REPORT OF TECHNICAL ACTIVITIES (1990-1994)

AND

MEDIUM AND LONG-TERM ORIENTATIONS

OF

OAU/STRC - SAFGRAD

Prepared for the Ninth Ordinary Session of the OAU
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TABLE OF CONTENTS

LIST OF ABBREVIATIONS.

AAFRAD	African Agricultural Food Research and Development Agency.
AMU	Arab Maghreb Union.
CEEAC	Communauté Economique des Etats de l'Afrique Centrale.
CFA	Communauté Financière Africaine.
CILSS	Comité Inter états de Lutte contre la Sécheresse dans le Sahel.
CIMMYT	International Maize and Wheat Improvement Centre.
CORAF	Conférence des Responsables de la Recherche Agronomique Africains.
CRI	Crops Research Institute.
ECA	Economic Commission for Africa.
ECOWAS	Economic Community of West African States.
IARC	International Agricultural Research Centre.
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics.
IER	Institut d'Economie Rurale.
IGADD	Intergovernmental Authority on Drought and Desertification.
IITA	International Institute of Tropical Agriculture.
INCV	Institut National de Cultures Vivrières.
INERA	Institut National d'Etude et de Recherche Agricole.
INRAN	Institut National de Recherche Agronomique du Niger.
INSAH	Institut du Sahel.
ISRA	Institut Sénégalais de Recherche Agricole.
IRA	Institut de Recherche Agricole.
NARS	National Agricultural Research Systems.
NGO	Non-Governmental Organization.
OAU	Organization of African Unity.
SACCAR	South African Centre for Cooperation in Agricultural Research.
SADC	Southern African Development Community.
SAFGRAD	Semi-Arid Food Grain Research and Development.
SCO	SAFGRAD Coordination Office.
SPAAR	Special Programme for African Agricultural Research.
STRC	Scientific, Technical and Research Commission.
WARDA	West African Rice Development Association.

PART I

SAFGRAD TECHNICAL ACTIVITIES

(JUNE 1990 - MAY 1994)

1. Introduction.

Based in Ouagadougou, Burkina Faso, Semi-Arid Food Grain Research and Development (SAFGRAD) is a regional project of the Organization of African Unity's Scientific, Technical and Research Commission (OAU/STRC).

In response to the worsening droughts which hit the African Continent, SAFGRAD was created more than 15 years ago by OAU Heads of State and Government with the principal objective of improving the quality and quantity of the major food grains (sorghum, maize, millet and cowpeas) of the semi-arid region of Africa. It was also to develop appropriate farming systems which could build and maintain the resource base for productive agriculture in this zone.

2. Evolution of SAFGRAD

During the first ten years of existence, SAFGRAD worked in close collaboration with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) on sorghum and millet, and with the International Institute of Tropical Agriculture (IITA) on maize and cowpeas as well as with the national research programmes of its member countries. It was during this first phase (1997-1986) that crop varieties and technologies were developed to improve the productivity and economic conditions of resource-poor farmers.

The second phase of SAFGRAD (1987-1992), while still involved in technology developement and transfer, directed its main thrust towards enhancing the capacity of national programmes through networking. Six networks were established; one each on maize, cowpea and sorghum in West and Central Africa, one for sorghum and millet in East Africa and the others for farming systems research and agroforestry in West Africa.

3. Management of SAFGRAD

Notwithstanding its administrative relationship with STRC and the OAU General Secretariat, the need was felt to involve more African scientists in decision-making and to develop indigenous human capital (capacity building) to assume greater leadership in directing and managing agricultural research and network activities. This resulted in the creation of the Council of National Agricultural Research Directors of all the 26 SAFGRAD member countries. The Council met biennially to review SAFGRAD activities and provide policy guidance.

A seven-member Oversight Committee, directly responsible to the Council of National Directors, oversees the administrative, technical and financial affairs of SAFGRAD and evaluates the performance of the networks. The Committee comprises eminent scientists, research managers and members of agricultural faculties of African universities drawn from West, Central, East and Southern Africa. It meets at least once a year.

The activities of each research network are guided by a Steering Committee composed of 5-8 NARS scientists who are actively involved in research on the particular crop or commodity. It meets twice a year.

The day-to-day activities of SAFGRAD are carried out at the SAFGRAD Coordination Office (SCO) in Ouagadougou, Burkina Faso. The SCO serves as the secretariat for the Council of National Directors and the Oversight Committee. It provides the political and administrative leadership crucial for sustaining network and other relevant activities aimed at raising the socio-economic lot of the rural population. Through its OAU umbrella, the SCO facilitates the movement of scientists, germplasm and research supplies among member countries. It organizes meetings for the various committees and facilitates the arrangement of scientific monitoring tours, training courses, seminars, workshops, etc.

4. Crop Improvement and Technology Generation

The amount of time required to develop new agricultural technologies for release is generally about 10 years. The systematic identification of constraints affecting food grain production on a regional basis, has been the basis of prioritizing SAFGRAD network research programmes. After assessing the potential of the different NARS, lead centres were organized on the basis of comparative advantage to solve certain problems on behalf of each network. This exercise led each network to develop about 4-6 lead centres with responsibilities to develop sorghum, maize, millet and cowpea cultivars resistant to several biotic and abiotic constraints.

This has resulted in the screening and development of cultivars against, for example, the plant parasitic weed, Striga, moisture strees, insect pests and diseases.

4.1. Collaborative Research Activities

As part of the crop improvement and technology developement process, collaborative research was aimed at exploiting the strengths of lead NARS centres in research personnel, infrastructure and ecological potentialities to

generate technologies that could be shared by other NARS. More than 25 projects were implemented by lead NARS centres of the crop commodity networks. Emphasis was always placed on alleviating the major constraints to food grain production in SAFGRAD member countries. It must be noted that any results obtained from such collaborative projects were discussed during network meetings and made available to all the members.

