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CSTR/OUA - SECRETARIAT
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LAGOS, NIGERIA.

SEMI-ARID FOOD GRAIN RESEARCH AND DEVELOPMENT (SAFGRAD)

JOINT PROJECT N° 31

PROGRESS REPORT 1979 - 1980

(Submitted by the International Coordinator of
OAU/STRC for JP. 31 SAFGRAD).

Ouagadougou, October 1981.

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I. INTRODUCTION.

To fully accomplish its role, OAU has particular interest in all aspects of the major problems of the continent including famine and desertification.

The Joint Project n° 31 on Semi-Arid Food Grain Research and Development (SAFGRAD) is a regional research project coordinated by the Scientific, Technical and Research Commission of the Organization of African Unity (OAU/STRC) based in Lagos, Nigeria.

Its principal objective is to develop improved cereal varieties (maize, sorghum, millet) and grain legumes (cowpea, groundnut) and cultural packages suitable to the small-scale farming systems common in semi-arid Africa and to promote their adaptation and use in farmer fields.

What is at stake is quite considerable. The harmonious development of all of Africa is greatly impeded by famine and its socio-economic repercussions. OAU/STRC JP 31 SAFGRAD includes all countries situated in the semi-arid zone of Africa a total of 25 countries bent on ending hunger and under-development. Self-sufficiency in food remains a vital imperative for these countries where population increase implies, as a matter of course, a rational increase in available food crops.

Sudano-Sahelian Africa is essentially an agricultural region where what lacks is not manpower, but improved, high-yielding crops and new or completely overhauled cropping practices to meet the food needs of ever-increasing populations.

The Project's activities may be divided into two broad areas:

- 1) Regional research on the staple cereals and grain legumes at the 3 African Regional Research Centres of the Project (Kamboinse in Upper Volta, Bambey in Senegal and Samaru in Nigeria);
- 2) Support to national research programmes including manpower development through training at both the medium and high levels.

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Although the United States Agency for International Development (USAID) which is the main donor agency of the Project had made funds available since 1977, the Project got started in 1978 with the organization of the administrative structure (setting up of the Coordination Office in Ouagadougou) and the recruitment of the essential technical personnel. By 1979, the maize and cowpea team and the farming systems unit were in full operation. It was only in 1981 that the Sorghum and Millet Team got established at the IRA in Samaru, Nigeria.

2. HISTORY OF THE PROJECT.

2.1. The Initial Project.

In 1964, OAU/STRC signed an agreement with USAID for a cereal research project which was known as the Joint Project 26. This research primarily concentrated on maize, sorghum and millet and mainly covered West and Central Africa. JP 26 achieved remarkable success. In 1976 when it phased out, results obtained were sufficient enough to warrant a more comprehensive project.

In January 1976, the Scientific, Technical and Research Commission of the Organization of African Unity (OAU/STRC) invited all Member States located in the semi-arid region of Africa to a conference in Ouagadougou, Upper Volta on food grain research and development. Delegates from fourteen African nations, together with representatives from five international organizations and five donor countries attended the meeting.

The conference recognized the need for a similar but larger and more comprehensive programme. A second meeting was again held in Ouagadougou in October 1977 to study in detail and finalize the new project which was to be known as Joint Project n° 31 Semi-Arid Food Grain Research and Development (JP 31 SAFGRAD).

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2.2. Modification to the Initial Project.

The new Project was originally designed for 18 Member States of the OAU (Benin, Cameroon, Cape Verde, Central African Republic, Chad, Ethiopia, Gambia, Ghana, Guinea, Ivory Coast, Mali, Mauritania, Niger, Nigeria, Senegal, Sudan, Togo and Upper Volta). However, following the success of JP 26 and the recommendations of the OAU Council of Ministers, several other States in the region became interested in the new Project. At present, participating Member States include Sierra Leone, Botswana, Kenya, Somalia, Tanzania, Guinea Bissau and Zambia, making a total of 25 OAU Member States covered by SAFGRAD.

2.3. Organization and Management of the Project.

In terms of management, the Consultative Committee (CC) composed of representatives of all participating Member States, and all contributing parties and cooperating bodies, is the main decision-making organ. The role of the CC is to exercise general supervision over the policies to be adopted in the planning and execution of the Project and to follow the development of activities.

To provide the CC with a continuous independent evaluation of the technical aspects of the Project, OAU/STRC formed a Technical Advisory Committee (TAC) composed of 6 African agronomic authorities chosen on merit, directors of the Projects' 3 Regional Research Stations, the 4 international research institutions cooperating with the Project (IITA, Purdue University, ICRISAT, IRAT) the FAO and the Chairman of the Scientific Council of Africa (SCA). OAU/STRC is the permanent secretary to the committee.

