INTERNAL EVALUATION OF SAFGRAD NETWORKS

SORGHUM, MAIZE AND COWPEA IN WEST AND CENTRAL AFRICA, SORGHUM AND MILLET IN EASTERN AFRICA

Undertaken by the Oversight
Committee of SAFGRAD

SEMI-ARID FOOD GRAIN RESEARCH AND DEVELOPMENT

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T A B L E O F C O N T E N T S

A C K N O W L E D G M E N T

This mission could not have been accomplished without the active and frank participation of researchers and officials of the national agricultural research institutions of the countries visited. We are deeply grateful for their assistance. Our gratitude is equally addressed to the Network Coordinators, the ICRISAT teams in Mali, Niger, Nigeria and Kenya and the IITA scientists in Nigeria. Finally, our thanks must go to SAFGRAD Coordination Office for its encouragement and support during the mission.

SUMMARY OF THE EVALUATION

The mission, carried out from 21st May to 5th June in West Africa and from 9th to 19th July, 1990 in East Africa, was an internal evaluation of research networks within SAFGRAD Phase II. For West Africa the mission was undertaken by a team comprising Mr. Hector Mercer-Quarshie (Oversight Committee member) Da Sansan (Oversight Committee member) Michel Sedogo (Director-General of CNRST, Burkina Faso) Jojo Badu Forson (ICRISAT Representative) and Joseph Suh (IITA Representative). In East Africa the team was composed of Hector Mercer-Quarshie (Oversight Committee member) J.B. K. Kavuma (Researcher of the Uganda Agriculture and Forestry Research Organization, Uganda) and Ibrahim Babiker (Oversight Committee member) who joined in the Sudan only. Regrettably, ICRISAT was not represented on the East Africa mission even though an invitation was extended for it to do so.

In the course of SAFGRAD-II, emphasis has been placed on four regional research networks, with the main purpose of strengthening the capabilities of national agricultural research systems (NARS) thereby increasing productivity and ensuring food self-sufficiency in the 26 SAFGRAD member states.

The objective of this internal evaluation was to assess the impact of the networks on NARS and assess the synergistic effect among the different partners involved in networking, indicate any strong and weak points of the current system and identify any new areas for consideration in the next phase of SAFGRAD.

At the end of this evaluation, conducted essentially in the form of interviews involving scientists and research management officials, the following findings were evident:

- NARS scientists and also IARC scientists in the region are generally satisfied with the functioning of the four networks.

- The networks have facilitated the exchange of germplasm both for testing and creation of new varieties. Whereas in West Africa improved maize and cowpea varieties are available for extension purposes, in East Africa improved sorghum varieties have either been released to farmers or are in the pre-release stage. Where no releases have taken place, it is more a question of time and internal organization or greater effort to arrive at this stage.

- Different types of short-term training (in-service training, seminars, workshops and monitoring tours) have helped to improve the research skills of technicians and scientists. With the extension of their duration and the establishment of long-term university post-graduate training, preferably in African institutions with financial support from SAFGRAD and governments, NARS capabilities could be further enhanced.

- Apart from some lead centres, the priorities of which had been defined before the establishment of networks, networks have substantially influenced the identification of NARS priorities and research needs.

- West and East Africa NARS had different opinions on the employer of the network coordinator. The West Africa NARS were unanimous in their desire to see network coordinators become fully the employees of the SAFGRAD Coordination Office. The East Africa NARS, on the other hand, wished to maintain an ICRISAT employee as the network coordinator.

To make the interaction between NARS and IARCs more effective, it is suggested that formal links be established among the relevant institutions (participation of IARCs in steering committee meetings, invitation of the SC and the SCD to

the programme planning and evaluation meetings of the IARCs, etc.

The Coordination Office has been acting effectively both within NARS and SC and as the spokesman of NARS and networks to the IARCs and donors. However, this liaison role is not always recognized by some national scientists because of inadequate information. The SCO should endeavour to rectify this information gap through more effective use of the Newsletter and visits to national institutions, and additionally, in East Africa by the appointment of a liaison officer.

The efforts made to disseminate scientific and technical informations should continue and made to reach more scientists. Suggestions and recommendations have been made in the report by the evaluation team to strengthen NARS.

A C R O N Y M S

CIAT	:	Centro Internacional de Agricutura Tropical
CIP	:	Centro Internacional de la Papa
EARSAM	:	Eastern Africa Regional Sorghum and Millet Research Network
IAR	:	Institute for Agricultural Research (Nigeria)
IARC	:	International Agricultural Research Centre
ICRISAT	:	International Crops Research Institute for the Semi-Arid Tropics
IDRC	:	International Development Research Centre
IER	:	Institut d'Economie Rurale (Mali)
IITA	:	International Institute of Tropical Agriculture
INERA	:	Institut d'Etudes et de Recherches Agricoles
INRAN	:	Institut National de Recherches Agronomiques du Niger
INSAH	:	Institut du Sahel
INTSORMIL	:	International Sorghum and Millet Project
NARS	:	National Agricultural Research System
OAU	:	Organization of African Unity
ODA	:	Overseas Development Agency (United Kingdom)
SAFGRAD	:	Semi-Arid Food Grain Research and Development
SCO	:	SAFGRAD Coordination Office
SC	:	Steering Committee
STRC	:	Scientific, Technical and Research Commission
UNDP	:	United Nations Development Programme
USAID	:	United States Agency for International Development

INTRODUCTION

The attainment of food self-sufficiency continues to be a major goal of African governments especially in the semi-arid regions. To succeed, technological transformation fully backed by agricultural research and effective technology transfer would be required. Effective agricultural research entails substantial input of qualified personnel and funds which no one African country can afford. This was the raison d'être that assembled Research Directors of Agriculture from semi-arid Africa in 1987. At this gathering the Directors agreed, among others, to bring together their research manpower and infrastructural resources to alleviate constraints to food production. The aggregate of research capabilities was to be employed in networks for the generation and evaluation of technologies.

The IARCs (IITA and ICRISAT) and the SAFGRAD Coordination Office (SCO) through USAID funding support have assisted NARS to set up the following fully operational crop commodity research networks since 1987:

1. The Eastern Africa Regional Sorghum and Millet Research Network (EARSAM)

2. The West and Central Africa Sorghum Research Network (WECASRN)

3. The West and Central Africa Cowpea Research Network (RENACO)

4. The West and Central Africa Maize Research Network (WECAMAN)

One of the management entities of the networks is the Oversight Committee. The Oversight Committee overseas SAFGRAD project activities, provides guidance in management, reviews

plans and monitors implementation of network programme activities.