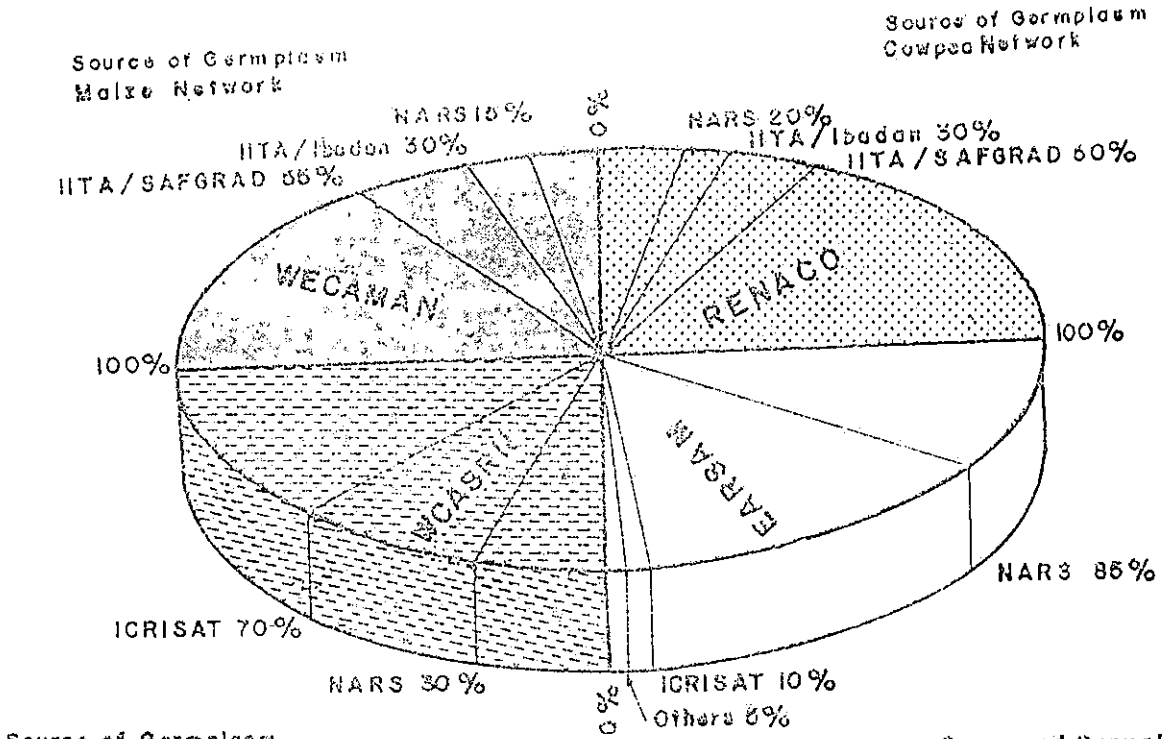
Technologies generated through the collaborative research projects for the maize, cowpea and sorghum networks for West and Central Africa and the sorghum/millet network for Eastern Africa are presented in Appendixes I-IV The mechanism optimizes the research strengths and comparative advantages of strong NARS (Lead Centres) which are relatively endowed with qualified research personnel, infrastructure, facilities and ecological potentialities for the generation and evaluation of technologies. These NARS centres not only accepted regional research responsibilities to solve problems of food production in their specific areas of research competence, but they also shared their research results with other member countries, particularly the weaker national programmes (Technology Adapting NARS). Furthermore, the four to six lead NARS centres of each network are considered as centres of excellence and anchor of the research activities.

4.2. Regional Trials

One of the means of exchanging and evaluating nationally proven elite crop varieties and other technologies was through regional trials. This approach enabled the participating NARS to assess the performance of their germplasm or technologies under different environmental and socio-economic conditions.

Each year, SAFGRAD packages elite germplasm from diverse sources for its regional trials as indicated in Fig.1. The regional trials served as a means of exchanging elite germplasm which was further tested in different member coutnries, adapted to local conditions and, if accepted, is released to farmers for increased food production. Three to six regional trials were carried out by each crop commodity network. The focus of each trial was to develop technologies for specific environmental and socio-economic conditions.

Fig. 1 Diffusion of Germplasm Via Networks



Source — Final Evaluation Semi-Arid Food Grains Research and Development, July. 1991.

5. Technology Verification

It is still common observation to see that high-yielding crop varieties which have been improved through research, often do not yield as much in farmers' fields as in research stations.

In order to narrow this yield gap and assist farmers to increase their yields, SAFGRAD has set up, during the past few years, a project in eight member countries involving farmers and extension development agents. The project is also aimed at promoting and forging linkages between on-station and on-farm technology verification trials so that broad technological options are made available to farmers.

In the eight participating countries, many technological options have been evaluated in nearly 100 villages. The number of farmers involved in the various tests has increased from 400 to nearly 1 200 during the last three years. A few of the viable technologies tested as well as some of the results being applied by the farmers are presented in Appendix V.

Since 1990, three agronomic annual planning and review workshops have been organized on this project, where researchers from participating countries, regional and international research and development organizations exchanged technical information and experiences relating to on-farm research and technology adoption. In addition, consultants were fielded periodically to assess the implementation of project activities in the eight participating countries.