3. RESEARCH IMPLEMENTATION, RESULTS AND PERSPECTIVES.

3.1. Implementing organizations.

Under financial agreements signed with USAID, the following organizations provide mutual and complementary support to JP 31 SAFGRAD:

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- International Institute of Tropical Agriculture (IITA).

Under an agreement signed with JP 31 SAFGRAD on 8 March 1978, IITA has detached four researchers to Ouagadougou. This team is made up of a maize breeder, a soil fertility agronomist, a maize agronomist and an entomologist who has been at post since April/May 1979. The team works on maize and cowpeas at the Kamboinse Research Centre in Upper Volta.

- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Under an agreement signed on 25 May 1978, ICRISAT has sent a team including a breeder, an agronomist, an entomologist with base at the IAR/ABU, Samaru, Nigeria and a soils specialist work on sorghum and millet. Under this agreement, provision is made for financial support for SAFGRAD, adequate technical material, short-term consultants and the training of African researchers.

- Purdue University in the United States has provided a team of three researchers under an agreement signed on 8 December 1978 to work on small farming systems in semi-arid Africa. The team is made up of an agricultural economist recalled to Purdue in March 1981 and who is to be replaced shortly, an anthropologist and an agronomist. Like the two institutes mentioned above, Purdue University handles training of national personnel and recruits short-term consultants. This team is also based at the Kamboinse Research Centre in Upper Volta.

3.2. ACTIVITIES AND PROVISIONAL RESULTS.

We present below, activities of the various teams working under the Project.

3.2.1. MAIZE AND COWPEA TEAM.

The maize and cowpea team has completed only two crop seasons so far, and it should be recognized that this is a relatively short period to obtain major research results. In addition, the results obtained will need further confirmation over a wider range of environments. However, the major results obtained so far, are summarized below. It should be emphasized that these results have been obtained through a joint effort of the maize and cowpea team and cooperators in the various national programmes:

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3.2.1.1. MAIZE PROGRAMME:

I. Over the last two years, the promising varieties which already exist and were developed by national or international institutions have been systematically tested across the semi-arid zone of tropical Africa. This effort provided the needed vehicle for exchange of genetic material particularly between English and French speaking countries.

II. Through this regional testing, it has been found that BDS III and Pool-16 are two promising early maturing varieties of maize which have performed very well in several SAFGRAD member countries. Similarly, among the medium maturing varieties IRAT-81 and TZPB have shown good promise in different countries.

III. In several countries, new varieties yielding 15 to 20 % more than the local varieties have been identified. The national programmes are being encouraged to have these varieties tested in on-farm trials and, if found suitable, to launch a production programme with them.

IV. Two cycles of recurrent selection to combine yield and early maturity have been accomplished and the better varieties from improved populations are now in the pipe line.

V. Other medium maturing promising populations which have been developed or identified are : Phil. DMR Comp., Hungarian Composite and BIU yellow.

VI. It has been demonstrated that for the semi-arid tropics the Temperate and Temperate X Tropical germplasm hold great promise. Several populations of this origin have been obtained from various sources for further selection and breeding efforts.

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VII. Yield increase of about 50 % (15 to 300 %) have been obtained by the tying of ridges. The proportion of ridges to be tied and the timing of the tying operation are a function of crop position on the toposequence and rainfall distribution pattern.

VIII. Plowing with oxen or tractor has given higher yields than both the conventional farmers hand-hoe cultivation and zero-tillage.

IX. In the absence of weeds, cultivation, with the sole purpose of breaking the soil can increase yields by up to 50 %.

X. Yield increase of 50 to 100 % have been obtained using crop residues as mulch.

XI. Substantial higher maize yields were obtained from maize planted after cowpeas than from maize planted after maize even under high fertility levels.

XII. Except in a few countries where maize borers are important, termites and millipedes seem to be the two most important insect pests of maize in the semi-arid regions.

XIII. Soil application of appropriate insecticides can substantially reduce the damage caused by the two insects.

3.2.1.2. COWPEA PROGRAMME:

I. For areas with rainfall of 700 mm or more, at least one promising variety, namely KN-1 (TVx 289-4G) has been identified. In the SAFGRAD regional cowpea variety trial initiated in 1980, KN-1 and Kpodigegue have been identified as promising varieties in several countries.

II. In the drier areas, a local variety, called Gorom-Gorom local, has consistently given good performance in comparison with other varieties.

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III. Substantial progress has been made in incorporating bruchid resistance in high yielding varieties.

