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REPORT ON THE SAFGRAD MASTER PLAN TECHNICAL WORKSHOP

8 - 13 July 1985
OUAGADOUGOU, BURKINA FASO



Semi Arid Food Grain Research
and Development

The Coordination Office OAU/STRC/SAFGRAD
BP : 1783
OUAGADOUGOU, Burkina Faso

Organization of African Unity

Organisation de l'Unité Africaine

COORDINATION OFFICE
OAU/STRC JP 31 SAFGRAD
B.P. 1783
OUAGADOUGOU
Telephone : 333-58
332-27



TELEX 5381 BF
BURKINA FASO

BUREAU DE COORDINATION
OUA/CSTR PC 31 SAFGRAD
B.P. 1783
OUAGADOUGOU
Téléphone 333-58
332-27

REPORT ON THE SAFGRAD MASTER PLAN

TECHNICAL WORKSHOP

1.0 Discussion of the SAFGRAD Master Plan Technical Workshop

The Semi-Arid Food Grain Research and Development Project, SAFGRAD, of the Organization of African Unity's Scientific, Technical and Research Commission, organized an extraordinary meeting of African research directors and scientists from 8 to 13 July, 1985 in Ouagadougou, Burkina Faso in order to discuss short- and long-term regional agricultural research programmes. On behalf of the Executive Secretary of OAU/STRC, the International Coordinator of SAFGRAD welcomed the participants of the workshop and emphasized that the food crisis that Africa is facing requires a long term solution. The purpose of the workshop was further elaborated as follows:

- . To critically assess constraints to the improvement of national research capabilities;
- . To identify long-term regional research priorities;
- . To propose mechanisms for SAFGRAD, through OAU/STRC, to facilitate the realization of indigenously-supported regional research networks, with major emphasis on the development of leading African scientists in various member states;
- . To develop the conceptual and institutional framework for a sub-Saharan, Africa-wide research promotion, coordination and technological development agency under OAU/STRC;
- . To discuss general problems related to keeping trained African scientists in agricultural research and extension development careers for a longer effective period of service and also to recommend solutions to the problems thus identified;
- . To define minimum resource requirements so as to establish national research networks for specific commodities and areas of research, i.e. sorghum, millet, maize, cowpea, groundnut, soil fertility, soil-water management, forages, etc.

To develop a sub-Saharan Africa-wide research granting system under OAU/STRC that may be funded by various donor agencies and some member countries of SAFGRAD.

During the morning session of 9 July, current research activities and the proposed expansion of the Accelerated Crop Production (Officer) programme were discussed. The chairman emphasized the importance of such a workshop, not only as a means of exchange of scientific information on improved technologies, but also as an opportunity to discuss frankly the proposed programme of SAFGRAD so it can be relevant and useful in stimulating an increase in food grain production in semi-arid regions of Africa.

The participants were requested to refer to the two major documents prepared for the discussion. These were the "Outline of The SAFGRAD Master Plan" and the SAFGRAD consultants' report. After the presentation of the SAFGRAD programme activities by the Director of Research, the following general topics were discussed:

1.1 Focus on alleviating food grain production constraints

This issue was raised repeatedly by several delegates who expressed the need and desirability of identifying constraints that hamper food production in semi-arid regions of sub-Saharan Africa. Global constraints pertaining to food grain production were identified. Specific constraints unique to each member country were expected to be surfaced by participants of the workshop, using examples from their national programmes. Some of the major constraints that impeded food grain production were outlined as follows:

- . Drought stress and rapid deterioration of the resource base for productive agriculture. The repeated drought situation during the last 15 years has also enhanced desertification. Rainfall deficiency and its erratic pattern of distribution have contributed to worsening food production situations.

- . Lack of suitable varieties and related technologies.

Technological changes are necessary to make major breakthroughs in food production. It was stressed that improvement of food grains needs to focus on making available drought-, disease- and pest-resistant varieties, as well as agronomic practices economically and technologically feasible to small farmers.

- . Inadequate indigenous research capabilities. In many SAFGRAD countries there is an acute shortage of qualified, experienced research scientists and technicians. Research management capabilities need to be strengthened. Delegates of the workshop emphasized that priority should be given to advanced degree training in order to upgrade the current research cadre of different SAFGRAD member countries.

- . Poor soil fertility and water conservation and management.

The committee stressed that SAFGRAD needs to focus research activities in this field, based on its Phase I experience.

- . Insufficient integration of cropping and livestock production systems, including agro-forestry.

The committee underlined the need for effective research coordination in order to minimize duplication of efforts and to use resources effectively for agricultural research and development. The committee also noted agricultural policy as one of the major constraints. For example, resources allocated for development of agriculture in most SAFGRAD member countries are below 6% of total government expenditures, whereas 80% of the workforce is in agriculture.

It was also emphasized that future plans of SAFGRAD should be formulated to overcome the above-mentioned constraints to food grain production. SAFGRAD's achievements in the generation and diffusion of technology (through collaborative research) were discussed, as noted in the report "Outline of the SAFGRAD Master Plan". It was reported that proposed long- and short-term programmes also focus on alleviating constraints to food grain production.

1.2 Proposed Expansion of the ACPO Activities

The International Coordinator reviewed the achievements and the activities of the Accelerated Crop Production programme during Phase I. It was reported that this programme is operational in five countries (Burkina Faso, Cameroon, Mali, Senegal and Togo). Through bilateral funding and other mechanisms, it is hoped and planned that the ACPO programme will be expanded in the future programme of SAFGRAD. Several delegates raised the issue of linkage between the ACPO and the national extension service. It was stressed that the ACPO must operate through the established national extension system.

Encouraged by the successful ACPO activities in the five countries where they have operated, SAFGRAD wishes to explore the possibilities of expanding the ACPO programme to new SAFGRAD countries. In this planned expansion, the SAFGRAD Coordination Office emphasized that it did not have a unique ACPO formula that would work for all countries, but would work with each country according to its needs.

There was a lengthy discussion on how ACPOs and FSR relate and what is really understood by the activities of each one. It was pointed out that the Coordination Office takes the ACPO activities as a pre-extension test of technologies. With respect to FSR, it could encompass several disciplines and where there is a well organized FSR set up in a country the need for an ACPO programme would be minimal.

After lengthy discussion, the delegates of the workshop stressed the catalytic role that ACPOs could play in promoting and diffusing on-farm adaptive technology, and its expansion to other member countries was recommended.

1.3 Comments on SAFGRAD Collaborative Research Programmes

Introducing the session, the chairman pointed out that the collaborative activities of SAFGRAD with international institutions such as IITA and ICRISAT, and national programmes as in Burkina Faso and a few other countries reflect SAFGRAD's coordination roles.

The IITA/SAFGRAD collaborative research focuses on maize and cowpea. Maize streak virus, which is prevalent in Africa, is the major disease problem. Attempts are being made to develop streak virus-resistant varieties. In order to develop short cycle varieties, germplasm has been introduced from CIMMYT, IITA and IRAT and tested in SAFGRAD member countries. Out of this pool, 16 were identified as promising varieties.

As regards cowpea, insect attack has been the major problem. Through screening and breeding, some improved varieties have been developed and released. The future activities of IITA/SAFGRAD in relation to the maize and cowpea improvement programme have been indicated in the "Outline of the SAFGRAD Master Plan".

Training local and regional staff in maize and cowpea production at Kamboinse Station and Ibadan, Nigeria, is also one of the major activities of IITA.

Regarding maize improvement, it was further explained that testing intermediate varieties using various levels of fertilizers and for resistance to streak virus disease is being conducted in the Northern Guinean Savanna in collaboration with IRAT. In the Sudan Savanna, work on early-maturing varieties (i.e. 90 days) of maize is conducted by IITA/SAFGRAD.

Concerning the FSR work done elsewhere by IITA, a question was raised: Why should IITA be conducting Farming Systems Research in Benin in addition to that of SAFGRAD's FSR? It was indicated that IITA has mandates both in humid and sub-humid Africa. The mandate for the humid zone does not overlap with that of SAFGRAD's mandate. IITA's FSR programme is in the humid regions of Benin.

The ICRISAT/SAFGRAD collaborative programme was discussed. It was noted that cereals such as sorghum and millet and pulses like pigeon pea, chick pea and groundnuts are the mandated crops of ICRISAT. ICRISAT's mandate is geographically restricted to the semi-arid tropics worldwide. SAFGRAD, however, is mandated to function within the semi-arid tropics of Africa only, and it is in this region that the activities of the two organizations overlap. This is the reason that SAFGRAD is contracting with ICRISAT for research in mutually agreed areas. It was noted that the major centre of ICRISAT in West Africa was in Niamey (Niger) for millet and groundnut, and in Southern Africa Bulawayo (Zimbabwe) was for sorghum and millet. Other countries where ICRISAT has located scientists are Burkina Faso, Mali, Senegal, Nigeria, Sudan and Kenya.

The youngest collaborative programme with SAFGRAD is the Eastern Africa ICRISAT/SAFGRAD sorghum and millet network, based in Nairobi (Kenya).

The ICRISAT/SAFGRAD Sorghum and Millet Coordinator then went on to present the objectives and achievements of ICRISAT/SAFGRAD in Eastern Africa. The objectives of the programme are :

- . To organize and conduct regional sorghum trials;
- . To coordinate and participate in the actual evaluation of the regional trials, introduce and evaluate sorghum germplasm;
- . To work closely with ICRISAT in formulating a long-term sorghum project for Eastern and Southern Africa;
- . To assist in the training of technicians at ICRISAT;
- . To serve as a consulting and advising unit on how best the improvement of sorghum and millet work could be achieved in the national programmes.

