la Région de l'Afrique Centrale
SABRN	Southern Africa Bean Research Network
SADC	Southern Africa Development Community
SDC	Swiss Agency for Development and Cooperation
SRO	Sub-regional Organization
TSBF	Tropical Soil Biology and Fertility
USAID	United States Agency for International Development
USD	United States Dollar

PREFACE

This document is the final report of the Eastern and Central Africa Bean Research Network on *Priority Setting Workshop*, held at the Hotel Intercontinental Nairobi, Kenya during 13-17 July 2003. This workshop gathered 36 stakeholders representing diverse categories involved in bean production to consumption continuum.

The priority setting process was initiated by ASARECA for networks to operate under ASARECA Consolidated Conceptual Framework (CCF) and to set priority on the current R&D interventions and identify new research frontiers in bean systems of ASARECA member countries. This could not be possible without prior analysis of bean sector, especially review of the research domain in ASARECA region and elsewhere in the world, the evaluation of the past research, and the constraints and opportunity analysis in the region. The diversity of expertise gathered helped in the identification and ranking of the themes/sub-themes based on criteria and sub-criteria agreed by ASARECA stakeholders in preparatory meetings. The reading of these pages is highly recommended as it offers to the reader the fundamental of priority setting and experience that should be gained in applying the principles used in this process to other agricultural programmes where prioritization of R&D activities is often discussed.

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EAST AND CENTRAL AFRICA BEAN RESEARCH NETWORK (ECABREN) PRIORITY SETTING MISSION, MAY-JULY 2003

EXECUTIVE SUMMARY

The ECABREN priority setting mission was conducted in 2003 by regional stakeholders to set priority on its R&D interventions and identify new research frontiers in bean systems of ASARECA member countries. The consecutive stakeholders' workshops and related processes came up with priority research agenda and detailed work plan and budget for the fiscal year of 2004 and for the period of 2003-2008.

ECABREN is one of the 19 networks of ASARECA, formed in 1995/96 from a merger of two sub-regional bean networks, namely EABRN and RESAPAC, in response to the request of the ASARECA Committee of Directors, to improve consistence, focus and collaborative efforts on bean crop research. Its mission is "to contribute to increased economic growth and improved livelihoods in the East and Central Africa while enhancing the quality of the environment.". The purpose aims at fostering an enhanced sustainable productivity, value added and competitiveness of the regional **bean** system.. The network has integrated different activities in four main results, which include: (1) Demand driven **bean** technologies/innovations generated and promoted.; (2) Enabling regional and national policy options for transformation of **bean** systems facilitated; and (3) Regional and national capacity for IAR4D in **bean** systems strengthened; (4) Availability of information on **bean** research and development enhanced.

To overcome the prevalent bean production constraints, ECABREN projects targeted three major research areas in 9 ASARECA countries:

- (a) Strategic Research to alleviate the effect of major biotic and abiotic constraints on beans.
- (b) Understanding socio-economic and policy constraints which impede a sustainable bean production. An array of complex characteristics could determine farmers' acceptance of new bean varieties.
- (c) The training of National Bean Research Program staff.

Over the last two and half decades, ECABREN activities covered various aspects of bean systems research namely, bean varietal development, seed systems, development of improved agronomic practices, development of strategies to enhance tolerance and /or resistance to biotic and abiotic stresses and promotion of integrated systems approach.

Achievements from bean germplasm improvement programme:

- Since 1985, member countries have released more than 90 bean cultivars.
- More than 30 new bush and climbing bean cultivars have been released across the region.
- Over 10,000 segregating populations, advanced lines, populations and sources of resistance have been distributed from the regional program to ECABREN countries in the past 27 years.

- A new participatory breeding scheme, participatory plant breeding (PPB), incorporating the existing formal breeding scheme was developed and is in operation in most countries.
- Advanced generations lines are being evaluated with farmers in nearly all countries following PPB methodologies.
- New regional breeding nurseries for red mottled, navy, climbing beans have been constituted and distributed to several collaborators.
- Over 500 segregating populations and lines of five major market classes were created and formed BILFA IV and V nurseries to be promoted in regions with low soil fertility status.
- Promising selection and evaluation of germplasm with high level of tolerance to low soil Phosphorus, Nitrogen and Aluminium / Mangan toxicities have been made at BILFA sites at Kakamega (Kenya), Mulungu (DRC), Selian (Tanzania) and Rubona (Rwanda). These lines were tested on-farm initially in the four countries and later in 6 others and several lines resistant to low soil P, N and low soil pH complex have been identified. Lines like UBR (92) 25 has been released in Uganda and several others in Tanzania, Sudan, DR Congo, Madagascar, Rwanda and Malawi.
- Bean cultivars descriptors and other promotional materials were developed in all nine programs