6. Technology Diffusion and Transfer

6.1. Training

One of SAFGRAD's major preoccupations has been the building of indigenous scientific research capacity towards a sustainable solution to Africa's food problems. Emphasis was placed on short-term group training, lasting from a few days to several months. The training is often tailored to the needs of the respective networks, national programmes or other clients. While some of the training was directed specifically to research scientists, some was focused on improving the research skills of technicians. The five-month training course for maize technicians, for example, emphasized field plot techniques, managmenet of field trials, variety maintenance, seed multiplication, statistical analysis and data interpretation, etc. The training seminar, organized for agronomists by the cowpea, maize and sorghum networks in 1991 at IITA, Ibadan, highlighted the need to improve the understanding of low input

technology strategy and strengthen collaboration among agronomists, breeders, extension agents and other scientists, if farmers' needs are to be truly addressed.

In addition to training that is specific to particular networks, SAFGRAD has also been involved in training with broader relevance geared to improving the quality of research of African scientists (Appendix VI).

In collaboration with the West Africa Rice Development Association (WARDA), SAFGRAD has organized two-week training courses in scientific writing for agricultural research scientists from national institutions and universities of OAU Member States. The first course took place in 1991 in Lome (Togo) and the second in 1992 in Yamoussokro (Côte d'Ivoire). The courses were intended to acquaint participants with the principles of good communication and to improve their skills in writing and publication of scientific research papers.

6.2. Monitoring Tours and Workshops

In addition to the above group training programme, informal training activities were also organized by the different networks in the form of monitoring tours and workshops. To maintain and strengthen the efficiency of any organization, frequent monitoring is essential. The monitoring tours involve about six NARS and 2-3 IARC scientists who visit laboratory and field research activities of 2-3 NARS. The tours which usually take place during the crop season, enable participants to see and interact with their peers on the different research activities taking place at research stations and in the field.

Workshops are organized biennially (on a rotational basis) to exchange scientific information and to report on the results of regional trials carried out by the different NARS on behalf of each network.

6.3. Major Technical Conferences of SAFGRAD

6.3.1. Inter-network Conference :

Towards the end of the second phase of SAFGRAD, an inter-network conference was organized in Niamey, Niger to enable scientists of the different SAFGRAD networks to exchange scientific information, new technologies and share experiences gained during that period. This pan-African effort brought together more than 140 participants from all the SAFGRAD networks in West, Central, East and Southern Africa, including representatives of other international and regional institutions.

The first plenary session of the conference was devoted to general topics of interest to the participants. The second session was reserved to activities of the different networks, namely: steering committee membership renewal, organization of regional trials, etc. In order to encourage and motivate scientific leadership among African scientists, the Executive Secretary of OAU/STRC awarded special certificates of merit to the most deserving participants: those who presented the best scientific papers during the conference or had developed new crop varieties which were being used by farmers to increase food production.

6.3.2. Conference on Sorghum Utilization :

It was soon realized that in the course of the project, SAFGRAD had developed and released some useful technologies. Several varieties of maize, sorghum and cowpeas had been released by the networks but were not yet attaining the expected levels of utilization by the rural population or by African industrialists. A conference was therefore organized on the processing and utilization of sorghum and other related cereals, to sensitize African policy makers on the industrial potential of these cereals, and the possible spillover effect on raising the socio-economic lot of African farmers.

Scientists, industrialists, farmers' groups, NGOs, policy makers and other interested individuals attended the conference at which topics such as baby and weaning foods, composite flour, and beverages were discussed. The significance of this conference could be seen in the light of the devaluation of the CFA franc early in 1994 in the Francophone countries of West and Central Africa. The conference as well as the devaluation underscored the need for African countries to devote a substantial proportion of their economic development to the utilization of local materials. This will reduce the volume of foreign exchange paid annually on importation of items which could be replaced with local substitutes.

As a follow-up to this symposium, the Ministry in charge of Scientific Research in Burkina Faso, organized a national forum for scientific research in March 1994. Results of scientific research from the university, agriculture and other sectors were displayed for the general public. Roundtable discussions were organized between research scientists and the business community, NGOs and policy makers, respectively.

It must be emphasized that, through its training programme, SAFGRAD has enhanced considerable improvement in the professionalism of NARS scientists. Since the 1991 internetwork conference of SAFGRAD, scientists, instead of presenting just country reports, have developed the habit of presenting

original scientific papers based on their own research. The quality of such presentations will continue to improve as more scientists strengthen their capability in scientific writing and general communication.

6.4. Working with Non-Governmental Organizations

Non-governmental (NGOs) play an important role, especially in implementing small projects in the transfer of technology at village level. There are many NGOs, both local and foreign, involved in agricultural and other rural development projects in many of the SAFGRAD member countries. This is a potential resource which should be tapped particularly for the benefit of the rural community.

Although national or even private seed companies exist in several African countries, most of them do not function efficiently. The few that do, often are incapable of delivering the seed in time to needy farmers located far away from the big cities. NGOs can therefore serve as a possible alternative in rendering such assistance.

Taking maize as an example, the SAFGRAD maize network has developed extra-early maturing varieties which can be used during the hunger period in the semi-ard regions before sorghum and millet (the principal cereals crops) attain maturity. (This maize can be ready for eating fresh 60-65 days after planting). With the availability of dams and large rivers (Senegal and Niger) in the semi-arid zone of West Africa, seed of such maize varieties can be produced by the local farmers themselves using irrigation during the cool season (November-February). Each family can then be supplied with small quantities of the seed to plant around the house during the cropping season, usually during the month of June.

This approach was tried by SAFGRAD in 1992 with a local NGO, "Sahel Solidarité" in Burkina Faso. With small financial assistance from the NGO (for purchasing fertilizer, hoes, fencing and other simple materials), seed and technical advice from the national programme, the village (Kokologho) succeeded in filling the hunger period for which food aid should have been requested from donors. More NGO contacts are being made by SAFGRAD for similar projects in other countries where seed companies cannot provide the local farmers' needs. This approach of encouraging local farmers to produce their own planting materials of improved crop varieties, if properly pursued, can lead to substantial increase in food production in most parts of Africa.

