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FRAMEWORK FOR THE LONG-TERM
PLANNING OF SAFGRAD

SEMI-ARID FOOD GRAIN RESEARCH
AND DEVELOPMENT PROJECT

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OUAGADOUGOU, Burkina Faso

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FRAMEWORK
FOR THE LONG TERM PLANNING
OF SAFGRAD

PART I

June 1985

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Semi Arid Food Grain Research and Development
The SAFGRAD Coordination Office
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ORGANIZATION OF AFRICAN UNITY
SCIENTIFIC, TECHNICAL AND RESEARCH COMMISSION

FRAMEWORK FOR THE LONG TERM
PLANNING OF SAFGRAD

PART I.
REPORT OF A TEAM OF CONSULTANTS

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June 1985

Semi-Arid Food Grain Research
And Development
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P R E F A C E.

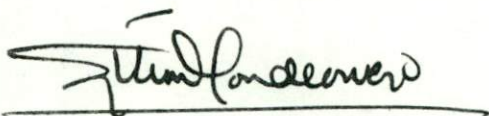
We were commissioned by the OAU/STRC SAFGRAD Coordination Office in Ouagadougou, Burkina Faso, to undertake a study of SAFGRAD activities with a view to developing a framework for the long term planning of SAFGRAD.

The accompanying report presents the results of our study. In this study, we have taken an independent position and considered all the components which would assist SAFGRAD to develop into a permanent African Research Coordination Agency. It is our hope that this report would provide the basis for formulating program entities that would be of interest to a group of donors.

We are very grateful to the OAU/STRC and to SAFGRAD for the opportunity to undertake this study and for the moral and technical support received throughout the mission.



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26 June 1985.

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ABBREVIATIONS

AGRHMET	Regional Centre for Training and Application of Agricultural Metreology and Hydrology.
ACPO	Accelerated Crop Production Officer
CC	Consultative Committee
CDA	Cooperation for Development in Africa
CMPPD	Comprehensive Master Plan Project Document
ECA	Economic Commission for Africa
FAO	Food and Agriculture Organisation of the United Nations
FAC	Fonds d'Aide et de Cooperation
FSR	Farming Systems Research
FSU	Farming Systems Unit
IARC	International Agricultural Research Centre
ICRAF	International Council for Research in Agroforestry
IRA	Institut de Recherche Agricole
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
IITA	International Institute of Tropical Agriculture
ILCA	International Livestock Centre for Africa
IMPPD	Indicative Master Plan Project Document
INSORMIL	International Sorghum and Millet Cooperative
IRAT	Institute for Research in Tropical Agricultural and Food Crops
IVRAZ	Institut Voltaique de Recherches Agronomiques et Zootechniques
OAU	Organisation of African Unity
OAU/STRC	Organization of African Unity/Scientific, Technical and Research Commission
PID	Project Implementation Document
SADCC	Southern African Development and Coordination Conference

SAFGRAD	Semi-Arid Food Grain Research and Development
TAC	Technical Advisory Committee
USAID	United States Agency for International Development
ORSTOM	Office for Scientific and Technical Research Overseas (France)
ISNAR	International Service for National Agricultural Research
CIMMYT	International Centre for Maize and Wheat Improvement
INSAH	Institute of the Sahel
CILSS	Permanent Inter-State Committee for Drought Control in the Sahel
SAT	Semi-Arid Tropics
PAM	World Food Program
UNSO	United Nations Sahelian Office

EXECUTIVE SUMMARY AND RECOMMENDATIONS.

I. THE GENERAL SETTING OF THE SAFGRAD PROGRAMME AND ITS OBJECTIVES.

The Semi-Arid Zones of Africa form major production areas for food and livestock products of the continent. However, the production potentials of this huge area are far from being realized; even worse, the resource base is subject to serious and continuous degradation as a result of recent droughts and rapidly growing populations. While the former has directly enhanced the desertification processes in the lowest rainfall zones, the latter leads indirectly to the same process under higher rainfall through overcultivation of a fragile resource base. While local farming technologies are often extremely sophisticated and contain valuable components for farming under high risk environments, these technologies also require important modifications to cope with the problem of sustained production under an increasingly permanent farming system (as compared to the earlier fallow systems).

For most African countries, these problems are compounded by poor infrastructures and marketing systems as well as weak (in terms of trained manpower, facilities and funding) National Research programmes and Extension Services, which are receiving relatively little support from their Governments.

The increased international awareness of Africa's food problems has caused a drastic expansion of foreign aid over the last decade. A multitude of funding and implementing agencies operating at national and/or regional levels through bilateral and multilateral agreements, have subsequently become active. While these developments certainly have had positive effects, they have also contributed to increased fragmentation of national research

efforts and to a large degree of overlap and duplication. Moreover there will often be crucial differences between national programme research priorities and the priorities of international and/or regional, often commodity oriented, research institutes and donors.

It was against this complicated background that SAFGRAD was created in 1977 as an OAU/STRC Project with mainly USAID support to reinforce and coordinate agricultural research and development for major staple food crops (maize, sorghum, millet, cowpea and groundnuts) on a regional basis; the ultimate goal being to increase the quantity and quality of these food crops available to the increasing populations of semi-arid sub-saharan Africa.

II. THE SAFGRAD MANDATE.

Because of the geographical vastness of the area and the complexity associated with agricultural production in physically and politically very diverse environments, a clear definition of the SAFGRAD mandate is important. Moreover, because of the large degree of fragmentation in research as a result of many externally funded projects, an overall coordination effort from a wide research and development perspective is considered essential for SAFGRAD.

R.1 - Consequently the following mandate areas were defined and recommended:

1. The geographical mandate of SAFGRAD covers the Semi-Arid zones of Africa and in particular the current 26 SAFGRAD member countries in West, Central, East and Southern Africa.

2. Being an OAU organization, SAFGRAD would provide technical feedback information to the OAU, and member country governments, on agricultural production, development and research to influence and to support the formulation and implementation of regional and national policies in these areas.
3. SAFGRAD would contribute to strengthening National Programmes through the identification of gaps in research and development efforts on a national and regional scale and to filling these gaps by -
 - i) providing specific support;
 - ii) ensuring greater complementarity between programmes and projects; and
 - iii) by stimulating exchange of information.
4. Specifically, SAFGRAD would contribute to strengthening the national technology transfer capacity (through its ACPO and FSR programmes) with a view to overcoming the common institutional barriers within National Programmes between various Research Departments (e.g. Agriculture, Forestry Livestock) and between Research and Extension.
5. SAFGRAD carries a major responsibility for information exchange between individual member countries and between the various African regions through workshops, conferences, symposia, monitoring/study tours, etc., and the dissemination of research results through regular publications.

6. SAFGRAD's training responsibilities would involve the systematic identification of long term training needs for various disciplines at various levels in the member countries, the identification and the coordination among various training opportunities.

III. PRESENT SAFGRAD ACTIVITIES.

The actual SAFGRAD programme covers the following major activities;

1. Support to regional technical research programmes of ICRISAT (sorghum and millet in East and West Africa) and IITA (maize and cowpea for West Africa) with a major emphasis on crop improvement aspects; as well as soil and water management (ICRISAT's till 1984; presently IITA).
2. Farming Systems Research in support of National Programmes (Burkina Faso; Cameroon and Benin); Farming Systems Research by the Purdue University team in Burkina Faso will be terminated in 1986.
3. Linkage of Research and Extension through the ACPO programme in five West African countries, namely Burkina Faso, Mali, Togo, Cameroon and Senegal.
4. Training for higher degrees and short term in-service training through ICRISAT and IITA programmes.
On-the-job training through monitoring tours.
5. Information exchange through organisation of annual workshops on maize-cowpea, sorghum-millet and FSR; organisation of specific conferences (e.g. on drought, in 1986).

IV. IMPLICATIONS OF MANDATE FOR LONG TERM PLANNING OF SAFGRAD.

Based on various discussions, the mission has arrived at the following major conclusions and recommendations for SAFGRAD orientations in its long term development.

1. General.

The mission feels that there is a major discrepancy between the ambitious SAFGRAD mandate and its currently available resources in manpower and funds, its organisational structure and its technical capabilities, to handle this mandate effectively. The following conclusions and recommendations will attempt to indicate how the SAFGRAD organization could be strengthened gradually over the next few years, and how the focus of the various technical programmes, of training and of inter-african coordination and collaboration could be improved.

2. Organization and management of SAFGRAD.

a) On the African development scene, which is characterized by a multitude of mostly temporary, foreign aid supported projects, there is a definitive need for a permanent African institution or agency to coordinate food crops research and development.

R.2 - Consequently it is recommended that the present project status of SAFGRAD be altered towards a permanent SAFGRAD Agency, under the umbrella of the Organisation of African Unity, Scientific, Technical and Research Commission. This Agency should develop the ability to provide technical information and advice to the OAU and its member countries on policy matters related to agricultural research and production. It should be a strictly technical organisation completely devoid of political influence.

- b) In order to deal with its coordinating responsibilities for technical subjects and training aspects across 26 member countries, SAFGRAD will require a considerable strengthening of:
- the main coordinating office in Ouagadougou which will also serve as the regional office for West and Central African countries;
 - the regional office in Nairobi to serve the East and Southern African countries;
 - links to high level national contact persons (preferably the Director of the National Agricultural Research Programme or his Deputy) in each SAFGRAD member country.
- c) Strengthening the overall SAFGRAD organisation is recommended as follows:
- R.3 - The Ouagadougou Coordination Office/West and Central African regional office should require the following additional personnel:
- Director for Training and Information
 - Senior Administrator
 - Liaison Officer for West and Central Africa
 - Research Officer on Resource Management and Crop Production
 - Research Officer on Farming Systems Research and Research-Extension linkages.
- R.4 - The Regional Office for East and Southern Africa would require :
- Liaison Officer for the region
 - Administrative Officer
 - Officer in charge of regional training and information exchange (workshops, publications, etc.).

The two regional Liaison Officers would work directly under the International Coordinator. The two Research Officers are required to strengthen the technical capabilities of the central SAFGRAD organization and would work under the Director of Research.

R.5 - Strengthening of the Ouagadougou Coordination Office and the regional offices should be phased over a 3-year period.

3. Technical aspects of SAFGRAD programme.

The mission concluded that the SAFGRAD research programmes as well as most National Programmes are overly focussed on crop improvement and crop variety testing. As a result, scarce resources for research and training are drawn away from urgently required programmes on "Resource management Research" to address the pressing problem of resource degradation. This research would involve long term experimentation on land-water-fertility management, agro-forestry and crop-livestock interactions.

R.6 - Consequently the mission recommends the creation of an interdisciplinary Unit on Resource Management Research (including the disciplines, land and water management, soil fertility management, ecology/plant physiology/cropping systems agronomy, socio-economics/anthropology) for the Sudanian zone to complement the activities by the ICRISAT Sahelian team in Niamey.

The mission has noticed that in spite of the many aid programmes in the region frequent gaps occur between various programmes. Research gaps also occur due to frequent institutional barriers which interfere with an integrated approach to solving agricultural problems. Through its FSR-IFAD funded project, SAFGRAD is making an important contribution in filling such research gaps.

R.7 - It is recommended that this part of the SAFGRAD activity be strengthened further, and that increased emphasis is placed on sociological/anthropological reasons, behind adoption or rejection of improved technologies. Recently it was agreed in principle that the coordination office (2 people) of the West African-FSR network would be located at SAFGRAD-Ouagadougou. This development could contribute considerably to SAFGRAD's competence in this critical research area.

R.8 - The mission recommends early implementation of this West African FSR Network.

In nearly all member countries, institutional barriers between Research and Extension stand in the way of efficient utilization of research results and farmer feed-back to research. The SAFGRAD response to this problem through the ACPO programme was valued highly by the representatives of various countries.

R.9 - The mission recommends the expansion of the ACPO Programme preferably in combination with FSR activities as a focal point for future SAFGRAD programmes. However, this expansion should take place in close consultation with National Programmes and IARCs. Standardisation of ACPO programmes was considered undesirable in view of the wide diversity of the operational modalities in the different national programmes. ACPO programmes should be designed to fit particular national systems.

The mission considers the ACPO approach as an initial response to improve research-extension communications. In most cases this should be followed however by a further expansion in on-farm research through multidisciplinary FSR teams.

R.10 - In the latter event, it is recommended that ACPO responsibilities be redefined and may be focussed increasingly on assistance to Extension services in the organisation of seed multiplication programmes and training of extension agents.

4. Training and information dissemination.

The mission felt that systematic identification of national training needs, based on an analysis of national resources of trained manpower and future needs was required under SAFGRAD II. Without such analysis the bias towards crop improvement programmes, at the expense of other disciplines, may continue to grow. The Training and Information component of SAFGRAD should be formalised, and with the following major activities:

- Training (technical and degree programmes) should occur as much as possible through African educational institutions and should be focussed on problems specific to African agriculture, emphasizing the linkage between research and development.
- SAFGRAD information on research gaps in various National Programmes should contribute to a better focussing of both training requirements and training programmes, thereby contributing to a strengthening of National Training Programmes and facilities.
- SAFGRAD's Training and Information programme should contribute to improving regional and interregional dissemination of research results for semi-arid Africa through organisation or co-sponsoring of workshops, conferences and the publication of a regular journal for applied agricultural research.

R.11 - It is recommended that SAFGRAD explores sources of funding for the publication of this African Agricultural Research Journal.

SAFGRAD should seek a collaboration with IARCs and other regional institutions (INSAH, SADCC) in publishing research results in the form of regional bulletins to further enhance the dissemination of these results over a wider audience.

5. Linkages.

R.12 - In its capacity as the coordinating African agency of OAU/STRC, SAFGRAD should continue to strengthen its linkages to:

- a) National Programmes of member countries (see recommendations under II):
- b) IARCs (IITA, ICRISAT, ILCA, ICRAF) as well as CIRAD, ORSTOM and AGRIHYMET as sources of research information and for backstopping. SAFGRAD's FSR and ACPO programmes should be utilized as important feedback channels to these institutions.
- c) Major regional programmes such as INSAH/CILSS and SADCC/SACCAR. Complementarity between SAFGRAD efforts and those of regional organisations is vital for both parties. As a coordinating agency SAFGRAD should take the lead in establishing regular contacts to achieve collaboration and complementarity between programmes. Eventually SAFGRAD should, through these linkages, be able to fulfill a mediating role between National Programmes and various regional and international research and development institutions, thereby aiding in the reconciliation of common differences in research priorities between National Programmes and the often single commodity orientation of regional and international collaborators.

6. Networks

The mission has been amazed about the number of "networks" (commodity, discipline or programme oriented) in the region, that are operational or in preparation. Given the weakness of many National Programmes in terms of trained manpower, an excessive number of frequently overlapping networks would tie up the scarce National research resources and may well become counter-productive.

R.13 - The mission therefore recommends that SAFGRAD seeks to strengthen existing networks on commodities and FSR by co-sponsoring these on the basis of mutually agreed conditions.

It is recommended that the ACPOs participate fully in various FSR networks.

7. SAFGRAD priorities and phasing.

The implementation of SAFGRAD programmes covering its wide mandate will have to be a gradual process, covering several years and requiring support from a group of donors, and the OAU.

R.14 - The mission therefore recommends the following priorities and phasing;

- From a regional perspective, strengthening the capacity of the Ouagadougou coordinating and regional office (for West and Central Africa) would take priority over a strengthening of the Nairobi regional office for East and Southern Africa.
- Among the various technical programmes, formalisation of SAFGRAD Training and Information component and the creation of a regional "Resource Management Research Unit" focussed on the Sudanian Savanna zone are greater priorities than further expansion of crop improvement programmes.

- There is a widespread need across Africa for stronger Research-Extension linkages through FSR and ACPO support. These are typically National Programme activities which however may have to be initiated through SAFGRAD support (technical and training) and funding to awaken the National interest over an initial 5-year period. Subsequently these programmes should preferably become the responsibility of the National programmes.

1 INTRODUCTION

1.1 Origin and Purpose

This document presents the observations and recommendations of the team of consultants who were commissioned by the OAU/STRC SAFGRAD International Coordination Office in Ouagadougou, Burkina Faso in May/June 1985, to study the objectives and activities of SAFGRAD, the Semi-Arid Food Grain Research and Development Project with the future long term development of the Project in mind.