IV. Efforts have been made to improve the seed quality (size and color) of the high yielding varieties.

V. Good progress has been made in screening the cowpea germplasm for adaptation to moisture stress.

VI. TVx 1193-7D, TVx 309-1G, TVx 1999-01F, TVx 1999-02E are promising lines in the pipe line.

VII. The response of cowpeas to various management factors has been studied and salient findings are :

- a) Time of planting. Optimum time of planting appears to be 2 1/2 months before the end of the rains.
- b) Soil fertility. Phosphorus deficiency has been shown to be a common factor limiting yield. Moderate rates of phosphorus application can result in yield increases of 50 % or more. The response to phosphorus has been found to differ with plant type : erect varieties giving the most pronounced and prostrate, photo-period sensitive varieties, the least.
- c) Land preparation. Plowing with oxen or tractor has given higher yields than preparation with the conventional hand hoe.
- d) Choice of soil. Within the same toposequence, yield differences of 300 % have been observed between upper and lower slope sites.

VIII. Management practices for a maize-cowpea relay cropping system are being developed. It has been shown that, in the Guinea savanna such a system can give good yields of both crops in one growing season.

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IX. It has been shown that among local cultivars, there are varieties which have a yield potential close to that of improved varieties and that they have certain interesting and perhaps useful characteristics. Furthermore, it has been found, that local cultivars often respond differently than improved cultivars to certain management factors. Ways of exploiting these unique characteristics and the response to various management factors are being studied.

X. It has been demonstrated that cowpea striga can result in substantial yield losses. A method for artificial infestation has been tested and results indicate that it is adequate for the screening of germplasm for resistance.

XI. Flower thrips, Maruca pod borer and aphids were found to be the most important insect pests in the semi-arid region. Control of flower thrips alone increased yield by 50 to 70 %

XII. Insecticide treatments at flowering stage had the maximum effect on reducing yield losses due to insects followed by treatments at the post flowering stage.

XIII. In a thrips screening trial, KN-1 was found to be susceptible and iVx 3236 appeared to be the most promising in terms of tolerance to thrips.

XIV. Synthetic pyrethroids applied at low dosages appear to be effective in controlling flower thrips and have significantly increased yields.

XV. Results have indicated the presence of a new biotype of aphids at Kamboinse (designated as K biotype) as some of the cultivars resistant to biotypes A and B elsewhere were found to be susceptible at Kamboinse. TVu 36, TVu 2896 and TVu 3000 have been identified as being resistant to aphid biotype K.

XVI. Minimum insecticide trials indicated that, under minimum protection, TVx 3236-1-2 was a promising variety and gave higher yields than VITA-4 and VITA-5.

XVII. A local variety, Kamboinse local, has been shown to possess some level of tolerance to the pod borer, Maruca.

FUTURE PERSPECTIVES FOR THE MAIZE AND COWPEA PROGRAMMES (1981)

Research is continuous, not static. For the 1981 season, the SAFGRAD maize and cowpea improvement programme proposes the following trial protocols which are available on request:

A) MAIZE

Breeding Objectives

- 1; Evaluation of existing promising varieties developed by national or international institutes in the semi-arid tropical region in Africa.
2. Population improvement through recurrent selection in two early and one medium maturing populations for high yield and tolerance to environmental stresses commonly encountered in the semi-arid tropics.
3. Collection and evaluation of local varieties and other new introductions from different countries.
4. Breeding for earliness and drought tolerance to develop high yielding early maturing populations.
5. Recombine the selected families and generate new set of fullsibs during the dry season for population improvement programs.

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6. Breeding for resistance to maize diseases specially maize streak virus.

7. Breeding for high quality protein in maize.

8. Seed increases either by hand pollinations or by isolation of promising varieties for agronomic studies or for further testing and multiplication in various SAFGRAD member countries.

9. Provide technical support and advice to Farming System Unit (FSU) SAFGRAD and to Accelerated Crop Production Officers (ACPO) located in different SAFGRAD member countries.

10. Assist in strengthening the national maize improvement programs in SAFGRAD member countries through technical advice and by arranging different types of training programs.

To accomplish these objectives, two major areas of work will be carried out.

1. Resident Research
2. Regional Program.

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- Agronomy.

Most of the experiments started in 1979 and 1980 will be reconducted at the Kamboinse, Saria and Farakoha stations as well as in farmer fields in collaboration with FSU.