In fulfilment of one of its mandates, the Oversight Committee recommended at its February, 1990 meeting that an internal review of all SAFGRAD research networks be carried out. The Oversight Committee also established an evaluation team to collate information on the performance of the various networks and survey the outlook of NARS in networking. The results of the evaluation would serve as a guide for the improvement of future network plans and development.

Terms of reference:

The terms of reference of the evaluation team were:

i. To assess performance of respective networks based on the expected output of SAFGRAD II

ii. To survey if the network activities have enabled or facilitated the release of improved varieties and related technologies that could enhance food grain production.

iii. To obtain feedback on the improvement of research skills of NARS.

iv. To survey if networks have positively influenced the development of NARS leadership and network management.

v. To assess current linkages (as viewed by NARS) among network entities (i.e. SCO, IARCs and Steering Committees of respective networks) and to propose areas of improvement in order to efficiently serve NARS.

vi. To determine if networks have influenced IARCs and NARS research agenda.

vii. To obtain the views of NARS on how network management could be transferred to NARS and be sustainable with minimum external financial support in the longrun.

viii. To identify specific areas of network research that need to be intensified in the overall networking activities.

MODALITY OF IMPLEMENTATION OF THE EVALUATION

For West Africa, the evaluation team was composed of the following:

1. Mr. Hector Mercer-Quarshie from Ghana, team leader and member of SAFGRAD Oversight Committee
2. Dr. Sansan Da from Burkina Faso, member of SAFGRAD Oversight Committee
3. Dr. Michel Sedogo, Director-General, National Centre for Scientific and Technical Research (CNRST), Burkina Faso
4. Dr. Jojo Badu Forson from ICRISAT, Niamey, Niger
5. Dr. Joseph Suh from IITA, Ibadan, Nigeria

The team visited the following countries on the dates indicated:

Burkina Faso	-	21 - 22 May, 1990
Mali	-	23 - 25 May, 1990
Niger	-	26 - 30 May, 1990
Nigeria	-	30 May - 2 June, 1990

During this visit the mission worked essentially using the terms of reference included in the format attached in Annex 1 and comprising a series of 19 questions. Whenever possible, the questionnaires were handed to those concerned for consideration before the meeting. For more exhaustive information, the mission also used documents provided by the institutions of the host countries.

In each country visited, discussions based on the questions were held with those directly involved in the networks (SAFGRAD Director of Research, Network Coordinators, Directors-General and Directors of Agricultural Research, Heads of Departments, Centres or Stations and, finally, national scientists). Depending on the participants, some questions were either deleted or discussed at greater length.

In Bamako, the ICRISAT Regional Programme Officer and the bilateral ICRISAT/Mali Programme Officer also participated in the survey.

At the Sahelian Centre in Sadore (ICRISAT/Niamey), the meeting was organized with the Acting Director-General, the Millet Improvement Programme Leader and the Coordinator of the newly establishment millet network.

In Kano, the sorghum breeder and the ICRISAT Regional Team Leader contributed to the evaluation.

Finally in Ibadan, the team consulted with Deputy Director-General (international programmes) the Directors of the Cereal and Grain Legume Improvement Programmes. A total of more than 60 individuals, among whom were about 40 national scientists, were contacted and took active part in the discussion with the evaluation team.

For the conduct of the evaluation in East Africa the team was proposed to be composed of the following:

1. Mr. Hectorr Mercer-Quarshie from Ghana, team leader and member of SAFGRAD Oversight Committee
2. Dr. Ibrahim Babiker from Sudan, member of SAFGRAD Oversight Committee
3. Dr. Seme Debela from Ethiopia Director, Institute of Agricultural Research, Ethiopia
4. Representative of ICRISAT

However, as a result of other commitments during the period of the evaluation, Dr. Seme Debela asked to be excused and was replaced by Mr. John B.K. Kavuma, a senior research scientist of the Uganda Agricultural and Forestry Research Organization. Dr. Ibrahim Babiker was also unable to join the team in Kenya and Ethiopia because of difficulties in securing visas for the two countries at the right time. Regrettably, ICRISAT did not respond to the request to have a representative on the team. Thus only two members participated in the evaluation in all the countries concerned.

The two-man team visited the following countries on the dates shown.

Kenya:	9 July, 1990, H. Mercer-Quarshie only
Kenya:	10 - 12 July, 1990, both team members
Ethiopia:	12 - 15 July, 1990, both team members
Sudan:	15 - 18 July, 1990, Dr. I. Babiker joined the team.

The procedure for the evaluation in East Africa was the same as adopted for West Africa. This dwelt on discussing the questions arising from the terms of reference and the format attached in Annex I with network participating scientists and research managers in different countries as well as relevant international scientists. The mission also made ample use of relevant literature provided by host institutions in coming to conclusions in the report.

Unfortunately the evaluation of EARSAM did not yield enough participants with whom discussions could be held regarding progress of the network. This was so especially in Kenya and Ethiopia. In Kenya, as we were told, three active participants of the network at Katumani Station had left for further studies overseas. Furthermore, there were incidents on the 9th of July which prevented the leader of the evaluation team who arrived earlier from accomplishing planned visits. The problem in Ethiopia arose from two sources. Firstly, there were delays in the issue of a visa at Addis Ababa airport to Mr. John B.K. Kavuma who was invited to join in the evaluation after Dr. Seme Debela had declined to participate and who, therefore, did not have sufficient time to process his travel documents. Secondly, most of the scientists, as we were informed, were engaged in a programme review meeting at the time of our visit and therefore could not be interviewed. It was, however, reassuring that in spite of the difficulties, the central figures in network activities in these countries were contacted. A list of persons interviewed is attached in Annex II.

Since different teams were engaged in the evaluation in East and West Africa, the findings and the recommendations of the evaluations are presented separately for the two regions. The conclusions of the evaluation are, however, combined.