Achievements from disease and pests control research:

- A breakthrough was made in identifying bean lines resistant to bean stem maggot. Two Bean stem maggot resistant lines, *Beshbesh* and *Melkie* were released in Ethiopia (ECABREN, 2002, PABRA, 2002) and exchanged to participating countries facing the same threat.
- As angular leaf spot (ALS) is commonly affecting beans in Africa and Latin America, potential sources of resistance were identified (e.g. A 285, A 240 and A 152).
- Bean fly was noted as the most important constraint, and sources of improved resistance were identified in both Africa and South East Asia and later on crossed with dominant African cultivars.
- Accurate, faster and low-cost techniques for characterization of pathogens and identification of resistant beans were established and training of scientists and graduate students is in progress.
- Genetic sources of resistance have been identified against several pathogens, even against Pythium root rots, to support resource- poor farmers to better manage bean diseases.
- Progress is being made in breeding for multiple disease resistance of popular bean types.
- There is an on-going process for refining an integrated management technology through improved understanding of pathogen biology and of farmers' indigenous knowledge.
- There is better understanding of pathogen diversity and distribution, using virulence and new molecular markers. A pathogen group causing angular leaf spot, unique to Africa, was recognized with implications for breeding.
- It was also found that management of bean diseases is best done through integration of genetic, crop management and biological components.

Achievements from agronomic interventions:

- Several bean lines resistant to low soil N, P and to low soil pH complex have been identified.
- The use of cover crops, green manures and multipurpose trees for soil fertility improvement tested and promoted.
- Application of organic residues originating from green manures, leguminous trees, manure, house hold refusal and crop residue for soil fertility improvement improved soil water holding capacity, thereby minimize occasional drought effects, by increasing water infiltration and decreasing run-off.
- Technologies for improving bean intercropping (population, planting dates, competition for resources) in various systems of maize, banana, and root crops developed.
- Various bean staking materials for climbing beans were identified and evaluated (e.g. Sesbania)

Achievements from bean systems R&D:

- The PRIAM project initiated by ECABREN in 1997 was successful in a) promoting community-based NRM agenda in eastern Africa in collaboration with partners b) facilitating institutionalization of PR approaches and c) refining and developing methods and approaches at different stages of PR processes.
- Multiple formal and informal capacity building and training events were organized for national researchers, farmers and traders.
- There is strengthened partnership among the NARIs, CIAT, ECABREN and NGOs created through exchange of materials, facilitating workshops, joint venture and seminars.
- There is a clear understanding of socio-economic issues affecting bean systems, e.g. farmer constraints, variety selection criteria, need for differentiated products etc.
- Different bean market classes to address different niches and systems were developed and disseminated.

New research frontiers in bean systems in ECABREN countries are:

- Developing drought resistance and disease tolerance bean varieties.
- Developing cropping techniques, particularly the promotion of sustainable, economic and socially acceptable agronomic practices for low inputs systems.
- Sustainable management and use of chemical and organic fertilizers, taking into account economic concerns.
- Development of small bean enterprises and creating market linkages.
- Developing decision guides for integration of technologies at various niches in bean systems
- Creation of more niches for bean/climber growers in various systems
- Modeling scenarios and predicting production trends.

The ASARECA networks, ECABREN included, will operate under the ASARECA Consolidated Conceptual Framework (CCF). Following ASARECAs' philosophy, ECABREN's research agenda will make the transition from focusing production constraints into thinking about interventions along various scenarios in the evolving market chain.

The new shift in paradigm may bring institutional changes and different funding arrangements. For example ECABREN will solicit funding directly from ASARECA through competitive grants as donors will put their money in ASARECA pots rather than supporting individual networks. Priorities will be given to research projects that may consider cross-cutting and more than one country issues targeting regional products. ECABREN will also reconsider the composition of steering committees to be more inclusive of all major stakeholders namely farmers, researchers, marketing experts, traders, policy makers etc...