1. Planting date trial
2. Soil preparation trial (in collaboration with the cowpea agronomist).
3. Seedbed trial.
4. Toposequence trial (in collaboration with the cowpea agronomist).
5. Spatial arrangement trial
6. Crop residue management trial

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7. Planting depth trial
8. Seedbed trial annex
9. Parthing-up trial
10. Cultivation trial
11. Manure trial
12. Peanuts-maize rotation trial
13. Tining of nitrogen application trial
14. Zinc trial
15. Tied-ridges trial
16. Ridging trial
17. Thinning trial
18. Tied-ridges demonstration trial
19. Maize-cotton intercropping trial
20. Mulch production "in siki"
21. Cowpea-maize rotation trial
22. Maize-cotton trial (in collaboration with FSU)

Maize and cowpea entomology.

The objectives for 1981 cowpea and maize entomology research program are as follows :

1. Studies on seasonal abundance of flower thrips, Maruca and pod sucking bugs.
2. Development of economic threshold for flower thrips.
3. Screening of cowpea lines for resistance to K biotype of Aphis Craccivora.
4. Evaluation of selected cowpea lines for resistance to thrips, Maruca and pod sucking bugs.
5. Evaluation of cowpea lines derived from crosses made with TVu 2027.
6. Estimation of loss due Callosobruchus maculatus to cowpea in storage.
7. Standardization of sampling procedures for cowpea pest.
8. Chemical control of millipedes and termites in maize.
9. Survey of insect pests of maize.

To accomplish these objectives, research work will be carried out at head quarters in Upper Volta (resident research) and in cooperations with the national scientists of various SAFGRAD countries (regional program).

COWPEAS.

Breeding (Govt. Upper Volta/IDRC/IITA/SAFGRAD).

Major objectives of the 1981 Cowpea Breeding Program are:

1. Incorporation of resistance to important field and storage insects that attack cowpeas.
2. Improvement of seed quality characteristics i.e. seed size and color.
3. Incorporation of drought resistance.
4. Selection of high yielding varieties adapted to different agroclimatic conditions.
5. Seed multiplication and on-farm testing.
6. Training of national researchers and technicians.
7. Provide technical support to the SAFGRAD project.

1981 SAFGRAD/IITA COWPEA AGRONOMY PROGRAMME.

I. Cowpea/Maize Relay Cropping : Trials conducted during the past two years have shown that in the Northern Guinea Savanna, good yields of both maize and cowpeas can be obtained in the same season with a relay cropping system. Emphasis in 1981 is placed on defining more precisely the management practices for this cropping system. Furthermore, an effort is being made to determine the range of climatic zones in which this system may be feasible.

1. Maize/Cowpea Relay Cropping Trial (Regional Programme)
2. Maize/Cowpea Relay Cropping I (resident): Photoperiod sensitive cowpea varieties.
3. Maize/Cowpea Relay Cropping II: Comparison of Early and Medium Maturity maize.

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4. Maize/cowpea Relay Cropping III: Maize Density and Row Spacing
5. Maize/Cowpea Relay Cropping IV: Cowpea Density.
6. Maize/Cowpea Relay Cropping V: Management for Sudan Savanna.
7. Maize/Cowpea Relay Cropping Trial (in collaboration with FSU in farmer fields)
8. Management of local cultivars trials
9. Planting dates, toposequence, screening, sorghum/cowpea, density and strige resistance trials.

3.2.2. Farming Systems Unit.

The goals of Farming Systems research correspond with the general goals of applied research for agricultural development :

- 1) identification of the principal constraints to production as ranked by the economic return to alleviating them ; 2) generation of outlines for new strategies for improving the well being of small farmers, specifically in terms of increasing the profitability of crop production ; 3 generation of statistics relating to the characteristics of small farm production technologies allowing the evaluation of the proposed strategies ; 4) design and execution of on-farm trials for the specification of physical response characteristics of proposed production techniques and 5) evaluations of production strategies within the context of the small farm productions systems where they were intended to be adopted.

The breadth of these goals makes it difficult to dictate what farming systems research and development should be in general but makes it possible to evaluate the success of individual farming systems programs.

During 1979, 1980, and 1981, the Farming Systems Unit (FSU) of the OAU/STRC J.P. 31 Semi-Arid Food Grains Research and Development Program has concentrated on developing and evaluating production strategies for the central region of Upper Volta. The general outlines of these strategies should

have a certain degree of validity in other West African countries where land is relatively cheap, labor relatively expensive by comparison with developing countries where population densities are much higher, and where international trade is inhibited by high overland transport cost.

- The FSU has developed a general production strategy for the central region of Upper Volta. This production strategy involves :

1) Immediate reinforcement of extensive sorghum and millet production capacity through increasing the productivity of labor during the early season by using donkey and ox drawn weeders and mechanical planters.