Concerning the achievements, he pointed out that :

- Regional trials were organized in four ecological zones, classified as :

- . High altitude
 - . Intermediate altitude
 - . Low altitude
 - . Very dry lowlands
- Several useful varieties developed by the national programmes of the region have been identified as useful. He remarked that the national programmes should be given credit for this effort and achievement. The coordination office of the region collaborated in analyzing and publishing the results. Some of the varieties were recommended for use in other countries. For example, Ethiopian varieties were found to be useful in Kenya and some Ugandan varieties in Ethiopia.

Using the germplasm collected in the region and that introduced from ICRISAT (Hyderabad), the US and Mexico, 3,500 samples of germplasm were screened in Kenya in two seasons in one location. From the 3,500 introductions, 200 elite nurseries were developed. The 200 have been sent to four selected countries with strong breeding centres to develop advanced breeding lines. The four centres are Ethiopia, Tanzania, Uganda and Kenya. This is believed to strengthen the programme in the region.

Annual workshops on sorghum and millet in the region have allowed the scientists to communicate directly and strengthen their collaboration. The workshops are rotated. The first workshop was held in Ethiopia and the participants were able to see the national programme. Ethiopian scientists were encouraged to participate and presented papers on breeding and other aspects of sorghum research. The second workshop was held in Rwanda.

The centre of attraction was the Rwandan sorghum programme. Rwandan scientists fully participated in the workshop. The third workshop was held in Tanzania. This workshop allowed participants to acquire an in-depth understanding of the programme in Tanzania. The fourth workshop is under preparation, to be held in Uganda towards the end of this month. The highlights of the workshop are presented in the annual proceedings. Most of the results are in relation to sorghum and not millet for the latter is of minor importance in East Africa.

Rotating the workshops as practised by ICRISAT/SAFGRAD for Eastern Africa was commended by delegates of the workshop. The delegates enquired why workshops were not held on a rotational basis in West Africa as well. In reply to the question, the chairman noted that the practice has already been started in West Africa, pointing out the workshop to be held in Cotonou (Benin) later this year.

The chairman added that strengthening the national programmes through workshops and other means of integration is well illustrated by the Eastern Africa ICRISAT/SAFGRAD coordination work. Furthermore, the contributions of the national programmes in developing their own varieties should be recognized and supported.

The delegates were also briefed on FSU/SAFGRAD research activities. It was noted that before the FSU programme was initiated in 1979 there was very little experience in Burkina Faso in farming systems research. There was not any technology for the FSU staff to adopt at the time. The objectives of the FSU programme were :

- . The identification of the main constraints to food grain production;
- . The identification of the technology relevant to West African conditions;
- . The development of a multidisciplinary research system to help the national programme and the training of local staff.

The most important findings regarding the identification of constraints were :

- . That farmers who were subsistence oriented had little cash to purchase some inputs;
- . The land is degraded in fertility and organic matter and that little water is available for production.

It was further reported that the six years of activity of FSU have contributed to the evaluation and development of technologies such as :

- . Tied-ridging as a means of making more water available to plants; introduction of new varieties of sorghum and cowpea released by ICRISAT, IRAT and IITA; and a mechanical ridger that could be pulled by animals.

SAFGRAD's latest involvement in Farming Systems Research was briefly explained. Its involvement was not to conduct FSR directly, but instead to identify research gaps and provide support to strengthen national FSR programmes in their deficient areas.

Regarding future programmes of SAFGRAD, the following areas of research emphasis were considered :

While collaborative research on SAFGRAD's five original food grains will continue with international institutes (IITA and ICRISAT), it was also suggested that bambara groundnuts be included as one of the mandated crops of SAFGRAD. Among the pest problems, it was also stressed, striga merits special research attention since it has spread rapidly throughout sub-Saharan Africa. An integrated approach to Farming Systems Research, including major components such as crop and animal production systems, forages and agroforestry was suggested. Based on the SAFGRAD Phase I experience, increased emphasis on Resource Management Research was recommended. SAFGRAD was encouraged to organize an interdisciplinary core group encompassing the following research disciplines :

- . Soil and water management (as a major activity)
- . Agro-climatology
- . Agro-ecology
- . Cropping systems
- . Farm implements and livestock
- . Forage and residue resource management.

There was the suggestion that SAFGRAD should take a regional approach to its FSR work.

Country Papers

Directors of Research and scientists from different countries read short papers (Annex I), commenting on research needs and enumerated specific constraints to agricultural research and development in their respective countries. Workshop participants also pointed out linkages between the on-going SAFGRAD programme and the respective national agricultural research systems.

2.0 Discussion on Consultants' Recommendations

The chairman invited delegates to give their frank views, since the assembled body of directors of national programmes was an appropriate body to examine the following issues :

2.1 SAFGRAD Mandate

Some members of the workshop pointed out that the current mandate of SAFGRAD may need to be expanded to include other crops such as cassava, yams and bambara groundnuts since its current mandate confines it to the alleviation of constraints to food grain production. It was further noted that a traditional crop like bambara groundnuts, which is widely cultivated throughout the semi-arid regions of tropical Africa, has been neglected, even though it is one of the most drought-resistant grain legumes. Some workshop participants, on the other hand, expressed their view that it is very important not to spread resources and effort too thinly: it is better for the SAFGRAD to focus its activities on its currently mandated crops. After lengthy discussion

the chairman summarized that it was the consensus of opinion of the meeting that SAFGRAD should restrict itself to the semi-arid zone and continue to work on problems related to the production of food grains already identified - including other relevant and complementary interdisciplinary research programmes. It was also the general agreement of the workshop participants that bambara groundnuts should be included as a SAFGRAD mandated crop. Realizing the extent of overlapping research activities among various regional and international agencies, it was stressed that the thrust of SAFGRAD activities needs to continue to be the coordination of research and the promotion of on-farm adaptive technology.

2.2 SAFGRAD as a Long-Term Agency

The chairman gave a brief explanation on the evolution of the SAFGRAD project and invited delegates to give their views. It was pointed out that the alleviation of constraints to food production problems in semi-arid regions of Africa requires long-term research and development activities. The long-term programme being discussed would necessitate 10 to 20 years of support by donors, member countries and other agencies. Some participants wondered whether donors would be willing to continue support to SAFGRAD if it ceased to be a project and became a permanent agency. Considering the broader problems related to food grain production under semi-arid environments in tropical Africa, donors have also realized the need for long-term research and development commitment. Whereas most of the participants agreed that SAFGRAD should be strengthened to implement its long-term plans, the question was raised whether its transformation into a permanent agency under the auspices of OAU/STRC would allow it to remain scientifically oriented in order to provide effective research coordination among its member countries.

Considering the disadvantages of SAFGRAD being entirely core-funded by OAU, including the shortage of resources and funds available to OAU itself, the committee recommended that the long-term activities of SAFGRAD continue to be supported by donors, while OAU continues to increase its funding contribution to SAFGRAD. Since the major SAFGRAD activities need to be supported by donors (within the next 10 to 20 years), no major changes in cost are anticipated if SAFGRAD becomes a permanent agency. It was further noted by delegates that the objectives of SAFGRAD as originally envisaged were long-term in nature. SAFGRAD was, from its inception, conceived by OAU member states to promote food grain research, technology development and its application in semi-arid Africa. Since the problem of food grain production will continue to exist for some years to come, the committee endorsed the consultants' recommendation that the present status of SAFGRAD be changed from project to agency without diluting its operational autonomy and efficiency.

The delegates reiterated that SAFGRAD should play a catalytic role in surfacing and making known constraints related to agricultural policy issues. In order for SAFGRAD to deal more effectively with research policy issues, the workshop recommended that membership in SAFGRAD's Consultative Committee and Technical Advisory Committee be restructured. For example, it was suggested that members of the Consultative Committee that represent member countries be ministers or vice-ministers of agriculture, or of an equivalent level.

2.3 Other Recommendations

The chairman asked members to direct their attention to the recommendations of the consultants. Recommendation six, which indicated some shift in research emphasis from crop improvement into resource management, was supported.

A delegate emphasized that the concept of farming systems was central to the achievement of the objectives set up by SAFGRAD. If Farming Systems

Research is properly conceptualized, all the programmes of ACPOs, farming systems and Resource Management would be seen as an integrated whole. On the other hand, it was pointed out that it would be difficult at this time to lump all research activities under Farming Systems Research. There remain differences of opinion over what constitutes Farming Systems Research. The need for gradual integration of multi-disciplinary research activities will be explored. Resource management research is recommended as a concentrated effort in the Sudanian zone. A delegate noted that the Sudanian zone was a high potential area in which there were abundant crop residues for ruminants. However, the crop residues were not being used effectively by these ruminants because of the lack of nitrogen. This could be corrected if some emphasis could be given to forage management to provide legumes for animals within the resource management concept. The inappropriateness of putting resource management into the Farming Systems Research programme at this stage was also emphasized.

The chairman directed delegates' attention to recommendations seven, eight and nine. A delegate asked for clarification on the position of SAFGRAD vis-a-vis the suggestion to include the West African FSR (WAFSR) network under the SAFGRAD umbrella. A delegate pointed out that a decision has been taken to locate the WAFSR network Secretariat with SAFGRAD's Coordination Office in Ouagadougou, but up to now no response has been received from SAFGRAD. He felt that it was necessary for a response to be made soon; otherwise, it is very possible that the WAFSR network would base itself elsewhere. Delegates expressed their support for the location of the WAFSR office being in Ouagadougou under the umbrella of SAFGRAD. A delegate wanted to know whether the WAFSR network was going to do research or just coordinate Farming Systems Research. The response was that the network activities would be the main function of the WAFSR programme. The Director of Research (SAFGRAD) said that there was a lot of similarity to the proposed activities of SAFGRAD and those of the WAFSR network. SAFGRAD had proposed a Farming Systems Research Network for the

semi-arid regions. Hopefully, the WAFSR network will strengthen SAFGRAD's FSR networking capabilities. The details on such topics as how to bring the two networks together and what funding can be expected from the network and what SAFGRAD can contribute remain to be discussed. The chairman summarized the discussion by saying that locating the WAFSR network Secretariat within the SAFGRAD Coordination Office in Ouagadougou was accepted in principle, but that details of the arrangement needed to be worked out.