6.5. SAFGRAD Impact Assessment

One of the recommendations of the final evaluation of SAFGRAD phase II was that a greater in-depth assessment of certain indicators be made since the time devoted to the evaluation was rather short, (only three months). An impact assessment study was therefore organized under the auspices of USAID. The purpose of the study was to determine the impact of agricultural research in improving farmer and consumer incomes resulting from the use of SAFGRAD technologies, evaluate on-station and on-farm performances of selected network member NARS and document institutional evolution and constraints to future development of selected NARS in the SAFGRAD network system.

The impact study took most of 1992; the final report was published in January 1994. The SAFGRAD Coordination Office involved the cooperative efforts of all network entities: Steering Committees, the Oversight Committee and International Agricultural Research Centres, particularly IITA and ICRISAT. Visits were organized for the evaluation team within the eight countries involved in the study, namely Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, Mali, Niger and Nigeria.

The study revealed that there was substantial impact from the research on the four SAFGRAD crops, particularly on maize and cowpeas in West Africa. For example, the estimate to the internal rate of return to public investment in maize research in Ghana was 73%.

Several varieties and technologies were developed and there were considerable spill-over effects of these to other member countries. SAFGRAD played a major role in the development and diffusion of technologies from its own networks as well as from other sources.

The national programmes of member countries were increasingly assuming responsibility for some of the networks. This was due to the increase in quantity and quality of research staff in the different NARS and to the enhancement of their scientific and professional capacity.

The study cautioned against the high external funding support to agricultural research (over 75%) in some of the NARS. It noted that the amount of technology available to influence productivity gains has increased. Future progress will depend on the level of financial commitment of the various governments to agricultural research.

PART II

MEDIUM AND LONG-TERM ORIENTATIONS

1. Introduction

There have been substantial changes in the SAFGRAD programme activities to enable it respond better to research and technology application needs. Consequently, its management entities also evolved to conform to programme and strategic changes. For example, the shift from resident research in SAFGRAD I (1977-1986) to collaborative research networks, as central focus in SAFGRAD II (1987-1992), enhanced the participation of NARS (National Agricultural Research Systems) managers and scientists in directly managing SAFGRAD.

The Council of National Agricultural Research Directors has been the policy-making organ during SAFGRAD II. The 26-member Council met every two years to review common agricultural research problems and to provide guidelines on policy issues and resolve outstanding matters referred to it by the SAFGRAD Coordination Office (SCO) and its Oversight Committee.

The management unit of SAFGRAD has been the Oversight Committee (OC) that was established by the Council of National Agricultural Research Directors. The seven-member Committee, elected by the Council, oversees the administrative, technical and financial affairs of SCO and monitors the performance of SAFGRAD networks. The OC met at least once a year

Following a study by the OC, an internal OAU meeting on SAFGRAD took place in September 1991, at the OAU general secretariat in Addis Ababa, Ethiopia. A recommendation was made to gradually transform SAFGRAD into a permanent institution to advise, elaborate, and implement food and agricultural research policy in Africa. A new thrust of SAFGRAD programmes would also respond to changing priorities of funding agencies and also enhance the commitment of Member State funds to research and technology adoption and utilization.

2. Collaboration in the Promotion and Development of Agricultural Research and Policy.

2.1. Networks:

i) Maize Network - SAFGRAD would liaise with IITA, CIMMYT and CORAF to promote collaborative research and enhance the adoption of maize production technologies.

ii) Sorghum and millet networks in West and Central Africa - would liaise with ICRISAT and INSAH to promote research and diffusion

of technologies.

iii) The West African Farming Systems Research Network - managed by SAFGRAD - would enhance the development of its resource management research activities. Negotiations with donors to continue funding support is in progress.

2.2. Improving the research environment.

Through its network system, efficiency of research could be improved through institutional reforms of national research systems in collaboration with regional and international agencies and through the regular Conference of National Agricultural Research Directors of member countries.

For the NARS to be effective, they should be insulated sufficently from domestic political pressures so that they can work on the same research problems over a sufficiently long period. Frequently, this precondition for effective research has been easier to achieve in the IARCs than in the NARS. With increased capital in the NARS and assuming that policy makers will increasingly recognize the high returns of research, the NARS should become even more effective. In general, improvement of the research environment includes:

- Establishment of conducive research policies, including research statutes with adequate allocation of funds and competitive salaries and benefits to attract scientists so that they can make research their long-term careers.

- Recognition of innovative and highly productive researchers at national level through periodic evaluation of research output and technology diffusion. Special prizes, merit awards and other financial incentives to more deserving scientists.

- Encouragement of technical publications in professional and national journals, technical bulletins and leaflets for extension and farmers' use. Such scientific tradition., i.e., building the knowledge base through publications, is virtually lacking in most of Sub-Saharan Africa.

- Promotion of multidisciplinary research and pooling of scientific talents and resources to alleviate specific constraints to agricultural production.

- Introduction of the system of competitive research grants which could motivate NARS researchers not only to increase output but also to be

creative, with major concern to transfer results to end users.

3. Project Activities.

3.1. Food Grain Production Technology Verification Project.

Benefiting countries:	8 countries (1990-96) in West and Central Africa.
Expected Project Expansion:	6 additional countries (1996-2005).

Background and Objectives.

In the 1990s and beyond, accelerated food production is crucial for Africa's survival. According to the World Bank estimate, agricultural production has to increase at least by 4% per annum, to keep pace with increasing population growth in Africa. The OAU, through institutions like SAFGRAD, is expected to play a key role to enhance agricultural development to attain the above mentioned production target.