FINDINGS OF THE EVALUATION IN WEST AFRICA

1) Assessment of networks on the basis of the outputs expected from SAFGRAD II

From the comments received from countries and interest groups involved in the operation of the networks, the following points were evident:

In general the network are fulfilling the objectives set for them. Even if the sorghum network has had some problems in the past in harmonizing the operation of its different units, it should be recognised that currently all the steering committees are operating smoothly and the network partners are generally satisfied. Time has also permitted a more regional (than national) vision of the technical problems to be overcome.

As an information support mechanism to national systems, the networks have fully played their role and should, according to many people, focus more on the concept of research networks and not networks involved mainly in variety trials.

Where, in addition to Network Coordinators, IARC regional programme team leaders existed, concern was expressed that the latter might play a coordination role which could result in confusion in the operation of networks especially if the duties of the different officials were not properly harmonized.

Many network committee members feel that the duration of meetings should be extended to facilitate more in-depth discussions on scientific matters rather than on organizational concerns. Some of them also suggested that the membership of these committees should reflect some disciplinary complementarity, instead of the predominance currently given to crop improvement, and that emphasis should be placed on those activities likely to enable the least advanced institutes to catch up with the rest. Initiatives towards strengthening horizontal relationships between national institutions should henceforth be encouraged.

2) Release of Improved Varieties and Related Technologies

It has to be admitted that the release of varieties, especially to farmers, has many prerequisites. These include: the time necessary for effective diffusion of these varieties, the active participation of systems and organizations operating

in rural areas the potential performance of the proposed varieties, etc. This question of release appeared a little bit premature to many of the scientists interviewed.

At present, networks constitute the appropriate framework for the privileged exchange of germplasm for testing and recommendation, or for use in variety improvement programmes. Meanwhile, the network activities have resulted in the pre-release and release of new cowpea and maize varieties in some countries. The production of improved seeds seemed to constitute a serious bottleneck to this release. The wish was therefore expressed that national programmes should find a solution to this problem. It may also be necessary for the SAFGRAD Coordination Office to use its privileged position to sensitize governments and member countries on the urgency to establish operational seed production services that could play their rightful role in diffusion of improved varieties.

3) Improvement of NARS Research Capabilities

The various types of short-term training which aim at exposing scientists and technicians to the utilization of new technologies adapted to limited farming conditions, and in the rational use of available resources were unanimously welcomed by the participants who thought that course duration should be slightly extended. The technicians could thus benefit by 6 to 9 months in-service training if funds were sufficient. Special emphasis should be laid on in-country training in which expertise is provided by national institutions (Universities, Research Institutes, etc) and IARCs. In this respect, SAFGRAD and IARCs could assist these institutions in repairing or acquiring the scientific equipment necessary to accomplish such a mission.

Greater efforts should be made to make scholarships available for studies leading to the acquisition of university degrees (DEA "Advanced Studies Diploma", Doctorat, M.Sc. and Ph.D). The needs of the institutions are enormous and the

improvement of the scientific capabilities of the least advanced national institutions involve a long-term process of strengthening the quantitative and qualitative basis of available human resources.

Despite difficulties related to uniformity of educational background of applicants and working language, the 1988 cowpea workshop and particularly the training provided by the maize network were often quoted as outstanding examples of courses that enabled participants to make positive contributions on their return to their home countries.

Participants indicated that the in-service training, seminars and workshops organized by most of the networks have contributed enormously to the improvement of their research capabilities.

Monitoring tours provided participants with the opportunity to discover new materials and discuss new problems. For reasons of efficiency, it is recommended that only two countries be visited at a time during such tours and the countries visited should vary from one year to the other.

The papers presented at the various workshops were said to be beneficial to participants. However, it is felt that the current procedure for the selection of papers seems to favour only the experienced scientists. The evaluation team suggests that papers be sent to selection committees without names of authors and that multi-authored papers incorporating multi-disciplinary approaches should be encouraged as a way of avoiding discrimination against papers of junior scientists.

4. The Promotion of NARS Leadership in the Area of Research and Network Management

Under the direction of their respective chairmen, steering committee members, being well aware of their regional responsibility, participate actively in deliberations on

scientific issues now that organizational concerns have been settled.

There is no doubt that the networks have had a beneficial effect on NARS leadership. Many NARS have been able to acquire experience and knowledge that have enabled them to identify constraints and suggest appropriate solutions. At present, some NARS are in a position to provide others with germplasm or other materials derived from their research. Many NARS publish reports on special projects they undertake for the networks and go on consultancy to other NARS. This type of dynamic inter-NARS scientific solidarity initiated within the networks under the auspices of steering committee chairmen and Network Coordinators, if strengthened in the course of time, will lead to further improvements in the capabilities of NARS and also better organized lead centres which will fulfil their expected roles.

5). Current Linkages Among Network Entities

The entities in question are the NARS, IARCs, the SCO and the steering committees of respective networks.

It should be mentioned that some links have always existed between NARS and the IARCs. The nature of these relationships have varied widely depending on the institutions and the objectives envisaged.

Some were established on a bilateral basis between the IARC and the countries, others on the basis of a commitment between a Network Coordinator and the NARS and yet others between IARCs and NARS scientists. Visits, seminars, workshops, monitoring tours and steering committee meetings have often been the starting points of these links.

The team noted that exchange of views has taken place between the SAFGRAD Coordinator and policy makers in IARCs during visits to each other's headquarters. The team would like

to commend the SAFGRAD Coordinator and IARCs for their effort but would also like to see the links strengthened. Perhaps a more formalized arrangement by which the SAFGRAD Coordinator meets the IARCs should be set up.

The role of SCO was not fully understood by some NARS. While some NARS commended the SAFGRAD Coordinator for visiting them, others indicated that their only contact was with the Network Coordinators and were unaware of the role played by the SCO. Surprisingly, even those who expressed ignorance about the role of the SCO lauded the active participation of the Director of Research in workshops and steering committee meetings. Obviously a number of scientists did not consider the Director of Research as part of SCO which would mean there is an information gap which needs to be filled. A pertinent point which arises is the extent to which the SCO and SAFGRAD Coordinator should be seen and involved with the scientists in the NARS. In the view of the evaluation team the more important consideration is whether the operations of the networks are effective and efficient. To achieve this may not necessarily require regular visits of the SAFGRAD Coordinator to the NARS. It is important though, to find a way to clarify to NARS scientists the roles of the different officers in the SCO. This can be done through the SAFGRAD Newsletter.