The study follows the decision of the SAFGRAD Consultative Committee (CC) in April 1984 that a Comprehensive Master Plan Project Document (CMPPD), be developed for SAFGRAD. The study is not a project evaluation of the SAFGRAD program. It takes a global overview of the activities of SAFGRAD and includes all components which could be financed by a group of donors.

In this document, we attempt to briefly review the past and present activities of SAFGRAD and in particular to focus attention on identification of those project areas where SAFGRAD could make its greatest and most valuable impact in the food crop production problems of the semi-arid regions of Sub-Saharan Africa. The document would thus serve as a base for the design and preparation of the SAFGRAD Indicative Master Plan Project Document (IMPPD).

1.2 Terms of Reference

The detailed brief for the consultants is given in appendix I and the terms of reference for the study were outlined as follows:

1. To review on-going research activities implemented by SAFGRAD entities and suggest new areas of research that could be complementary to the on-going research programs.

2. To examine current research networks of SAFGRAD and other organisations and delineate the most appropriate roles for SAFGRAD vis-a-vis national research programs and the IARCs (IITA and ICRISAT) in:
 - . developing leadership of African scientists in different member countries;
 - . establishing a dynamic regional research network that is guided and executed by scientists of member countries themselves;
 - . strengthening multi-locational research networks within each national program;
 - . recommend how SAFGRAD could improve current research networks and also identify new areas of research networking.
3. To review the INSAH, SACCAR etc networks and recommend appropriate linkages and working relationships with SAFGRAD.
4. To identify research priority areas (including gaps in current international research) for short term and long term SAFGRAD activities.
5. To assess SAFGRAD's regional research strategies and propose how its links to national programs can be strengthened.
6. To assess SAFGRAD's FSR approach and propose mechanisms for facilitating establishment of regional FSR networks.
7. To examine the Accelerated Crop Production Officers' Program of SAFGRAD and suggest technical and administrative measures that need to be taken in order to strengthen and also expand the program.

8. To indicate minimum support requirements for some national research programs in order that they may fully participate in regional research networks on crop commodities, etc.
9. To appraise the short and long term training activities of SAFGRAD and suggest additional training needs (if necessary) and/or improved means of coordination.
10. To examine the management of SAFGRAD including the TAC and CC structure, the Coordination Office and the OAU/STRC Lagos Office, and propose re-structuring (if necessary) as well as directions for long term evolution of SAFGRAD as a sub-Saharan Africa wide research coordination and technology development and promotion Agency of OAU/STRC.

1.3 Methodology

Two members of the team Dr. W.A. Stoop and Professor Anthony Youdeowei arrived in Ouagadougou, Burkina Faso on May 20th and May 19th respectively. On Tuesday May 21st, 1985 the members were briefed by the SAFGRAD International Coordinator, Dr. J.M. Menyonga and the Director of Research, Dr. Taye Bezuneh; at this meeting, the program for the entire mission was briefly discussed.

Visits were made to some key SAFGRAD project sites in Burkina Faso (Kamboinse), Mali (Sotuba), Cameroun (Maroua) and Kenya (Nairobi), see appendix II for travel itinerary. During these visits, detailed consultations, meetings and interviews were held with several scientists in national and international research organisations, key people in United Nations Agencies, the USAID, SAFGRAD research staff and ACPOs. A list of all persons met is given in appendix III which contains the country reports.

Towards the end of the mission, Dr. N. Bosso, a third consultant, joined Professor Anthony Youdeowei to visit the OAU/STRC office in Lagos for consultations with Professor A.O. Williams, the Executive Secretary of the OAU/STRC.

In addition, we consulted many SAFGRAD documents including USAID Evaluation reports on SAFGRAD, Reports of CC and TAC meetings and Annual Reports of SAFGRAD activities and International Agricultural Research Centres (IARCs).

Excellent logistical and administrative support to the team was provided by the SAFGRAD Coordination Office in Ouagadougou and valuable information on SAFGRAD Phase II was given by the USAID mission in Burkina Faso.

The field studies which started on the 21st of May 1985 were concluded on the 9th of June 1985 when the consultants returned to Ouagadougou. Further discussions were held with personnel at the SAFGRAD Coordination Office and with USAID, Ouagadougou before the team proceeded to prepare a draft report. The draft report was discussed with the International Coordinator and the Director of Research after which it was finalised, prepared and submitted before the consultants departed from Burkina Faso on the 29th of June 1985.

2. BACKGROUND

This section presents a brief overview of the African food problem with particular reference to the semi-arid zones, to provide some background to the SAFGRAD Project.

2.1 The African Food Problem.

Africa is afflicted with a continuing food crisis which has assumed alarming proportions in recent times. The situation has resulted from several causes, two of the most important being the rapidly increasing human population and the unfavourable environmental conditions, especially drought, which seriously affects the reliable production of staple food crops. In the semi-arid zones of Africa which constitute the SAFGRAD mandate area, food production has consistently failed to keep pace with the rate of population growth and traditional food production systems are grossly inadequate to satisfy the food needs of the increasing rural and urban populations. The situation has attracted deep concern not only within Africa but also in the international community.

Considerations of permanent solutions to this human problem have, among the other issues, focussed attention on the analysis of the environmental, scientific and institutional difficulties which are major barriers to rapid and steady production of the principal food crops of semi-arid Africa, namely the cereals Sorghum, Millet and Maize and the legumes Cowpea, Groundnuts and Bambara nuts.

These issues will now be briefly discussed.

2.1 Environmental difficulties.

The environment of semi-arid Africa is characterised by high temperatures, low, highly variable and unpredictable rainfall patterns, fragile and mostly infertile soils. The area is subjected to serious and continuous degradation as a result of the recent series of droughts enhanced by rapid desertification processes. In areas with a higher rainfall, overpopulation leads to heavy cultivation and over exploitation, which also leads to rapid degradation of the fragile resource base.

2.1.2. Scientific difficulties

Rapid progress to substantially increase the food production capacity of semi-arid African countries can be made by improvements in local production systems developed by scientific research and effectively communicated by national agricultural extension services to the farmers. This has been well emphasised by the OAU Heads of State in the 1980 Lagos Plan of Action which states as follows.

"Article 36

..... Science and technology have a pivotal role in the development of agriculture, especially in connection with agronomic research, training and extension. Within the context of agronomic research, special emphasis should be placed on improvement of selected seeds, fertilizers, pesticides and other chemicals suitable for African conditions.

Article 38.

..... It is crucial that research findings be made available within minimum delay to the farming community. It is therefore recommended that,

- a closer link be established between research and extension services,
- the extension services should lay more emphasis on the spread of existing technologies ..."

In the semi-arid zones of Africa there is a shortage of well trained scientists and technologists for effective organisation and execution of agricultural research. In a few instances where trained manpower is available, there is often under utilisation or misplaced deployment of trained personnel. Expertise in planning, implementing, and evaluating agricultural research is weak and there are hardly any serious links or

effective communication between national agricultural research, extension services and the farming population. There is also very poor coordination of agricultural research within the region and many research efforts are carried out in isolation; this has given room for duplication and overlap of research activities which tend to be counter-productive.

2.1.3 Institutional difficulties.

There is considerable effort in establishing agricultural research and training institutions within the semi-arid zones of Africa. However, such institutions face many difficult problems including:

- . shortage of indigenous research management personnel;
- . acute shortage of funds for execution of research and development projects;
- . lack of adequate equipment and facilities;
- . lack of sufficient trained agricultural researchers, social scientists and technicians;
- . sometimes inappropriate and poorly defined agricultural research policies;
- . lack of effective mechanism for the distribution of improved technologies.

For example there is no regional and often not even national coordination of regular production and distribution of improved seeds to farmers.

These difficulties, together with several others not cited here, remain major constraints to the mobilisation of science and technology to solve the food problem in Africa. Nevertheless conscious efforts are being made to overcome these difficulties through various research and development activities.

2.2. Present Research and Development Activities in Africa.

Agricultural research and development activities abound in semi-arid Africa. These activities may be grouped into:

- . National Programs;
- . Regional Programs; and
- . Bilateral Programs.

2.2.1 National Programs are organised by the relevant government ministries and funded largely through annual government allocations. These programs usually suffer from acute financial, administrative and manpower problems.

2.2.2 Regional Programs include those research and development efforts funded by United Nations agencies and foreign donors like FAO, USAID, IFAD, UNDP, ECA etc. Some of these activities are directed at strengthening national programs through direct support of research and training, while others focus attention on development of regional research networks, which cover a number of countries. Financial contributions by foreign donors to African agricultural research and training have been substantial in recent times. For example for the 8 Sahelian countries alone, donors have contributed an estimated 11 Billion US dollars in development assistance between 1975 and 1982, more than 30 per cent of which went to agricultural development. There are now over 50 agencies and organisations operating in the agricultural scene in the Sahel alone; these constitute a complex network with varying degrees of coordination of their activities in the different countries. They usually operate either directly or through national programs.

2.2.3 Bilateral Programs involve direct assistance from foreign governments to a particular country. They usually operate through national programs and may collaborate with a regional program, focussing on specific national requirements.

2.3 Need for Coordination of Research

2.3.1 The Concept of Research Coordination

Weaknesses of national agricultural research and extension programs and the fragmentation and poor coordination of research activities in Semi-Arid Africa have directly and indirectly affected progress in agricultural development in the region.

A multitude of funding and implementing agencies actively operate at national and/or regional levels through bilateral and multi-lateral agreements. While these activities have positively affected agricultural development, they have also increased fragmentation of national research efforts and to some degree caused overlap and duplication. In addition, there are usually fundamental and legitimate differences between the priorities of national programs and those of International and/or regional agricultural research programs which are mainly commodity oriented. The need therefore arises for an African Agricultural Agency which would play the vital role of coordinating research and organising networks between national, international and regional agricultural research and development efforts and encouraging the free exchange of materials, ideas and technical information throughout the Semi-Arid zones of Africa.

This concept of a research coordinating organisation was translated into action by the establishment of a program known as JP 31, Semi-Arid Food Grain Research and Development, SAFGRAD, Project through the initiative of donors, representatives of African member countries and research organisations at the Ouagadougou conference in 1976.

2.3.2 Brief History of SAFGRAD I.

The history of SAFGRAD dates back to USAID Project JP 26 which was developed in 1969 in collaboration with the OAU/STRC Organisation of African Unity, Scientific, Technical and Research Commission. This project focussed attention on regional research for improvement of food

crops mainly maize, sorghum and millet in West Africa and was based at the Institute of Agricultural Research (IAR) of the Ahmadu Bello University, Samaru, Zaria, Nigeria. This project ended in 1976 and as a result of its success, another project known as Project JP 31 in OAU/STRC was initiated by USAID in 1977 with the title SAFGRAD, Semi-Arid Food Grain Research and Development Project. SAFGRAD was a multi-donor effort to develop and coordinate regional research to accelerate the improvement of local production of Sorghum, Millet, Maize, Cowpea and Groundnuts in the Semi-Arid Zones of Sub-Saharan Africa. This project originally started with 18 member states but has now been extended to cover 26 African States namely Benin, Cameroon, Cape Verde, Central African Republic, Chad, Ethiopia, Gambia, Ghana, Guinea, Ivory Coast, Mali, Mauritania, Niger, Nigeria, Senegal, Sudan, Togo, Burkina Faso, Botswana, Guinea Bissau, Kenya, Sierra Leone, Somalia, Tanzania, Zambia and Uganda.

SAFGRAD activities consisted of two major components:

- (i) regional coordination of research, and
- (ii) strengthening of national agricultural research programs and transfer of appropriate technologies to farmers.

To support the regional coordination of research, three research centres representing defined ecological zones within the region were developed at the Institute for Agricultural Research Samaru, Nigeria, the Centre National de la Recherche Agronomique in Bambey, Senegal and the Kamboinse Research Station, in Burkina Faso.

Two international agricultural research centres, the International Institute of Tropical Agriculture IITA in Ibadan, Nigeria

and the International Crops Research Institute for the Semi-Arid Tropics ICRISAT in Hyderabad, India were contracted to provide scientific and technical assistance to the project for commodity research. A third institution, Purdue University USA, provided scientific research and technical support for the Farming Systems Research Program.

SAFGRAD was designed to strengthen national programs of member countries and to establish close links between national research and extension through the Accelerated Crop Production Officers ACPOs, who are located within national agricultural programs.

The project was also to facilitate exchange of materials and information between researchers in the region, to organise conferences, workshops, symposia and study tours, to train African agricultural scientists and technicians and to publish technical materials and reports.

The major components of SAFGRAD were outlined as follows:

- . improvement of sorghum, millet and groundnuts, under research contract to ICRISAT;
- . improvement of maize and cowpea under research contracted to IITA;
- . Farming Systems Research contracted to Purdue University, USA;
- . strengthening national agricultural programs through training, workshops, seminars etc.; and
- . establishing close links between national research and extension through the ACPO program.

The management of SAFGRAD is undertaken by the OAU/STRC Coordination Office based in Ouagadougou, Burkina Faso which is headed by the International Coordinator, supported by a Director of Research and

a Financial Controller . Overall program directions are given by two management bodies namely the Consultative Committee (CC) and the Technical Advisory Committee (TAC). The Executive Secretary of OAU/STRC Lagos is the Chairman of both the CC and TAC and oversees the general operations of the SAFGRAD coordination office.

3. ACTIVITIES AND ACHIEVEMENTS OF SAFGRAD I.

The following brief account of SAFGRAD activities during the first phase of operations gives some idea of the scope of work done and the ways in which SAFGRAD has tried to fulfil its objectives. Technical details of these activities can be obtained from SAFGRAD annual and research reports.

Detailed observations and comments on SAFGRAD activities in the 4 member countries visited (Burkina Faso, Mali, Cameroon, Kenya) by the mission are given in the country reports in Appendix III.

3.1.1 Operations in member countries.

SAFGRAD started with a mandate covering 18 semi-arid African countries but by 1985 the number of member countries had been increased to 26, extending through West, Central, East and Southern Africa. The area is estimated to have a total population of 250 million people, a majority (about 75 per cent) of whom are small scale farmers producing most of the staple food items consumed in the region. SAFGRAD has initiated programs in many of its member countries in the following areas.

- . strengthening national research programs;
- . research coordination and networking;
- . establishing links between national/regional research and national extension services;
- . training and research information exchange through conferences, workshops, symposia, monitoring tours etc.

3.1.2 Strengthening National/Regional Research Programs.

This activity involves contract research with ICRISAT (for sorghum, millet and groundnuts) and IITA (for maize and cowpeas). SAFGRAD funded scientists from these international research institutes are posted to national research/regional research centres where they conduct research

on the improvement of crop varieties and production systems of the mandated food crops.

Research is also undertaken on soil fertility, soil/water management and Farming Systems to support national FSR programs of Burkina Faso, Cameroon and Benin Republic.

Through this system SAFGRAD generates improved varieties of, and technologies for the production of sorghum, millet, maize and cowpeas. No work has been done on groundnuts.

3.1.3 Research coordination and networking.

Regional research networks are organised to bring together scientists from different member countries to share their experiences and exchange materials and information. Networks have been established for maize/cowpea, sorghum/millet and for Accelerated Crop Production Officers (ACPOs). Effective organisations of these networks reduces, to some extent, the amount of overlap and duplication of research between national and regional research institutions.

3.1.4 Linkage between Research and Extension.

Effective transfer of new technologies from the research stations to farmers continues to be a major constraint to increased food crop production. SAFGRAD responded to this weakness by establishing the Accelerated Crop Production Officers (ACPOs) program. An ACPO has been attached to each of the five countries, Burkina Faso, Mali, Cameroon, Senegal and Togo to link research with extension. In farmers fields, the ACPOs conduct trials on new crop varieties and technologies developed in national and regional research stations.

When a new crop variety or technology is accepted by farmers, it is then passed on to the national extension service for distribution to other farmers. The reactions of farmers to the new crop variety or technology are fed back to national and regional scientists by the ACPO, thus serving as a vital two way link between research and extension.

