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**Semi-Arid Food Grain Research And Development
Recherche et Développement des Cultures Vivrières dans les Zones Semi-Arides**

REPORT ON THE IMPACT ASSESSMENT OF SAFGRAD NETWORKS:

LEVEL I. INSTITUTIONAL ANALYSIS

EXECUTIVE SUMMARY*

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REPORT ON THE IMPACT ASSESSMENT OF SAFGRAD NETWORKS:

LEVEL - I - ANALYSIS OF INSTITUTIONAL BASE

EXECUTIVE SUMMARY

The first phase of SAFGRAD generated technologies targetted to improve the production and productivity of major staple food crops (i.e sorghum, maize, millet, cowpea and groundnut) and the development of sustainable farming systems. The USAID funded component of SAFGRAD II evolved into networking based on the above mentioned crop commodities. The assessment of impact was carried out at four levels of research and development activities. The first level, the focus of this paper, dealt with the analysis of the changes for building the institutional base of the agricultural research capacity in the eight-case-study countries namely Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, Mali, Niger and Nigeria during the period 1982-1991.

The three implementing entities and partners of SAFGRAD project have been the International Institute of Tropical Agriculture for the improvement of maize and cowpea; the International Crop Research Institute for Semi-Arid Tropics for the improvement of sorghum and millet, and the Organization of African Unity, Scientific, Technical and Research Commission (through its Coordination Office) that effectively linked regional and national research efforts in 26 member countries.

The analysis of data collected revealed that these countries vary in their research policy, planning and organization. Some NARS have established a "Council" comprised of various development, planning and finance ministries as in Burkina Faso. National research institutions in other countries operate under the "Board of Governors or Directors" as in Ethiopia, Kenya and Niger. Further variation, of policy and research management structure is the "Supervisory Committee" which membership comprised of various technical ministries or senior researchers and policy makers as in Mali, Ghana and Cameroon.

At regional level, policy guidance, planning, identification of research priorities, development and implementation of network programmes is provided by the institutions established by National Agricultural Research Systems. These include: The Council of Agricultural Research Directors, the Oversight Committee (Management Unit of SAFGRAD), and the Steering Committee (Technical Management Units) of the respective networks. The Council of NARS provided policy guidance and facilitated institutional cooperation for network development. The Oversight Committee served as "Board of Management: to manage SAFGRAD project including internal appraisal of networks.

The Steering Committee of 6 to 8 full time researchers provided technical management for the respective networks. The research systems in NARS such as Kenya, Ethiopia are well structured and coordinated with clearly defined objectives and programmes. On the other hand, in countries like Ghana, Nigeria, Niger and Cameroon, the organization of research is administratively diffused and as a result research policy direction and planning are not adequately coordinated. With the exception of Mali and Niger agricultural research and extension organizations in the countries studied are under two or more separate ministries and this has contributed to the existence of poor linkages between these two essential units of agricultural development. The monitoring and evaluation systems of research are not fully developed in NARS such as Ethiopia, Niger, Mali, and Nigeria.

There has been a significant agricultural research capacity building during the last two decades. According to ISNAR data (1980/85), 43 sub-Saharan NARS had a total of 4,870 researchers. Almost 12 years later, the eight case-study countries, alone have close to 3900 researchers. During the last decade (1982-91), the number of researchers have tripled in Burkina Faso, Ethiopia and Ghana. In Niger and Kenya, the number of researchers has almost doubled. Also, there has been sustained improvement in the quality of research staff in the countries studied. Although a

large number of the researchers have limited experience, about 25 and 40% of the researchers have Ph.D and M.Sc level training, (for example, in Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya and Nigeria).

About 105, 87, 83 and 75 scientists are currently involved in maize research in the 17 countries of West and Central Africa, 8 countries in sorghum and millet improvement in Eastern Africa, 17 countries in sorghum as well as cowpea improvement in West and Central Africa, respectively. In all cases, most of the qualified researchers are based at the lead NARS centres. For example, about 25, 50 and 60 % scientists working on the improvement of sorghum, maize and cowpea, respectively in West and Central Africa, as well as 35 % of researchers working on the improvement of sorghum and millets in Eastern Africa are based at the respective lead NARS centres. By pooling together research talents through networks, NARS have been able to attain the "critical research mass effect" at regional level, which has influenced agricultural development at the national level.

The SAFGRAD contribution has largely been in enhancing professional development and the improvement of research skills. This was attained through long-term training, of which more than 30 scientists were trained at M.SC and Ph.D level. Currently, some of them are research leaders in their respective countries. Short-term training in various aspect of crop improvement, production and farming systems was provided to about 400 NARS researchers and technicians in more than 22 countries. Another vital activity of networks, has been scientific monitoring tours to different NARS and occasionally to IITA and ICRISAT programmes. The scientific tours organized involved 65 and 100 participants during SAFGRAD I and II, respectively.