Review of the Research Domain

The purpose of the review of the research domain was to contribute to the formulation of a coherent set of research priorities in the bean sub-sector based on a comprehensive understanding of the subject matter and their role in the economies of the ASARECA countries. The exercise also required a comprehensive understanding of production, management, marketing and processing constraints and the potential roles of different partners in the ASARECA countries.

Secondary data/information was obtained from: (a) earlier diagnostic work, (b) official statistical sources on socio-economic and biophysical variables, and (c) published descriptions of production and resource management systems.

Primary data/information was obtained from the National Bean Program Coordinators of the respective member countries. A detailed questionnaire was developed and used by national partners to complement the available data and provide a comprehensive regional data base on beans.

In few cases, there was data inconsistency, which made it difficult to interpret the information obtained from the various sources.

Identification of major cross-cutting constraints from ECABREN countries

Priority setting methodology

The priority setting process followed a 7-step procedure adopted during the ASARECA Technical Advisory Meeting of 17th March 2003. The seven steps were (1) Establishing a network committee for priority setting; (2) Review of the research domain; (3) Constraints analysis; (4) Evaluation of existing results; (5) Defining research themes; (6) Priority setting of research themes; (7) Recommendations for implementation. The Priority Setting Committee (PSC) was established in May 2003 consisting of the ECABREN Coordinator, a Technical Expert, and a Socio-economist. Training on the priority setting process was conducted by ASARECA at Entebbe during the week of May 4-9th 2003.

Final list of sub-themes

The final list of sub-themes after the priority setting was as follows:

1. Development and dissemination of varieties with multiple constraints' resistance for major bean market classes
2. Development and dissemination of varieties with drought resistance for major bean market classes

3. Development and dissemination of varieties with improved micro-nutrient levels in major bean market classes
4. Development and dissemination of appropriate climbing bean varieties for various agroecologies and farming systems
5. Development and dissemination of environmentally friendly integrated disease and pest management technology options
6. Development and dissemination of crop, soil and water management technology options.
7. Improving the availability, accessibility and quality of seeds through synergy between formal and informal seed systems
8. Facilitating development and promotion of enabling policies for bean production, marketing and consumption systems
9. Development and promotion of post harvest technologies (products, standards, grades, nutritional value)
10. Promoting the development of bean farmers' and traders' organizations to enhance their efficiency and competitiveness
11. Undertaking market studies to promote efficient input-output bean markets
12. Development, packaging and promotion of appropriate extension materials and information on bean production and commercialization
13. Strengthening partnerships, networking and linkages amongst stakeholders
14. Improving availability and accessibility to information on bean research and development (e.g. early warning information)
15. Strengthening stakeholders' capacity for beans research and development.

Final selection

The participants in the Stakeholders' Workshop agreed to use a combination of the selection options mentioned above. It was decided to (a) consider the last four sub-themes (No. 12-15) as cross-cutting capacity building issues to be integrated into all other sub-themes; and (b) to take the first 8 of the 15 sub-themes as High Priority while the next three become Medium Priority. The last four are Low priority, but as mentioned they are also capacity building issues that cannot be ignored. A fourth variant is to begin from the results of the third option and categorize the 11 sub-themes (excluding the 4 capacity building sub-themes) into High, Medium and Low priority sub-themes. The results are summarized in Table 1a.

Table 1a. Ranking sub-themes through scoring and grouping of major future research frontiers

Sub-theme	Score	3rd Option Priority	4th Option Priority
Crop, soil and water management options.	3.93	High	High
Appropriate climbing bean varieties.	3.90	High	High
IDM and IPM options.	3.73	High	High
Varieties with drought resistance.	3.66	High	High
Varieties with multiple constraints' resistance.	3.58	High	Medium

Availability and accessibility of quality seed.	3.45	High	Medium
Extension materials and information.	3.34	High	Medium
Post harvest technologies.	3.20	High	Medium
Farmers' and traders' organizations.	3.05	Medium	Low
Market studies.	2.97	Medium	Low
Varieties with improved micronutrient levels.	2.94	Medium	Low
Partnerships, networking and linkages.	2.88	Low, Cross-cutting capacity building	
Enabling policies.	2.43	Low, Cross-cutting capacity building	
Strengthening stakeholders' capacity.	2.24	Low, Cross-cutting capacity building	
Availability and accessibility to information.	1.84	Low, Cross-cutting capacity building.	