3.1.5 Training and research information exchange.

An important activity of SAFGRAD is training of research scientists and technicians. Training programs involve long term degree training for higher university degrees, and short term in-service training for researchers and technicians arranged by the IARCs to provide opportunities for acquisition and improvements of competence in specific skills. The primary aim of training is to help build up the "critical mass" of well trained researchers and technicians for research in member countries. Information exchange is coordinated through the organisation of workshops, conferences, and seminars; an international symposium on drought in food grain production in semi-arid sub-Saharan Africa is scheduled for February 1986.

3.2 Major Achievements of SAFGRAD

Research

- i. SAFGRAD has successfully established research collaboration between regional/international agricultural research centres, IITA and ICRISAT, and national programs of member states.
- ii. Three regional research networks have been organized involving 25 member countries.
- iii. Improved varieties of Sorghum, Millet, Maize and Cowpea which are early maturing, disease and pest resistant, drought tolerant and high yielding have been developed and are undergoing pre-extension tests on farmers fields in many SAFGRAD member states.

Technology transfer

- iv. The ACPO program was valued most highly in all the member states visited. This program has successfully:

- . linked national research and extension services;
- . introduced new improved crop varieties and technologies to farmers through national extension services;
- . provided a feed back of information from farmers to researchers.

3.3 Summary.

The overall activities of SAFGRAD are summarised by the following illustration of the SAFGRAD strategy for development and transfer of technologies (See Figure 1).

SAFGRAD core effort is an important and critical intervention in the technical process of development and transfer of appropriate technologies to the small farmers of the semi-arid regions of Sub-Saharan Africa. Figure 1 is a visual representation of the SAFGRAD strategy which identifies the input and output functions in the technology development and transfer process involving strengthening of national program activities to increase their receptivity to new technologies. The National research and extension activities thus strengthened become sensitised to pass on the technologies to farmers with the aim of increasing and stabilizing food crop production. The operational framework of the SAFGRAD strategy designed to achieve this objective can be conveniently divided into two components A and B as shown in the figure.

Component A consists of the generation of technologies such as improved crop varieties and special crop production practices appropriate for the Semi-Arid conditions of Sub-Saharan Africa. Technologies are generated through a regionally coordinated system of collaborative research conducted by scientists in international agricultural research centres, (IARCs) and through research networking. In the second component B, technologies which have been developed and found appropriate are passed on

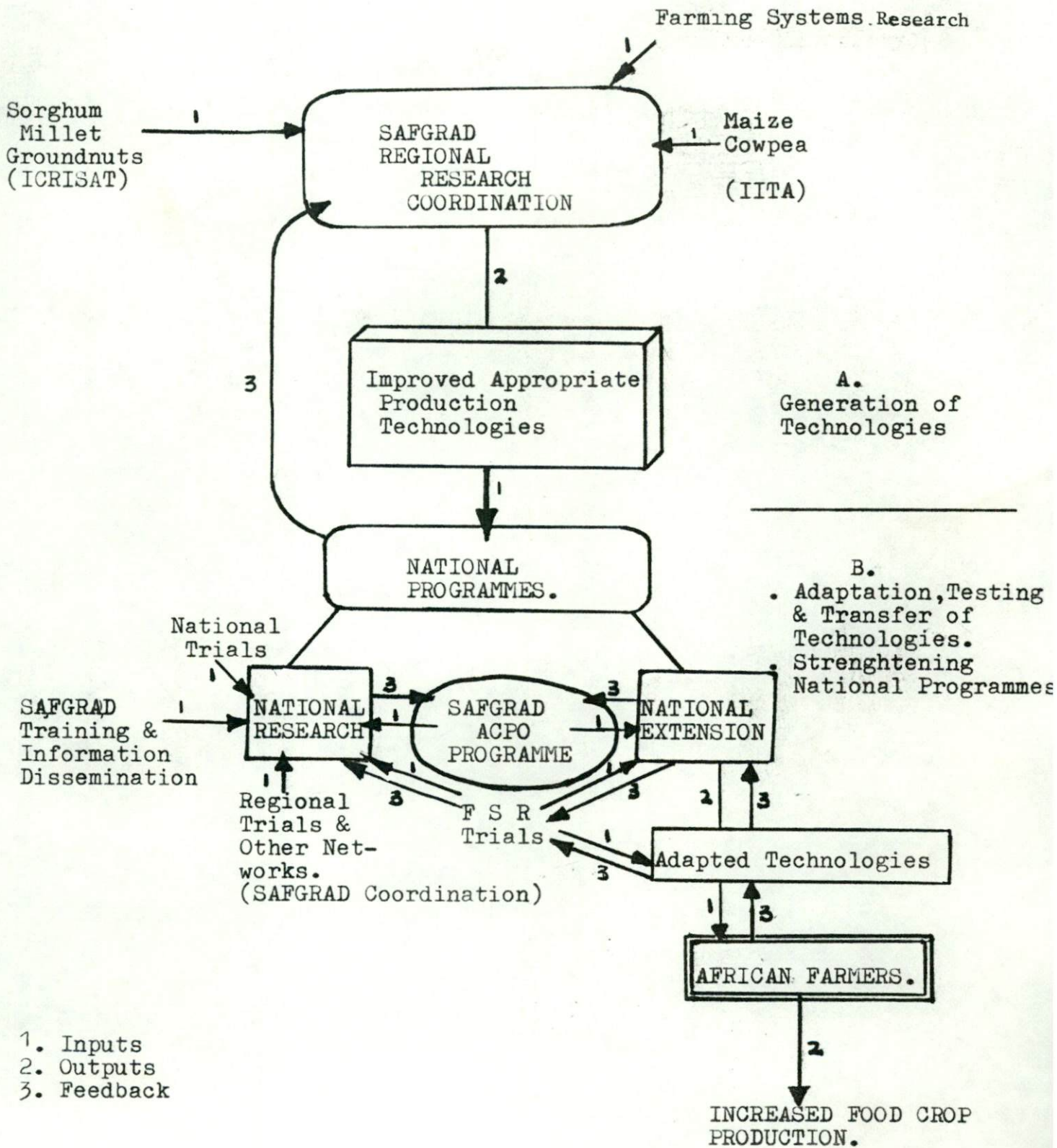


Figure 1. Flow chart of SAFGRAD Technical Input/Output functions to strengthen National programmes in member countries, leading to increased food production by African small scale Farmers.

to the national agricultural research and extension programs of SAFGRAD member states for adaptation and adoption, through a system of national adaptive trials conducted at national research stations and on farmers fields. SAFGRAD makes a major input in this important activity by providing institutional research facilities, coordinating the national adaptive trials, regional collaborative commodity specific trials, training and information dissemination, Farming Systems Research activities and the Accelerated Crop Production Officers (ACPOs) scheme. All these SAFGRAD activities provide backstopping which strengthens national efforts and would enable them to absorb and transfer the new technologies to farmers.

The ACPO program of SAFGRAD serves as a vital link between national research, extension services, and the farmers; it thus provides inputs and methodologies necessary for farmers to successfully adopt new production technologies. A direct feedback mechanism is also established within this system whereby problems of technology adaptation and/or adoption in farmers fields are referred back to national research and if necessary to the SAFGRAD collaborative research network involving the appropriate IARC. The success achieved by the ACPOs in Mali and Cameroon provides convincing evidence that this SAFGRAD system of technology development and transfer meets an urgent need. We wish to point out, however, a number of factors which are critical to the successful operation of this scheme:

- i. There must be a minimum level of national research and extension competence and infrastructures for SAFGRAD to utilize and build upon.
- ii. The national research and extension administration must accept the SAFGRAD concept and system of operation and agree to cooperate with it.

- iii. The SAFGRAD program should be fully integrated into the national agricultural research and extension administration.
- iv. There must be national research back-up teams to conduct on-station adaptive research which would provide the technology for the ACPO to transfer to the farmers through national extension services.

4. FUTURE DEVELOPMENT OF SAFGRAD: STRENGTHENING SAFGRAD ACTIVITIES
AND LINKAGES

4.1 Definition of the role of SAFGRAD

In the previous sections we outlined the complexity of African food crop agriculture and its constraints, the vastness of the area involved, the limited national resources in trained manpower and funds for agricultural research and the many different donor and technical assistance agencies active on this scene. Poor communication and overlapping activities are very common problems.

Against this complex background, SAFGRAD has a unique and important role to play in several vital areas, being concerned not only with agricultural research but also the transfer, and adoption of the results of this research as well as development in general. Its regional mandate allows therefore the following focus of activities:

- a Strengthening research capacity at the national and regional level by identifying the gaps in research needs and filling these.
- b Adjustment of research and development programs to assure a maximum of complementarity, thereby eliminating wasteful duplication.
- c Strengthening of the technology transfer process at the National level and information feed back process (ACPO and FSR activities).
- d Improve communication networks between researchers of national and regional programs; exchange of materials and other information through meetings, training, publications etc.

- e Feedback of research results to national and regional (OAU) policy makers to influence the policy decisions affecting agricultural research and production in semi-arid sub-Saharan Africa.

4.2 Permanent institutional arrangements for SAFGRAD.

If SAFGRAD is to meet the goals outlined in the previous section in a concrete way for the huge geographic mandate area, then this has important consequences for its internal organisation. These consequences cover three general areas:

- the institutional change from a temporary project status to a permanent Agricultural Research Coordinating Agency of OAU/STRC, being funded by a group of donors.
- considerable strengthening of the staff at the Ouagadougou Coordination Office and the establishment of Regional offices.
- the establishment of a reliable communication network through high level liaison persons (e.g. Director of National Research Programs or his Deputy) in each member country to facilitate efficient exchanges of information with the coordinating offices and for in-country coordination of SAFGRAD activities.

In order to make concrete contributions to research and development of agriculture in member states, SAFGRAD will need to build up its knowledge and an information base about the member countries through continuity and permanent relationships. Only through this slow process will SAFGRAD in the long run be able to gain the confidence of its partners and prove the value of its contributions. Moreover, there has been a general under-estimation, not only by SAFGRAD, but also by Funding Agencies, about the time requirements for generating improved, farmer acceptable technologies under the very variable climatic and political conditions typical of semi-arid Africa.

Since the start of the SAFGRAD project in 1977, considerable progress has been made, however, in strengthening the research network and in promoting on-farm adaptive research (ACPO and FSR activities). Because of this progress and the need for continuity, a change in the institutional arrangements is recommended and will be discussed further in subsequent sections.

Nevertheless the present SAFGRAD mandate appears too vast to be handled effectively with the present resources available to it, and the organisation is advised to emphasize within this mandate a limited number of priorities. Based on the feedback during the mission the "Linkage between Research-Extension" and "Training and Information exchange" within and between major African Regions, should be some of these priorities.

4.3 Research

In the domain of agricultural research one could recognize several different orientations:

- research towards increased production of specific commodities
- research towards increased and more stable production of selected cropping systems presently used by small farmers
- research towards sustained production at low levels of inputs (biological control of pests and diseases; resistant varieties; biological N-fixation by legumes) to prevent vast areas from going out of production in the very near future due to overcropping and soil degradation.

Basically all three of these orientations serve equally important roles in securing food production in the future, as well as improving rural

living conditions thereby reducing the socially undesirable increased rural exodus and subsequent urbanisation, which occurs to-date. The latter orientation is particularly relevant to the SAFGRAD mandate area in which marginal and fragile farming environments prevail. Consequently, land degradation processes associated with continued farming of predominantly rainfed food crops, form a much greater threat than occurs for the farming of more demanding commodities such as rice, wheat, maize, potatoes etc., in potentially richer environments.

In the past, much research in Africa has been conducted in isolation from the real farming world and therefore research as a tool to accelerate development has not been exploited. However, even today with a greater appreciation of the potential benefits of research, the expectations are often unrealistic. Research aimed at improving African farming, will have to be based first of all on a proper understanding of the present systems and their various constraints. It is not unusual that research program priorities and emphasis do not reflect farmer-felt constraints, which in the end leads to the frequent rejection of the researcher proposed technologies.

Secondly research is often a slow process, of which the outcome may be unpredictable, and with results being different from expectations. In addition, research for rainfed agriculture in the semi-arid tropics poses the problem of huge environmental diversity and variability for the target area. Consequently, there is little ground for the belief that international or regional research could ever result in the development of a simple, generally acceptable and standardized technology, whether this is an improved variety or a cultural practice like tied ridges.

Thus in order to solve the diverse variety problems of the semi-arid African environment, a far greater balance in research activities (away from the present over-emphasis on crop-varietal work) will be required in the future. Suggestions in that direction for the evolution of SAFGRAD will follow in the next sections.

4.3.1 Resource management research.

Many reports in recent years have drawn attention to the ever accelerating degradation of the agricultural resource base in Africa (in the humid as well as semi-arid zones) under the pressures of growing rural populations and decreasing rainfall. As a result, traditional agricultural technologies which are often extremely sophisticated, but which evolved under conditions of an abundant farm land situation, are inadequate in coping with the problems of (semi) permanent cultivation and the resulting land management constraints (both with respect to fertility and water). Consequently land degradation is taking on frightening proportions throughout the semi-arid zone, first through fertility depletion and subsequently through increased run-off erosion.

The mission feels that this area should receive top priority in future SAFGRAD activities, since continued land degradation may to some extent even jeopardize the crop improvement efforts. At present however, resource management research in most of the countries in the region is overshadowed by crop improvement efforts, as holds also for SAFGRAD phase I. Moreover, much of the soil-water management research in the past has been conducted from a purely technical/engineering view point. SAFGRAD phase I (ICRISAT soil-water management; IITA agronomy) has been more realistic in that respect, though still the disciplinary scope was too narrow and its linkage to small farmer realities in Africa was weak; consequently the large scale adoption of these research results is unlikely.

Major reasons for the weaknesses in resource management research are probably the following:

- its site specificity and consequently the limited transferability of technologies;
- its complexity, because of the many interactions

- between different technical disciplines as well
- as with socio-economic factors at the farm level;
- its long-term experimental requirements under both on-station and on-farm conditions.

A contribution by SAFGRAD in solving these problems would be desirable. This would require a strengthening of its resident research programs with disciplines such as crop and cropping systems physiology/ecology; long-term fertility management (involving both chemical and organic means); land and water management/engineering and socio-economics to provide a vital link to the needs and means of major farmer target groups. This expertise could be acquired by a modest expansion of the resident research programs (both at Ouagadougou and Nairobi), while at the same time shifting the emphasis of the on-going crop agronomy programs and establishing closer collaboration with other organisations in this field. By bringing together institutions like CIRAD (water-balance studies - the former IRAT program in Ouagadougou) AGRIHYMET and ORSTOM (zonation and hydrological questions), the ICRISAT Sahelian Center (for zonation, soil physics; animal traction/mechanisation), ILCA on crop-livestock interactions and ICRAF on agroforestry, SAFGRAD would play an important coordinating role both at regional and national levels.

The SAFGRAD Resource Management group should emphasize/stimulate regional activities on the following topics:

- i formulation of rather broad, major agro-ecological zones on which resource management research should be focussed;
- ii inventory of past and on-going research programs and their scientific manpower for the different member countries to identify existing strengths and gaps;

- iii a multidisciplinary approach through which integrated technologies acceptable to farmers can be developed (e.g. the use of cropping systems rotations and/or patterns in combination with land management such as anti-erosion bunds and tied-ridges to reduce runoff);
- iv the development of methodologies and installation of experiments designed to follow the long-term evolution of soil productivity under different farm management systems;
- v a farming systems perspective and focus on major different farmer target groups to ensure that the developed technologies are technically, socially and economically acceptable to the rural population.

Ideally the regional research team would eventually conduct a modest resident program and funnel most of their activities through the National programs; thereby strengthening those efforts and ensuring complementarity and information exchange between these programs and other regional efforts (e.g. the CIRAD soil moisture balance studies; ILCA, ICRAF, ICRISAT etc).

4.3.2 Commodity research

The present Commodity research involves the crop improvement programs for the major food crops of maize, sorghum, millet, cowpea and groundnut in the semi-arid zones of Africa. However some major crops of more regional significance like Bambara groundnuts in West Africa and Teff in East Africa particularly Ethiopia are not included while their economic importance is large.

In terms of specific problems, major yield losses due to Striga are reported for all cereal crops and cowpea while increasing problems with streak virus and termites occur for maize.