2) Long term maintenance of soil fertility slightly higher levels through the use relatively small of locally produced rock phosphate fertilizer without nitrogen or phosphate fertilizer.

Although the short term marginal productivity of the phosphate application is lower than for the animal traction weeding the long term marginal productivity may be much higher. Small amounts of urea (20 kg/ha) are advised during the introduction of the rock phosphate into a new area simply to preserve farmer confidence in the fertilizer supplier until the farmer learns to appreciate the characteristics of the rock phosphate.

On-Farm trials of photoperiod insensitive cowpeas have indicated the potential of photoperiod insensitive cowpeas as a cash crop if the spraying can be done in a very timely fashion, so that the cost can be kept low. These cowpeas have cultural requirements similar to the requirement for peanuts and therefore should be regarded as a replacement or adjunct to peanut production rather than a replacement for the traditional cowpeas, which are only grown in association with sorghum and millet, and have a special role in maintaining soil nitrogen. Trials have shown that without spraying, even in association, photoperiod insensitive cowpeas do not yield any better than local cowpeas.

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FSU Trials of the ICRISAT sorghum variety E-35-1 indicate that the variety does not perform as well as the local sorghums under poor conditions and that it should probably only be used on small parcel around the houses. In general, varietal improvement has been found to be of secondary importance compared to the improvement of weed control and soil fertility.

- On-Farm Trials.

The greater part of the trials done by the FSU have been oriented toward evaluating the profitability of low cost production techniques for extensive cereal production. They have been and will continue to be oriented toward the elements of the production strategy outlined in Section III.

With reference to rock phosphate it has been determined that an application of 100 kg/ha of fine ground rock phosphate on average sorghum and millet fields where the mean yield is about 400 kg/ha, one can expect a response of about 25 kg/ha in the first year. The after effects in the second year are better, but the value has not yet been determined. Economic analysis indicates that the after effects from the rock phosphate are clearly the most important element in its profitability.

Combinations of applications of Rock Phosphate and small amounts of urea with animal traction incorporation produced for larger increments in yield. Most of these increases in yield were due to the improved weed control, but yield increases through improved weed control are not currently thought to be sustainable without phosphate fertilization.

Nitrogen levels will be maintained through the use of legume rotations and associations as is the current practice. Because these cereal fields are not plowed this fertilizer would have to be applied at the first weeding.

3) Increasing cash crop production of peanuts both by improved tillage and fertilization and by increasing areas planted to peanuts at the expense of areas planted to extensive sorghum and millet.

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4) Increasing cash crop production of cotton, sesame, and cowpeas through improved insect control by using low toxicity insecticides which can be used on any crop with minimal danger.

5) Increasing the productivity of animal traction capital by increasing its use on non-plowed fields for weeding and planting as noted above, as well as by increasing the amount of plowing done for intensive crops, using the time saved during the first weeding, and the land made available through moderate sorghum and millet yield increases.

FSU 1981 RESEARCH PERSPECTIVES.

1. Household labor allocation data is being recorded for a random sample of families in six zones of Upper Volta (Zorgho, Fada, Kaya, Ouagadougou, Ouahigouya, and Houndé). This data will complement last year's more intensive socio-economic data collection effort and will be evaluated in terms of already identified agricultural production zones (soils, varieties, location), rainfall spacing and amounts, stratified groups of farmers (within household and without), input and equipment/animal use. These data in turn will help us evaluate and modify next years field trial program.

2. Experimental Trials include:

- (1) Long Term Fertility Trials
- (2) Maize-Cotton Tied Ridge Trial (with assistance of SAFGRAD-IITA)
- (3) Sesame Trial
- (4) Cowpea Trial (KN-1 versus Local) (with assistance of IDRC cowpea Breeder).
- (5) Earth Pea (Bambara Groundnut) Trial.
- (6) Earth Pea Variety Demonstration Plot.
- (7) Maize Variety Trial (with assistance of SAFGRAD/IITA - Maize Breeder).
- (8) Maize-Cowpea Relay Trial (with assistance of SAFGRAD/IITA Cowpea Agronomist).
- (9) Non-Photosensitive Local Early Millet Demonstration Plot
- (10) Non-Photosensitive Local Early Millet/Earth Pea Relay
- (11) Sorghum Variety Trial (with assistance of SAFGRAD ICRISAT)

3. Pre-Extension Field Trials.

- (1) Sorghum-Maize-Cotton on Village Field Trial.
- (2) Millet/Sorghum on Bush Fields Trial.
- (3) Peanut/Cowpea Production Trials
- (4) Commercial Scale Cowpea Demonstration Plots.