The links between the NARS and IITA are good. This is primarily due to the Coordinators of the maize and cowpea networks who have worked hard to improve relations by relaying information from the NARS to IITA and back. The ICRISAT programme has also sought a close link with NARS but it does not appear to have succeeded to the same extent as IITA probably because, for a long time, there was no full time Coordinator. The newly appointed Coordinator who indicated he spends 90 percent of his time in coordination work is likely to succeed in his endeavours to forge close links between ICRISAT and NARS, given the good start he has made.

The mission also noted that networks represent an ideal

framework for an exchange of ideas and information among NARS which in the past worked in isolation and ignored all that was being done in neighbouring countries. If SAFGRAD could facilitate direct links among NARS through a system of exchange of national scientists and sabbatical leave in neighbouring country institutions, this would be one further step to bring NARS closer together.

6) Influence of Networks on Research Agenda of NARS and IARCs

Networks, as a tool for facilitating exchange of information and materials, came into being in 1987 by which time most of the strong NARS had set out the goals and procedures of research currently underway. It is easy then to see why the networks have not had too much influence on the research agenda of the strong NARS. This is not to say that there have not been adjustments in their programmes as materials and finances have been provided by SAFGRAD and as policy and economic changes have impacted on the programmes. On the other hand, NARS with weak scientific and financial resources whose programmes had either not been initiated or well defined at the establishment of the networks, have relied heavily on the networks for the definition of their research agenda.

It is expected that NARS, through the network steering committee which prioritizes the constraints to receive research emphasis, would influence the IARC as the Coordinator, in his strategic position, feeds information into the two systems. This mechanism seems to have worked well in the maize and cowpea networks. However, it was the view of some NARS that in the past ICRISAT did not fully take their priority problems into account in its research programmes. It is hoped that the new sorghum Network Coordinator will interact more with NARS so that this shortcoming can be rectified. To foster effective dialogue between steering committees and the IARCs in the process of

ensuring concurrence of views on the research agenda of IARCs, it is suggested that IARC programme leaders be also invited to relevant steering committee meetings.

7) The Transfer of Network Management to NARS

The evaluation team heard arguments for and against the appointment of coordinators from the NARS.

Among the arguments made against the appointment of coordinators from the NARS were:

1. The inadequacy of qualified staff within the NARS and the possible collapse of NARS resulting from the loss of scientists to the position of network coordinators.

2. The greater trust of IARCs by donors and the apprehension that donor support may be lost if NARS took hold of network management.

Having spoken with the NARS in considerable detail about this issue, the evaluation team is convinced that there are enough competent scientists in some NARS whose appointments as coordinators will do credit to the networks without adversely affecting the NARS from which they come. Regarding the second argument, it can only be observed that over the years, the SCO has managed its affairs in such a way that it has received the commendation of various external evaluation teams and therefore should attract the confidence of donors.

Some of the arguments adduced in favour of the transfer of network management to NARS were:

1. Appointment of coordinators from NARS will better guarantee continuity of performance as IARCs support for the coordinators position is unlikely to be permanent.

2. Appointment of coordinator from NARS will not only reinforce the apparent confidence of NARS in their ability to manage the networks but will also fulfil the goal set for SAFGRAD.

3. Resources of NARS may be upgraded particularly if the coordinators are located in the NARS institutions.

4. The rapport between NARS and the coordinator will be enhanced since the latter comes from the NARS.

The overwhelming view of the NARS and some IARC representatives was that management of the networks should be transferred to NARS now. It is, however, imperative that the following conditions are met if the arrangement is to succeed:

1. The recruitment of the coordinator from the NARS should be based on international standards (qualifications, experience, remuneration, etc.)

2. The coordinator should be located in a Lead Centre or an IARC which would backstop him.

3. The coordinator should under no circumstance serve in his own country.

4. The coordinator should be bilingual or steps should be taken to that effect.

5. The scientific and managerial environment in a chosen NARS location must be congenial for network activity.

6. National governments should be encouraged to make financial and material contribution for the operation of the networks.

7. To ensure the continued linkage between IARCs and network coordinators and rapid inflow of technological

innovations, and also given the large number of countries and problems requiring attention, it is recommended that the IARCs appoint counterpart network coordinators who will serve to support the NARS Network Coordinators. It is hoped that this recommendation will not be misconstrued as providing the IARCs with a channel for continued control of the networks. It is only meant to assist the NARS coordinator extend and intensify his coverage of problems needing solution.

FINDINGS OF THE EVALUATION IN EAST AFRICA

1. Expected Outputs of SAFGRAD II

The NARS are generally enthusiastic and very supportive of the EARSAM network which has succeeded in breaking down the barriers that prevented scientific exchanges amongst countries. The steering committee under its chairman has provided sufficient leadership in the recognition of problems in a regional perspective. The regional orientation of participants has been reinforced by monitoring tours and workshops which have revealed the scientific capacities in the different countries.

The NARS appreciate very much the training courses, workshops, seminars, symposia and monitoring tours all of which have contributed to upgrade technical and scientific skills in the region. They, however, wish to see an extension of the duration of the training courses coupled with the establishment of a Regional Training Centre and the continuation of monitoring tours whose participants include steering committee members as well as others. While collaborative research on various topics is enhancing the research management and capabilities of NARS, the one major activity that remains to be vigorously tackled is the long-term postgraduate training without which the pace of development of sustained research will be slow.

The region has some of the best endowed institutes for development of germplasm. While all the NARS commended the germplasm exchange and evaluation which have resulted in varieties in various stages of release the Technology developing NARS (TDN) wished to see the exchange tailored to the needs of the different countries as some of them have the capacity for handling large nurseries.

So far millet has not received the desired attention. Some NARS expressed concern abou' this and wanted greater resources to be devoted to the crop.

A major role of the SCO under SAFGRAD II is to promote effective development of networks through providing administrative support to Network Coordinators, the attraction of funds for network activities and the sensitization of national governments and IARCs to NARS concerns. In all these spheres the NARS are very much appreciative of the success which the SCO has achieved even while calling for more information on the specific functions of the different officers of the SCO and the general improvement in the dissemination of information to NARS scientists.

ICRISAT has made substantial contribution to the development of the network in terms of manpower development, supply of seeds and literature, provision of funds, transport and consultancy. However, the NARS feel that ICRISAT can and must do more. They are also asking for more intense consultation with ICRISAT in the setting of research priorities.

