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CIAT SUPPORT FOR NATIONAL RESEARCH STRATEGIES IN AFRICA THAT ADDRESS BEAN TECHNOLOGY NEEDS OF SMALL FARMERS [1]

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Introduction

Small farmers the world over typically differ from large commercial producers in their needs for technology, for both environmental and socioeconomic reasons. The bean research literature from Africa now abounds in examples of decisions of resource-poor farmers that have been influenced by need to manage production on poor soils (Wortmann and Allen, 1994) or under high incidence of diseases, insects, or weeds (e.g. Georgis, 1990) with minimal use of external inputs, to reduce risks of total crop failure by compromising on potential yields (e.g. Kisakye et al, 1987), and to satisfy multiple objectives that may include traditional diets and market preferences (Voss, 1992).

A high-input, high-yield approach to technology development is much less likely to be successful in achieving impact with small-scale farmers than with commercial producers in the same country. The appropriate research strategy may vary according to national technical or political objectives but, if it is to be realistic, should be designed with a local focus.

Strategic planning

Each national bean research programme needs to develop a set of research strategies based on an understanding of farmers' needs and their diversity. Certainly most of the larger bean programmes in Africa, and each of the regional networks, have done this (Table 1). Their strategic plans generally have been revised after an interval of about four years, and are available as published network documents.

The planning methods used in these national and regional exercises were proposed in most cases by CIAT, based on the techniques of participatory planning by objectives introduced by the Swiss Development Cooperation, our first donor in Africa. Some refinements have been introduced with experience. The method has proven particularly useful in planning interdisciplinary interventions which are to be carried out by several actors or teams, and its application to bean research is described by Scheidegger and Buruchara (1993). The principles employed are:

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* participation by a broadly based group of institutions and disciplines;
* democratic discussion, where all ideas are considered important, often with an independent moderator;
* consensus through discussion and reformulation;
* continuous visualisation through use of cards posted on a board, rather than verbally.

Over the course of an intensive one-week workshop, this group lists and checks all problems related to the subject; ranks the problems and organises them into cause-effect chains and thence into a problem tree; converts the problem tree into a set of priority objectives; devises and ranks potential strategies that respond to the objectives; and quantifies resources needed and attributes responsibilities for implementation.

A factor limiting the effectiveness of some early planning workshops was a lack of participants' detailed understanding of farmers' real problems. Workshops in Ethiopia and Kenya were therefore preceded by commissioned diagnostic surveys in distant production zones; in Uganda an adequate start was achieved by inviting a farming system report from each production zone. In several instances CIAT assisted in diagnostic surveys and trials, in assessments of suitability of existing technology, as well as in methods for setting priorities.

Also, as some national agricultural research systems (NARS) still overlook potential partnership with development agencies, a careful review of planning participants usually pays off. The most successful workshops have been those that included senior (but not necessarily all) researchers representing a wide range of relevant disciplines drawn from several institutions, extension subject matter specialists and field staff of non-governmental organisations in bean-growing areas, traders, and so on. In Ethiopia it was important to include exporters of navy beans; data on informal cross-border trade in beans would be useful in Tanzania.

Agreement on zoning for better adaptive research is important. Ethiopian participants recognised four zones (Girma and Kirkby, 1990), and since then have progressed a good way towards decentralising variety selection as human resources permitted this. Kenya (Wabule et al, 1991) has at least five bean research zones; resources permit active research in four of these, with almost completely decentralisation. Tanzania has long defined three zones by elevation, with separate institutional responsibilities for serving them (Mushi and Youngquist, 1992). Uganda distinguished three important zones by rainfall/vegetation criteria (Grisley, 1991) and now addresses their distinct needs from a central programme and satellite testing sites, making good use of NGO collaborators in the zones.

Table 1. STRATEGIC PLANNING WORKSHOPS SUPPORTED BY REGIONAL BEAN NETWORKS

	1989	1990	1991	1992	1993	1994	1995
Great Lakes	Regional multidisc.		Breeding	Regional multidisc.			
Eastern Africa		Ethiopia	Kenya Uganda	Soil fertility		Uganda Breeding	Ethiopia Regional multidisc.
Southern Africa			Regional multidisc.	Malawi Tanzania		Breeding	
Pan-African	Insect pests	Viral diseases Soil fertility/ cropping systems		Drought Fungal diseases	Insect pests	Bacterial/viral diseases Improvement for low fertilty soils Seed dissemination	Fungal diseases

In recent years some emphasis in most programmes has shifted from breeding for disease resistance to a more balanced attention to integrated pest/disease management including use of resistant varieties, selection for specific soil constraints and research on soil amendments, and strategies for improving the availability of seed of new varieties. The last objective is increasingly being implemented in association with NGOs. These changes can be attributed, at least in part, to these planning workshops. Meanwhile, countries that started strategic planning several years ago, such as Ethiopia, are now embarking on revisions of their plans; as an iterative process, it is to be expected that the next round may be more sophisticated in its use of zonal data and farmer feedback. In several cases bean research plans have been used as models for the development of NARS-wide programme planning that is increasingly required by government and external donors.

Kenya, Tanzania and Uganda have made use of national strategic plans for guiding the design of annual bean research plans and/or for monitoring implementation by collaborating institutions. While this aspect appears to have been particularly helpful to national research coordinators in large or decentralised programmes, the use of a strategic plan for justifying individual research projects should have considerable utility for smaller programmes; under conditions of restricted funding and staffing, the forging of a coalition among institutional partners becomes even more important to achieve real benefits for the clients of research. Most programmes have had some exposure to strategic planning methods through involvement in the regional network -- participatory methods have also been used extensively by some of the pan African specialist working groups (Table 1). CIAT would like to encourage the development of strategic plans in all countries that have not yet attempted to do this, and we suggest that the Steering Committee review the demand and assess the capacity of the network to assist the process.