In 1981, SAFGRAD/FSU expects to make a major effort to interest agricultural researchers and Voltaic extension service agents to visit the laboratory villages and discuss with us and the farmers the implications of the various trials discussed above.

3.3. Sorghum and Millet Team.

After much administrative hold-up, the working Agreement between OAU/STRC and the Federal Government of Nigeria enabling the SAFGRAD Regional Research Centre in Samaru, Northern Nigeria, to begin operations was signed on 5 November 1980. Since the cropping season was already well under way and given the fact that certain logistic needs were yet to be met, the SAFGRAD/ICRISAT was unable to begin work in 1980. Plans are, however, well under way for this team to begin activities during the current 1981 cropping season.

RESEARCH PERSPECTIVES OF THE SORGHUM/MILLET PROGRAMME.

Sorghum Breeding.

The primary objective of sorghum breeding programme will be genotype alteration so as to result in higher levels of productivity and stability. Genotypic changes leading towards productive cropping systems in place of the subsistent ones will receive attention. Emphasis in the earlier years will be on introduction and adaptation. Simultaneous efforts will be made to capitalize on promising local germplasm. Experiments during 1981 will include:

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- (1) Preliminary yield trials at Kano and Samaru
- (2) Growing breeding material at Kano and Samaru for selection and making fresh crosses.
- (3) Preliminary screening of breeding material for major diseases, insect pests and Striga under early and late plantings.
- (4) A nutritional study at Samaru
- (5) Preliminary studies on genotype - input relations and crop competition
- (6) Introduction of African improved cultivars in several of the African countries.

Note: Several of the studies depend on receipt of seed material and its clearance by plant quarantine.

Entomology.

1. Yield-loss studies due to stem borers.
2. General survey of borer species and damage in Northern Nigeria.
3. Resistance of photosensitive sorghum to head bugs.
4. Resistance studies to major sorghum pests.

Agronomy.

1. Pearl Millet Spacing Trial.
2. Local Pearl Millet Landrace X Nitrogen Fertilizer Trial.
3. Local Pearl Millet Landrace X Nitrogen Fertilizer Trial.
4. Local Sorghum Landrace X Nitrogen Fertilizer Trial.
5. Local Sorghum Landrace X Nitrogen Fertilizer Trial.

In addition to the above experiments, support will be given to the breeders, pathologist and entomologist on the team. Below we present some interesting sorghum and millet results obtained by ICRISAT Upper Volta with whom we work collaboratively.

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HIGHLIGHTS OF RESEARCH

SORGHUM BREEDING.

Collections of local sorghum varieties from various West African countries were screened for the second year in 1980, and elite long duration lines have been isolated for yield testing and for crossing with improved cultivars.

Progeny of local variety x improved cultivars were screened through F4 with the goal of recovering high-yielding lines with improved early vigor, drought tolerance, and photosensitivity.

The cultivar E 35-1 was tested on 130 farms throughout its zone of adaptation (600-650 mm annual rainfall). In Kamboinso village, under supervised cultural operations, its average yield was 2165/kg/ha; in other locations, under reduced supervision and where drought frequently delayed planting, the mean yield was 1025 kg/ha.

About 60 pure lines and hybrids were selected in various trials on the basis of drought tolerance and agronomic characters for multilo-cational testing in 1981. Segregating lines through F4 were severely screened on shallow soil under end-of-season drought conditions, and emphasis was placed on selecting non-senescent plants.

PEARL MILLET BREEDING.

In a germplasm evaluation and utilisation trial, 67 single plant selections were made. Entry P 242, a Souni type, was most promising.

Twenty-eight plant selections were made from 17 entries in newly-received West African lines. In addition, 23 plants were selected in the earlier West African collection for breeding medium-cycle varieties. A set of Togolese lines showed good yield and disease-resistance characteristics.

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Synthetics and composites tested generally had lower ergot infection levels. Synthetics trials from ICRISAT Center had several high-yielding disease-free entries. For the Ex-Bornu composite, average grain yields of first- and second-cycle full-sib progenies were 960 and 870 kg/ha, respectively.

Selections were made from F1 and F2 populations, and from advance generation lines from various crosses. F2 seed was harvested from 20 selected crosses; Thirty-seven F3 and 23 F4 plants were selected from various preliminary trials.

Six on-farm trials of Ex-Bornu were harvested, grain yields ranged from 500 to 1400 kg/ha. Eight other trials failed due to pollen-wash. It appeared that seeding in the first half of July could minimize the risks of pollen wash and bird damage.

STRIGA RESISTANCE BREEDING.