2. Release of Improved Varieties and Related Technologies

Exchange and evaluation of germplasm have been major activities of the network and high commendation was given these activities not only because of the technical impact they are making but also because of the channels they have created for fostering bilateral exchanges even outside the network.

It was observed that in Kenya the evaluation of germplasm has resulted in the release to farmers of a sorghum cultivar, IS76, and another local selection said to be resistant to long smut. Additional three cultivars are in the pre-release stage in Kenya, according to minutes of the EARSAM steering committee meeting held in October 1989. The strong NARS in Ethiopia and Sudan have also identified very useful germplasm which is currently being incorporated in the breeding programme. Sudan, for example, has identified four cultivars which have good resistance to drought. A very interesting development was that various NARS have identified certain countries as being sources of excellent germplasm and are therefore placing greater emphasis on materials from those sources.

The network has come to reinforce existing research activities particularly in the strong NARS. It was therefore sometimes difficult to delineate its contribution from what existed before it. The situation is complicated further by the existence of a number of complementary collaborative activities in a country like Sudan where INTSORMIL, ARAB LEAGUE/UNDP and EARSAM are all supporting sorghum research. In this connection it is relevant to mention that in Ethiopia two and three cultivars are listed in the minutes of the steering committee meeting of October 1989 as released and in pre-release stage, respectively, while in the Sudan two cultivars are said to be in a pre-release stage. And yet none of these countries credited the EARSAM with any contributions to this achievement.

As regards the development of technologies, the case of the successful development of a long smut screening technique by Kenya through collaborative research with EARSAM is an outstanding achievement. It is necessary to publicize the screening technique for other scientists to learn how to screen for resistance against this serious disease. In Ethiopia appropriate technologies and germplasm with good level of striga resistance have been developed. Interestingly, West African scientists have requested for some of this germplasm for

evaluation. In the Sudan an integrated approach to the control of striga has been developed albeit under an IDRC funding. The approach involves the use of reisitant cultivars, a trap crop and the application of urea and herbicides. It is suggested that in spite of the fact that the technology was developed under IDRC sponsorship, EARSAM should disseminate information on it to relevant NARS to help combat the striga menace.

Regrettably, the work on pearl millet seems to be at a low level. The crop, we were informed, is very important in Tanzania, Sudan, Kenya and Uganda. It would be worthwhile to increase activity on this crop. The activity could start with exchange of germplasm based on the experiences of ICRISAT in West Africa as well as India and other countries.

We were informed that some work on finger millet was being initiated. Although no statistics were available, it appeared that Uganda was the major producer. It was difficult to judge the emphasis required on this crop in a regional programme such as EARSAM when only one country seems to be the important consumer.

3. Improvement of Research Skills of NARS

Improvement of research skills under SAFGRAD comes from training, collaborative research, workshops and symposia and monitoring tours. It has to be mentioned that the research capabilities of the Sudan and Ethiopia were quite high even before the operations of EARSAM began. And yet the impression gained was that there has been an improvement in the research skills of NARS including the Sudan and Ethiopia as a result of the operations of EARSAM, even though there is also a lot of room for further improvement.

In-service training generally of a two-week duration has been organized on specific topics of regional interest. Whereas it was found that course participants came home with enhanced capabilities and motivation, the duration seemed

inadequate for in-depth training. Of course, it was pointed out that for medium duration courses candidates could be sent to ICRISAT, India. It is suggested that consideration should, however, be given to the establishment of a Regional Training Centre to which candidates requiring specialised training could be sent. The expenditure involved in extending the duration of the course within the region would in all probability be less than sending candidates all the way to India. In the meantime, use could be made of the facilities and expertise existing in some NARS as we found in the Sudan for Striga and drought control.

Improvement of research skills always has its basis in training at the postgraduate level. This is where the greatest deficiency is and where urgent action can pay great dividends. Whereas the weak NARS should receive priority attention in this matter, it seems even the strong NARS such as the Sudan cannot be forgotten completely. They are being bled of their competent staff by countries which can afford to give higher remuneration. NARS are called upon to give greater emphasis to postgraduate training in their bilateral relations with donors. However, SAFGRAD could also help by equipping certain outstanding universities in the region to enable them embark on postgraduate training.

The biennal workshop has developed to an extent that now only the best papers get the chance of being presented. The view was expressed that papers from collaborative research should be given priority in the workshops. This may seem like creating an unfair advantage for scientists on the collaborative research projects over the others. It is suggested that the system of reviews to ensure that only the best papers get presented should be maintained. The presentation of invited papers from world renowned experts adds another learning and motivation dimension to the network and should be encouraged. It is suggested that many more participants - including those

whose papers may have been rejected - should be invited to participate in the workshop.

Collaborative research on striga, ergot, smuts anthracnose, chilo and drought and characterization of agro-ecological zones in the region are proceeding. They are beginning to be the proving ground for development of scientific skills and competence.

In Kenya screening methods for long smut have been developed. In Ethiopia and Sudan striga control methods for sorghum have been developed as well as drought resistance screening methods in the Sudan. All these show the high level of competence now available in the region.

Monitoring tours were given low priority by Ethiopia NARS and by the network coordinator. They felt that expenditures made on this activity could be better utilized on some other programmes. In the Sudan the view was that personal interaction and exchanges were the keys to the success of the network. Monitoring tours promote this personal interaction. Furthermore, given the rise in the standard of workshop presentations, monitoring tours may prove to be the only chance weak NARS have of showing what they are doing or what they have to offer. These tours must therefore be encouraged as a separate activity with greater participation.

4. Development of NARS Leadership in Research and Network Management

The concept of the steering committee composed of active NARS scientists who develop regional programmes for execution is a very good one. Whereas in the beginning the steering committee was composed of non-senior scientists, the same cannot be said of the present committee members. The committee is now made up of seasoned scientists. Under their leadership the concept of technology-adapting NARS (TAN) has

been accepted together with the allocation of 80% of resources to the technology developing NARS (TDN) and 20% to the TAN. Members seem more committed to work for the region and take their responsibilities seriously. The competence exhibited in the collaborative research already referred to, participation in the drawing up of the SAFGRAD strategic plan, the eargerness with which NARS experts participate in offering training courses are all manifestations of the leadership roles of NARS in network management. However, the time is ripe for EARSAM to make even greater use of the highly qualified and experienced scientists from TDN to help the TAN through visits, advise and on-the-job training.