The research scene is dominated by three major actors:

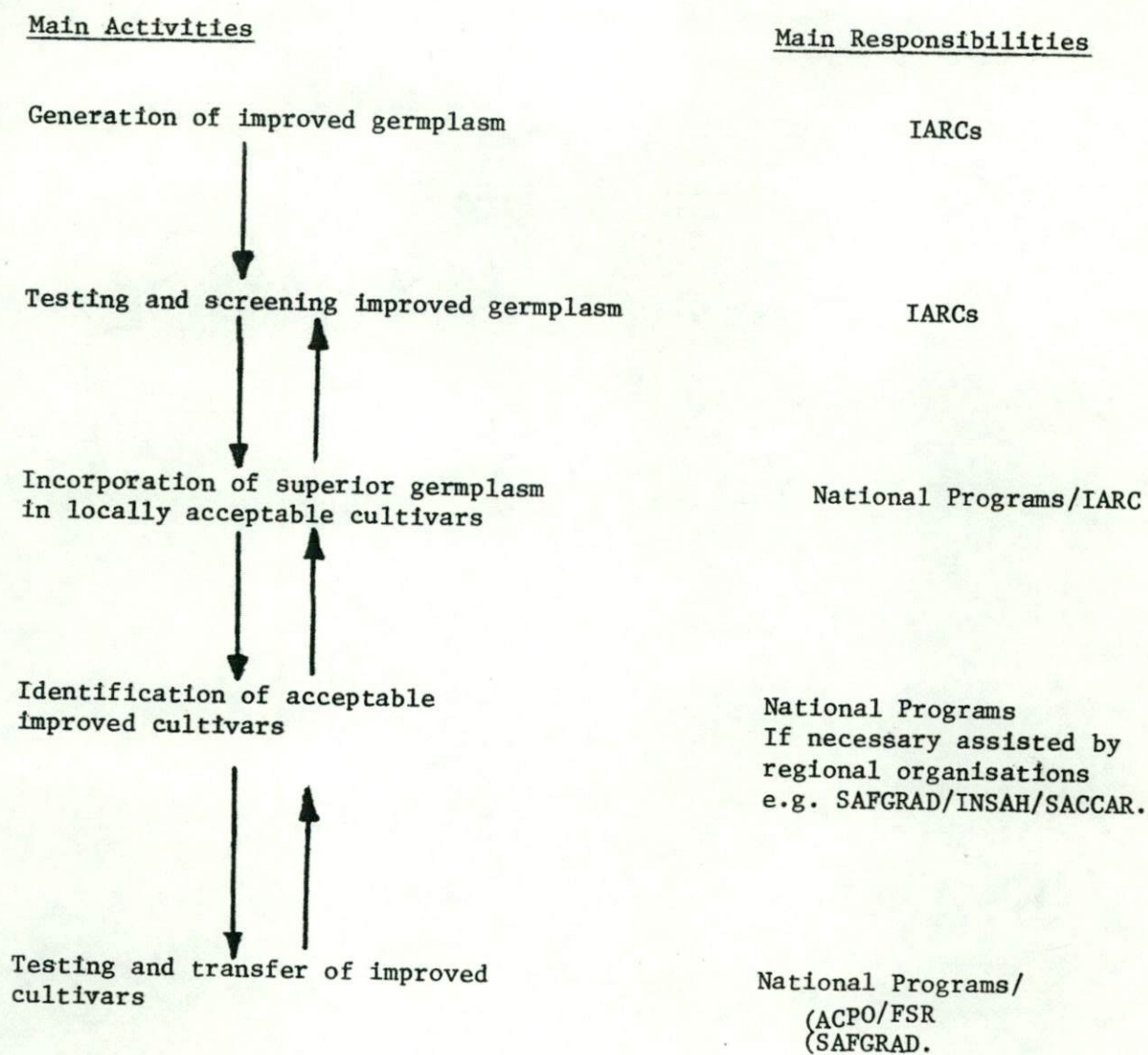
- international agricultural research centers mainly ICRISAT and IITA; to a lesser extent CIMMYT;
- regional programs (INSAH; SAFGRAD; SADCC)
- national programs.

Ideally the international programs are to provide national and regional programs with a wide array of improved germplasm of high yield potential and/or with specific disease and pest resistance, and tolerance to major environmental stresses (moisture stress; high temperatures, wind, soil crusting, or soil fertility constraints etc). Subsequently, the National programs are charged with directly utilizing and/or incorporating this germplasm in their local cultivars. (See Figure 2). In the absence of strong National Programs and because of the Centers' desire to show an impact of their work in the on-farm situation, IARCs have in several countries accepted adaptive research responsibilities, which, however, should be seen as a transitional phase towards building-up a National research capability for a specific commodity.

The development of adapted high yielding improved cultivars for the major food crops obviously involves various stages; each having specific testing/experimentation requirements.

While the generation of improved germplasm would require screening against specific biological and environmental stresses in a relatively few, well chosen "hot-spots", the testing of improved varieties for adaptation and consumer acceptability by National programs would involve many more locations. Because the former activity forms the ground work for all subsequent crop improvement work, these studies need to be conducted most accurately and with adequate facilities; the organisation of this activity would therefore logically fall under the responsibility of the respective IARCs.

Figure 2: Scheme for Technology generation process for crop improvement.



As a first and immediate response to the above problems SAFGRAD has introduced the concept of "Accelerated Crop Production Officers" (ACPOs), to bridge the gap between research and extension with respect to technology transfer as will be discussed in section 4.4. However, an efficient technology transfer process needs the continued support of a technology generation effort based on both on-station and on-farm research.

It has been in this on-farm domain, where food crop technologies need to be integrated into the overall farming system (often involving long term aspects of crop-livestock interactions, agroforestry and resource management as well as socio-economic considerations) that National programs have shown critical gaps.

Well-staffed interdisciplinary international programs have also experienced the frequent rejection of technically and economically sound technologies by farmers, which would underline the need to involve the social disciplines to a greater extent than was done in the past.

The actual situation in most National Programs is:

- fragmented research programs missing both the interdisciplinary and "Farming Systems" perspectives.
- inadequate appreciation of existing farming systems and their various constraints.
- the frequent lack of scientists in socio-economics disciplines able to work in on-farm situations.
- critical shortage of scientists able to provide interdisciplinary linkages essential to any systems approach notably in the areas of crop-livestock interactions/agroforestry/land-water-fertility-plant relations.

These conditions seriously jeopardize the Farming Systems Research (or "Recherches Système de Production") efforts started by most of the National Programs in recent years.

However the generation of specific, adapted, improved varieties, their testing and transfer to farmers should increasingly involve the National programs in collaboration with regional organisations. In this latter area, the mission has observed considerable overlap and duplication of efforts between IARCs/National Programs/Regional organisations/and Development projects. It is suggested that IARCs limit their activities in this area, that regional organisations collaborate in designing common trials (SAFGRAD-INSAH;; SAFGRAD-SACCAR) and that National programs guide to some extent the presently often haphazard testing done in Development projects. The various international and regional trials should be accompanied by clearly stated objectives.

4.3.3 Farming Systems Research/on-farm research.

In the past, agricultural research has been conducted mostly on experiment stations away from the realities of day-to-day farming. Consequently many researcher developped "improved technologies" overly concerned with yield maximization of single commodities proved inappropriate and were rejected by farmers. Moreover, even appropriate technologies would not reach the farming community because of the frequent communication gap between Research and Extension. The recognition of these problems has led to increased emphasis on:

- i interdisciplinary research involving different technical and biological disciplines as well as socio-economic aspects of farming;
- ii on-farm testing/research of promising improved technologies as a means to provide feedback information to research.

Both these developments are totally logic but do pose serious problems to most national programs operating under severe constraints of trained scientific manpower, funds, and facilities.

Against this background, the mission has found very positive responses to the SAFGRAD/IFAD initiative to strengthen National FSR programs with specific missing disciplines (Burkina Faso: agricultural economist, livestock specialist and soil scientist; North Cameroon: agricultural economist, agronomist and hopefully in the future a social scientist).

For this strategy to be effective in the long run, it must be combined, however, with training (both on-the-job and degree training) of counterparts. Moreover, the posted experts should be fully integrated into the National research effort and should contribute to the linkage of the National program to various network activities.

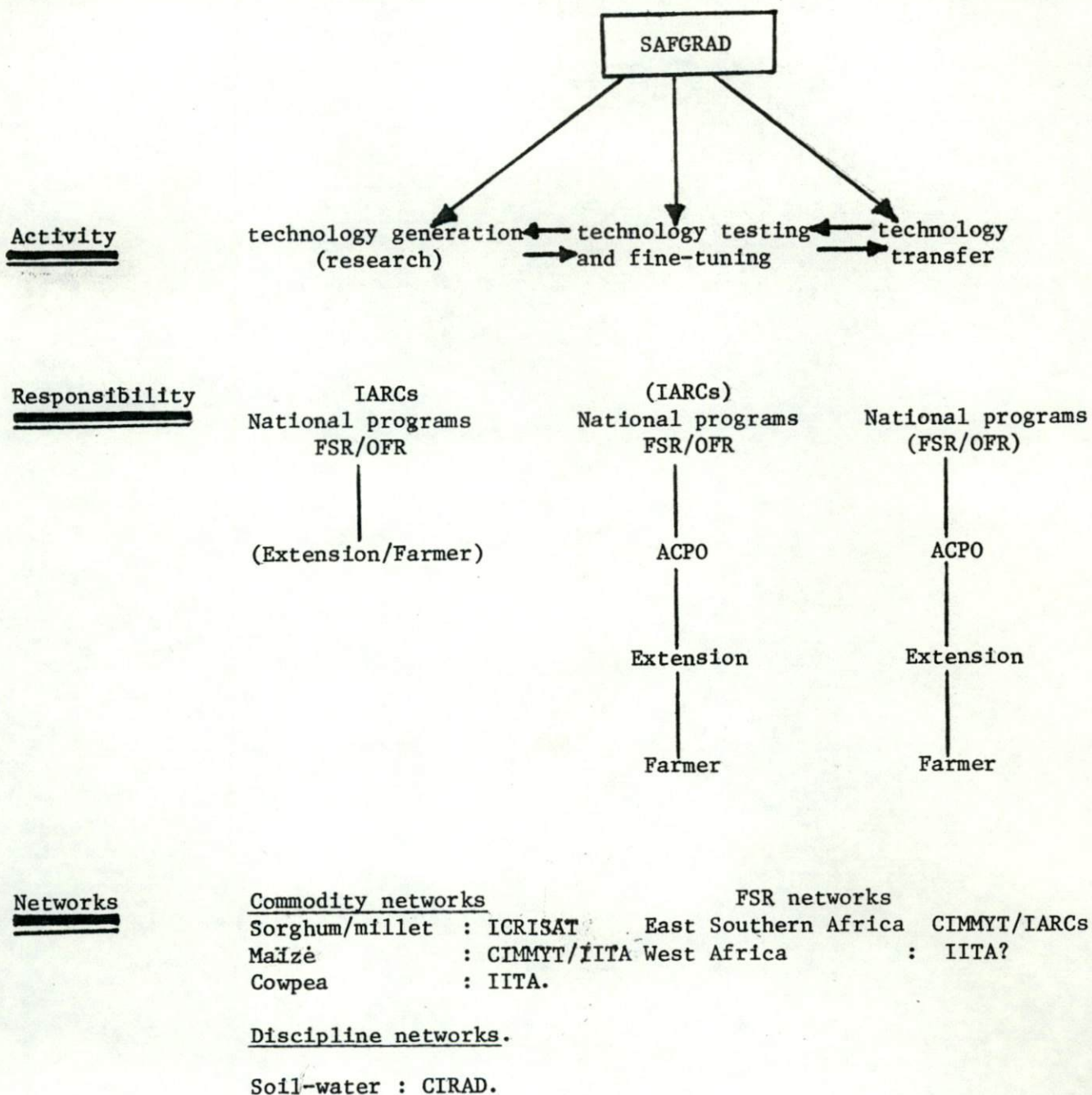
The mission feels that this type of assistance is much needed and is an effective way to implement the SAFGRAD objective of strengthening National Programs (as illustrated in Figure 3). In addition, this support should be exploited to generate feed-back information which is vital to SAFGRAD in performing its coordinating role. Therefore, the mission recommends that SAFGRAD explores ways to further expand this part of the project in its second phase.

4.3.4 Research networking.

In view of the immense problems, the limited funds and lack of sufficiently trained scientific manpower of National Programs to handle these problems, the exchange of information on research methods, approaches and results becomes extremely important. To achieve these exchanges networking efforts were started during the first phase of SAFGRAD. This involved:

- distribution of a SAFGRAD newsletter;
- organisation of annual workshops for
 - a) sorghum and millet (in collaboration with ICRISAT)
 - b) maize and cowpea (in collaboration with IITA)
 - c) farming systems research (in collaboration with ICRISAT, Purdue University, IRAT);

Figure 3 Scheme: SAFGRAD Coordinating Activities and Collaborating Institutions.



- monitoring tours (mobile workshops) during the cropping season;
- organisation of regional trials.

Though the principle of networking is sound, one must be sensitive to two major constraints in the present set-up:

- a the workload for organizing the various networking activities has been carried mostly by the international research staff. As remarked in the IITA/SAFGRAD report (1984), present staff levels do not permit the simultaneous organisation of both a strong resident research program and a regional research network.
- b the limited number of national research staff are confronted with large demands on their available time and resources to participate in international workshops and conducting international trials.

Because of the limited resources, these demands may well interfere with the organisation of a national research effort aimed at solving specific constraints in the local agriculture.

In its coordinating capacity SAFGRAD should play a major role in solving the above-mentioned conflicts of interests. As a first step it would be important that all member countries appoint a fairly high level liaison person who will coordinate the various SAFGRAD network activities for his country and who will feedback his country's specific research needs to the SAFGRAD organisation.

Likewise SAFGRAD would require a strengthening of its staff (both at the Ouagadougou office and in the Nairobi Regional Office) to handle the increased workload associated with networks.

With respect to specific networks there are many on-going activities: most of the major food crop commodities are presently organised or being organised by the international centers on a regional basis (maize and cowpea in West Africa by IITA; maize in East and Southern Africa by CIMMYT; sorghum and millet by ICRISAT in the West, East and Southern African regions). Likewise networks on Farming Systems Research are operated by CIMMYT in East and Southern Africa and are being organised by IITA/IRAT in West Africa, while a soil-water management network for semi-arid Africa is being created through CIRAD (see Figure 3).

While SAFGRAD may want to consider the creation of additional networks for instance on "resource management research" and "technology transfer" these would risk to partially duplicate the on-going activities. Therefore it might be more advisable for SAFGRAD to serve as linking agency between these different regional African networks and their participating national programs. SAFGRAD would thus provide an overall coordination through its regional research support and through its assistance to National programs in specific areas of weakness in research and its linkage to extension (illustrated in Figure 3).

SAFGRAD's participation (as a co-sponsor or partner) in the various networks would be an important contribution and would aid in its capability to identify specific research gaps and strengths in various member countries. Filling these gaps through technical assistance (see the FSR and ACPO programs) exchange of information and various forms of training (section 5) will provide an overall integrated form of networking for the African semi-arid zone as a whole and which could be highly profitable.

4.4 Technology transfer.

4.4.1 The Role of ACPOs.

Throughout the mission, in both francophone and anglophone countries, technology transfer and the linkage between Research and

Extension has been cited as a major constraint to increased agricultural production. SAFGRAD's response to this problem, through the use of "Accelerated Crop Production Officers" (ACPOs) was valued highly by the National Programs in Cameroon and Mali which had active ACPO programs. Moreover, other international institutes like ILCA and ICRAF indicated their interest to collaborate closely with such ACPO programs.

In spite of these positive responses, the mission needs to make some critical comments on the ACPO programs visited in Mali and Cameroon (see also Appendix III - Country Reports):

- the ACPO domain of linking Research with Extension is basically too wide to be handled effectively by a single officer; consequently existing ACPO activities have focussed mainly on annual campaigns of multi-location on-farm varietal testing.
- because of heavy involvement in annual varietal testing, a vital long term perspective which would emphasize resource management including soil-water and soil fertility management, agroforestry and crop-livestock interactions is virtually missing.
- both the Mali and Cameroon ACPOs are dealing with large numbers of trials (280 and 200 respectively which are executed through collaboration with Extension Service (thus involving important training aspects).