The chairman asked for views to be expressed on recommendations nine and ten. A delegate was of the opinion that the definition of an ACPO was too loose in the document. An integration of the ACPO into a collaborative research and extension institute in order to link the process of technology generation and its delivery to farmers was necessary.

Regarding recommendation eleven, the Director of Research indicated that if SAFGRAD took any initiative in the publication of scientific journals, the emphasis would be on the semi-arid regions. The chairman suggested that SAFGRAD should explore the possibilities of reviving scientific publications, including national and regional journals such as the Agricultural Science Journal of Africa, if the fund was available. Some participants cautioned that publishing journals was not an easy undertaking and wondered whether SAFGRAD should not instead consider assisting countries which already have journals which, because of financial difficulties, are not being published regularly. The Director of Research pointed out that, given its current shortage of personnel, SAFGRAD could not handle the publication of a scientific journal and that it would rather see the timely publication of its Newsletter. There were no comments on recommendations twelve or thirteen.

Finally, the chairman expressed his hope that the Coordination Office would take note of all that had been said and that the next phase of SAFGRAD's activity would reflect the views expressed.

3.0 Linkages and related activities

The chairman then called for delegates representing each of the following organizations to give a brief outline of their activities :

- . The West African Farming Systems Research Network
- . Pasture Network for Eastern and Southern Africa (PANESA)
- . SADCC.

3.1 West African Farming Systems Research Network (WAFSRN)

WAFSRN is an association of national FSR programmes in the West African sub-region with the primary objective of facilitating the exchange of experiences and ideas among FSR practitioners in national programmes. There are discussions of common methodologies and FSR is viewed in its entirety as a continuum from diagnosis of on-station trials, to on-farm trials and finally, development activities.

Membership : All countries in the region are members.

Organization : Steering Committee - Chairman

- Coordinator
- Members of IARCs
- Country Representatives

Strategy : Network, symposia

Problem-oriented thematic workshops

Newsletter

Long-term plans : Zonification

Identification of funding sources

Strengthening national FSR programmes

Assisting in training

Future Activities :

- Institutionalizing FSR programmes in national research systems;
- Comparing the English FSR approach to the French one (e.g. Nigerian vs. Senegalese).

The Pasture Network for Eastern and Southern Africa was described by a workshop participant (Annex I). Other participants believed that a similar programme could be initiated in semi-arid West Africa.

3.2 SADCC - Southern African Development Coordination Committee

The Food Security Project is based in Zimbabwe and is supported administratively by the Zimbabwe government, USAID and the Australian government.

SADCC member countries are : Zimbabwe, Zambia, Malawi, Tanzania, Mozambique, Angola, Botswana. All projects under Food Security are identified by a Consultative Technical Committee, which consists of three members from each country (Research, Extension, Economics and Marketing).

Examples of some projects under Food Security :

- . Crop yield loss and food technology
- . Grain storage facility
- . Staff retention
- . Soil survey and mapping
- . SADCC library.

The following points and questions were raised in the discussion that followed the presentations :

- . That there was a trend towards proliferation of bodies, institutes and other groupings
- . That perhaps under FSR, all aspects relating to agricultural research could be considered
- . That there was a need to look at relationships between problems as a part of a whole ecosystem rather than each problem in isolation
- . Why was the livestock component being ignored by FSR?
- . Need for exact specification of roles of networks that were being formed
- . Must avoid overlapping and duplication between regional projects and SAFGRAD.

Salient features of SACCAR :

- . Not a research centre but an information centre for collation of data and publishing of research results
- . Assists national programmes in manpower assessment and training
- . Solicits funds for national programmes
- . Identified sorghum and millet research funds and based programme in Zimbabwe
- . ~~Seaw~~ ^{Seaw} - to be based in Tanzania
Bumasa *Manjambique*
- . Groundnuts - to be based in Malawi
- . Interested in addressing land and water problems
- . Funds for some research programmes not yet identified.

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3.3, INSAH

Complementary research and coordination activities could be developed in order to strengthen regional research networking. The major overall contribution that SAFGRAD could make to regional organizations like **SACCAR** and INSAH would be through its FSR and ACPO programmes and livestock research which is not covered by SACCAR in Southern Africa. Lessons on organization could be learnt from the SACCAR model.

Management Entity

The following points of concern arose out of the discussion by participants that followed the presentation on linkages :

- . Proliferation of research bodies and its resultant effect (i.e. brain drain) on weakening of national capabilities
- . Difficulties of overall coordination of regional networks and programmes
- . Reiteration of the need of clear-cut roles of all bodies being formed and of SAFGRAD
- . Role of SAFGRAD as a mechanism for strengthening of national capabilities
- . SAFGRAD should influence policy on both food production and distribution within the region
- . SAFGRAD should identify research gaps and support national research programmes to alleviate constraints.

RECOMMENDATIONS OF THE TECHNICAL WORKSHOP

ON THE SAFGRAD MASTER PLAN

I. THE SAFGRAD MANDATE

Recognizing the possible overlap and duplication of research and development efforts, the committee re-examined the overall mandate of SAFGRAD and recommended that its :

1.0 Geographical mandate should cover the semi-arid zones of Africa and, in particular, the current 26 SAFGRAD member countries in West, Central, East and Southern Africa.

2.0 Crop commodity research should focus on the generation of technology for tropical food grains (i.e. sorghum, millet, maize, groundnuts, cowpea and bambara groundnuts).

*Bambara
nuts*

Whereas there is an apparent need to strengthen food grain crop protection research within each national research programme, the committee stressed that SAFGRAD should facilitate research coordination on striga, an Africa-wide pest problem of food grains.

II. FUTURE PROGRAMMES

The outline of the SAFGRAD Master Plan, as well as the recommendations of the consultants on future research activities, were thoroughly examined. The committee found the plan ambitious and recommended that SAFGRAD focus primarily on food grains and prioritize other related programmes. The committee stressed that, in addition to research on the mandated crops, the following areas of research should receive high priority :

1.0 Resource Management Research

The consultants' recommendation for the creation of an interdisciplinary research unit to strengthen resource management research was approved. The major emphasis of this unit will be on soil fertility, land and water management, ecology and crop residue utilization within its mandated ecological zones (low and high potential areas), with the goal being to induce an immediate and sustained impact on restoring the resource base for productive agriculture.

2.0 Farming Systems Research

The need for a holistic and integrated FSR approach to alleviate on-farm constraints was stressed. The committee recommended that SAFGRAD should strengthen national FSR programmes by filling research gaps. Recognizing the proliferation of FSR programmes in various member countries, SAFGRAD should endeavour to play a key role in the coordination and strengthening of FSR networking.

3.0 The Accelerated Crop Production Programme

Realizing that the ACPO programme is continuously evolving through accommodation of different approaches specific to the locality in which it is operating, and recognizing the successes of the programme in some member countries, the committee recommended the expansion of the programme in those countries that expressed a need for it. It was also agreed that the focus of activities of the ACPO should remain on on-farm multi-locational trials as well as bridging the gap between national research and extension systems in order to speed up the process of introducing improved innovations to farmers.

4.0 Research Networking

Recognizing the proliferation of research networks promoted by various international and regional agencies, and given the acute shortage of research scientists and resources in many national programmes, the committee expressed concern about the overlapping of research networking activities.

The committee recommended that the central focus and main activities of SAFGRAD, and particularly of the OAU/STRC Coordination Office, should be to provide effective coordination of research networks for its mandated crops and related programmes through cooperation with national, regional (INSAH, SACCAR, etc.), and international agricultural research programmes (IITA, ICRISAT, etc.). The aim of SAFGRAD support should be to enable national scientists to direct and administer the regional networks in the long run. The committee further recommended that workshops, particularly those administered and coordinated by SAFGRAD, be held annually on a rotational basis in different member countries.

III. RESPONDING TO NATIONAL RESEARCH PROGRAMME NEEDS

1.0 Direct Research Support

Considering the limited resources for research, as outlined by different member countries, the committee recommended that SAFGRAD should identify research gaps and provide direct support to national programmes (similar to its FSR programme) in order to alleviate constraints on targeted research projects.

2.0 Allocation of Resources to Research

The committee noted that only one to ten percent of government resources are allocated to development of agriculture in most SAFGRAD member countries. Because of SAFGRAD's OAU/STRC umbrella

and Africa-wide mandate, the committee recommended that SAFGRAD should play a catalytic role in promoting the allocation of more resources to agricultural research and development in member countries.

3.0 Training

The committee recommended that SAFGRAD should place more emphasis on the training of qualified scientists and technicians in its member states:

4.0 Manpower Retention

Inefficient utilization of trained researchers and the "brain drain" of qualified scientists have become increasing constraints to the improvement of indigenous research capability of many African countries. It was recommended therefore that SAFGRAD member countries and donors need to exert joint efforts to create suitable conditions in order to retain and encourage research scientists in their respective countries.

IV. LINKAGES

In SAFGRAD's role as an Africa-wide research coordination unit of the OAU/STRC, the committee recommended that SAFGRAD ought to take the leadership to establish functional linkages and cooperation with other regional organizations, such as INSAH, SACCAR and the IARCs, in order to minimize duplication of efforts. It was recommended that SAFGRAD's officers should also make more frequent contacts with high officials of governments of member countries in order to strengthen linkages between SAFGRAD programmes and national agricultural research systems.