Resistance F N 13, IS 8686, and SPV 103 to Striga infestation was confirmed in multilocational trials in Upper Volta and adjoining countries.

Large interactions between Striga strains, host cultivars and soil-water factors were observed.

Several new sources of resistance were identified in sorghum. Most promising are Najjadh, IS 2862, IS 9830, a few photosensitive low-stimulant lines and some Upper Volta germplasm accessions.

A few millet lines of African origin have been identified as less-susceptible, and performed well under combined Striga and water-stress in northern Upper Volta. P 2671 and P 2350 were outstanding. Promising lines from the Genetic Resources Unit trial in Niger include P 242, P 213, P 342, P 1410, and P 2609.

.../...

Detailed analysis of the physiological strains of Striga enabled tentative division of semi-arid West Africa into four zones: Zone I above latitude 13°N (350-500 mm annual rainfall), has millet-specific Striga strains; Zone II at 13°N has a Striga strain capable of attacking both sorghum and millet; Zone III between 12-13°N has only a sorghum-specific Striga strain; Zone IV between 11-12°N (800-100 mm annual rainfall) has two different Striga strains, one specific to sorghum and the other to millet.

PLANT PATHOLOGY.

After five years' testing in a sick-plot, four Ex-Bornu type millet lines, notably 700651, have consistently shown low downy mildew infection levels. Low-susceptible lines of Mali and Upper Volta origin have also been identified. In local varieties, downy mildew occurrence was likely influenced more by the relative importance of oospore- and zoospore-origin infections and rainfall patterns than by "Ridomil" (GGA 48988, CIBQ-GEIGY) application, even at high seed-dressing rates.

293 less-attacked heads were selected from 313 millet lines in test for reduced susceptibility to ergot. Germplasm materials from southern Mali and from Niger offer promising sources of resistance. Days to flowering and ergot susceptibility were not correlated, showing that it may be possible to select for early-maturing resistant lines.

Under severe smut infection pressure, Super Serere Composite full-sib selections were less-attacked. Many ICRISAT hybrids appear unacceptably susceptible to the disease.

Durable resistance to sorghum grain molds has been repeatedly identified at a high-rainfall site. E 35-1 and several other advanced lines possess adequate resistance to the disease. No correlation between sooty stripe reaction and flowering date was observed.

Location of sources of resistance to sorghum charcoal rot disease showed that E 35-1 and IS 3443 were not infected.

.../...

ENTOMOLOGY

Generally, pest infestations in Upper Volta are more severe in southern regions, where annual rainfall exceeds 900 mm.

Sorghum shootfly infestation in Upper Volta is insignificant but may cause severe stand loss in dry-season seed multiplication plots on research stations.

The most severe panicle infestations by the sorghum midge occur below latitude 13°N. In a preliminary trial, two local varieties, Fada 80 and Fada 109, were uninfested.

Stem-borer (Busseola fusca) infestation of sorghum in Upper Volta is relatively low, but in northern Nigeria sorghum infestations could be very severe.

Borer infestation of millet, caused primarily by Acigona ignefusalis, is higher and more extensive than in sorghum. Stem infestation and internode damage is greater when planting is retarded. Intercropping with legumes or application of phosphate fertilizer increases borer infestations.

The millet earhead caterpillar occurs between latitudes 12° and 15°N. In a trial in south-central Niger, three late-maturing varieties, Souna 3, NBB, and a local check, evaded infestation, but Nigerian Composite, NKP, and CIVT II which flower 56-60 days after planting showed varietal resistance.

The spittle-bug is an occasional pest on sorghum in Upper Volta, but becomes important only during unusual weather conditions (high humidity, abundant rainfall), as occurred in 1979.

.../...

AGRONOMY.

Improved understanding of crop adaptation to soil and climatic environmental factors was obtained, and also of the suitability of a crop for a particular management system. Successful adaptation is reflected by yield stability over time and across locations, and by reduction of the risk of crop failure.

Different agronomic management systems have been tested on farmers' fields using different varieties, crop combinations, dates of planting, and relative positions along a toposequence. These systems are designed to be acceptable to farmers of limited means and to maintain soil productivity: they include rotation with legumes, intercropping, and the use of natural rock phosphate fertilizer and animal-drawn equipment.

Local photosensitive lines are adapted to early planting and to local soil-types, as their long growth-cycle compensates for lack of soil preparation and fertilizer. However, these traditional crop varieties and practices give less flexibility for crop rotation, maintenance of soil fertility, and protection against soil erosion. Improved cereal and cowpea varieties adapted to late planting can take advantage of a diversity of improvements in crop, land, and water management, e.g., by the use of different plant types in crop associations; variations in plant population and spatial arrangements; low-density legumes in intercropping as an alternative form of pest control; differences in complementary crop requirements; residual effects of legumes and phosphate fertilizer on subsequent cropping; semi-permanent seed-beds, graded- and tied-ridges on upland soils.