Network activities such as short and long-term monitoring tours and special and general conferences have contributed to the improvement of research skills. During SAFGRAD I, training was provided to 8 and 22 people from member countries at Ph.D and M.

Sc levels, respectively. Short-term training were offered to 250 and 140 participants during SAFGRAD I and SAFGRAD II, respectively. In Cameroon, an extension-agronomist trained at the M.Sc level through SAFGRAD is currently playing an active role in the promotion and adoption of technologies. A number of technicians were trained in sorghum protection, and seed production in Ethiopia and Kenya. In Mali, two sorghum breeders and agronomists were trained at M.Sc. level while more than 10 technicians were trained to assist in the evaluation of sorghum varieties and agronomic practices at on-farm level. Through the IITA/SAFGRAD and ACPO programme, more than 15 technicians were trained in cowpea improvement and production. The major SAFGRAD support to strengthen maize research has been in the training of more than 20 technicians in field plot techniques, and variety maintenance. In addition, in Mali, the project provided training for a maize agronomist at M.Sc. level and placed an expatriate agronomist in Mali for the promotion of on-farm adoption of maize technologies from 1979-1985.

While there was two to three fold increase in the number of NARS researchers with doubling or tripling of the number of technicians and substantial increase in non-technical personnel, expenditure per scientist has continuously declined. A large proportion of the national research budgets contributed by the national governments were used to cover salaries. External funding support to national research was quite high in Burkina Faso, Mali, Niger (over 75 % of the total budget) but, relatively lower in Ethiopia and Ghana. In general there was significant decline in the operating funds made available to researchers during the past ten years.

The biennial workshops, seminars, general conferences, biennial conference of National Agricultural Directors and the Network steering committees organized by the Project, allowed more than 2500 researchers and technicians not only the exchange technical information, sharing of experiences, review of agricultural research policy issues and technical programmes, but

also to gradually improve professional partnership among NARS and between IARCs and NARS researchers. As an example, the biennial workshops enabled researchers from various countries to review results of the previous seasons and to plan collaborative research projects for the subsequent season. During the workshops technical papers were presented and views exchanged on the performance of elite germplasm in the regional trials conducted at different ecological zones.

One of the major outputs of the network activities was technical publications. About 500 publications including annual reports were generated through the Project. About 52% and 48% of the publication were in the generation and transfer of technology respectively

The technical research performance of Lead NARS centres showed that the mechanism optimized the research strength and comparative advantages of relatively strong NARS, the IARCs technical backstopping with specific needs of Technology Adapting NARS. It showed substantial change in the Lead NARS capability for generation of technology.

The six Lead NARS of West and Central Africa Maize Network have developed 10 early drought tolerant varieties, 15 extra-early maize varieties, as well as three improved agronomic practices (tied-ridging, seed treatment and fertilizer recommendations). Furthermore, through the maize network, 33 late and intermediate varieties, 24 early maturing varieties and 16 extra-early maturing varieties have been made available to NARS. In collaboration with IITA, the network has developed research facilities to enhance screening for streak resistance in Togo and Ghana NARS (Lead centers). These two Lead centers have a regional responsibility for the conversion of maize germplasm for streak resistance.

The six Lead NARS centers of the West and Central Africa Cowpea Network, have developed more than 10 striga resistant

cowpea cultivars, 6 drought resistant cultivars, and, in collaboration with IITA, 7 aphid resistant cultivars were developed. Furthermore, more than 76 cowpea cultivars with good adaptation to various ecological zones were made available to NARS through the network.

The five Lead NARS Centers of the West and Central African Sorghum Network has identified seven promising genotypes with resistance to striga. More than 206 early and medium maturing elite sorghum cultivars were evaluated of which 17% were incorporated into 18 national sorghum improvement programmes; about 13 cultivars are in farmers fields; about 8 cultivars in pre-release stage in 5 NARS; 20 cultivars are extensively used in breeding programme in 4 NARS; 2 cultivars have been utilized as solid food in 2 NARS and 1 cultivar has been used for preparation of drinks (brewery etc) in 3 NARS.

The five Lead NARS Centers of the Eastern Africa sorghum and millets network have identified 25 striga resistant sorghum genotypes, evaluated 25 and 16 elite sorghum cultivars in the dry lowland and intermediate zones of which two and four top yielding varieties were released respectively. Furthermore, among the 16 elite finger millet cultivars developed three varieties were released in the sub-region.

Finally, the partnership of the Organization of African Unity (through its Coordination Office) with the IARCs and donors such as USAID has enhanced the improvement of research capacity of NARS and developed African scientific leadership and confidence.

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