Policy and institutional constraints

The two overriding policy/institutional constraints identified by the stakeholders were:

- Inadequate institutional capacity to address the needs of the bean sector across the region.
- Non-conducive policy environment for bean production and commercialization.

Policy Recommendations and Conclusions

Policy recommendations:

The following policy-related recommendations were suggested to foster the efficiency of ECABREN:

- (1) ECABREN should continue to develop bean varieties to address the various biotic and abiotic constraints, particularly low soil fertility and pest and disease resistance following the already identified market classes and regionality considerations.
- (2) Significantly more attention should be given to the promotion of well-proven market-led technologies for wider impact. An example in this regard is the climbing bean varieties. In this context, the development of appropriate extension materials is necessary.
- (3) Considerably more work is also required in the promotion and production of alternative bean-based products that would facilitate an increased consumption of beans. Therefore, more resources in ECABREN need to be devoted to the participation of socio-economists and food technologists in bean research, preferably in multi-disciplinary team approaches.
- (4) ECABREN should contribute to the development of policies that support small-scale seed systems, especially to promote synergies between the formal and informal seed systems. In addition to sponsoring relevant studies in this regard, another approach to achieving this goal is by facilitating regular interaction between small-scale seed producers, large-scale seed producers, the regulatory authorities, extension services, and development agencies (NGOs, donors, etc) to

create the necessary awareness about the plight of small-scale seed producers and their potential role in assisting farmers to access improved seeds.

- (5) Likewise, ECABREN in collaboration with ECAPAPA, other networks and other stakeholders should continue to explore policy issues on the affordability of production inputs, infrastructure and transport systems. With regard to rural access roads, interaction with the relevant road authorities and donors already involved in the sector should focus on continued support to community-based road maintenance approaches.
- (6) In terms of priorities of funding network activities, the high priorities identified are as summarized in **Table 1a**. The project proposals developed from these sub-themes are presented in a different report.
- (7) The human resource involved in the national bean research programs is of differing qualities and capacities. ECABREN should continue supporting the training of researchers to enhance their capacities, particularly the training of socio-economists and if possible support their deployment in national bean research programmes in countries most badly affected by lack of socio-economists in the programmes.
- (8) At the farmer level, the most constraining factor is lack of organization. ECABREN has an important role to play in supporting the evolution of farmers' organizations that could play multiple roles such as (a) participation in technology development and dissemination; (b) marketing; (c) advocacy and democratization. A starting point is the establishment of Bean Common Interest Groups (Bean CIGs). This role would best be undertaken in collaboration with the national extension systems.
- (9) The network should continue to involve a variety of stakeholders in its activities. More effort is needed in attracting the participation of processors, transporters, input stockist, etc. on a regular basis.
- (10) From an observation of the amount of work involved in the priority setting process, it is clear that the coordination effort should not be underestimated. This role will become more complex as more diverse stakeholders are included and the need for speedier communication becomes felt. For this purpose the network coordinator needs additional human resource capacity. It is considered important to specify that the support of an assistant with M.Sc. (Socio-economics) would be most suitable, given that the coordinator is a bio-scientist.

Conclusions:

The following are the key conclusions from the Priority Setting Process:

- (1) The bean commodity value chain is beset by a plethora of constraints at each stage of the chain. ECABREN has already achieved significant results by following a market-driven approach in its research agenda. A lot of research has gone into beans in the region and particularly in terms of variety development of appropriate market classes. On the other hand, considerably less work has gone into promotion and production of alternative bean-based products that would facilitate an increased consumption of beans.
- (2) The fact that there are many constraints at each stage of the value chain means also that there is a risk that if priority identification has a narrow focus, there could be some aspects of the various stages of the value chain that are overlooked, with potential setbacks to the bean industry. A more balanced approach that would look at each stage of the value chain is therefore advocated.