The main objectives of this project are:

i) To intensify the production of food grain through the application of improved packages of technology.

ii) To narrow the "yield gap" of performance of technologies between production on research stations and on farmers' fields.

iii) To deliver technological options to farmers in order to minimize risks of crop failures due to environmental and socio-economic constraints.

iv) To promote on-farm and on-station technology verification trials and thereby identify suitable technologies that could maximize production of food grains.

Activities.

Field level on-farm verification trials of elite germplasm and related technologies in eight countries would continue in West and Central Africa. In 1994/2005, depending of availability of funds, the project activity would be expanded to 6 other countries in East and Central Africa.

Expected output.

i) Delivery of suitable crop production technologies to resource poor farmers in semi-arid regions;

ii) Improved technical linkages and feedback between research and extension;

iii) Technology evaluation and adoption, capacity building of participating national programmes;

iv) Improved farmer participation in the evaluation of technologies;

v) Contribution, in the long run, towards food self-sufficiency and security.

3.2. Integrated Sustainable Agricultural Development.

Future self-reliance and sufficiency in food, shelter and energy will depend very much on integrating production systems, while concurrently improving the environment. The project would have 6 to 10 country-level pilot projects in integrating crop/livestock and agroforestry systems, etc. to enhance the development of sustainable agriculture by preventing degradation of the resource base, while building the fertility of the soil through recycling of renewable resources between sub-systems of production. This project was developed as an OAU-ECA joint venture.

Benefiting countries:

(i) Pilot project activities (phase I - 5 countries).

(ii) Pilot project activities (phase II - 10 countries.

(iii) Through networking - More than 30 countries.

Duration of project:

Phase I - 1995-2000
Phase II - 2000-2005.

Expected Output.

i) Enhancement of recycling of resources among sub-systems of agricultural production (i.e., cropping systems, agroforestry, livestock husbandry, forage legumes, etc.).

ii) Development of sustainable agricultural production systems to meet the food, shelter and energy needs of rising village populations, while at the same time building the resource base and improving the quality of the environment.

iii) Development of land use systems that are technically, economically and soially viable in the short-run and ecologically sound in the long-run.

iv) Practice of sustainable agricultural development in the village sites involving the three partners: farmers, rural development workers and multidisciplinary research groups.

3.3. Strengthening Research Linkages and Collaboration among African Agricultural Experiment Stations in the Semi-Arid Zone, North and South of the Sahara.

In many countries of Africa, the semi-arid ecology is the major food production region. Even though different staple food crops are grown north and south of the Sahara, countries in these regions can benefit from exchange of technologies on the development of semi-arid agriculture.

Specific objectives are:

i) To establish an inventory of research and available technologies on semi-arid agriculture.

ii) To establish linkages between agricultural experiment stations and among researchers.

iii) To enhance training of researchers and technicians on various aspects of research station management and sustainable agricultural production in semi-arid ecologies.

iv) To facilitate technical assistance among African countries.

Activities.

i) Meeting of semi-arid Agricultural Research Station Directors and senior researchers would be held in 1996 in Addis Ababa. Participating countries are: Algeria, Egypt, Libya and Tunisia from North Africa; Sudan, Ethiopia, Senegal, Burkina Faso, Niger, Mauritania and Chad from sub-Sahara Africa.

ii) Agenda of the meeting and themes for the various sub-committees would be elaborated.

Expected output.

Some of the expected outcome will be:

i) Establishment of a viable Network of Semi-Arid Agricultural Research Centres to enhance a continuous flow and exchange of technical information.

ii) Establishment of a technical database on semi-arid agricultural experimentation: i.e. resources, manpower, programmes, facilities, etc.

iii) Facilitating the exchange of professional staff on short and long-term basis among countries and between Member States north and south of the Sahara.

iv) Promotion of better understanding and friendship among agricultural research managers and scientists from institutions in both sub-regions.

Unfortunately, lack of OAU financial support has delayed the implementation of this project.

3.4. Training, Seminars, Symposia and Continent-Wide Conferences.

		Approximate period.
a)	Training in farming systems research methodology	1995-2005 (every other year).

b)	Researchers/farmers/extension NGOs - seminar on technology needs and diffusion.	1995-2000 (every other year).
c)	Special theme symposium	1996-2008 (every three years.
d)	Scientific writing, in collaboration with WARDA.	1996-2000 (yearly or every other year).
e)	Training on the improvement of research skills.	1996-2005 (every alternate year).

Please note that most of the above activities are implemented in collaboration with regional national and international agricultural research centres and universities. Donor support will be solicited as soon as programmes are fully elaborated.

4. Coordination and Revitalization of Agriculture and Food Policy Research at OAU Level Beyond 1996.

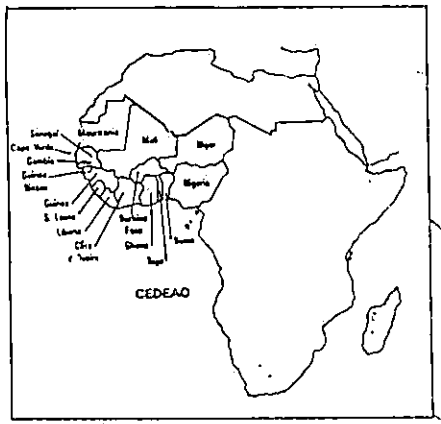
Several of the institutions within the five sub-regional economic and political groupings indicated in Appendix VI and depicted in Fig. 2, conduct some research in agriculture, food policy and resource management. While the interaction among institutions and research scientists between North and South (external to Africa) has been sustained, institutional collaboration and technical exchange between the sub-region, (within Africa) is virtually lacking.