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V. INSTITUTIONAL DEVELOPMENT OF SAFGRAD

It was noted that the mandate of SAFGRAD provided by OAU is of a long-term nature. The committee, after lengthy deliberation on this matter, stressed that the activities of SAFGRAD should remain strictly technically oriented. Realizing that the alleviation of food production constraints and improvement of the resource base for food production involve long-term research and development activities, workshop participants recommended that SAFGRAD should be viewed as an agency of OAU/STRC dealing with long-term problems and having autonomy in its operation and the mandate to solicit funding from donors.

Part-emphasizes on National System development not regional

The strengthening of the SAFGRAD headquarters at Ouagadougou and the SAFGRAD Coordination Unit for East and Southern Africa in Nairobi was also supported by the committee, pending (as recommended by the consultants) further study of the matter and based on available resources. The committee further recommended that OAU/STRC should campaign for a larger OAU contribution to SAFGRAD.

dealing with long term problems

VI. RESEARCH COMMUNICATION

1.0 Newsletters and Journal

Considering the shortage of professional staff at the SAFGRAD Coordination Office, the committee recommended that SAFGRAD should concentrate its efforts on facilitating the timely publication of its Newsletter.

maybe

Regarding the proposed regional journal on agricultural research in the semi-arid regions, it was recommended

that SAFGRAD should not publish a separate journal but

should endeavour to facilitate and encourage the realization of existing regional journals.

2.0 SAFGRAD Liaison in Member Countries

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Objectives
Priority

Realizing that communications with member countries could be improved by appointment of a 'liaison officer', the committee recommended that SAFGRAD should identify a person within each national research programme to serve as its liaison. SAFGRAD should formally request each member country in writing for the nomination of the liaison officer.

VII. THE CONSULTANTS' REPORTS

The workshop participants discussed the consultants' recommendations and accepted the major recommendations with some modifications, as indicated in this document.

VIII. COMMENTS ON THE COMPOSITION OF THE TAC AND CC

The committee discussed the composition of both the Technical Advisory Committee (TAC) and the Consultative Committee (CC) and proposed the following recommendations :

1.0 TAC membership should include :

One representative each from West, Central, East and Southern Africa - (4);

One representative each from ICRISAT and IITA - (2)

Two renowned scientists from West/Central and East/Southern Africa (2)

The SAFGRAD Coordination Office - (2)

It was felt that the Chairman of TAC should be separate and not a regular member of the Consultative Committee.

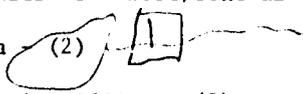
2.0 The CC should consist of the following nine members :

The Executive Secretary of OAU/STRC as Chairman - (1)

Four high-level representatives from the four regions - West, Central, East and Southern Africa - (4)

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One representative per major donor - USAID, IFAD and
FAC - (3);

The SAFGRAD Coordination Office - (1);

It was generally agreed that the International Agricultural
Research Centres (IARCs) should not be members of the CC,
since they are already full members of the TAC.

SAFGRAD MASTER PLAN TECHNICAL WORKSHOP
8 - 13 JULY 1985

HOTEL SILMANDE
OUAGADOUGOU
BURKINA FASO

A G E N D A

SAFGRAD MASTER PLAN TECHNICAL WORKSHOP

A G E N D A

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MONDAY, 8 JULY 1985

15.30 - 16.30

REGISTRATION

Opening of the Workshop
(International Coordinator, SAFGRAD)

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TUESDAY, 9 JULY 1985

08.00 - 09.00	SAFGRAD Master Plan Introduction (Director of Research)
09.00 - 10.00	Current SAFGRAD Research Programmes
10.00 - 10.20	C O F F E E B R E A K
10.20 - 11.20	Proposed Expansion of the Accelerated Crop Production Programme (International Coordinator, SAFGRAD)
11.20 - 12.30	Discussion
12.30 - 15.00	L U N C H
<u>15.00 - 17.00</u>	<u>SAFGRAD COLLABORATIVE RESEARCH PROGRAMMES</u>
15.00 - 15.30	Comments by IITA Representatives
15.30 - 16.00	Comments by ICRISAT Representatives
16.00 - 16.30	Comments by FSU Representatives
16.30 - 16.45	C O F F E E B R E A K
16.45 - 17.00	IFAD-FSR Support to National FSR

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WEDNESDAY, 10 JULY 1985

08.00 - 09.00	Future Related Research Programmes (Director of Research)
09.00 - 10.00	Discussion
10.00 - 10.20	C O F F E E B R E A K
10.20 - 12.30	Strengthening National Research (Director of Research) a. Research Support b. Training Needs
12.30 - 15.00	L U N C H
15.00 - 16.00	Discussion
16.00 - 16.20	C O F F E E B R E A K
<u>16.20 - 17.30</u>	<u>COMMENTS ON NATIONAL RESEARCH NEEDS</u> (Workshop Delegates)
16.20 - 16.40	Benin
16.40 - 17.00	Togo
17.00 - 17.20	Gambia

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THURSDAY, 11 JULY 1985

Comments on National Research Needs
(Workshop Delegates)

08.00 - 08.20	Mauritania
08.20 - 08.40	Tanzania
08.40 - 09.00	Guinea Bissau
09.00 - 09.20	Zambia
09.20 - 09.40	Burkina Faso
09.40 - 10.00	Chad
10.00 - 10.20	C O F F E E B R E A K
10.20 - 10.40	Kenya
10.40 - 11.00	Senegal
11.00 - 11.20	Central African Republic
11.20 - 11.40	Nigeria
11.40 - 12.00	Ivory Coast
12.00 - 12.00	Ghana
12.30 - 15.00	L U N C H
15.00 - 16.00	Discussion
16.00 - 17.00	Linkages among Regional and Sub-Regional Coordination Units

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FRIDAY, 12 JULY 1985

08.00 - 09.30	Institutional Development of SAFGRAD Summary of the Consultants Report (Director of Research)
09.30 - 10.30	Discussion
10.30 - 10.45	C O E F F E E B R E A K
10.45 - 12.45	Group Sessions
12.45 - 14.45	L U N C H
14.45 - 16.00	Group Session
16.00 - 16.20	B R E A K
16.20 - 18.00	Rapporteurs Report and Discussion

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SATURDAY, 13 JULY 1985

09.00 - 11.40	General Recommendations
11.40 - 12.00	Closing Remarks (International Coordinator)

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A N N E X E S

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Country: G H A N A
Participant: Hector Mercer-Quashie
Topic: COMMENTS ON RESEARCH NEEDS OF NORTHERN GHANA

INTRODUCTION

Ghana lies between latitude 5° - 11° N. It is the 40% of the land area of Ghana which falls between latitudes 8° - 11° North that is in the semi-arid zone and consequently in the mandate zone of SAFGRAD. The soils of this zone are deficient in nutrients especially nitrogen and phosphorus and are generally shallow and have poor water holding capacity. Constant cropping and indiscriminate burning leave the soils bare and make it susceptible to wind and water erosion. The zone is characterised in the north eastern section by acute population pressure.

The major crops grown are millet, sorghum, maize, rice, groundnuts, cowpeas, pigeon peas, bambarra groundnut. Yams and cassava and soya beans are currently being investigated. Of these crops, only maize, cassava and cowpeas are researched into in the south of the country.

CONSTRAINTS TO INCREASE FOOD PRODUCTION

Of the constraints relevant to food grain production the following may be listed:

- . Inadequate and erratic rainfall.
- . Inadequate research information on soil fertility and plant-soil-water management.
- . Insufficient integration of cropping and livestock activities.
- . Lack of agro-forestry investigations.
- . Losses from weeds, pests and diseases.
- . Lack of suitable varieties.
- . Lack of appropriate technologies and bottle-necks in the diffusion of available information.

RESEARCH ORGANIZATION

Research is carried out under the overall direction of the Council for Scientific and Industrial Research (CSIR). The CSIR which is under the Ministry of Industries, Science and Technology controls about a dozen research institutes and units. One of its component research institutes is the Crops Research Institute which is responsible for all food crop research except Oil Palm, Cocoa, Coffee, Cashewnut and Cola.

The Crops Research Institute which is in the mandate zone of SAFGRAD has its headquarters at Nyankpala. There are four other smaller stations (Wa, Damongo, Yendi and Manga) and many other test sites.

NYANKPALA AGRICULTURAL EXPERIMENT STATION

The goal of the Station is to develop technologies that will stabilize and increase food production in semi-arid zone, especially on small farms without unnecessary reliance on externally imported inputs. In other words, the Station has to show the way to increase the use-efficiency of resources available to farmers.

Programme Implementation

For implementation of the task assigned there are two major departments (1) the Crop Improvement Department and, (2) the Farming Systems Department. The Crop Improvement Department has the following -

Maize breeder,
Rice breeder,
Food legumes breeder,
Assistant Sorghum breeder,
Millet breeder, and
Soya bean breeder.

The Farming Systems Department has the following:

Two Agricultural Economists,
Two on-Station agronomists,

Two On-Farm agronomists,
Soil fertility scientist,
Soil chemist,
Soil microbiologist, and
Assistant entomologist.

Of the 17 scientists listed above, 7 are expatriate and may need to be replaced in time.

A recent evaluation of the Station by consultants identified the following scientific personnel needs :

Soil physicist,
Weed scientist,
Additional legume breeder,
Root crop breeder, and
Plant pathologist.

In all 14 scientists need to be trained and posted to Nyankpala within the next few years. For these scientists to be effective technical support for them will be required. At least 10 senior technicians must be trained to support the programme.

Crops of interest to SAFGRAD and their problems.

Maize: The objective of the maize programme is to develop
(1) high yielding varieties which have appropriate maturity period for each of the agro-ecological zones, (2) Streak resistance, (3) Drought resistance, (4) Stem borer resistance, (5) Lodging resistance, and (6) Required kernel type and colour.