However, because of this heavy workload, the farmer feedback and data interpretation are limited to yield comparisons; secondary characteristics like grain quality, storability, socio-economic aspects and policy implications of tested technologies as well as follow-up efforts to evaluate farmer adoption in subsequent seasons are not included.

- by comparing only two varieties, or improved technologies in large plots (1/4 ha each), the scope of the program becomes basically very narrow, leaving farmers with very little choice on alternatives to their present practice. However, for farmers to cope best with the very diverse and variable semi-arid environment requires a flexible attitude involving a wide range of technological alternatives (in terms of varieties and cultural practices).

The mission felt that the ACPO programs are making a very valuable contribution at present but that these programs could be strengthened if they would concentrate on fewer trials in fewer (but well-selected and contrasting) locations. In that case greater emphasis to farmer feedback and a concern for the fitting of improved technologies into the local farming systems (as a complement to the present yield criterion) could be included. ion

The missing link between research and extension, common to most African countries, can initially be tackled through an ACPO program. However because of the wide range of issues involved, ACPO programs should either evolve towards more complete FSR programs or work in close collaboration with FSR. With FSR program established, the ACPO would increasingly serve as a Liaison with extension, through training extension agents in multilocation demonstration trials, without responsibility for detailed follow-up activities (already covered at an earlier stage by the FSR team).

Finally, the level of success of ACPO programs will obviously be greatly influenced by the quality of results generated by the research programs as well as by the strength of collaborating Extension services. Even the few countries visited during this mission differed greatly with respect to their institutional organisation, availability of trained manpower and facilities, scope and strength of agricultural research and extension.

Consequently we feel that a standardization of ACPO programs is undesirable, but annual meetings among ACPOs, preferably in combination with the FSR meetings, are considered essential.

In view of the general weakness of technology transfer and Research-Extension linkages in African countries and the need for the SAFGRAD Agency to focus its efforts on a few major and critical domains, we strongly feel that this part of SAFGRAD program should be strengthened along with the earlier recommended FSR activities. Thus though ACPO responsibilities should be carried preferably by National Programs, SAFGRAD should also be able to provide funding to initiate additional ACPO programs (e.g. in collaboration with SADCC in Southern Africa) and prevent existing ones from collapsing. Moreover regional exchanges (visits) among programs (ACPOs, their staff and/or counterparts) should be stimulated.

4.4.2 Seed multiplication units.

The problem of seed multiplication of improved varieties for experimental purposes and/or for extension was frequently cited as a problem (Mali, Cameroon, Burkina Faso). The mission however considered seed multiplication of open pollinated varieties as an organisational rather than a technical problem. Moreover the seed multiplication area, provided profitable high yielding varieties are available, should be considered a typical domain of independent private enterprise. Consequently the mission believes that SAFGRAD should limit its involvement in this area to assistance (through ACPO) to development and extension agencies.

4.5. Linkages

Because of its regional coordinating and gap-filling roles in the agricultural research/development mandate area, strong linkages of SAFGRAD with National programs and with other technical and funding agencies (bilateral and multilateral) are vital. In order to be fruitful, these linkages will require a minimum investment of time in collecting and exchanging base information between the various partners.

a Linkages with National Programs.

In view of its mandate to strengthen National Programs of member countries SAFGRAD, as an African organisation supported by OAU, has a major task to establish regular contacts and to build-up an information base for each country. Since this is a complex task, SAFGRAD should, whenever possible, make use of already available sources such as the ISNAR data-base on various countries and of the ISNAR country review reports.

SAFGRAD should be sensitive to the fact that National research priorities will frequently differ substantially from those considered desirable by regional, international and/or discipline/commodity oriented research institutions. Since the resources of National programs are often very limited, there should be a concern that these are not blocked by projects of limited importance to national objectives.

In this area SAFGRAD could eventually play an important mediating role between National Programs and for instance the IARCs.

In order to facilitate effective linkages with National Programs, it would be important for SAFGRAD to have a permanent and fairly high-level contact person in each country (preferably the Director of the National Research Institute or his Deputy; see also section 4.2). This contact person should be responsible for providing the SAFGRAD Coordinating Offices (Ouagadougou or Nairobi) with all relevant information about his country's research programs, manpower status (technical and scientific), research facilities and funding, and signalling critical needs and research gaps. Moreover this contact person would be the intermediate between SAFGRAD and relevant Ministries

as well as with various national research programs and respective scientists; as such he would assist in the coordination of visits by SAFGRAD personnel.

b Linkages with donors.

Regular contacts with donors (multilateral and bilateral) to inform them about SAFGRAD programs and to explore possible availability of funds for various projects identified in the different member countries, should be part of SAFGRAD activities. Moreover, SAFGRAD should be aware of specific preferences of donors for certain countries or regions, as well as their preferences for special types of assistance (e.g. training; production systems; organisation of short term courses etc.).

c Linkages with international research institutions.

SAFGRAD already has well established links with two IARCs, i.e. IITA and ICRISAT, which implement various critical research programs through USAID funding as part of the SAFGRAD project. Within the framework of the SAFGRAD/IFAD funded FSR activities, collaboration with ICRAF on agroforestry is likely in the very near future.

Likewise ILCA has a number of projects/networks on livestock related studies, which could be of critical importance to SAFGRAD-FSR activities, in particular the projects on:

- Research on crop residue and by-product utilization
- Pasture agronomy
- Small holder mixed farming
- Animal traction.

With the appointment of an animal specialist under the SAFGRAD-FSR project with Burkina Faso a linkage to these projects would be important.

The mainly applied and production oriented research programs of SAFGRAD should ensure that the results of more basic research, conducted on the soil-water balance by CIRAD: on agroclimatology and hydrology by ORSTOM and AGRIHYMET are fully utilized in increasing the understanding of the SAT environment. SAFGRAD linkage to these research institutes (particularly through its FSR and ACPO programs) would contribute to the wider utilization of their research results and to improved feedback about farmer level constraints associated with various improved technologies. Moreover, most member countries know strict institutional barriers (e.g. between crop production, livestock and forestry research; between research and extension), which might be reduced through interdisciplinary SAFGRAD-FSR and ACPO activities as reinforced by links to various IARCs.

d Linkage to Regional networks (INSAH/CILSS/SADCC/SACCAR)

Particularly in the West African region, there appears at present a considerable overlap between SAFGRAD and INSAH/CILSS. However our impression is that with some minor shifts in emphasis both programs could achieve a considerable degree of complementarity (see Appendix III: Comments on Mali visit). Because of SAFGRAD's limited activities in Eastern and Southern Africa no such similar situation has yet developed with SADCC/SACCAR. In view of the present agreement about research coordination between IARCs under SADCC, SAFGRAD's role in Southern Africa would be in the areas of -

- i. Strengthening Research-Extension linkages through ACPO programs, and
- ii. improved inter regional communication between the different African SAT regions, through SAFGRAD sponsored workshops, conferences, study tours, Group Training, etc.

To assure a proper complementarity of activities SAFGRAD should explore the specific needs for ACPOs in each country together with the SADCC coordinating office and with the specific National Programs.

e Linkages with various U.N. agencies (UNDP, FAO, UNSO, PAM).

Linkages with the U.N. agencies can be important for two reasons:

- as a possible funding source for regional projects (UNDP-UNSO); training fellowships and organisation of workshops/conferences;
- for exchange of information about agriculture and its practical problems and research needs in the SAT (FAO, PAM).

Consequently the linkage between these agencies and SAFGRAD, which is at present not particularly strong, may evolve in the future through increased contacts (participation in workshops and exchange of reports).

5. TRAINING AND AGRICULTURAL RESEARCH INFORMATION DISSEMINATION.

5.1 Training

5.1.1 Introduction

In Africa, the acute shortage of adequately trained and experienced manpower namely researchers, research managers and technicians, remains a major barrier to rapid progress in agricultural development and production. Without a cadre of well trained and dedicated professionals in all aspects of agriculture, independent national and/or Regional agricultural research and development cannot be successfully executed. Even in a few African countries where scientific manpower is available, there is considerable underutilisation or misplaced deployment of expertise. Additionally, national and regional research institutions need to be strengthened and fully developed, while steps should also be taken to create the research environment to instil in the African researcher, the professional conscience necessary to build a strong research activity within his region. African countries need to give absolute priority to manpower training and development so that they could build up their critical mass of indigenous agricultural research capabilities in the shortest possible time, in view of the need and urgency to move ahead rapidly in agricultural production.

Achievement of the objectives of SAFGRAD aimed at strengthening the capabilities of national programs of member states would rely heavily on the availability of relevantly trained indigenous researchers, technicians and extension agents. These are the people who would actively generate and transfer the technologies which are required to encourage increased agricultural production.

5.1.2 SAFGRAD Training Activities.

Since its inception, SAFGRAD initiated a training entity for African researchers and technicians, as an important component of its overall

program activities. The training program in SAFGRAD I was made up of the following components:

- . Short term training involving the improvement of crop production skills both in laboratory research and in the field. This training was organised primarily through research contracts with IITA and ICRISAT where participants were trained in the institutes headquarters at Ibadan, Nigeria and Hyderabad, India or at the Kamboinse research station in Burkina Faso.
- . Long-term training which involved attendance of participants at formal courses in institutions of higher learning and leading to the acquisition of Masters and Doctorate degrees. The FSU research contract arrangement with Purdue University USA provided opportunity for this kind of training. Hardly any African University has so far been utilised for degree training.
- . Other activities with strong training elements include:
 - ACPO Field-day and Workshop
 - research networking
 - symposia, workshops and conferences.

SAFGRAD I training achievements are specified in the SAFGRAD 1983/85 Progress Report as follows:

"... as at 31st March 1985, SAFGRAD has succeeded in training about 30 scientists at higher degree (M.Sc and PhD) levels in various aspects of food grain research and production in the semi-arid regions of sub-Saharan Africa. The areas of training cover agronomy, plant breeding, agricultural economics, soil science, crop protection,

plant nutrition and agricultural engineering. With regard to short term training lasting a few weeks to six months, more than 80 candidates have participated in courses ranging from laboratory methodologies to various aspects of field training. This category of training has been achieved partly through the cooperating institutions - ICRISAT, IITA and Purdue University".

Comments.

- i. The SAFGRAD I training activities have made modest contributions to manpower needs at various levels in national and regional programs.
- ii. SAFGRAD training efforts are regarded as complementary to other training activities of national and bilateral funding agencies within the SAFGRAD mandate area and should therefore be encouraged and strengthened.
- iii. Although training is considered a priority entity of SAFGRAD's Program, coordination of training has not been formalised within the SAFGRAD coordination office at Ouagadougou.
- iv. Training does not seem to have been programmed on the basis of information provided by detailed appraisal of the manpower needs of SAFGRAD member states.
- v. Monitoring of progress and evaluation of training have received rather limited attention.
- vi. Records available show that during the period of SAFGRAD I, an average of 2.5 researchers/country and 4.0 technicians/country were trained in only 15 out of 25 member countries.

These are only modest contributions towards strengthening the manpower capabilities of national programs.

- vii. The problem of shortage of trained manpower, however, remains acute and widespread in many countries in semi-arid Africa. SAFGRAD's preliminary projections for training in the next 10 years indicate plans to involve a minimum of 264 people on short-term and 85 people on long-term training programs to provide the manpower inputs considered necessary to sustain food grain research networks in semi-arid Africa. The situation thus calls for establishment of a dynamic and directional manpower development and training program in SAFGRAD, and a drastic improvement of coordination of training activities.

5.1.3 Recommendations

In view of the crucial role of training in strengthening national and regional programs and institutions, we recommend the following major objectives, goals and activities for a formalised and expanded training component for SAFGRAD activities in the years ahead.

a Training Objectives.

- . To assist SAFGRAD member states to increase their indigenous manpower research capabilities in all aspects of agricultural research and development.
- . To contribute, in consultation with member countries, to strengthening of agricultural training institutions through manpower development proposals.

- . To establish formal working arrangements with selected African Universities and other African Institutions of higher agricultural education in order to utilise them for specialised and relevant training of African agricultural researchers and technicians.
- . Coordinate the training of persons capable of dealing with the problem of technology transfer to small scale African farmers.
- . Contribute to the development of African research capacity to formulate, implement, organise and manage and to evaluate applied research programs.

b. Goals

The goals to be achieved by a well coordinated SAFGRAD training program are outlined as follows:

- . accumulation of reliable data on the actual manpower situation and subsequent training needs of SAFGRAD member countries. This would form a data-base for agricultural development planning for increased food crop production.
- . establishment of an appropriate procedure for the effective selection of potential candidates for training.
- . Effective coordination and monitoring of progress in training and appropriate placement of trained researchers and technicians in national and regional programs.

- . Establishment of a mechanism of follow up action to evaluate the impact of trained personnel on the performance of national and regional agricultural programs.
- . Development of adequate resources in national and regional African institutions to provide local and relevant training to African researchers, technicians and extension personnel.
- . Build up of indigenous African capabilities in the formulation, organisation and successful management of agricultural research in the semi-arid zones of sub-Saharan Africa.

c Program Activities.

i. Definition:

The activities which are now specified concern the overall formal organisation of training within the permanent structure of SAFGRAD Agency.

We define training to include the following:

- . Long-term degree training which should be undertaken, preferably in African Universities and other local institutions of higher learning and aimed at the acquisition of M.Sc and PhD degrees. Such training should be organised so that the research component of the training is undertaken within national

or regional research programs in any of the SAFGRAD member countries.

This arrangement would provide the opportunity for trainees to be fully exposed to and thus appreciate the problems which they would encounter in their work on completion of training. In addition, this arrangement removes the problems of adjustment and reorientation which African Scientists, trained under conditions markedly different from the circumstances of their home continent, contend with on their return from training abroad.

- . Short term individual training for researchers and technicians on specific techniques in collaborating International Agricultural Research Centres and other institutions.
- . Formal Training of Technicians and technical support personnel in local and oversea institutions.
- . Training Workshops, Seminars, study tours, Symposia and conferences, for researchers, ACPs, national and regional scientists and outreach personnel (extension).
- . Group Training involving 2-4 weeks training for small groups of people (10-35) in special subject areas.

- . Informal training through the provision of facilities for research information publication, exchange of ideas and sharing of experiences.

ii. Organisation.

To implement a successful training program, the Training and Information Dissemination component of SAFGRAD activities should be formalised and the Headquarters Office of SAFGRAD in Ouagadougou should be strengthened with the appointment of a Director of Training and Information. The job description of this senior SAFGRAD personnel is given elsewhere in this report (see section 6.3). Priority activities of this component would be to:

- . undertake a detailed assessment of the manpower training needs in agricultural research and development for all SAFGRAD member states.
- . compile detailed dossiers of the capabilities of training institutions and courses available within Africa.
- . on the basis of information obtained from the above, prepare in consultation with national and regional program directors, training program plans for each region in the SAFGRAD mandate area.

- . determine the sources of trainees and establish a speedy procedure for selection of candidates for training.
- . establish collaborative arrangements with local and regional institutions for mounting relevant training programs and admitting SAFGRAD trainees.
- . explore all possible sources of funding to implement training programs.

iii. Subject Areas for Training and Distribution of Trainees.

In a preliminary outline master plan document prepared by SAFGRAD in January 1985, priority subject areas for training and related fields of study in the mid to long term program were given. We have reviewed this list, added more topics, and attempted to prioritize them as follows:

- . Crop environmental resource management (soil conservation, fertility, soil/water management, vegetation management, agro-climatology).
- . Crop improvement/breeding.
- . Crop Protection; Integrated Pest/Disease management.
- . Agricultural engineering, including Animal Traction.
- . Agricultural Economics
- . Extension Agronomy and Seed production Technology.

- . Sociology and Anthropology
- . Agroforestry and Forage Agronomy
- . Crop/Animal Production
- . Research Management and Computerisation.
- . Crop Storage and Food Processing technology.

The needs of the different SAFGRAD countries for training in different subject areas will vary and this should form the basis for selecting trainees in the different subject areas. The distribution of numbers of trainees to the SAFGRAD member states and to subject areas should be carefully worked out in order to avoid wasteful over emphasis on a particular subject area and bias in favour of some member countries.

iv. Funding

The successful implementation of the recommended expanded SAFGRAD training program demands that adequate long term and steady funding should be guaranteed. We identify, among others, the following sources of funding which should be fully exploited for servicing SAFGRAD's Training Program.