5. Current Linkages among Network Entities

We were informed that the ICRISAT programme in East Africa is controlled by the Hyderabad headquarters. The relations between SCO and ICRISAT appear to be cordial. We were unable to determine the intensity of contacts between SCO and the Hyderabad office. In view of the developments that are likely to occur in ICRISAT in East Africa - for instance we were informed that a regional centre was under consideration - it would be necessary to set up a framework which brings the two sides together at least once a year. During this meeting any concerns from either side can be addressed.

ICRISAT office in Nairobi has good relations with NARS as a result of the hard work of the Network Coordinator and the other ICRISAT scientists working with him. ICRISAT provides many services to NARS, sometimes under SAFGRAD auspices and at other times through ICRISAT's own resources. For the beneficiaries it was difficult to tell the source of the assistance, and perhaps this did not matter to them. However, the image and perception of SAFGRAD may be vitiated in such circumstances. It is therefore important that the beneficiaries are clearly informed about the source of the assistance.

The opinion was expressed that the Network Coordinator needed to devote 100 percent of his time to the network, failing which the network would suffer. In this connection, the need for the Coordinator to travel more often in the region to help solve problems was also mentioned.

The services provided by EARSAM/ICRISAT include seed supply, training, both long and short-term, consultancies, supply of reference materials, equipment and also financial support. Whereas the assistance given NARS such as Kenya was described as excellent, others such as Ethiopia complained of the inadequacy of such assistance. In fact, it was the contention of Ethiopia NARS that it received less support from ICRISAT than it did from organizations such as CIAT and CIP. ICRISAT in the past had special programmes with the Sudan and Ethiopia. It is possible that the ICRISAT assistance to these NARS has now been dispersed over many more countries in EARSAM, hence the inadequacy mentioned by NARS such as Ethiopia.

The team observed that while some NARS commended the SCO for quietly helping the operations of the network, with the knowledge that SCO's role could not be direct, others had very little information about the role of the SCO. Those who commended the SCO linked the success of the network to the quiet encouragement offered by it to the Network Coordinators in fostering various activities that improve the network coupled with SCO's efforts to convince donors to sponsor the network. However, even this group thought more could be done by SCO in seeking financial support from Japan, UNDP, ODA and also African Governments to meet the rising demands of the network.

In order to improve the image of the SCO particularly for those who have little information about SCO, it is suggested that the SAFGRAD Newsletter highlights the activities of the SCO.

6. Influence of Network on Research Agenda of NARS and ICRISAT

The EARSAM network came into being in 1986 by which time most of the NARS had already identified their constraints, set their goals and established the procedures of research currently underway. This is not to say that modifications in focus have not been made as materials, finance and consultancies have been provided by SAFGRAD and as NARS themselves have come to consider regionally common problems.

The scientists interviewed were agreed that whatever influence they had on the research agenda of ICRISAT was rather indirect. Through discussions on research priorities in steering committee meetings, through informal discussions with ICRISAT scientists especially those who work on NARS research stations in the region and also through collaborative research work with ICRISAT, some of their ideas are passed on to ICRISAT scientists. It is, however, a great puzzlement and concern that ICRISAT has, up to now, not devoted considerable resources to tackle the rather menacing issues of striga and drought. It is also surprising particularly to the Sudan that ICRISAT has continued to neglect working on grain quality desired in the region. It is suggested that these major issues of concern should be communicated to ICRISAT for resolution.

7. Transfer of Network Management to NARS

It was the view of NARS in EARSAM that the issue of transferring network management to NARS be approached with caution. In their opinion, it was the competence of the person in the coordinator's chair that mattered most and not the organization to which he belonged. As far as they were concerned, the existence of a strong steering committee with the mandate to guide the activities of the network and the effective implementation of agreed programmes by the Coordinator, were the keys to successful network. The NARS saw a positive advantage in maintaining an ICRISAT appointed Coordinator who facilitated ready backstopping by the IARC. It was also felt that

ICRISAT's excellent image and therefore better bargaining power ensured ready access to donor funds without which the network could not operate. They, however, saw the need for a change in the background of the personality in the coordinator's position and asked that an African be appointed. They thought the appointment of an African would create confidence in the participating scientists and ensure that the Coordinator was fully familiar with the problems and the environment in which he operated.

The current Network Coordinator, however, thought that the Coordinator of the network should be an employee of SAFGRAD and expressed the opinion that there were excellent African candidates who could fill the position.

It will be recalled that NARS in West Africa had called for transfer of network management to SCO. For the reason underlying the difference in opinion between EARSAM NARS and West African NARS, we could only hazard a guess. The guess is that whereas West African NARS have SAFGRAD office very close to them and receive most of their services from SCO, East African NARS rely almost entirely on an ICRISAT appointee for their services. It is therefore reasonable for West African NARS to feel confident in the capability of SCO and for East African NARS to wish not to rush into breaking off a relationship that has served them so well.

CONCLUSIONS

All the information available to the evaluation team shows that the maize, sorghum and cowpea networks in West Africa and the sorghum and millet network in East Africa are operating quite satisfactorily, after the appointment of all the full time coordinators. The different partners (SCO, Network Coordinators, SC, NARS, IARCs which are untiringly striving for the harmonization of the established structures have been instrumental in this regard.

However, the success of the networks would be enhanced if the membership of the steering committees could be made more interdisciplinary so as to avoid establishing exclusively variety - trial networks to the exclusion of agronomic aspects which are currently the impediment to agricultural production. In Eastern Africa, it is also necessary to upgrade the efforts on millet research and, additionally, incorporate pigeon pea and sorghum utilization research to reinforce EARSAM.

In spite of the commendable accomplishments during the past few years, training and information still deserve special attention.

In-service training sessions, seminars, workshops and monitoring tours have been beneficial to participants. Short-term training must, however, be extended in duration and improved. In Eastern Africa a regional Training Centre should be established to create the congenial atmosphere required for training purposes. In West Africa facilities for training already exist at IITA, Ibadan (Nigeria) and also at ICRISAT Sahelian Centre, Niamey. Long-term training, preferably in educational establishments within the region for university postgraduate degrees (M.Sc., Ph.D, Doctorat), must be included among the priorities of SAFGRAD and its member countries because it is currently the major constraint to the improvement of the research capacity of NARS.