The humid zone maize programme has six scientists that have collaborative research in design and conduct of experiments in the semi-arid zone. There is also an annual Maize and Cowpea Workshop to which the Secretary of Agriculture, his deputies and directors of agriculture and scientists from research institutes and universities, extension personnel, seed distribution organizations and agro-chemical dealers participate. At this workshop the

past year's work is reviewed, recommendations made and a new programme for the coming year drawn up.

A similar annual workshop on farming systems research is in preparation and hopefully will be held in February 1986 at Nyankpala.

Sorghum and Millet:

Objectives of the improvement work are (1) High yield, (2) Drought resistance, (3) Striga resistance, (4) Insect and disease resistance, (5) Medium statured plant type, and (6) Acceptable grain quality for food.

Cowpeas:

Objectives of the improvement work on this crop are (1) High yield, (2) Disease and pest resistance, (3) Drought resistance, and (4) Early maturity.

Groundnut:

For groundnuts the objectives in the breeding programme are (1) High yield, (2) Pest and disease resistance, (3) Drought resistance, (4) Early maturity, and (5) High oil content.

USEFUL MATERIALS RECEIVED FROM SAFGRAD

The Nyankpala Station has recommended one early maturing variety of maize, Safita II, to farmers in the northern savanna zone of Ghana. The variety was bred at the Kamboinse Station by the IITA/SAFGRAD team.

The Station has also received new bruchid resistant cowpea varieties from the IITA/SAFGRAD breeding programme and these are very welcome materials.

SAFGRAD ACTIVITIES REQUIRED FOR STRENGTHENING THE

NYANKPALA STATION PROGRAMME.

1. SAFGRAD must put in place a network on sorghum and millet through which germplasm can be obtained for direct recommendation or for breeding purposes.
2. SAFGRAD should initiate a soil and water management network to strengthen research activities in this important field.

3. Assistance is hereby being sought to train the 14 scientists and 10 technicians identified earlier.
4. Training of liaison officers of the Regional Ministries of Agriculture which Nyankpala Station serves is urgently needed.
5. Retention of senior scientists due to lack of research resources is one of the major problems. SAFGRAD is requested to consider supporting senior scientists on sabbatical leave to help them acquire fresh outlook in their work and also benefit materially.
6. SAFGRAD must endeavour to get itself better known in member countries, and through this, help research programmes to have greater support from African governments. The International Coordinator is requested to travel more often to meet highly placed officials in member countries in pursuance of this objective.
7. The rotation of the venue for workshops with all the publicity that it generates will help increase the awareness of the activities of SAFGRAD among our people.

Country: B E N I N

Participant: Prof. D.F. ADJAHOSSOU

Topic: PAPER ON BENIN RESEARCH NEEDS

The People's Republic of Benin has varied climatic zones, including sub-humid and semi-arid zones.

The two major food grain research stations are, NIAOULI, serving the four southern provinces, and INA research station serving the two northern provinces. These stations are closely related to the SAFGRAD mandate area.

Research Personnel available at INA Station :

- 4 national researchers
- 1 French research expert
- 1 SAFGRAD Agronomist
- 1 SAFGRAD Agricultural Economist (being recruited)
- 15 research technicians
- 32 skilled labourers for research operation as well as administrative and financial officers.

Future training needs

Considering the acute shortage of trained researchers in Benin, long-term training to strengthen food grain and farming systems research is required (at M.Sc and Ph.D levels).

Major Constraints

Lack of qualified researchers, fund for the improvement of research infrastructure, are the major constraints. However, with the implementation of SAFGRAD farming systems research at INA it is to be hoped that research facilities would also be improved.

Type of Research support

- Strengthening of INA station in Bagou area and at the sub-station of DONGA in Atacora area;
- Establishment of formal linkages with ICRISAT for sorghum, millet and groundnut improvement.

Country: K E N Y A

Participant: Abdullah Naji Said

Topic: NATIONAL RESEARCH NEEDS AS RELATED TO SAFGRAD
MANDATE

COMMENTS

1. Prior to my arrival here I was not aware that I would be required to speak on this topic therefore I have not been able to present a comprehensive write-up.
2. Research work on Semi-arid agriculture started in Kenya in the early 40s, but a greater emphasis came in around mid-70s, as a result of population pressure in the higher potential land resulting in migration of agrarian peasants to the marginal and drier parts of the country. Land per capita in the high rainfall areas is now at about 0.9 ha. We estimate it to decrease to 0.5 ha per capita by 2000 A.D., calling for even more concerted efforts in dryland farming.
3. The main DRYLAND FARMING PROJECT is situated at KATJMANI, about 80 km South East of Nairobi. The station is fairly well staffed and was beefed up by an FAO aid and personnel. Three FAO personnel are still complimenting the local staff at the station.
4. The ICRISAT/SAFGRAD Sorghum/Millet project activities also located at this station has already been presented to us ably by Dr. Brahane, the Regional Coordinator.
5. IDRC sponsored and supported a Pigeon Pea Project in the dry areas successfully and improved cultivars have been established.
6. A USAID Cowpea project is still in progress under the mandate of the Department of Crop Science, University of Nairobi.
7. MIRCEN Project on Biological Nitrogen Fixation is already producing and marketing packed Rhizobia for biological nitrogen fixation, under the mandate of the Department of Soil Science, University of Nairobi.
8. Animal traction and land management work at the Department of Agricultural Engineering, University of Nairobi, and the Ministry of Land and Settlement.

9. Work is being planned at the Kibwezi Dryland Station - World Bank loan.

10. Extension - T. & V. in phases. IFAD/World Bank.

-- Agricultural Information Services under the Ministry of Agriculture and Livestock Development Kenya Government?

- Courses:

- visual aids production.

11. Integration of crops and livestock.

Work going on at - Katumani

- Department of Animal Production

- KARI : Kenya Agricultural Research Institute

- Kitale Agricultural Research Station

- SR - CRSP - Dairy goat development in Western Kenya by Winrock International and the Kenya Government.

RELATIONSHIPS WITH SAFGRAD

- Continuation with the Sorghum/Millet Programme

- Implementation and pushing sorghum/millet in the Semi-Arid areas.

Food habits on maize too strong. ACPO Programme under SAFGRAD for Sorghum and Millet will be very helpful.

- Integration of crops and livestock - 1 find missing in the Master Plan - Relevance of this here and under Pasture Networking.

- Other complimentary roles :

- Biological nitrogen fixation,

- Draft power.

- T. & V. Programme under ACPO

- Seed multiplication and distribution.

- Crops and livestock integration programmes.

PASTURE NETWORK FOR EASTERN AND SOUTHERN AFRICA
(PANESA)

BACKGROUND INFORMATION

- Conceived as part of the Recommendations at the end of a workshop on "Pasture Improvement in Eastern and Southern Africa" held in Harare, Zimbabwe in September 1984 under the auspices of IDRC and SADDG. Steering Committee elected to draw up a document on PANESA. Has gone through the formative stages already.

4 Terms of Reference of the Steering Committee :

- Outline the objectives of PANESA
- Define the ways and means of implementing those functions
- Define the qualifications and activities of a Coordinator of PANESA.
- Outline methods of evaluating the performance of PANESA annually.
- Draw up a budget and solicit funds.
- donor agencies - Current status is that IDRC will be the main funding agency.

OBJECTIVES

- Encouraging production of pastures and other related feed resources in the region through national and regional cooperation.
- Provision of experimental and other relevant literature to scientists working in the discipline.
- Promote manpower training at higher levels and at technical supportive levels.
- Dissemination of germ plasm for national and regional testing and extension.
- Production of PANESA newsletter and organizing annual workshop.
- Promote and encourage National Forage Networks.

Relevance of PANESA for this Meeting

- Integration of livestock and food crops through :
 - recycling of arable farm by-products such as stovers, bean tops, groundnut tops and others such as legume forages to enhance soil fertility.
 - Draft power.
 - Manure utilization where feasible.
 - Animals and their effects on soil management.

Workshop in Nairobi from 11th - 16th November, 1985 (tentative).

- Theme : "Feed Resources for the Small Scale Livestock Producer".

Suggestion : Formation of -

Pasture/Feed Resources Network for West African region.

Country: T A N Z A N I A

Participant:

Topic: AGRICULTURAL RESEARCH IN TANZANIA

1.0 STRUCTURE

There is the Ministry of Agriculture and Livestock Development responsible for crop development, livestock development, irrigation, relevant research and training at lower, middle and post-graduate levels. Training at undergraduate level is the responsibility of the Ministry of Education through the Universities. Crop and livestock research is conducted by 4 parastatal organizations under the Ministry of Agriculture.

- a. TANZANIA Agricultural Research Organization (TARO) for crop research;
 - b. TANZANIA Livestock Research Organization (TALIRO) for Livestock research;
 - c. UYOLE Agricultural Centre for Crop and Livestock in the South;
 - d. TANZANIA Pesticide Research Institute (TPRI) for research on pesticides.
- TARO and TALIRO have a number of research Institutes and Centres and UYOLE also has a number of Centres/Stations. There is a project on Rice and Maize Research at Dakawa and another one on horticultural research at Tengery which are directly under the Ministry.

The Ministry is in the process of reorganizing the above research organizations to facilitate even better coordination.

2.0 CONSTRAINTS

2.1 General constraints to Agricultural Production are :

2.1.1 Drought conditions in some areas

2.1.2 Insufficient allocation of resources - both local and foreign to the Agricultural sector. This constraint affects and weakens the extension service and agricultural research.

2.2 Constraints relevant to food grain production are :

2.2.1 Maize

- 2.2.1.1 Distribution of rainfall in time and place.
- 2.2.1.2 Lack of suitable varieties resistant to drought and streak in low and medium altitude.
- 2.2.1.3 Large post harvest losses - inadequate storage.
- 2.2.1.4 Poor extension services.
- 2.2.1.5 Lack of sufficient farm power and labour.
- 2.2.1.6 Poor supply of inputs.
- 2.2.1.7 Lack of Credit.
- 2.2.1.8 Poor prices for the producer.