- i. The allocation of a separate training fund within the core budget of SAFGRAD.

This could be sought from the OAU headquarters through the OAU/STRC, the ECA, CDA, and UNDP etc.

- ii. Bilateral funding arrangements between foreign donors and SAFGRAD member countries.

- iii. The training component in research contract arrangements with IARCs like IITA, ICRISAT, ILCA, ICRAF etc.
- iv. Fellowships negotiated with United Nations agencies like FAO, UNSO, UNEP etc. on SAFGRAD collaborative programs.
- v. National programs within SAFGRAD countries.

5.2 Agricultural Research Information Dissemination

There is considerable agricultural research activity in the semi-arid zone of Africa with several agencies supporting research in national and international research centres.

In many instances the exchange of information between agricultural research organisations and researchers is strongly limited. Newsletters, Research Briefs, Research Highlights etc., are regularly produced by different organisations and agencies. These publications provide useful but restricted information about research activities; their distribution also tends to be confined mainly to specialists. Several conferences, workshops and symposia etc., are held regularly on a wide range of topics all over the region and the proceedings are often published very late, sometimes up to 2 years after the event. When proceedings are published late and are poorly distributed, they tend to be of limited use to researchers.

We note that research information published at the appropriate time and readily available to the researcher remains an essential tool for the design and implementation of research. It is also useful for professional training, reduces wasteful duplication of experiments and raises the standard and quality of agricultural research. Availability and widespread dissemination of research information to researchers increases their awareness of the range of research activities taking place within and outside their region and reduces "scientific isolation".

During this mission we noted a serious lack of scientific communication, not only between regions but also within the same region.

We also noted the very obvious absence of well produced agricultural journals where researchers and technicians in semi-arid sub-Saharan Africa could regularly publish their research findings. The regular publication and effective distribution of agricultural journals, bulletins and proceedings of specialised scientific meetings would provide African scientists with a "home base" opportunity for publication and dissemination of their research findings to a truly relevant audience.

There are several constraints which are responsible for the present poor state of agricultural research publication in Africa but full consideration of this matter is outside the scope of the present assignment.

Major components of SAFGRAD objectives are regional coordination of research and strengthening of national and regional programs through training, workshops, conferences, seminars etc. Publication and effective dissemination of research information are recognised as powerful tools for facilitating SAFGRAD's efforts to achieve these objectives. The establishment of a strong publication and information dissemination system within SAFGRAD would contribute significantly to reducing "scientific isolation" of researchers in semi-arid Africa and provide a publication focus for research activities within the SAFGRAD mandate area.

Since we have regarded the organisation of workshops, conferences, symposia and study/monitoring tours as components of the overall training program of SAFGRAD, we recommend that publication and information dissemination throughout SAFGRAD mandate area be formally organised and be the full responsibility of the proposed Director of Training and Information.

6. MANAGEMENT OF SAFGRAD

6.1 INTRODUCTION

The tenth term of reference of our assignment specified that we study the present organisation of the SAFGRAD coordination office in Ouagadougou and make recommendations on any modifications which are necessary to enable the office effectively perform its Africa-wide coordinating functions. This section specifically addresses this term of reference.

The organisational effort of SAFGRAD co-ordination office should be examined against the background of the functions it is expected to perform and the goals to be achieved in the context of the special African and international environment within which SAFGRAD operates. First we describe the present arrangements in the SAFGRAD office and then we comment on certain features of the SAFGRAD operational environment to give a background to our recommendations for an organisational framework for the coordinating office. These comments will be followed by an outline of our proposals for an organisational structure for the coordination office which we consider adequate for effective management of SAFGRAD.

6.1.1 The Present Organisational Structure

The present office in Ouagadougou is the coordinating office of OAU/STRC SAFGRAD program and is headed by an International Coordinator. Within this office, the only other senior management personnel are one Director of Research and a Financial Controller. They are assisted by a small core of support staff. This office has the total responsibility for the organisation and management of the SAFGRAD Project under the general overview of the OAU/STRC office in Lagos. The project now covers 26 African countries stretching from Cape Verde islands in West Africa through Tchad in Central Africa to Kenya, Zimbabwe and Botswana in east and

Southern Africa. There is a coordinator for SAFGRAD's East and Southern African sorghum and millet program, based in Nairobi, Kenya.

This Coordinator reports directly to the Ouagadougou office.

We observe that the coordination office responsibilities are broadly as follows:

- . Coordination of research to meet the set objectives of SAFGRAD and liaison with the OAU/STRC office in Lagos.
- . Coordination of the on-farm field testing of technologies developed from research through national program participation of member countries.
- . Organisation of regional networking and information interchange amongst researchers in sub-Saharan Africa.
- . Promotion of SAFGRAD concept and activities among international donor agencies and African member states.
- . Coordination of training programs.
- . Administrative arrangements for CC and TAC meetings and preparation of SAFGRAD progress and annual reports and newsletter.
- . Organisation of symposia, conferences and workshops.
- . Financial management of project implementation.

Every effort is being made by the incumbent international coordinator, the director of research and their team in Ouagadougou to perform these functions as effectively as possible within the resources available to them.

6.2 SAFGRAD operating environment.

Some comments on the special features of the SAFGRAD operating environment are pertinent to bring into perspective the magnitude and

complexity of the conditions under which SAFGRAD is expected to perform in order to achieve its objectives and goals.

The present mandate area of SAFGRAD covers 26 African countries in semi-arid sub-Saharan Africa. The area is vast and stretches over a wide range of climatic and ecological zones. Communication systems within the zones are rather inefficient and many parts are virtually isolated. Air travel connections are highly limited and often unreliable, time consuming and therefore expensive. For example Maroua in Northern Cameroon is virtually cut off from Ouagadougou in spite of both towns being within West Africa, with travel between the two towns taking at least 2 days.

These problems of poor communication and unreliable flight connections within the wide expanse of the SAFGRAD mandate area are very real barriers to easy coordination of SAFGRAD operations and these difficulties should not be underestimated.

During the field mission to Cameroon and Kenya the difficulties of effective coordination with the present complement of staff at Ouagadougou and the problems of communication in Africa were highlighted.

There are also very distinct differences in administrative procedures in the various SAFGRAD countries and political ideologies are also markedly different.

In an early section of this report, see section 4.1, we redefined the objectives and goals of SAFGRAD and delineated the functions of the coordination office in Ouagadougou. It can be seen that SAFGRAD has an ambitious program which demands a very strong headquarters office for effective coordination of its Africa-wide activities.

The scope of work and the difficulties of the operating environment make it imperative that the SAFGRAD headquarters office in Ouagadougou should be adequately strengthened and staffed with well qualified, internationally respected and competent senior personnel who should be provided with sufficient material resources to carry the SAFGRAD workload.

6.3 Recommended organisational structure.

The recommendation for an organisational structure for SAFGRAD which now follows takes a number of key issues into consideration.

- i. the transformation of SAFGRAD from a project into a permanent OAU Agricultural Research and Development Coordination Agency for semi-arid sub-Saharan Africa. The case for this development had been made earlier in this report (see section 4);
- ii. the need to strengthen the headquarters of this new Agency with key staff to enable the institution to cope with the workload as specified in its defined functions. We note that the USAID evaluation team made a similar recommendation in 1984;
- iii. ease of effective coordination of activities throughout the vast geographical mandate of SAFGRAD;

In our proposed structure, we have concentrated mainly on the key senior management personnel. We, however, expect that each senior staff will have accompanying staff support as budgets would permit.

The proposed organisational structure is presented in Figures 4 and 5.

1. The SAFGRAD Agency will be under the OAU/STRC office in Lagos, Nigeria.
2. The Headquarters office will be headed by the International Coordinator (already appointed). He will be assisted by a Director of Research (already appointed), a Director of

Training and Information (new), an Administrator (new) and Financial Controller (already appointed); (See Figure 5).

3. The Headquarters office for SAFGRAD Agency should remain in Ouagadougou, Burkina Faso.
4. There should be 2 regional offices, one for West and Central Africa located within the Headquarters office in Ouagadougou and a second regional office for East and Southern Africa located in Nairobi, Kenya. A SAFGRAD regional liaison officer should be assigned to each regional office to coordinate all the administrative and technical activities of the region. The liaison officers will report to the international coordinator.
5. The functions of these key officers are broadly defined as follows:

International Coordinator (appointed)*

- i. Liaison with OAU/STRC Executive Secretary Lagos;
- ii. Liaison with Funding Agencies and Donors;
- iii. Liaison with Directors of National and International Agricultural Research and Development programs;
- iv. Liaison with International Research Institutes and Universities;
- v. Overall supervision of Headquarters office and Public relations.

Figure 4: Headquarters and Regional Offices of SAFGRAD Agency

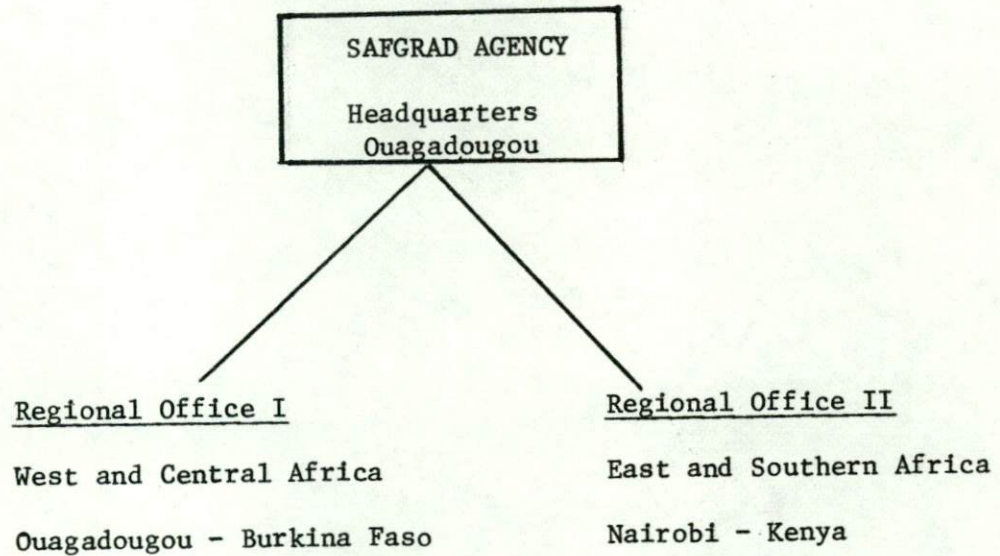
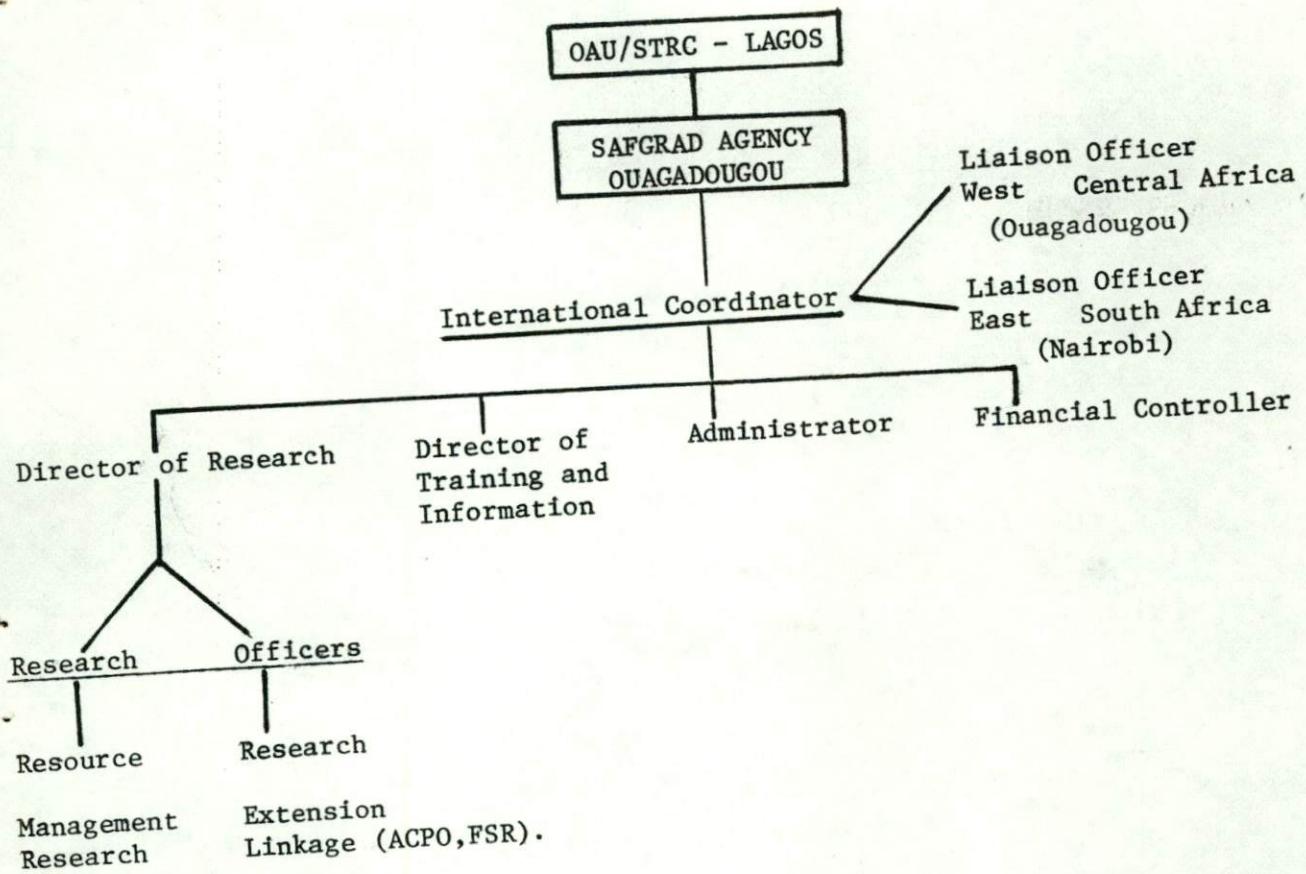


Figure 5: Organisational Chart for SAFGRAD Agency



Director of Research (appointed)

- i. Coordination of all international research activities funded by SAFGRAD;
- ii. Linkage of international research to National needs and strengthening of national research activities;
- iii. Coordination of SAFGRAD efforts in strengthening national extension Services and technology transfer through forging close links between national research and extension by means of ACPO programs;
- iv. Organisation of Regional research Networks.

Director of Training and Information (new)

- i. Coordination of agricultural manpower training needs assessment in national agricultural research and extension programs of SAFGRAD member states;
- ii. Organisation of all training activities and follow up actions:
 - . long term degree training
 - . short term in-service training
 - . technicians training
 - . group training
 - . individual specialised training.
- iii. Organisation of workshops, symposia, conference, study/monitoring tours etc.;
- iv. Coordination of Funding for Training;

v. Production and Publication of Agricultural
information materials

- . Proceedings of conferences, workshops
etc.
- . Journals: scientific journals to
publish agricultural research in
Africa.
- . Newsletters and briefs.
- . Bulletins and annual reports.
- . Other publications on SAFGRAD
activities.

Financial Controller (appointed)

All financial matters.

Administrator (new)

- i. All personnel matters.
- ii. Employment contracts.
- iii. Research contracts.
- iv. Travel arrangements for scientists,
consultants and SAFGRAD staff.

Liaison Officers (new) for Ouagadougou and Nairobi
regional offices:

- . Regular contacts with National
Programs.
- . Back-up support to outposted SAFGRAD
personnel.
- . Feedback of information to Director of
Research and Director of Training and
Information.
- . Promotion of SAFGRAD activities in the
region.

Research Officers (new) (2)

- . Assist Director of Research in coordination of research activities for regional and national programs.
- . Assist in identifying and planning research activities in critical areas of resource management (including crop production) and Research-Extension linkages.
- . Assist in the regional dissemination of research results through reports, workshops, study tours and conferences.

We suggest the following qualifications for guidance in appointment of the new personnel recommended. Qualifications of Recommended Additional SAFGRAD Staff.