The dissemination of scientific and technical information has been undoubtedly upgraded but needs to be extended to reach all NARS structures. The evaluation team congratulates SAFGRAD on the publication of its symposium and workshop proceedings and urges it to continue such endeavours. The team has noted that national scientists are not well informed about the role of the SCO, its initiatives and achievements. The use of the Newsletter and the organization of more visits to NARS should enable the SCO to make itself better known. In Eastern Africa

the appointment of a liaison officer should also improve SCO's presence and image.

The interaction between IARCs and NARS through networks has become effective, thanks to the presence of coordinators from these IARCs. It could be further improved by the institutionalisation of a framework in which programme leaders, in addition to Network Coordinators, are limited to meetings of steering committees and a reciprocal participation of the members of the latter in the planning sessions of IARCs.

Horizontal relationships among NARS are good; SAFGRAD can enhance this further by supporting joint workshops of different networks, region-wide conferences on relevant issues and also visits of scientists of NARS from one country to another.

While the NARS in West Africa are eager for the appointment of Network Coordinators by SCO from amongst their ranks, the NARS of EARSAM are anxious that the EARSAM coordinator remains an ICRISAT appointee, but expressing strong preference for someone fully familiar with the problems and the environment in which he operated.

R E C O M M E N D A T I O N S

RECOMMENDATIONS ON WEST AFRICAN NETWORKS

1. Strengthening the scientific capabilities of national institutions is a prerequisite for their effectiveness. In this respect, the team recommends that:

   - Long-term academic training be provided, preferably in training institutions (universities, research institutes, etc) within the region.

   - Adequate material and financial means be allocated to NARS to enable them fulfill their mission.

   - Training courses in data processing and micro-computer utilization be organized for scientists.

   - Depending on their needs, national research systems be provided with minimum working equipment, particularly micro-computers.

   - Working visits be instituted and facilitated among national scientists.

2. For international research institutes and national systems to interact effectively in the definition and implementation of priority research programmes, the team recommends that:

   - International institutes participate in the meetings of all relevant steering committees.

   - SAFGRAD be invited by these institutes during the evaluation and definition of their programmes.

3. For a better dissemination of information, SAFGRAD is requested to:

- ensure more effective information exchange between SCO and the NARS.

- systematically send a copy of its publications to each agricultural research library and to government ministries incharge of agricultural research of its member countries.

- create and disseminate an agricultural journal.

4. For a greater integration of the research work being carried out in the respective national research institutes, the team recommends that, henceforth, particular emphasis should be placed on the agronomic and especially multidisciplinary approaches which would further valorize current achievements.

5. The dissemination of useful germplasm is indispensable to varietal improvement programmes or to trials leading to the release of improved materials. Consequently, the team recommends that SAFGRAD should take appropriate steps to alleviate any administrative and financial constraints impeding the smooth exchange of seeds with network member countries.

RECOMMENDATIONS ON EARSAM

The following are recommendations which, in the opinion of the evaluation team, are worth serious consideration for the improvement of the network.

1. In order to reinforce the scientific and technical capabilities of NARS, the team recommends that:

   - Postgraduate training should be emphasized in selected disciplines to provide leadership and sustainable research activity. In this connection SAFGRAD should solicit funds to strengthen this activity for the benefit of the NARS.

- The attention of ICRISAT should be drawn to the need to establish a regional training centre for Eastern Africa. In the mean time, EARSAM should take advantage of the facilities and expertise that exist in countries such as Sudan and Ethiopia in the training of personnel.

- Papers presented at workshops should be selected on competitive basis. More scientists should be invited from participating countries to increase interaction and cross-fertilization of ideas at the workshops.

- Monitoring tours should be emphasized and be organized separately from steering committee meetings to provide interaction with weaker NARS.

2. To provide the means for effective network activities, the team recommends that:

- More financial and material support should be given to the lead centres for them to develop technologies for application by all NARS.

- The OAU/STRC should make greater efforts in the search for additional donors including Japan, UNDP and ODA.

- SCO, through OAU/STRC, should sensitize policy makers in the different countries on the urgent need for them to make financial contributions to SAFGRAD operations.

3. To establish a more integrative and effective network which answers to the concerns of the region, the team recommends that:

- Exchange of germplasm should be tailored to the needs and the capacity of the NARS to utilize them. For the strong NARS the base of germplasm exchange should be enlarged to include observational nurseries.

- Attention should be paid to legume intercropping, sorghum utilization, crop and soil management should be incorporated into the research programmes of the network.

- Given the seriousness of the devastations caused by drought and striga in the region, ICRISAT should be urged to establish special projects on these issues.

- Greater efforts at improving millets should be made in the region. In this connection, exchange of pearl millet germplasm between West and East Africa should be intensified.

- Western Sudan probably has similar environment as West Africa. A stronger link between West African networks and Western Sudar should be established.

- To promote more interaction among different SAFGRAD networks, joint workshops should be held every three years.

4. To overcome the inadequacies in the dissemination of information the team recommends that:

- The SCO should ensure more effective information exchange with the NARS.

- More information on the EARSAM be included in SAFGRAD Newsletter to attract the attention of East African scientists. Participants of EARSAM should be encouraged to contribute articles to the Newsletter.

- SAFGRAD should publish a scientific journal specialized on the agriculture of the semi-arid regions of Africa.

5. For SAFGRAD to express its presence in Eastern Africa in a more concrete manner, it is suggested that the decision to have a liaison officer in the region should be implemented.

6. EARSAM has so far operated with an orientation of an organization that seeks to bring individual scientists together. To facilitate communications with scientists outside the SAFGRAD network and to improve SAFGRAD's image and leverage in Africa, SAFGRAD must attempt to forge links with institutions in the region. This calls for greater involvement of institution leaders in the activities of SAFGRAD.

A N N E X E S

A N N E X I

APPRAISAL OF SAFGRAD NETWORKS

I BACKGROUND

Food self-sufficiency and security will continue as the major objectives of economic development in most countries of Sub-Saharan Africa. Considering the trends of population growth in the sub-region (average of 3% per annum), food production needs to expand at least by 4% annually in order to contain the apparent manifestation of hunger and malnutrition. Agriculture, therefore, would be the main foundation for economic growth and development during the next two decades.