- (3) In the case of breeding, it is possible to view the work undertaken so far as being “substantial” and therefore focusing further investments in activities beyond variety development in the market chain may add value. Unfortunately this approach has a fundamental flaw, the implicit assumption that once bred, bean varieties are absolutely stable over time. This is far from the case since new strains of disease pathogens and new pests are appearing all the time and varietal resistance breaks down all the time. Hence varietal development is a continuous activity. This also makes prioritization that much more difficult.
- (4) The process of PS was facilitated by the availability of some basic information from ECABREN. However, additional information was sought from the National Bean Program Coordinators. The information they provided was very useful in profiling the current status of the bean sector in ECABREN countries. Nevertheless there are still some serious data gaps in the bean sector in most countries. There is a clear need to regularly update the national data on the bean industry. Funding for the activity of data compilation and report writing will be needed.
- (5) There were difficulties in getting a wider cross-section of stakeholders to participate in the priority-setting process. Some of those invited did not manage to come to the stakeholders’ workshop. It is clear that one reason why many did not come was the relatively short notice they were given. At any rate, the catchment of stakeholders was also narrow. In future, it will be necessary to allocate more time for the exercise to allow the “recruitment” of more contacts and broader stakeholder categories. The result of having a stakeholder representation heavily skewed in favor of scientists is that the priorities selected also reflected this disciplinary bias. Thus it is critically important to involve a wider cross-section of stakeholders in the priority setting process to ensure that the production through consumption value chain is adequately represented.
- (6) The priority setting process identified but implementation strategies should be developed to enhance integration across sub-themes, institutions and countries.
- (7) There was considerable correspondence between the initial identification of sub-themes by the PS team and the list that was developed by the Stakeholders Workshop.

Review of Priority Setting Outcomes by Stakeholders at the Regional Steering Committee Planning Meeting in April 2004

The ECABREN stakeholders attending steering committee planning meeting reviewed the outcomes of 2003 Priority Setting workshop and agreed by consensus of need to identify new research products so that integrated prioritized research themes/sub-themes could achieve food security and nutrition and incomes in the region. Based on their importance to contributing to the livelihoods of people in the region, four products were identified and ranked as follows:

- beans for food and health,
- navy or canning beans for domestic and export markets

- snap bean for domestic, regional and international markets, and
- large white & sugar beans for domestic, regional and international markets.

Aspects of the previously 11 prioritized research projects could then be integrated in the four new research products. The brainstorming from formed working groups led to the identification of projects' objectives, outputs, indicators and research activities to producing each research product that all stakeholders recommended as basis for ECABREN new research agenda for the future.

The following are the projects and their outputs as formulated by the stakeholders:

Project 1: Enhancing utilization of nutrient rich beans for improved nutrition and income

The project outputs identified are: (i) Five micronutrient rich climbing and bush bean varieties identified regionally; (ii) Three sustainable integrated nutrient, disease and pest management options that enhance micronutrient density in bean varieties characterized across agro ecological zones; (iii) Acceptable post-harvest and value adding packages developed and validated; and (iv) Micronutrient dense bean varieties and improved agronomic practices disseminated and promoted.

Project 2. Improving competitiveness of navy beans for domestic and export markets

Project outputs identified include: (i) Domestic and export market for navy bean identified and characterised, and linkage among market actors improved; (ii) Appropriate navy bean populations developed and adapted varieties identified; (iii) Integrated disease, pest, soil nutrient and water management options for navy beans are developed, tested and adapted; (iv) Post-harvest value addition technologies for navy beans are tested and adapted; and (v) Pre-and post-harvest technologies are promoted and disseminated.

Project 3: Improving competitiveness of snap beans for domestic and export markets

Outputs identified are: (i) Potential snap bean regional and international markets characterized and opportunities identified; (ii) Snap bean varieties that meet domestic and export markets identified and adapted; (iii) Improved production options for export snap beans developed; (iv) Improved post harvest management options for snap beans developed; (v) Producers, traders and other strategic partners organized/facilitated in dissemination and promotion of technologies to ensure growth in volume and quality of snap bean export.

Project 4. Development and dissemination of dry large white & sugar beans for domestic, regional and international markets

Outputs identified include: (i) Potential large white & sugar bean domestic, regional and international markets identified and characterized; and opportunities identified and disseminated to end-users; (ii) Large white and sugar bean varieties that meet domestic, regional and export markets developed; (iii) Improved production options

for large white & sugar bean varieties for export developed; (iv) Improved post harvest options for large white & sugar bean varieties developed and promoted; (v) Producers, traders, processors, and other strategic partners organized/facilitated to disseminate & promote new technologies to ensure growth in volume and quality of large white & sugar beans export.