2.2.2 Sorghum and Millet

As for Maize above, and also the problem of :

- 2.2.2.1 Losses due to birds (quelea quelea)
- 2.2.2.2 Lack of varieties which are more drought resistant and at the same time be palatable.

2.2.3 Grain Legumes

- 2.2.3.1 Rain distribution
- 2.2.3.2 Weeds
- 2.2.3.3 Diseases
- s.s.3.4 Inadequate extension service.

3.0 NATIONAL RESEARCH NEEDS

Priority of National Research Needs are:

3.1 Generation of Technology for the Semi-arid food grains

3.1.1 Sorghum

The programme is divided into West and East and Southern Africa. Tanzania falls in between East and South and therefore receives materials from North east and South - SADCC.

Tanzania receives materials for low and medium altitudes only.

In 1984/85 SAFGRAD breeding nursery for Eastern Africa consisted entries contributed by Tanzania, Ethiopia and Uganda.

We would be interested in screening nurseries for pest and disease resistance.

3.1.2 Maize

Varieties sent by SAFGRAD are being evaluated at Ilonga along with local varieties.

3.1.3 Cowpeas

Exotic varieties sent by SAFGRAD are being evaluated for their performance under Tanzanian conditions along with local varieties.

It is felt that such programmes should continue.

4.0 Training

At present the available graduate research manpower for major food grain research programmes is a total of 74 of which 50 are nationals, and the rest are expatriates. For maize programmes there are 14 scientists for breeding, agronomy/Soil Fertility, plant protection and on-farm research. For sorghum there are 5 scientists, millet 2, and Pulses 18.

For future long-term training needs we reckon we require 5 places for Ph.D, and 10 places for Masters level.

Short term training in specific areas for graduate as well as technicians is considered to be very important and also, seminars and study tours.

5.0 Direct Support to National Programmes

This is also an important area of research needs where important deficiencies may occur in the course of implementing SAFGRAD approved research programmes. The support should be to the identified programmes rather than individual scientists.

TANZANIA

6.0 The Semi-Arid Food Grains Research and Development Cooperative Programmes

6.1 Sorghum:

The programme is divided into West and East and Southern Africa. Tanzania falls in between East and South so she enjoys materials from both North East and South - SADCC.

The programme covers :

Low altitude)

Medium altitude) Semi-arid areas.

High altitude)

Tanzania receives materials for the low and medium altitudes only.

In 1984/85 SAFGRAD breeding nursery for Eastern Africa consisted 600 entries contributed by Tanzania, Ethiopia and Uganda each 200 entries to be planted in Tanzania, Uganda, Ethiopia, Kenya and Tanzania.

We also received breeding nursery from SADCC.

Under the programme we would be interested in screening nurseries for pest and disease resistance.

6.2 Maize:

The regional maize programme extended by SAFGRAD is on the lines of Sorghum and Millet.

Varieties sent by SAFGRAD are being evaluated at Ilonga along with the local varieties viz: 'Kito', 'Kilimo' and 'staha'. The trial is continued since 1982/83. The results are communicated to SAFGRAD every year.

6.3 Cowpeas

Regional cowpea programme is also on the lines of Sorghum, millet and maize. The exotic varieties sent by SAFGRAD are being evaluated for their performance under Tanzanian conditions along with the local varieties. This trial is also on since 1982/83 and the results are communicated to SAFGRAD.

T A N Z A N I A

Table 1.

FUTURE TRAINING NEEDS FOR STAFF OF RESEARCH INSTITUTIONS, 1984

<u>LEVEL</u>	<u>CROP SCIENCE</u> <u>(Food and Cash Crops)</u>	<u>FOOD CROPS</u>	<u>FOOD GRAINS</u>
Doctorate	13	7	5
Masters	28	14	10
Bachelors	68	34	26

Table 2.

TANZANIA

MAJOR FOOD GRAIN RESEARCH PROGRAMMES AND CURRENT AVAILABLE RESEARCH MANPOWER

PROGRAMME AREA	DISCIPLINE AREAS	MANPOWER NATIONALS			EXPATRIATES		
		<u>BSC</u>	<u>M.SC.</u>	<u>Ph.D</u>	<u>B.SC.</u>	<u>M.SC.</u>	<u>Ph.D</u>
1. Rice	Breeding, Agronomy and weed control, Farming Systems research and Irrigation development and water management.	5	4	1	14	1	-
2. Maize	Breeding, Agronomy/Soil fertility, plant protection and farm research	5	6	1	1	-	1
3. Sorghum	Breeding, agronomy, Pest and disease control and on-farm research	2	1	1	-	-	1
4. Millet	Selection, Breeding, agronomy and on-farm research	1	1	-	-	-	-
5. Pulses (beans & cowpeas)	Breeding, agronomy, Pathology entomology and on-farm testing	5	11	2	-	-	-
6. Wheat & barley	Germplasm evaluation and selection agronomy, crop protection, soil and water management and Agro-mechanization.	2	1	1	2	2	2
	TOTAL	20	24	6	17	3	4

Country: Z A M B I A

Participant:

Topic: COMMENTS ON AGRICULTURAL RESEARCH OF ZAMBIA

At present Agriculture has been given top priority nationally with emphasis on diversification so as to become self-sufficient in food needs and produce surplus for export. National Council for Scientific Research is the overall advisory body; National Commission for Development Planning handles negotiations with donor agencies for agricultural research which is carried out by the Research Branch/Department of Agriculture/Ministry of Agriculture and Water Development.

Livestock Research is presently carried out by three bodies; two in the Ministry of Agriculture and Water Development (Department of Agriculture (Research Branch) and Department of Veterinary and Tsetse Control) and National Council of Scientific Research.

Research in Zambia is commodity oriented and coordinated by specialist teams.

1.0 Maize: Through the effort and emphasis within the last five years on breeding, five hybrids and two open-pollinated varieties to suit three ecological zones are ready to be released this year. Nine scientists work in the maize research team (7 breeders; 2 crop protection officers). Zambia participates in the SAFGRAD trial network; and also cooperated with both CIMMYT and IITA.

Deficiency: Agronomists in the maize team

SAFGRAD could help in training.

2.0 Sorghum and Millet: Suffered from piecemeal research effort; unfavourable pricing and over-emphasis on maize.

Presently a team of 4 scientists are working in the sorghum and millet team (2 breeders; 1 agronomist and 1 trainee millet breeder). Training available through SADCC/ICRISAT/INTSORMIL.

Deficiency: Experienced Millet Breeder.

3.0 Groundnuts: falls within the National Oilseeds Development Project.

4 scientists working on groundnuts (2 breeders;

2 agronomists).

Deficiency: Training - post graduate.

4.0 Cowpeas: falls within the Grain Legume Research Team.

3 scientists (Breeder, Agronomist and Plant Pathologist) working part-time on cowpeas.

Constraint: Training and funds for operational research because of need to conduct research in many areas of country by a small team.

Overall Constraints:

- . Lack of adequate trained national manpower.
- . Shortage of training scholarships.
- . Shortage of Operational Research funds.
- . Shortage of Vehicles.

5.0 Present Status of Research

- . 70 Zambian professional Officers - most with BSc degrees.
- . Approximately 60 Expatriate Officers.
- . Strategy for Research and Extension drawn up - up to 1981.
- . Network of Research Stations and trial sites exist within the country.
- . Training programme drawn up to year 2000.
- . FSR teams formed - one for each province in the country envisaged - seven teams in place now.

SAFGRAD Linkage.

Would like to participate in ACPO programme and exchange information on FSR project and benefit from exchange visits.

Country: S E N E G A L

Participant: DR. M'BAYE N'DOYE

Topic: NATIONAL NEEDS FOR AGRONOMIC RESEARCH SUPPORT
AS EXPRESSED BY ISRA UNDER SAFGRAD.

The unexpected presentation of this paper necessarily leads to some inaccuracy inconsistent with the definition of a master plan. On the other hand, the objectives of this plan being already defined, the participating countries need to find common grounds so as to relate national objectives, so that the plan could be useful. This paper reflects the past and future research collaboration of ISRA and SAFGRAD :

I. SUMMARY PRESENTATION OF THE NATIONAL RESEARCH STRUCTURE
IN SENEGAL.

The Senegalese Institute for Agricultural Research (ISRA) was created by a 1974 Act and placed under the Minister responsible for Scientific and Technical Research. This institute inherited the activities previously carried out by the former french institutes, which had been entrusted by the government, with the management of some research sectors until 1974. ISRA's mandate covers the whole agricultural sector : oceanographic and fisheries, zootechnical and veterinary, forestry, agronomic and horticultural research.

ISRA presently includes five (5) research departments :

- 1 Department for animal production research
- 1 Department for forestry production
- 1 Department for oceanographic production research
- 1 Department for plant production research
- 1 Department for farming systems research and technology transfer.

The last two departments are currently in direct relation with SAFGRAD's activity.

ISRA is managed by a Director General and a Scientific Director. Its activities cover 11 research centres throughout Senegal, among which 6 are dealing with agronomic research.

The Bambey National Agronomic Research Centre, one of the oldest in Western Africa, is the main agronomic research centre. At the time the SAFGRAD project was initiated, the Bambey station was among the three national research centres to be developed and served for SAFGRAD research activities. It is the department of plant production that conducts research on SAFGRAD mandated crops.

This department has the following research programmes and scientists :

- Multidisciplinary research on groundnut, with 8 researchers;
 - Multidisciplinary research on millet, with 6 researchers;
 - Multidisciplinary research on sorghum with 2 researchers;
 - Multidisciplinary research on cowpeas with 6 researchers;
 - Multidisciplinary research on maize with 2 researchers;
 - Multidisciplinary research on cotton with 4 scientists;
 - Multidisciplinary research on garden crops with 6 scientists;
 - Multidisciplinary research on irrigated rice with 6 scientists;
 - Multidisciplinary research on rainfed and flooded rice with 7 researchers.
-
- Foundation seeds with 2 scientists
 - Storage with 1 researcher
 - Fruit tree growing with 4 researchers
 - MIRCEN Project with 1 researcher.