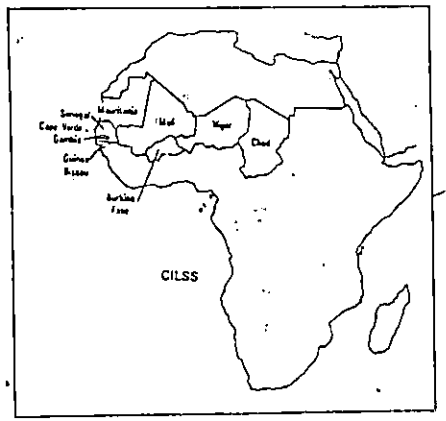
Since the last four years, the Special Programme for African Agricultural Research (SPAAR) of the world Bank is filling the gap in coordinating and revitalizing agricultural research in the sub-regions. The OAU/STRC-SAFGRAD could play a key role in promoting inter-African research cooperation through facilitating technical and institutional interactions among sub-regional economic and political groupings in order to enhance the use of science and technology in the realization of the African Economic Community, within the next three decades.

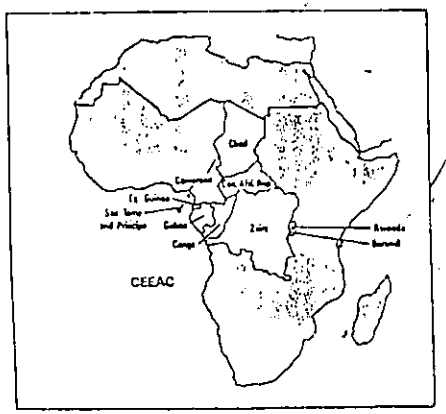
Other than the NARS themselves, the key players to bring about institutional change and development at regional and national levels are SPAAR and those IARCs operating in Africa. Although donors have appreciated OAU's partnership (through SAFGRAD) in strengthening national research in the past 15 years, they have, however, been expecting the institutionalization of SAFGRAD by OAU as a permanent agency for the coordination and promotion of agricultural and food policy research in sub-Saharan Africa. Feedback from national systems indicates that the role of OAU/STRC as a continental scientific organization vis-à-vis SPAAR and the IARCs is not well articulated. There is a consensus, however, that OAU/STRC should serve as the focal institution for SPAAR, donors and other regional agencies involved in the development of agricultural research systems in Africa.

The partnership of OAU/STRC and SPAAR in the revitalization of agricultural research and in instigating institutional reorganization and policy reforms is crucial. Thus far, OAU/STRC has not been a key partner to the World Bank's initiative (through SPAAR) to enhance capacity building in agricultural research in Africa. This would have provided effective services to various sub-regional and national institutions so that they can evolve as institutions and programmes that could meet contemporary and future challenges of science and technology development in agriculture, food and natural resource management in Africa.

Fig. 2.





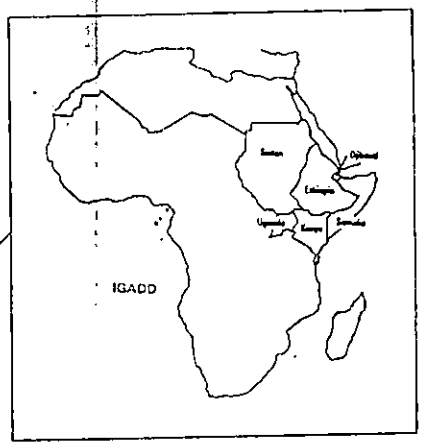


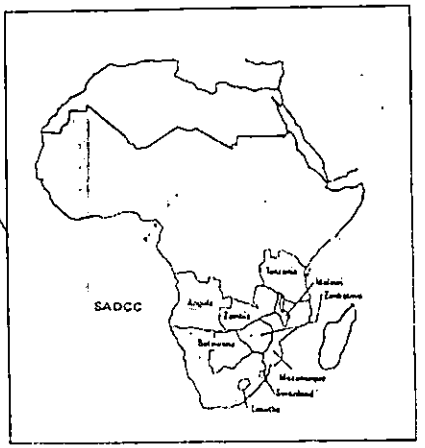
OAU

IRCAREP

Comité Inter-régional de Coordination de la Recherche et de la Politique Agricoles

Inter-regional Committee for the Coordination of Agricultural Research and Food Policy in Africa.





A mechanism for enhancing research collaboration at regional and continental level within OAU/STRC system was proposed during a Task Force Meeting on SAFGRAD last March in Abidjan, Côte d'Ivoire. The Task Force Committee:

i) examined the role of OAU's Scientific, Technical and Research Commission in coordinating agricultural research with a view to attaining food self sufficiency and security;

ii) deliberated on collaborative mechanisms between OAU/STRC on the one hand, and the various regional and international organizations engaged in agricultural research and development in Africa, on the other; and

iii) considered and recommended the structure and management entity for a new Africa-wide organization (with enlarged ecological and commodity mandate) that would replace the present SAFGRAD in a restructured OAU/STRC.

The new coordinating body, African Agricultural Food Research and Development Agency (AAFRADA), will coordinate agricultural research and development activities in all agro-ecological zones of Africa (instead of only the semi-arid ecologies covered by the present SAFGRAD). Its commodity mandate includes all major food crops of Africa and related agricultural production activities which enhance the development of sustainable agriculture and the environment (functions and management entities of AAFRADA have been reported in the Task Force Committee Report, March 1994).

The ultimate purpose of the above is to enable OAU to better focus its attention and limited resources on social and economic development problems of the continent, especially now that the struggle for political independence of all parts of Africa is over.