Technological transformation in agriculture is the major avenue to bring about significant increase in food production of which agricultural research plays a key role. SAFGRAD II emphasis has been the devevopment of multinational collaborative research networks with major thrust to strengthen NARS research capabilities. Since food production problems transcend political frontiers, linguistic and cultural barriers, networking has been employed to facilitate the exchange and evaluation of technologies. As a result, NARS decided to bring together their research manpower and infrastructural resources to alleviate constraints of food production of regional dimension.

A comparative advantage has therefore been realized by pooling research resources together with relatively strong and weak national research programmes as well as with IARCs to minimize the effects of major constraints (such as drought, Striga, insect, disease, environmental stresses, etc) to food production in the region. NARS aggregate research capabilities is the "driving force of networks" for the generation and evaluation of technologies.

The IARCs (IITA and ICRISAT) and the SAFGRAD Coordinator Office (SCO) through USAID funding support have assisted NARS to set up the following fully operational, crop commodity research networks:

i. The West and Central Africa Sorghum Network

ii. The East Africa Sorghum and Millet Network

iii. The West and Central Africa Cowpea Network

iv. The West and Central Africa Maize Network.

Furthermore, the management entities of the network include:

i. The Conference of Directors of Agricultural Research of SAFGRAD members countries - which meets every two years provides policy guidance towards the resolution of common research problems of regional dimension.

ii. The Oversight Committee - oversees SAFGRAD project activities, provides guidance in management, reviews plans and monitors implementation of network programme activities.

iii. The SAFGRAD Coordination Office - provides research coordination, administration and legal framework for the networks: facilitates development of scientific and management leadership among NARS; smoothens and strengthens linkages among NARS institutions, governments and between NARS and IARCs.

iv. The Steering Committees of the respective networks - set research priorities, plan network programmes, and monitor implementation of activities.

v. The IARCs: IITA provides technical management support for Maize and Cowpea Networks in West and Central

Africa, while ICRISAT provides similar facilities for West and Central Africa Sorghum Network, and Sorghum/Millet Network for East Africa.

II. SCOPE OF WORK

The Oversight Committee in its meeting of 5 - 8 February, 1990, after reviewing the SAFGRAD activities, established a Network Appraisal Committee in order to obtain feedback on the performance of the various networks and survey the outlook of NARS in networking. The main purpose of the appraisal is to improve future network plans and development. In general, the scope of work of the Committee would be:

i. To assess performance of respective networks based on the expected output of SAFGRAD II.

ii. To survey if the network activities have enabled or facilitated the release of improved varieties and related technologies that could enhance food grain production.

iii. To obtain feedback on the improvement of research skills of NARS.

iv. To survey if Networks have positively influenced the development of NARS leadership and network management.

v. To assess current linkages (as viewed by NARS) among network entities (i.e. SCO, IARCs and Steering Committees of respective networks) and to propose areas of improvement in order to efficiently serve NARS.

vi. To determine if Networks have influenced IARCs and NARS research agenda.

vii. To obtain the views of NARS on how network management could be transferred to NARS and be sustainable with minimum external financial support in the longrun.

viii. To identify specific areas of network research that need to be intensified in the overall networking activities.

SAFGRAD II EXPECTED OUTPUT

		Performance Rating		
	List of Network Activities	Low	Satisfactory	High
1.	Functioning of NARS-driven steering committee			
2.	Workshops and monitoring tours have enabled NARS to appreciate each other's programmes and problems of food production			
3.	In-service training, seminars, workshops, monitoring tours and improved research skills of NARS			
4.	Regional trials include useful germplasm that have led to the release of varieties by NARS			
5.	Collaborative research activities improve NARS leadership in networking			
6.	Networks have influenced the identification of research priorities and needs by NARS			

	Low	Satisfactory	High
7. Coordinator's have promoted interaction among NARS researchers and linkages with IARCs by involving national scientists in network activities and keeping them abreast of the technical progress in the respective crop improvement programmes			
8. SCO promotion of the development of NARS leadership in research and network management			
9. SCO - services to networks and collaboration with IARCs			
10. Technical support by IITA for the management of Cowpea and Maize Networks.			
11. Technical support by ICRISAT for the management of Eastern Africa Sorghum and Millet Network and the West and Central Africa Sorghum Network			
12. Participation of NARS scientists and research managers in identification of constraints and preparation of the network strategic plan			

	Low	Satisfactory	High
13. SCO as spokesman on behalf of NARS and networks to IARCs and donors			
14. NARS impression of networks			
15. Influence of NARS on research agenda of the IARCs			
16. Influence of SCO on research agenda of the IARCs			
17. SAFGRAD Newsletter received			
18. Proceedings of workshops and occasional SAFGRAD publications received			
19. Network exchange of germplasm and related techonologies facilitated the release of varieties and adoption by farmers			

A N N E X II

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APPENDIX III

DOCUMENTS CONSULTED

(1) Coordination Office, Meeting of the Working Group on SAFGRAD Collaborative Research Network Strategic Plan, Ouagadougou, Burkina Faso, 27 November - 1st December, 1989

(2) Evaluation of SAFGRAD Phase II Project. Checci and Company Consultancy Inc., Washington, D.C. Sept. 1988

(3) Guiragossian V.A., Regional Network to Improve Sorghum and Millet in Eastern Africa. Paper distributed during meeting of the SAFGRAD Oversight Committee, 1-3 August 1988, Nairobi, Kenya.

(4) Guiragossian V.A., Annual Progress Report 1989. Eastern Africa Regional Sorghum and Millet Network (EARSAM).

(5) Minutes of East Africa Sorghum and Millet Research Network, Mogadishu, Somalia, 24-25 July, 1988.

(6) Minutes of the Fifth EARSAM Committee Meeting in Wad-Medani, Sudan. Oct. 22-25, 1989

(7) Organization of African Unity - Scientific, Technical and Research Commission (OAU/STRC), "SAFGRAD Phase II", Meeting of National Agricultural Research Directors of SAFGRAD Member Countries, 23-27 February 1987, Coordination Office, Ouagadougou, Burkina Faso.

(8) Report on 5th meeting of Oversight Committee of SAFGRAD, 5-8 February, 1990, Ouagadougou, Burkina Faso

1990-07

SORGHUM, MAIZE AND COWPEA IN WEST AND CENTRAL AFRICA, SORGHUM AND MILLET IN EASTERN AFRICA

OUA/CSTR-SAFGRAD

OUA/CSTR-SAFGRAD