Director of Training and Information.

1. Graduate in Agriculture or Biological Sciences with a minimum of 10 years post qualification experience in agricultural research or related disciplines. Should have postgraduate degree preferably a Ph.D.
2. Experience of educational programs and organisation of training courses.
3. Experience in scientific editing and publication.
4. Fluency in English or French and with a working knowledge of the other language.

Liaison Officer.

1. Background in agriculture or Biological Sciences with at least 5 years post qualification experience in agricultural research or related discipline.
2. Fluent in English/or French, and with a working knowledge of the other language.
3. Some experience in management and public relations.

Administrator

1. Graduate in Agriculture or Social Sciences with experience of administration in an academic/research institution.
2. Some management training.
3. Fluency in English or French and with a working knowledge of the other language.

Research Officers.

1. Graduate in Agriculture with at least 5 years post qualification experience. Postgraduate degree preferably a Ph.D essential.
2. Some experience in Agricultural Extension.
3. Experience with scientific writing and editing.
4. Fluency in English or French and with a working knowledge of the other language.

6.4 Regional Offices.

The vastness of the SAFGRAD mandate area covering 26 countries in semi-arid Africa, together with the problems of easy and effective communication within the zone, present major difficulties of coordination from the SAFGRAD headquarters in Ouagadougou. During the mission to Mali, Cameroon and Kenya, the lack of information and appreciation of SAFGRAD's activities were most apparent. Clearly, it is a major task for the Ouagadougou Office with its present organisation and complement of staff to effectively establish SAFGRAD presence throughout the mandate area; in fact it is unrealistic to expect that this could be properly done. There is, however, a crucial need to establish and maintain strong SAFGRAD presence throughout the mandate area, especially for its long-term activities. Our discussions in Nairobi, Kenya revealed the desire of countries in east and Southern Africa for SAFGRAD to intensify operations in the area. In order to undertake effective coordination of agricultural research and development throughout

semi-arid Africa, we therefore recommend the establishment of 2 SAFGRAD Liaison Offices.

- i. Regional Office for West and Central Africa located within the Headquarters of SAFGRAD in Ouagadougou. A liaison officer should be appointed to support the coordination of SAFGRAD activities in West and Central Africa.
- ii. Regional Office for East and Southern Africa: To be fully responsible for coordinating SAFGRAD activities in East and Southern African countries and to report to Ouagadougou. This office should have the following staff complement:
 - Liaison Officer for the region
 - Administrative Officer
 - Regional Training Officer to be in charge of regional training and organisation of workshops, symposia etc.

The Regional Liaison Officers will report directly to the International Coordinator in Ouagadougou.

6.5 Management structure of SAFGRAD.

The management structure of SAFGRAD includes two management bodies, namely the Consultative Committee (CC) which formulates and monitors policies and the Technical Advisory Committee (TAC) which provides guidelines on all research and other technical matters of SAFGRAD; TAC is a subcommittee of CC. After an initial period of inactivity, between 1978 when SAFGRAD started and 1982, both committees have now started to meet regularly due mainly to the initiative and hard work of the incumbent International Coordinator and the Director of Research.

Present Membership and Terms of Reference

Consultative Committee.

Membership of the CC was revised in 1983 and is now composed as follows:

Executive Secretary OAU/STRC	Chairman	1
USAID (donor)		1
Other SAFGRAD donors		2
Representatives from IARC		
IITA		1
ICRISAT		1
African Country Representatives		2
Total membership		8

Secretariat: SAFGRAD International Coordinator

The terms of reference for the CC are:

- . to review overall SAFGRAD project and make recommendations on policy matters.
- . review management, organisation, or technical problems and make recommendations for donors, implementors and participating cooperating countries to follow in seeking solutions to problems.
- . facilitate project implementation and assure sound administrative management and technical practices.
- . serve as a receiving and reviewing body for questions or suggestions from any participating or cooperative party.

Technical Advisory Committee.

The revised membership of TAC is as follows:

Executive Secretary OAU/STRC	Chairman	1
USAID donor		1
FAC/IRAT donor		1
Representatives of African Countries		3
Representatives of IARCs		
IITA		1

Purdue University	1
SAFGRAD International Coordinator	1
Total membership	10

Secretariat: SAFGRAD Director of Research.

Terms of Reference:

- . to review annual research work plans and submit recommendations to the CC.
- . review other research work plans/documentation related to SAFGRAD in the Sudan Sahelian Zone and submit recommendations to the CC on approaches for improvement or coordination of food crop research
- . review annual research work plans for ACPO and submit recommendations to the CC, National Officers and ACPOs.
- . furthermore, based on the OAU/USAID and international institute consultative meetings in Ouagadougou and Brussels, the TAC will review Farming Systems Research results and advise the CC on coordination and approaches of FSR.

Comments and Recommendations.

1. We fully endorse the establishment of the Consultative Committee as the policy management instrument of SAFGRAD. However we have reservations about the present form of the TAC.
2. The terms of reference of both the CC and TAC remain valid.
3. We draw attention to the similarities in the composition of membership of the CC and TAC, and note the possible duplication of representation in these two management committees.
4. We note from the report of the meetings of the CC and TAC of November 1983 and April 1984 and October 1984 that many more people than specified in the revised membership of both committees attended the meetings. It is recommended that SAFGRAD maintains the composition of both committees at their meetings in order to eliminate unwieldiness in the conduct of meetings.

5. We note that the Executive Secretary of the OAU/STRC is the Chairman of both the CC and TAC. It is understood from the terms of reference of both committees that the TAC is a technical subcommittee which makes recommendations to the CC for approval. The present arrangement of the same person functioning as Chairman of both committees creates the situation whereby the chairman technically makes recommendations to himself for approval. In our view, this is an awkward situation which needs to be reviewed.
6. Given the small size of the SAFGRAD coordinating organisation, the need to increase efficiency and reduce the costs of annual meetings of the CC and TAC, we suggest that SAFGRAD considers to abandon a separate TAC and instead create a small Executive Committee of the CC. In view of this suggestion, the CC may be enlarged by 2 or 3 members. The terms of reference of the Executive Committee would be the same as the former TAC. The SAFGRAD Director of Research should serve as the Secretariat for the Executive Committee.
7. The earlier part of this section made recommendations about a new organisational structure for SAFGRAD headquarters office in Ouagadougou. Our recommendations included the establishment of new senior staff positions at the headquarters office. This recommendation has implications for the composition of the CC. We therefore recommend the following membership for the CC:

Recommended Composition of the CC.

OAU/STRC Executive Secretary	(Chairman)	1
Donors: USAID		1
IFAD		1
FAC/IRAT		1
International Agricultural Research Centres		
IITA		1

ICRISAT	1
*ILCA	1
*ICRAF	1
Representatives of SAFGRAD African Countries	
West Africa	1
Central Africa	1
East Africa	1
Southern Africa	1
SAFGRAD International Coordinator (Secretary)	1
Total membership	13

The CC will meet once a year to consider recommendations from the Executive Committee and to formulate policies. Emergency meetings may be called by the chairman if necessary.

The Executive Committee of the CC should consist of a small core of 4-5 technical people who are members of the CC. They should appoint a chairman on a rotating basis. The committee should hold 2 statutory meetings every year. One of these meetings should be combined with a field tour for in-depth review and evaluation of one or two SAFGRAD projects. In that case, about 2-3 experts may be specially co-opted from outside SAFGRAD into the Executive Committee to assist with the project review/evaluation.

6.6 Relationship with OAU/STRC Office in Lagos.

SAFGRAD Agency is an institution under the auspices of the Organisation of African Unity, Scientific, Technical and Research Commission (OAU/STRC), which has overall responsibility for policy formulation and general direction of the SAFGRAD coordination office at

*When they participate in SAFGRAD activities.

Ouagadougou. It is important that the Ouagadougou Office be delegated sufficient authority and freedom to take decisions and effectively manage research coordination throughout the SAFGRAD mandate area. Thus, the Ouagadougou Office should properly assume the role of an effective executor of research management coordination. This is in line with the observations and recommendations of the SAFGRAD Evaluation Report. However, the International Coordinator should ensure frequent consultations with the OAU/STRC Executive Secretary in Lagos to brief him fully on major decisions taken at Ouagadougou. The OAU/STRC Lagos should establish a clear mechanism which guarantees that decisions and actions are taken on matters at the appropriate times; especially policy and technical matters related to SAFGRAD member countries.

6.7 Channels of Communication.

SAFGRAD Agency as a permanent African organisation of the OAU/STRC, is primarily concerned with encouraging high and stable production of important food crops of semi-arid Africa. This is a matter of deep concern not only to the OAU Heads of state and the Council of Ministers responsible for Agriculture and Rural Development but also to the international community. The unique position of SAFGRAD under the umbrella of the OAU should be fully exploited for the successful implementation of SAFGRAD programs. An open channel of communication to the OAU Heads of State and Council of Ministers for Agriculture and Rural Development thus exists through the Scientific, Technical and Research Commission for SAFGRAD to draw the attention of the OAU to pressing technical problems which are barriers to efforts by SAFGRAD member countries to achieve accelerated food crop production for self-sufficiency and food security. We are of the opinion that there is an urgent and important need for many African Governments, especially those in the Sudan Sahelian region, to reorientate their agricultural research policies in order to give greater financial and other resource allocations to

agricultural research and extension, food crop pricing policies and to the development of rural infrastructures. The field experience accumulated by SAFGRAD through its Research Coordination and Networking, ACPO, Linkages, and Training and Information exchange programs should be made readily available to the OAU Headquarters through the Lagos Office of the OAU/STRC. We strongly recommend the full utilisation of this channel of communication by SAFGRAD in its long-term and permanent operations.

7. APPENDIX

APPENDIX I. CONSULTANTS BRIEF

SCOPE OF WORK FOR THE SAFGRAD MASTER PLAN CONSULTANTS.

BACKGROUND INFORMATION

The Semi-Arid Food Grain Research and Development Project of the Organisation of African Unity, Scientific, Technical and Research Commission (OAU/STRC) is a sub-Saharan Africa-wide regional research coordination and technology promotion agency. SAFGRAD's program is comprised of several entities being implemented in various locations by various organisations. The operational framework of SAFGRAD includes:

1. Regional collaborative research with International Agricultural Research Centres (IARCs), particularly IITA and ICRISAT. This regionally oriented research activity is expected to generate research results, that could alleviate widespread constraints to food production in the region.

The purpose of the program is to provide backstop research services to the national research programs of SAFGRAD member states.
2. National research programs. The main thrust of the SAFGRAD program is to strengthen the indigenous research and development capabilities of its member states. Varieties and other crop production technologies generated through IARCs, SAFGRAD's cooperative research program, and some national, research programs are further evaluated through SAFGRAD's research networks.

Furthermore, SAFGRAD provides direct technical research support to national programs (for example, FSR research grants, etc). The regular short and long-term training activities of SAFGRAD also contribute to strengthening the national programs.

3. Research networking. Regional cooperative research trials, particularly for maize and cowpea, have been established and more than 23 countries have been participating since 1979. The sorghum and millet regional cooperative trials for Eastern and Southern Africa were started in 1981. Ten countries are participating in these regional trials. The other research networks that will be initiated in the near future are:
 - West African sorghum and millet regional trials;
 - Farming Systems Research network;
 - Soil-water management, fertility and conservation regional cooperative research activities;
 - West Africa groundnut regional cooperative research trials.
4. Technology transfer. The difficulty in moving adaptive technology to the farmer is one of the major constraints to the total effort of increasing food production. The Accelerated Crop Production Program is SAFGRAD's approach for introduction and diffusion of relevant research results. First, the programs provide a bridge between the national research and extension programs of member states. The ACPO program is seen as "SAFGRAD's response to a critical weakness in the crop research program: getting research results disseminated, tested, adapted and to the farmer:. At present, the ACPO program is operational in five countries (Mali, Burkina Faso, Senegal, Togo, Cameroon).

TERMS OF REFERENCE

To review on-going research activities implemented by SAFGRAD entities and suggest new areas of research that could be complementary to the on-going research programs.

- . To examine current research networks of SAFGRAD and delineate the most appropriate roles for SAFGRAD, vis-a-vis national research programs and the IARCs (IITA and ICRISAT) in:
 - developing leadership of African scientists in different member countries;
 - establishing a dynamic regional research network that is guided and executed by scientists of member countries themselves;
 - strengthening multi-locational research networks within each national program. Finally, recommend how SAFGRAD could improve current research networks and also identify new areas of research networking.
- . To review the INSAH, SACCAR, etc., networks and recommend appropriate linkages and working relationships with SAFGRAD.
- . To identify research priority areas (including gaps in current international research) for short and long-term SAFGRAD activities.
- . To assess SAFGRAD's regional research strategies and propose how its links to national programs can be strengthened.
- . To assess SAFGRAD's FSR approach and propose mechanisms for facilitating the establishment of regional FSR networks.
- . To examine the Accelerated Crop Production Program of SAFGRAD and suggest technical and administrative measures that need to be taken in order to strengthen and also expand the program.
- . To indicate minimum support requirements for some national research programs in order that they may fully participate in regional research networks on crop commodities, etc.
- . To appraise the short-and-long-term training activities of SAFGRAD and suggest additional training needs (if necessary) and/or improved means of coordination.
- . To examine the management of SAFGRAD, including the TAC and CC structure, the Coordination Office and the OAU/STRC Lagos Office, and propose restructuring (if necessary), as well as

directions for long-term evolution of SAFGRAD as a
sub-Saharan, Africa-wide research coordination, and
technology development and promotion agency of OAU/STRC.

APPENDIX II.

ITINERARY AND WORK SCHEDULE

May 1985

- | | | |
|--------|---|--|
| May 19 | - | Arrival of Anthony Youdeowei in Ouagadougou |
| May 20 | - | Arrival of W.A. Stoop in Ouagadougou |
| May 21 | - | Briefing with J. Menyonga and Dr. T. Bezuneh |
| May 22 | - | Visit to ORSTOM, Ouagadougou |
| | | Meeting with Dr. Ohm FSU |
| | | Visit to FAO, Ouagadougou |
| May 23 | - | Visit to UNDP, PAM, IRAT, USAID |
| | | Visit to UNSO |
| | | Discussions with Dr. Pattanayak, ICRISAT. |
| May 25 | - | Travel to Mali |
| May 26 | - | Mali Meetings with ACPO; National Research |
| to | | Scientists. Visits to Field Station. |
| May 28 | | Meetings at INSAH. |
| May 29 | - | Travel to Abidjan |
| May 30 | - | Abidjan to Douala and Yaounde |
| May 31 | - | Meetings at USAID, Yaounde |
| | | Visit to Research Station Nkolbisson |

June 1985

- | | | |
|--------|---|--|
| June 1 | - | Visit to OAU office, Yaounde |
| | | Travel to Maroua |
| June 2 | - | Maroua - Meetings with ACPO. Visits and |
| to | | discussions with CRSP Scientists, IARC Scientists, |
| June 4 | | National Agricultural Research Scientists; Visit |
| | | to Farmers Fields and on-Farm Trials. |

June 4 - Travel from Maroua to Douala
June 5 - Travel from Douala to Nairobi
June 6 - Discussion with SAFGRAD Coordinator for
to East and Southern Africa: meetings in ICRAF;
June 7 visit to OAU office, Nairobi; Visit to ILCA, ICIPE.
June 7 - Travel from Nairobi to Abidjan
June 9 - Travel from Abidjan to Ouagadougou
June 10 - Ouagadougou. Reporting on Field visits to
to J. Menyonga and T. Bezuneh. Visit to Kamboinse station
June 16 (ACPO) Meeting with IBRAZ FSR Coordinator.

Field Visit to On-Farm Trial with Dr. Matlon
Preparation of Draft Report;
discussion of Draft Report with J. Menyonga
and T. Bezuneh.

- Meeting of Consultants
June 17 - Dr. Stoop leaves for Holland
Anthony Youdeowei and N. Bosso travel to
Abidjan/Lagos
June 18 - Meetings with Executive Secretary OAU/STRC
to June 19 Lagos
June 19 - Anthony Youdeowei travels to Abidjan
N. Bosso travels to Nairobi
June 20 - Travel from Abidjan to Ouagadougou
June 21 - Report Writing
to Preparation of Final Report
June 27 Submission of Final Report
June 28 - Anthony Youdeowei leaves for Abidjan
June 29 - Travel from Abidjan to Lagos
June 30 - Travel from Lagos to Ibadan.