The department for farming systems and technology transfer consists of 3 operational systems teams :

- In Basse Casamance
- In Sine Saloum
- In the Senegal River area.

Each team includes at least one economist, one sociologist, one

zootechnician and one agronomist and may be complemented either by an agricultural engineer or a soil physicist.

This department also includes support research at the various research centres and coordinates the activities of the Macro-economic analysis Bureau (BAME).

II. ISRA/SAFGRAD COLLABORATION DURING THE FIRST PHASE

The relations between ISRA and SAFGRAD date back to the resolution of the 27th Session of the OAU Council of Ministers in June 1976, in Mauritius. An assistance agreement was signed in 1978 with the main objective of posting an ACPO who would conduct all the work permitting the transfer of the improved plant material of the major food crops (millet, sorghum and maize), and grain legumes (groundnuts, cowpeas), to the farmer.

This programme was implemented from 1978 to 1983 and suspended in 1984 and 1985 for a redefinition and a general reorientation. One may say here that the overall balance has not been satisfactory, neither for SAFGRAD nor for ISRA. For such a collaboration ISRA and SAFGRAD met last April and we hope that it will resume on new grounds with the initiation of the second phase being prepared.

WORKING POSSIBILITIES AND NEEDS WITH SAFGRAD

I would like first of all to reiterate our willingness to work with SAFGRAD within its areas of competence. We are particularly prepared to collaborate on millet, sorghum, cowpeas and maize, but also to explore the new commodities such as groundnuts, bambara nuts including farming systems research. We feel that in all these areas we can contribute to a fruitful exchange while taking advantage of SAFGRAD support.

We have already agreed with SAFGRAD to recruit a new ACPO and to resume in the Central North and Northern zone a large scale testing of the

commodities for which a range of new varieties have reached the pre-extension and extension stages. The ACPO work would focus on testing new varieties of millet, sorghum, cowpeas and mostly groundnuts. In the central north zone his work would collaborate with that of the agronomist of the Sine Saloum Farming Systems team. This work would be conducted in close collaboration with the Commodity and Systems teams.

Secondly, we have agreed that SAFGRAD would support the multi-locational trials as well as the confirmation trials on the material already developed in the same programmes and on maize. In Senegal the ACPO would have yearly plan of activities and also submit annual reports to ISRA and SAFGRAD in collaboration with ISAR and SAFGRAD.

For this particular reason I was stressing yesterday, the need for an adapted role of the ACPO in terms of the national research system, because the needs are probably different from one country to another.

Finally, I would like to apologize again for the incompleteness of this report which has been prepared hurriedly.

Thank you for your attention.

Country: C H A D

Participant: Mr. Nekouam NDOMIAN

Topic: CHAD DRAFT PAPER FOR SAFGRAD WORKSHOP

INTRODUCTION

The Division of Agricultural Research (DAR) is under the Direction of Agriculture of the Ministry of Agriculture and Rural Development. The DAR's main responsibility is for planning, coordinating and implementing food crop research, including SAFGRAD's mandated crop.

1. Research Staff

There is acute shortage of trained research workers.

The present research cadre includes :

- Three (3) Ph.D Agronomists;
- One (1) Rural Development Engineer;
- Seven (7) Agronomist Engineers one of whom is highly skilled;
- Two (2) Agricultural Scientists;
- One (1) Agricultural Engineer;
- Eight (8) Agricultural Labour Foreman
- Thirteen (13) Technician Officers of Agriculture
- Two (2) Crop Officers
- Two (2) Instructors of Agriculture
- Sixty (60) Field assistants and farm labourers.

2. Training Needs

In order to strengthen the national research system, training in various fields of agriculture are depicted in the following table :

Disciplines	Short Term		Medium Term		Long Term	
	A	B	A	B	A	B
Genetics and Experimentation	4	6	8	12	12	20
Agro-Economy	1	2	1	2	3	6
Farm machinery	1	2	-	-	3	6
Entomology	1	2	3	6	6	12
Plant Pathology	1	2	3	6	6	12
Bioclimatology	2	2	-	-	4	8
Agricultural Science	3	4	3	4	6	12
Post-harvest Technology	1	1	2	4	4	8
Agricultural and Soil Science	1	2	3	6	6	12
Agro-Pastoralism	1	2	-	-	2	4
Weed Science	1	2	1	2	4	8
Plant Biology	1	2	3	6	6	12
Seed Production	1	4	2	2	4	8
Extension and Transfer of Technologies	3	6	2	4	2	4
TOTAL	22	39	31	54	68	132

A = Researchers

B = Technicians

3. Major Constraints

3.1 Lack of encouragement of research workers

3.2 Poor financial support

Research on maize and cowpea was carried out at the Bebedja IRCT (the wetter area). Research in dry areas was discontinued since 1979, for that Chad needs to be assisted to strengthen sorghum and millet research in this region.

3.3 Operational difficulties of the Food Grain Research of CILSS/INSAH Project.

The programme needs to be supported by plant breeders in order to carry out research of IRCT crop and the Regional Project for millet, sorghum, cowpea and maize improvement of CILSS/INSAH.

3.4 Constraints

DAR structure does not enable it to effectively plan, coordinate and implement food grain research since research stations, farms and trial sites suffer from poor infrastructure. Agricultural research activities are almost fully financed through foreign aid (FAC, FED, FAO, USAID, etc.), with a decreasing Chadian participation, due to its economic problems. DAR has limited qualified staff to carry out the national crop research. The small staff that are working on crop research are not encouraged to continue due to poor working conditions compared to other institutions (OMVGD, ONDR, IRCT, etc.).

4. Research Support Required

Within the framework of OAU/STRC No.31 joint project, SAFGRAD, CHAD DAR needs :

- One expatriate as an ACPO (RPAA). This RPAA will be assisted by a Chadian counterpart to facilitate the transfer of technology;
- A soil scientist; and
- direct research support to DRA in the following disciplines:

- . Genetic and crop improvement
- . Plant Protection
- . Soil Science research
- . Seed multiplication
- . Pre-extension and transfer of technologies section

There is a need to strengthen the above research units.

Concerning aid in staff, it may be suggested that occasional consultancy services could be helpful in strengthening food grain research. One of the major projects in Chad is the "Integrated Project of Agricultural Research in the Sahelian Zone". It has a budget of one billion two hundred ninety-five millions four hundred eighty-five thousand francs (1,295,485,000 CFA F), allocated as follows:

1. Crop breeding and genetic improvement
252,070,000 CFA F
 2. Fertilization and Cultural Techniques
114,435,000 CFA F
 3. Building and fitting of soil and plant laboratory and
two greenhouses
475,080,000 CFA F
 4. Pre-extension
453,900,000 CFA F
- Total : 1,295,485,000 CFA F.

CONCLUSION

Chad, through the Division of Agricultural Research (DAR), would be interested to receive assistance from SAFGRAD to establish the ACPO programme.

DAR currently has 39 civil servants and sixty contract and permanent farm labourers. They could be effectively utilized through funding and external technical support. Furthermore, it is hoped that the working conditions and status of research workers would be improved.

Country: T O G O

Participant: Mr. T. AITHNARD

Topic: SAFGRAD/JP31/OAU/STRC EXTENSION RESEARCH
ACTIVITIES PROJECT IN NORTHERN TOGO.

1. General Considerations

The administrative regions of savanna and of Koro are considered as semi-arid regions where OAU/STRC/SAFGRAD/JP31 ACPO programme was started with USAID assistance in 1979. Since 1980, SAFGRAD/Togo ACPO programme is supported by FAC under the auspices of the Direction of Agricultural Research (DRA) of the Ministry of Rural Development.

Several development projects are operational in the region (Northern Togo) including those by UNDP/FAO Project; FED/Kara and FED/Savannahs Projects; Nainiele Ranc Project; USAID Animal Traction Project: Many non-Governmental Organizations (NGO) (SOTOCO) along with Savanna and Kara DRDR.

Agricultural research programme has linkages with several projects. Some of the research activities are :

- IRAT for food crops improvement research;
- IRCT for cotton improvement research;
- DRA with its WARDA programme and Togo Rock Phosphate carries out multilocational trials with the ACPO programme;
- NorthernTogo project has also cooperative research programme with SAFGRAD ACPO.

It should be noted that few performing results have been recorded through such a piecemeal research intervention and that each programme presents a specific problem.

The present objective of the Togolese Government with the new strategy for Rural Development is to harmonize all development activities on the field so as to introduce relevant technologies.

The same applies to the field of Agricultural Research on food crops that is entrusted to DRA.

The SAFGRAD ACPO has been conducting research trials under DRA and it is effectively coordinating research trials in the regions.

2. Objectives

2.1 General objectives

- . To conduct thematic research aiming at improving cereals and legumes, including agronomic practices;
- . To promote systems research for regional development through the improvement of traditional farming systems;

2.2 Specific Objectives

- Improvement of cereals (sorghum, millet, maize) and legumes (cowpea, groundnuts). A particular emphasis will be put on sorghum/millet breeding with a view to finding high yielding varieties more adapted to the ecologies and to the taste of consumers in those regions.
- Improvement of cultural techniques, especially the practice of animal traction and the use of rock phosphate and acidified fertilizers.
- Improvement of traditional farming systems through introduction of appropriate technologies and their transfer through pre-extension to farmers.

3. Project Description

Togo/SAFGRAD is currently conducting its research-development programme, with FAC aid (ACPO and 15 million CFA F/year) and Togo's participation (staff, financial counterpart, etc.).