The Task Force Committee, in recognition of the need for a committee to coordinate inter-regional agricultural and food policy research in Africa, to enhance the institutionalization of AAFRADA, recommends the establishment of a transitional Inter-regional Committee for Coordination of Agricultural and Food Policy Research. The Committee would harmonize inter-regional research cooperation and thereby minimize duplication of efforts at regional and sub-regional levels.

The membership of the Inter-regional Committee will consist of the Executive Secretary of OAU/STRC (as Chair) and one representative each from the following six (6) regional/sub-regional organizations: ECOWAS, CILSS, IGADD,

CEEAC (CAS), AMU, and SADC.

The implementation of the above proposal largely depends on the availability of funds.

Appendix I. Collaborative research project activities of Maize Network in West and Central Africa.

	Project	Lead Centre Country	Number of Researchers	Remarks
i	Breeding maize for drought Striga , insect pest and disease resistance.	Cameroon	12	Developed drought tolerant synthetics from Pool 16 DR and from IITA and SAFGRAD sources. Agronomic management practices for early and extra early maize cultivars were developed. CMS 8806 and Pool 16 DR released.
ii	Development of early and extra-early maize with drought resistance.	Burkina Faso	5	In collaboration with Burkinabe National Programme, developed several drought resistant cultivars being utilized in the regional trials. Several extra early maturing maize cultivars (less than 82 days to maturity) developed. Streak resistance incorporated into TZEE-W, TZEE-Y, and CSP Early.
iii	Screening maize cultivars to stem borer resistance	Côte d'Ivoire	5	Network provided assistance to develop research facilities. Identified 3 species of stem borers in Northern Côte d'Ivoire Screened several accessions of maize.
iv	Screening for streak resistance in maize cultivars.	Togo	4	Improved facilities for screening streak resistance. Two maize populations are being improved for streak resistance. Varieties EV 8443-SR and Ikenne 81495R, released.
v	Development of maize of different maturities and with streak resistance.	Ghana	10	Various populations of maize for different purposes with white dent, yellow/flint dent and different maturity groups (120, 105 and 95 days) developed. Incorporated streak resistance to standard maize cultivars. Varieties SAFITA-2, Drokes SR, and Abelehee released.
vi	Fertilizer requirements for maize and cowpea mixture.	Nigeria	8	At Samaru, Northern Nigeria-Maize grain yield increased with the application of up to 75 kg N/ha and 40 kg P_2O_5/ha. For cowpea, N application depressed grain yield while responding to P, up to 80 kg P_2O_5/ha.

Appendix II. Collaborative research project activities of Cowpea Network in West and Central Africa.

	Project	Lead Centre Country	Number of Researchers	Remarks
i	Breeding for drought, Striga, insect pests and disease resistance.	Burkina Faso	5	Identified cowpea lines with combined resistance to insect pests and diseases. These include KVX 402-5-2, KVx 402-19-1, KVX 402-19-5 and KVX 396-4-5-20. Developed Striga resistant cowpea cultivars. These include SUVITA-2, TN27-80 KVX 61-1, KVX 402-5-2.
ii	Control of cowpea storage insect pests.	Cameroon	2	The following storage technologies developed: a) Use of a plastic cover and an insulating cushing made of cowpea pod husks or any other plant material to permit temperature to rise up to 65°C to kill the bruchids; b) Use of ash: 4 volumes cowpea + 3 volumes ash mixed together destroyed weevil population. c) Use of botanical products: neem seed oil protects cowpea grain from bruchids.
iii	Development of cowpea for sub-humid and coastal zones and control of storage pests.	Ghana	10	Line CR-06-67 was the most promising. Four plant products namely neem seed oil, Jatropha seed oil, groundnut oil and black pepper powder were as effective as acetellic 2% dustin protecting cowpea grain from weevils for at least six months.
iv	Development of drought, Striga, insect and disease resistant cowpea cultivars.	Niger—	9	Identified cultivars resistant to Striga, namely: TN 93-80, TN 121-80 and B 301.
v	Development of improved cowpea cultivars resistant to insect pests, Striga control through crop management and control of seed borne diseases.	Nigeria	8	Suitable dual purpose cowpea cultivars developed for Northern Nigeria. Land races resistant to insect pests identified. Increased levels of application of phosphorus up to 60 kg P_2O_5/ha improved cowpea yields. IT86-D-1056 was found to combine resistance to Septoria leaf spot and scab IAR/IITA determined genetics of importance to Striga.
vi	Development of multiple pest/disease resistant cowpea cultivars and breeding for drought resistance.	-Senegal	3	Identified 3 lines (IS 87-416, IS 87-432 and IS 87-437) with combined resistance/tolerance to insect pests (such as thrips) and diseases, e.g. bacterial blight and virus. Lines IS 86-275 and B 89-504 were also observed resistant to virus and bacterial blight.

Appendix III. Collaborative Research Project Activities of the West and Central Africa Sorghum Research Network.

	Project	Constraints Addressed	Lead NARS	Number of Researchers	Remarks on Technology Generation
i)	Screening resistance sorghum genotypes to Anthracnose	Disease	Burkina Faso	6	Several resistant sorghum lines to anthracnose were identified from local sources.
ii)	Identifying sorghum cultivars resistant to head bug	Insect damage	Mali	12	More than 25 sorghumlines resistant to head bug were identifie. The insect biology and its economic importance was studied. Early planting recommended.
iii)	Broadening the use of sorghum	Utilisation	Nigeria	10	Local sorghum variety Farafar was found suitable for wheat sorghum composite bread and confectionery. Variety SK5912 developed by IAR, is utilised to produce malt for the production of industrial beer. Non alcoolic beverage are also produced from sorghum.
iv)	Screening resistant sorghum cultivars to long-smut.	Disease	Niger	4	Methodology for screening was developed. A number of cultivars resistant to long-smut disease were identified.
v)	Identification of Striga resistant sorghum cultivars.	Parasitic weed	Cameroon	5	More than 10 tolerant sorghum lines were identified which are being further evaluated through regional trials. Some varieties released.