Research in support of regional networks

Now that all three African regional bean networks are graduating to regional or national leadership following nearly ten years of intensive training, CIAT's role in them is shifting further towards provision of technical support, while continuing to catalyze pan-African interaction among bean networks. Support to the development of new varieties by national programmes includes the generation of a wider genetic base for selection, leading to the provision of segregating populations and nurseries, the contribution of entries in regional trials, and the making of custom crosses. Several regional staff focus on identifying and incorporating resistance or tolerance to selected insect, disease and edaphic problems, and combining them with sources of high yield potential.

Principal research themes currently being undertaken by CIAT in support of regional bean networks in Africa are the following:

1. Continuing assessment of priorities for bean research

* Catalyzing setting of priorities at regional and pan-African levels

* Mapping agro-ecological zones (e.g. Wortmann and Allen, 1994)

2. Bean germplasm improvement for Africa

* Characterization of pathogenic variation of angular leaf spot and anthracnose in Africa

* Development of populations resistance to angular leafspot, bean common mosaic virus, root rots and bean stem maggot (problems that can be inadequately addressed in Colombia)

* Bean Improvement under Low Fertility in Africa (BILFA)

* Distribution and analysis of pan-Africa resistance nurseries

* Screening World "Core Collection" in Africa

3. Participatory research on integrated crop/soil fertility management (methodology and pilot studies)

* Management of root rots through soil amendments

* Integrated management of bean stem maggot

* Farmer-participatory methods for crop/soil fertility management

* Improving cost-effectiveness in use of local and imported fertilizer (e.g. Wortmann et al, 1992)

* Low-cost on-farm methods for variety testing (e.g. Sperling et al, 1993)

4. Achieving adoption and measuring impact

* Study of effectiveness of non-formal seed channels, and farmer seed-producer groups, for variety multiplication and dissemination.

* Adoption and impact surveys (e.g. Sperling et al, 1994)

CIAT's staffing profile -- interdisciplinary, with bases in three national programmes in Eastern and Southern Africa -- aims to maintain a close working relationship with a good number of NARS, and to encourage and complement human resources and research sub-projects within the networks.

Recent published output from some CIAT supporting research is indicated against research themes shown above. Other outputs include the following:

* Development of low-cost seed storage, obviating need for a cold room at every station (Fischler, 1993)

* Publication of an annotated list of bean diseases, to facilitate logical decisions on quarantine clearance (Allen, 1995)

* A compendium of research methods for bean stem maggot (Ampofo, 1991)

* Identification of research sites where bean varieties perform in a similar manner (Smithson and Grisley, 1992)

* Implications of farmer management of varietal mixtures for research strategy (Voss, 1992)

* Demonstration of effectiveness of incorporating farmer bean experts into the research programme (Sperling et al, 1993)

* Bean morphological characters that could be used in selecting for ability to suppress weeds (Wortmann, 1993)

Regional collaboration

CIAT welcomes the advent of self-managing regional bean networks in the SADC and Great Lakes (RESAPAC) regions. At the same time we all lament the continuing lack of financial support in SADC for collaborative research sub-projects; CIAT's publication of the magnitude of bean crop losses by country, ecological zones and constraints in Africa may assist in justifying new sources of financial support (Wortmann and Allen, 1994). However, the reality may be that networks generally will need increasingly to survive on the shared resources of their members -- financial resources as well as those of skilled personnel.

In that sense, the SADC Bean Network may become once more a forerunner of the future, placed in the position of developing new, workable modes of operation. The regional research sub-project mechanism should become even more the centre of the Network if the objective is to seek efficient use of scarce resources through pooling of problems and sharing of responsibilities. Sub-projects should not require external

funding, although of course collaboration is nicely lubricated when some additional funds are present.

Much more advantage might also be taken of opportunities for direct bilateral collaboration between research groups in neighbouring countries which share agro-ecological conditions. Central Malawi and eastern Zambia, and the northern parts of both countries with southern Highlands of Tanzania, might form natural research complexes that economise on everyone's expenses. The Steering Committee might wish to consider ways in which SACCAR's network communications funds could be employed to catalyze these and similar interactions.

Pan-African collaboration

Collaboration among regional bean networks has been focussed on technical planning and information exchange: pan-African specialist working groups (Table 1) and three publications series. Working groups generally meet about once in three years to review research advances and priorities for Africa, and are advisory to regional steering committees in areas where no individual committee is likely to have extensive expertise.

In future, inter-regional collaboration is likely to become more important as greater efficiency is sought through shared research and more specialised needs for training and information exchange. The other two networks, EABRN and RESAPAC, are in the process of merging to save on administrative costs and capitalise on research opportunities, although they plan to maintain internal working groups to address common problems of the existing sub-regions.

Members of the SADC Network may wish to know of the following activities planned by EABRN and RESAPAC, and to which SADC is invited to participate at its own cost:

* Use of Crop Growth Models: Egerton, January 1996
* Survey Data Analysis: Egerton, 12-23 February 1996
* Bean Market Opportunities: Arusha, 1996
* Scientific Writing Retreat, Egerton, 17 Feb-2 March 1996

Until now, collaboration among regional bean networks has been mediated by CIAT, often in response to an initiative from one of the networks. This role is likely to continue, but CIAT proposes to strengthen the links by forming a pan-African steering committee that would more directly represent the regional networks in identifying opportunities for common activities or sharing of information. Separate funding is being sought for pan-African activities.

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