The emphasis put on Development has brought about a complementary request of 7 millions with FAC.

For the 1986-90 period the objective is to intensify currently the activities for research system and thematic research, especially on millet and sorghum.

With regard to the first component it may be considered that the present organization, with a yearly budget of about 26 million CFA F, will be able to effectively implement research programmes.

The second component requires :

- The presence of an Expatriate researcher, expert in sorghum/millet breeding, who will be replaced by a National currently trained in this field.
- A team of national technicians
- An investment and operational budget, that will help not only to support the thematic research programme, but also establish a specific research infrastructure for the region.

Finally, a specific component for National Staff Training will be required.

4. Cost of the Project (f.c. Operation and Bill-book calendar)

The proposed expansion of SAFGRAD Research Activities in Togo's Northern Region for the 1986-90 period is estimated at 697 Million Constant CFA F or 919 Million current francs.

Assuming that FAC financing is acquired and that the Togolese national will be in charge a complementary budget for the ACPO project would be about 370 Millions constant francs.

CALENDAR OF THE PROJECT OPERATIONS FINANCING
(IN MILLION CONSTANT CFA F)

Nature des Opérations.	Unité mes.	1985	1986	1987	1988	1989	1990	Total	Observations.
<u>PERSONNEL BURKINABÈSE.</u>									
- R.P.A.A.	h/an	1	1	1	1	1	1	6	
- Sélectionneur Sorgho.....	h/an	-	1	1	1	1	0,5	4,5	
<u>PERSONNEL TOGOLAIS.</u>									
- Ingénieur T. Agricoles (A2).....	h/an	2	3	3	3	3	3	17	{ 1en Format { 1Hom RPAA { 1Hom.Sorg { Dapong, { Bassa, Kara { 2x(" "
- Ingénieur Adjoint (B).....	h/an	1	3	3	3	3	3	16	
- Techniciens (C)..	h/an	2	6	6	6	6	6	20	
<u>FORMATION.</u>									
<u>Longue durée :</u>									
- Sélection Sorgho-Mil.....	h/an	1	1	1	1	-	-	4	(en cours)
- Système	h/an	-	-	1	1	1	-	3	
- RPAA.....	h/an	-	-	-	-	1	1	2	
<u>RECYCLAGE ET TRAVAIL DE COURTE DUREE.</u>									
	h/mois	-	-	5	5	6	-	16	
<u>EQUIPEMENT.</u>									
- Constructions magasins.		-	x	x	-	-	-	-	
- Véhicules.....		-	3	-	-	-	-	3	
- Motos, Scoylettes		-	6	-	-	-	6	14	
- Matériel agricole, labo, bureau et mobilier		-	x	x	-	-	-	-	
<u>FONCTIONNEMENT.</u>									
- Recherche Système		x	x	x	x	x	x		
- Recherche Thématique.			x	x	x	x	x		

CALENDAR OF THE PROJECT IMPLEMENTATION

Nature des Opérations.	1985	1986	1987	1988	1989	1990	Total	Observat.
<u>+ PERSONNEL ÉTRANGER.</u>								
- R.A.A.....	30	30	30	30	30	30	180	(Env.Rech.)
- Sélectionneur.....	-	30	30	30	30	15	135	
<u>+ PERSONNEL TOGOLAIS.</u>								
- Ingénieur A2.....	3,2	4,8	4,8	4,8	4,8	4,8	27,2	
- Ingénieur Adjt B...	0,8	2,4	2,4	2,4	2,4	2,4	12,8	
- Techniciens C.....	1,2	3,6	3,6	3,6	3,6	3,6	19,2	
<u>+ FORMATION.</u>								
- Sélection borgho-hil	7,2	7,2	7,2	7,2	-	-	28,8	(Bourse Fa quise)
- Recherche système....	-	-	2,2	2,2	7,2	-	21,6	
- R.A.A.....	-	-	-	-	7,2	7,2	14,4	
- Stages courte durée....	-	-	1,2	1,2	1,2	-	3,6	
<u>+ ÉQUIPEMENT.</u>								
- Constructions magasins	-	2,5	2,5	-	-	-	15,0	
- Véhicules.....	-	10,5	-	-	-	7,0	17,5	
- motos, Mobyettes	-	1,5	-	0,5	-	1,5	3,5	
- matériels agricole, Labo, bureau et mobilier	-	15,5	10	-	-	-	23,5	
<u>+ FONCTIONNEMENT.</u>								
- Recherche système	15	20	20	22	22	22	125	(financ. FA)
- Recherche Thématique	-	20	20	20	20	20	100	
<u>+ DIVERS ET IMPREVUS 10% (Équipt + Fonct).</u>	1,5	2,5	5,9	4,2	4,2	5,5	26,8	
Coût total du Projet francs constants	58,9	160,5	151,8	133,1	132,6	119	755,9	
Coût total du Projet en francs courants.	58,9	176,5	182,1	173	198,9	190,4	979,8	

NIGERIA

It was reported that several research institutes are engaged in the improvement of different crops (cereals, tree crops, etc.). The Institute of Agricultural Research (IAR) of Ahmadu Bello University at SAMARU, is a research centre that conducts research on SAFGRAD mandated crops including FSR. The general objective of the cereal improvement programme (at Samaru) is to identify high yielding varieties of sorghum, millet, maize, cowpea etc.

CONSTRAINTS

One of the strategies for removing constraints is a coordinated on-farm testing programme. No trained manpower problem for research was reported but the following constraints were mentioned :

- . Shortage of funds;
- . Lack of research material and poor service and maintenance of research equipments.

Possible Cooperative Programme between IAR and SAFGRAD

Since IAR has broad germplasm and tested crop production technology, SAFGRAD could provide the linkage to channel the same to its other member countries. IAR could play a key role in strengthening SAFGRAD.

IVORY COAST

Similar global constraints was outlined as reported by different member countries. Collaborative research with SAFGRAD could be in the development of short-cycle maize varieties. Some of the constraints mentioned were :

- . Lack of highly qualified research scientists;
- . Lack of adequate research resources.

MAURITANIA

In addition to environmental stress, it was reported that Mauritania lacks both trained manpower and resources to strengthen its national research systems.

GAMBIA

Reported that its research focus is on applied phase and takes advantage of existing research programmes of neighbouring countries such as Senegal, regional programmes such as (INSAH and SAFGRAD), and that of IARCs (IITA, ICRISAT, CIMMYT, etc.). No major constraints to research has been mentioned.

GUINEA BISSAU

Similar constraints to that of Mauritania was reported.

BURKINA FASO

It was reported that the National Agricultural System has already been organized into several major programmes including FSR. Burkina Faso being the SAFGRAD headquarters most of the regional research on maize, cowpea, sorghum, soil-water management research is being conducted at Kamboinse Agricultural Research Station in cooperation with IBRAZ crop research. It was pointed out that it is essential to balance the interests of national and regional research programmes. Regarding the strengthening of the national research system the following constraints were listed :

- . Lack of highly qualified research scientists;
- . Lack of research resources and funds;
- . Require support to research management.

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LIST OF PARTICIPANTS.

TECHNICAL WORKSHOP : SAFGRAD MASTER PLAN
8 - 13 JULY 1985, OUAGADOUGOU, BURKINA FASO.

1.	Mr. T. AITHNARD	Director	Togo
2.	Mr. V. NGUYEN	Technical Advisor	Togo
3.	Mr. M.S. SOMPO CEESAY	Assistant Director	The Gambia
4.	Mrs. Isabelle MIRANDA	Natl. Coordinator	Guinea Bissau
5.	Prof. D.F. ADJAHOSSOU	Director	Benin
6.	Mr. Mamadou DIARRA	Director	Mauritania
7.	Dr. B.K. PATEL	Ag. Assistant Director	Zambia
8.	Dr. L. ILMOLELIAN	Director	Tanzania
9.	Prof. Abdullah Naji SAID	Chairman, Dept. Animal Prod., Univ. Nairobi.	Kenya
10.	Dr. Brhane GEBREKIDAN	ICRISAT/SAFGRAD Reg. Coord. (Sorghum & Millet)	Kenya
11.	Dr. H. DOSSO	Plant Breeder, IDESSA	Ivory Coast
12.	Prof. G. ABALU	Agric. Economist, J.A.R.	Nigeria
13.	Dr. C.C. NWASIKE	Millet Breeder, ABU	Nigeria
14.	Mr. H. MERCER-QUARSHIE	Co-Manager, Nyankpala Station.	Ghana
15.	Mr. Mbaye NDOYE	Director, CISRA.	Senegal
16.	Mr. Roger BLOOM	USAID	Burkina Faso
17.	Mr. A. FLEMING	USAID/SAFGRAD	Burkina Faso
18.	Dr. N. MULEBA	Agronomist, IITA/SAFGRAD	Burkina Faso
19.	Dr. H.W. OHM	Director, FSU/SAFGRAD	Burkina Faso
20.	Dr. G. KONATE	IBRAZ Representative	Burkina Faso
21.	Dr. Tadesse KIBREAB	Soil Scientists, FSR	Burkina Faso
22.	Dr. Kassu YILALA	An. Prod. Specialist, FSR	Burkina Faso
23.	Mr. Issa DRABO	Director, Kamboinsé Station.	Burkina Faso
24.	Mr. Sansan DA	Project Manager, IBRAZ	Burkina Faso
25.	Dr. J. NAGY	Agric. Economist FSU/SAFGRAD	Burkina Faso
26.	Mr. Nekouam NDOMIAN	Rural Development Engineer	Chad
27.	Dr. N'Getta BOSSO	Consultant, SAFGRAD	Burkina Faso
28.	Dr. J.M. MENYONGA	Int. Coordinator, SAFGRAD	Burkina Faso
29.	Dr. Bezuneh TAYE	Director Research, SAFGRAD.	Burkina Faso.