APPENDIX III

COUNTRY REPORTS

1. BURKINA FASO (22 - 25 May and 9 - 17 June)

Institutions and Projects visited.

- SAFGRAD (Dr. J. MENYONGA and Dr. Taye BEZUNEH)
- USAID (Mr. E. MELAVEN, Director; R. BLOOM, J. BECKER)
- Purdue University FSU (Dr. H. OHM)
- SAFGRAD/IFAD FSR Team (Dr. Kassu YILALA; Dr. Kibreab TADESSE)
- UNDP (Mme A.N. GUIMBA; Ass. Res. Rep.)
- FAO (Mr. G. DIAGNE Res. Rep.)
- UNSO (Dr. NZEKIO)
- PAM (Mr. T. TALBERG)
- ORSTOM (Mr. GROUZIS)
- IRAT/CIRAD (Dr. R. NICOU Director)
- ICRISAT (Dr. C.M. PATTANAYAK, Dr. P.J. MATLON)
- Kamboinse Experiment Station (Chef Station Mr. DRABO)
- IITA Program (Dr. M. RODRIGUEZ, Dr. V. AGGARWAL)
- ACPO (Mr. Moussa KABORE)
- IBRAZ (Mr. M. SEDOGO Director; N. BOSSO; M. SIBIRI).

SAFGRAD Contributions to Burkina Faso National Program.

- Resident Research programs on maize and cowpea (IITA) and sorghum (ICRISAT) located at Kamboinse Station are fully or partially financed by USAID under the SAFGRAD project. Likewise research on land and water management (ICRISAT, presently IITA) and soil fertility (changed to cowpea agronomy by IITA) are funded under SAFGRAD.
- The ACPO program has been in operation since 1978 and is financed by SAFGRAD operating under the Ministry of Agriculture and Livestock (Extension Services), thus forming a link to the SAFGRAD Resident Research Program at Kamboinse.

- The SAFGRAD/FSU program with Purdue University started in 1978 and will be terminated in 1986. It is replaced in 1985 by a SAFGRAD-FSR support team funded through IFAD composed of an agro-economist, soil scientists and livestock expert as a direct support to the National Program of IBRAZ on "Production Systems".

Possible areas of support and collaboration with National Programs.

- The National Program of Burkina Faso has only recently been established; The National Institute, IBRAZ, covering both agriculture and livestock, was created only in 1981 and has been operating under severe financial constraints. Nevertheless IBRAZ has defined 8 major research programs to be carried out in 4 experiment stations (in the future 3 stations may be added).
- Through technical advice and sharing of facilities, SAFGRAD's research programs particularly on cowpea and sorghum contribute to the National Programs on cereal and legume crops.
- The technical disciplines chosen for the SAFGRAD/IFAD FSR team clearly complement the nationally available technical personnel. However, in line with its objective to strengthen the National FSR program, the SAFGRAD-FSR team, will need to be integrated totally into the IBRAZ program on "Systemes de Production" and should be involved in other geographical areas in addition to the former FSU villages. One should therefore not seek an impact on FSR by the team as such (in a limited geographical area) but rather an impact on the National Program as a whole.
- Through the SAFGRAD-FSR efforts and the West African FSR network, other components may be brought in by involving institutes like ILCA and ICRAF.

- Likewise the Burkina Faso ACPO program should evolve towards greater direct support to the National Program and particularly the Extension Services. As discussed for other countries and in the main text, the ACPO role should be redefined when FSR programs become operational to prevent duplication.

Given the objectives of the international crop improvement efforts by ICRISAT and IITA (see section 4.3.2. and scheme Figure 2), the ACPO should gradually become closer involved in testing the research products of the National Program instead of the present local testing of regional SAFGRAD products.

SAFGRAD collaboration with other Institutions.

- Given the many institutions with representatives in Ouagadougou, the SAFGRAD coordinating office is quite ideally placed and regular contacts with other donors (UNDP/UNSO/World Bank), bilateral and technical assistance agencies (CIRAD/ORSTOM/FAO) can be established and maintained easily and at minor costs.
- Important technical information is available from IRAT and ORSTOM. Utilization of this information is important to the more applied activities of SAFGRAD. Moreover IRAT has always had a strong program on soil-water plant relations (presently expanded through a CIRAD network) and the proposed "Resource Management Research" unit of SAFGRAD should therefore seek close collaboration.
- Other organisations such as FAO, PAM, CILSS, UNSO will be important to SAFGRAD in providing feedback information on major problems in the region.

2. MALI (25 May - 29 May)

Institutions and Projects visited.

- SAFGRAD (ACPO Program Lamine Traore)
- USAID (S.K. Reddy)
- ICRISAT (Scheuring and Shetty)
- Experimental Station Sotuba. (SRCVO-Scientists)
- INSAH (Thomas, Kere, Sidibé)
- IDRC-FSR Program-Mali Sud (A. Johnson)
- DRA (Lasine Dembele; Dolo)

SAFGRAD contributions to Malian National Program

- The ACPO program was valued very highly by everybody as a critical contribution to establish a two-way contact between research and extension which did not exist in the past. In addition to testing promising varieties and agronomic practices on farmers fields in pre-extension trials of large plots (1/2 ha) contributions in training extension officers in the 7 National Extension Organisations are an important contribution to strengthening the linkage between research and extension. In 1984, 280 trials were conducted by the ACPO Program.
- The SAFGRAD regional trials posed some problems. Generally the National Program is very short of funds so that there are considerable reservations against trials, which they feel profit, mostly the international programs, without immediate benefits to the National program. INSAH, which is organizing similar regional trials supports these with extra operating funds and a similar policy by SAFGRAD was suggested several times.

Possible areas of support and collaboration with National Program.

- Continuation of the ACPO program on SAFGRAD funding was considered vital.

- Multiplication of Foundation seeds for
 - 1) Stocks for research testing (on-station^{IRAM} and on-farm)
 - 2) Large stocks for distribution among farmers by Extension Services.
- The on-station research appears totally dominated by crop-varietal efforts at the expense of agronomic work particularly on long term soil conservation (soil fertility - and soil moisture studies). The latter area will be reinforced in 1985 through a CIRAD project with one expatriate expert; further reinforcement appears desirable.
- Large-scale Support to FSR (national program) by USAID will start in 1985, to strengthen and expand the existing efforts in South Mali (DRSPR) to the Haute-Vallee and Mil Mopti regions. Participation of these teams in SAFGRAD-FSR network activities should be further explored. Under this USAID-FSR program 19 positions for degree training will be available to strengthen national agricultural research in general.

Collaboration with INSAH.

There are obviously many overlapping interests and activities between SAFGRAD and INSAH:

- 1) Activities on sorghum, maize, millet, cowpea work, especially regional trials
- 2) Activities on Ecology and Environmental protection
- 3) Networking activities and the organisation of training and workshops for the 8 Sahelian member countries of CILSS.

Some of the activities can be considered complementary - like the organisation of seed collection of local cultivars. In other areas (e.g. workshops) it should be explored whether co-sponsoring by SAFGRAD and INSAH in some cases is possible as an effort to economise on costs and with SAFGRAD providing the link with a wider African clientele. The INSAH Director expressed great interest in collaboration with SAFGRAD, as was formulated also in the 1981 agreement between the two institutions.

General Comments

- Irrespective of the important positive contributions by the ACPO program, it has also - mainly because of its one-man show - some serious weaknesses:

- 1) it is limited to a few technological alternatives, without consideration whether these would be priority constraints for specific systems. For example the main emphasis is in testing of crop varieties for grain yield with very limited and superficial consideration for reliable assessment of the pests and diseases and to environmental resource changes.
- 2) the program is too large and too thinly spread to allow more than very superficial contacts with farmers, consequently the much desired interaction with farmers is grossly lacking and there is no follow-up evaluation on whether results were ever adopted by farmers.
- 3) social or economic considerations of proposed technologies, critical in technology adoption, are not considered.

To some extent these weaknesses could be solved through close collaboration with various FSR programs.

- Apart from our concern that resources committed to crop variety programs were disproportionately large in comparison to those for "resource base studies", the crop variety work appears to overemphasise the yield criterion. Secondary factors such as grain quality and yield stability (pest, and disease resistance) may be equally important factors to farmers. Moreover, the time required for testing improved varieties, first through the crop

improvement program, then the SRCVO multilocation testing for 3 years and then ACPO testing for another 3 years appears excessively long, before the improved varieties become available to extension.

Because of the large variations between locations, typical for the Sahel and Sudanian zones, a properly chosen multilocation network of on-station and on-farm sites should yield reliable information in about half the time it takes at present.

3. CAMEROON (30 May - 4 June)

Institutions and projects visited

- Yaounde - IRA (Dr. J.P. Ekebill. Director and A.M. Maimo - Assistant Director.
- USAID (W. Litwiller, Chief Agriculture and Rural Development Office.
- National Cereals Research and Extension Program (NCRE/IITA) (E. Atayi team leader; L/T. Empig, maize breeder.
- Maroua - IRA (Mr. Boli, Director; T. Shilling groundnut breeder)
- Bean/cowpea CRSP (Moffi Ta'ama, entomologist)
- N.C.R.E. (O. Dangi sorghum breeder)
- SAFGRAD - ACPO (J. Johnson, J. N'Zoning; A. Diali J. Samaki)

SAFGRAD contributions to the Cameroon National Program

- At present SAFGRAD support is limited to the ACPO position in North Cameroon (Maroua)
- In the near future (1986 season) SAFGRAD activities will be expanded with an FSR contribution for the semi-arid North; consisting of an agri-economist and soil scientist.
- Participation in regional SAFGRAD trials for maize and cowpea in collaboration with IITA/SAFGRAD (Kamboinse) including field visits by Kamboinse staff; participation in SAFGRAD workshops.

Possible areas of support and collaboration with National Programs.

- The SAFGRAD ACPO and FSR activities should be considered complementary to the activities of the USAID funded program for "National Cereals Research and Extension" executed through a contract with IITA and through the SODECOTON (Extension &

- Given the major orientation of IRA on crop and crop improvement programs there appears a need to strengthen the Resource management Research component, particularly for the North.
- Further strengthening of Research - Farmer linkage (in addition to FSR and ACPO support) would be required and the need for a social/anthropological scientist was emphasized by the National Program.
- The Cameroon situation (more than in Burkina Faso or Mali) is characterised by distinct institutional boundaries, not only particularly between IRA (agricultural research) and IRZ (livestock research), but also between Research and Extension. It should be explored whether through ILCA and ICRAF participation in FSR (on-farm research) these barriers might be reduced.
- Discussion with the cowpea-entomologist at Maroua revealed a great similarity in problems between North Cameroon and Central Burkina Faso. Greater collaboration/exchange of materials with IITA/SAFGRAD - Kamboinse would greatly benefit and could speed up research in Maroua (for instance on bruchid resistance).
- Likewise the sorghum program would benefit from exchanges with ICRISAT-Kamboinse particularly for Striga resistant materials.

General Comments

- Cameroon is one of the few countries in which the National contribution to agricultural research has been drastically (3 to 4 times) increased in the last five years; salaries are fixed at reasonable levels and operating funds do not appear a major constraint.
- As compared to the Sahelian countries, the donor support to agricultural research is consequently less and limited to fewer organisations (CIRAD, ORSTOM, UNDP/FAO, IDRC, CEA, USAID/IITA) which appear well integrated into the National Research

effort, focussed on the major agro-ecological zones of the country.

- However, the number of expatriate scientists has remained fairly high (47 expatriates against 82 nationals). The lack of sufficiently well trained nationals operating independent programs was considered a major constraint and the need for planning future training requirements was mentioned several times.
- The USAID programs in the North were reinforced through a special "liaison office" in Maroua (subcontracted to Development Management Systems, DMS) responsible for logistic (administration, garage, a transport arrangement, etc.) support. This is an important contribution in reducing the administrative bother, which in many other projects is carried by scientists at the expense of their research efforts.

Comments on the ACPO program.

- The efforts by the ACPO program were highly appreciated and suggestions were made about a second ACPO to expand activities towards the areas South of Maroua (important cotton area).
- However some similar criticisms as for the Malian Program should be made: too many trials (174 in 1984) for too many crops, too much oriented on the biological yield factor with insufficient communication from farmers. With respect to the new varieties a greater effort should be made to fit these into the existing systems (with respect to adaptation to planting dates, landtypes, crop protection practice etc.).

- The ACPO program could be complemented considerably with the arrival of the FSR supports, which should lead to redefinition of the ACPO tasks and possibly could lead to greater ACPO involvements in organizing seed multiplication and training of Extension agents in the conduct of demonstrations.

4. KENYA (4 - 6 June)

Institutions and projects visited.

- SAFGRAD - Regional Office (Brhane Gebrikidan, Coordinator)
- OAU Office (W. Masiga - Director)
- ICIPE (Prof. T.R. Odhiambo - Director)
- ILCA (Solomon Bekure)
- ICRAF (B. Lundgren - Director : H. Steppler (Chairman
Governing Board ICRAF: Rep. SADCC).

SAFGRAD Contributions to East and Southern Africa

- The major SAFGRAD contribution to East Africa is presently through the regional sorghum and millet crops improvement programs executed through a contract with ICRISAT.
- This program has succeeded in bringing together, the sorghum and millet scientists of various National programs through a series of regional trials and an annual regional workshop held every year in a different country. The proceedings of each workshop have been made available and are distributed through SAFGRAD.

Possible expansion of SAFGRAD activities in the East and Southern African regions.

- The Regional SAFGRAD coordination has prepared proposals to strengthen the regional sorghum and millet program by adding an entomologist, pathologist and a land and water agronomist. The latter position expresses the importance attached to proper management of the soil resource base for the marginal environments under which sorghum and millet are grown.

- As in West Africa, the links between research and extension tend to be weak in the entire East and Southern African region and therefore ACPO programs could be extremely useful.

Many countries participate in the CIMMYT FSR network, established by the CIMMYT-Economics program. Given this situation ACPOs could make an important complementary contribution to these FSR activities.

It is recommended therefore that SAFGRAD explores the possibilities for ACPOs in greater detail through consultations with the National Programs - the IARCs involved, and the coordinating SADCC Unit (to be established in Gaborone) in charge of coordinating various IARC activities in Southern Africa.

- It should be obvious that the above expansions of SAFGRAD activities, which will bring along greater needs for training and communications, will require a strengthening of the coordination office in Nairobi. This would probably involve the appointment of:

- a liaison officer for East and Southern Africa, working directly under the International Coordinator, thus allowing Dr. Brhane Gebrikidan to concentrate on the coordination of the sorghum-millet program.
- administrative officer.
- officer for regional training, workshops and communications.

- The possible expansion of the SAFGRAD coordination office in Nairobi was discussed with the Director of the regional OAU office. Provided sufficient time (6 to 12 months) was allowed the OAU would negotiate additional office space with the Kenyan Government. The indications are that such a request would receive favourable consideration from the Kenyan Government.

SAFGRAD relations with SACCAR/SADCC.

According to Dr. Stepler representing SADCC, research needs (with the exception of maize) are presently fully covered for the Southern African countries through collaboration of National programs with various IARCs which will be coordinated through a SADCC/ISNAR office in Gaborone. SAFGRAD's contributions to the region therefore would have to be focussed on

- the linkage to other African regions - information exchange workshops etc., and perhaps training.
- strengthening of Research - Extension linkages.

The SAFGRAD regional coordinator would carry a major responsibility in further exploring the possibilities while establishing his local contacts in the various countries.

The SADCC countries have committed themselves to pay an increasing share of the SADCC budget amounting to 20% in year 5.

SAFGRAD Collaboration with ILCA and ICRAF.

Both ILCA and ICRAF have highly relevant activities in trying to stabilize farm production in semi-arid regions and therefore could be important collaborators in particularly the SAFGRAD FSR and ACPO programs.

Negotiations between IFAD and ICRAF for funding agroforestry research in collaboration with the SAFGRAD-FSR activities in Burkina Faso, Benin and Cameroon are at an advanced stage.

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