Appendix IV. Collaborative Research Project Activities of the Eastern Africa Sorghum and Millet Research Network.

	Projet	Constraints Addressed	Lead NARS	Number of Researchers	Remarks on Technology Generation
i)	Development of sorghum cultivars resistant to Striga	Parasitic weed	Ethiopia	7	Identified 25 Striga resistant sorghum genotypes.
ii)	Screening Anthracnose resistant sorghum cultivars.	Disease	Ethiopia		17 sorghum lines from Ethiopia and 50 lines from ICRISAT were found promising.
iii)	Screening drought and Striga resistant sorghum cultivars.	Drought, Parasitic weed	Sudan	17	Developed integrated method of drought and Striga control.
iv)	Screening for host plant resistance to stalk borer.	Insect pest	Somalia	18	Research facilities developed but work discontinued.
v)	Identification of Finger Millet blast resistant genotypes	Disease	Kenya	8	Several accession were evaluated by ICRISAT and KARI.
vi)	Screening sorghum cultivars-resistant to long-smut.	Disease	Kenya		18 lines of sorghum were identified.
vii)	Screening sorghum cultivars resistant to Ergot.	Disease	Rwanda	2	Eight and six resistant lines were identified from Rwanda and Ethiopian NARS.
viii)	Evaluation of nutritional and food quality of sorghum.	Grain quality	ICRISAT		16 cultivars from the region were evaluated. Varieties with higher rating included SPV475(India). Dabar (Sudan) and IS24129 (Tanzania).

Appendix V. SAFGRAD-Technology Verification Project Activities in West and Central Africa

Country	Implementing Institution	Project Title
1. Burkina Faso	Institut d'Etudes et de Recherches Agricoles (INERA).	Test en milieu paysan de paquets technolo-
2. Sénégal	Institut Sénégalais de Recherche Agricole (ISRA).	a) Mise au point d'itinéraires techniques et amélioration des systèmes de production à base de mil. b) Paquet technologique minimum pour le milieu paysan.
3. Niger	Institut de Recherche Agronomique du Niger (INRAN).	a) Test d'adaptation des nouvelles technologies en milieu paysan-culture associée Mil/Sorgho. b) Paquet sur l'association Mil/Arachide/-Niébé.
4. Mali	Institut d'Economie Rurale (IER).	Improvement of Maize production in semi-arid regions of Mali.
5. Cameroon	Institut de la Recherche Agronomique (IRA).	Developing agronomic packages of technology for early and extra-early maize cultivars in North and Far North Cameroon.
6. Ghana	Crops Research Institute at Nyankpala Station (CRI).	On-farm agronomic research in Northern Ghana.
7. Nigeria	Institute of Agricultural Research, Ahmadu Bello University (IAR/ABU).	On-station and on-farm agronomic testing of appropriate technology to increase yield of sorghum/millet/cowpea crop associations.
8. Togo	Direction de la Recherche Agronomique (DRA) Antenne Régionale SAFGRAD/DRA.	Transfert de technologies en milieu paysan (sorgho, mil, maïs, niébé).

Appendix VI. Training Workshop and Seminar Activities of SAFGRAD (1990-1994)

Type of training or workshop or seminar	Network involved	Location and period	N° of NARS participants	Countries represented	Remarks
1. Maize research and production techniques	Maize	Kamboinse, B.F. June-Oct, 1990	6	6	Research technicians
2. Agronomy research seminar	maize, cowpea, sorghum	Ibadan, Nigeria 7-19 Jan., 1991	20	12	Research scientists
3. Workshop on food grain research and production in semi-arid Africa.	Inter-network	Niamey, Niger 8-14 March, 1991	99	22	Research scientists & managers
4. Agroforestry information for development	Agroforestry	Bamako, Mali 12-23 Aug. 1991	12	4	Documentalist
5. Scientific writing for agricultural research scientists	All networks	Lome, Togo 17-30 Nov., 1991	20	8	Research scientists
6. Datachain application in research	Agroforestry	Niamey, Niger 2-13 Dec., 1991	15	4	Research scientists
7. Regional planning workshop	Agroforestry	Ouagadougou, B.F. 19-23 Oct., 1992	50	4	Research scientists
8. Scientific writing for agricultural research scientists	All networks	Yamoussokro, C.I. 16-28 Nov., 1992	30	16	Research scientists
9. Agroforestry research for development	Agroforestry	Dakar, Senegal 14-25 June, 1993	20	4	Research scientists
10. Agroforestry information management	Agroforestry	Dakar, Senegal 11-23 Oct, 1993	20	4	Documentalists
11. Field experimentation and data collection	Agroforestry	Niamey, Niger 1-14 Nov., 1993	20	4	Technicians

Appendix VII. Sub-regional economic and political groupings and their agricultural research coordinating agencies.

Regional economic and political grouping	Number of countries	Research coordinating agency	Year established
i) SADC	9	SACCAR	1994
ii) CILSS	9	INSAH	1976
iii) ECOWAS	16	Evolving	1975
iv) CEEAC	10	Evolving	1983
v) IGADD	6	Evolving	1986
vi) OAU/STRC-SAFGRAD	26	SCO	1977

1994

REPORT OF TECHNICAL ACTIVITIES (1990-1994) AND MEDIUM AND LONG-TERM ORIENTATIONS OF OAU/STRC - SAFGRAD

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