Village studies at Nakomtenga have shown how farmers adapt and modify recommendations for cultivation of an improved sorghum variety.

.../...

ECONOMICS.

Pilot farm surveys were started in two villages near Ouagadougou. Technical and financial budgets were constructed for major cereal and legumes grown under local management. The use of local sorghum and millet varieties, and farmers' planting strategies were analyzed across several environments.

The donkey-drawn houe manga traction system under farmers' management significantly increased returns to both land and labor. It permitted more thorough weeding and was found to be labor-saving. Although its major effect is to increase labor efficiency during first weedings, which come at a peak workload period, it was not labor-displacing. Data suggested that area expansion followed adoption of the traction system, increasing the demand for labor during the slack periods.

Under improved management, on-farm trials of E 35-1 showed no significant differences in yields or financial returns when compared to local white sorghum varieties. E 35-1 outyielded local white sorghums under improved management only on plots near dwellings (by 23%) and in late plantings (by 38%). Disadvantages of E 35-1 were poor stand establishment under low tillage, and planting period inflexibility. Improved management procedures-- preplanting soil preparation, chemical fertilizer, and organic manure-- gave average yield increases of 200% over local varieties grown under traditional management.

Reconnaissance surveys were conducted in villages representative of the agroclimatic regions of Upper Volta. These provided a description of the different local farming systems, enabled sites to be chosen for 1981 village studies and added to development of hypotheses which will be tested in an expanded village study program.

.../..

3.3. ACCELERATED CROP PRODUCTION OFFICERS (ACPOs).

A principal link between research under SAFGRAD and extension in the participating Member States are the Accelerated Crop Production Officers (ACPOs). These are competent agronomists who are integrated into in the host country's national research. They conduct field trials on newly developed grain varieties using new cultural practices and report results obtained to the SAFGRAD Coordination Office for analysis. They further collect information on existing varieties, and cultural practices, tastes and preferences of people in their area in respect of cereals and grain legumes. This data is then integrated into the SAFGRAD regional research to date, 6 Member States have been provided with ACPOs. USAID finances 4 of them and the French Aid and Cooperation Fund (FAC) 2 Arrangements are under way to post either national or expatriate ACPOs in the remaining Member States. It is to be noted that these specialists work under the National Director of Agronomic Research in the host country. The latter are indeed requested to report on ACPO activities in their countries during the TAC meeting.

3.4. WORKSHOPS.

SAFGRAD workshops are a forum for the exchange of experiences, ideas and knowledge between national researchers on the one hand and international specialists on the other, and make it possible to sum up progress of research in Member States and plan regional trials through the formulation of recommendations. They are a crucible for high-level reflection and consultation of all Member States.

The continuous improvement of both the quality and content of these workshops implies increased efforts in the intrinsic value of the participation of delegates from Member States.

Since its creation, JP 31 SAFGRAD has organized 6 workshops:

- 3 on maize and cowpea
- 2 on sorghum and millet
- 1 on farming systems.

Others are scheduled for the coming years and we request Member States to apply recommendations issuing from such meetings to enable us better tackle the problems and evaluate progress achieved.

4. TRAINING OF AFRICAN SCIENTIFIC PERSONNEL

Training is one of the key objectives of SAFGRAD. Officials trained will go back to their respective countries to strengthen national programmes or be integrated into research teams already in place.

At present, 16 Africans from 4 Member States are undergoing M.Sc and Ph.D training in the United States. 10 technicians from 7 Member States have already been trained at IITA headquarters in Ibadan and at the Kamboinso Regional Research Centre. 11 more candidates from 5 Member States will very soon be sent to the US for long-term training. 6 others from 6 Member States will also undergo maize and cowpea training in Upper Volta while 18 additional candidates will go to India for specialization in sorghum, millet and groundnuts. (see Annex IV).

5. PROPOSED EXTENSION AND FUNDING FOR THE SAFGRAD PROJECT.

5.1. Definition of a semi-arid zone under SAFGRAD

African States that are members of the Project or desirous of becoming members should satisfy the following conditions:

- be politically independant
- have a considerable semi-arid zone
- have as basic crops those that are to be improved under SAFGRAD.

These characteristics generally fit the areas in the 400-1200 mm rainfall zone.

.../...

5.2. Should SAFGRAD be extended in its current form ?

The OAU is desirous of extending SAFGRAD to cover 15 other countries not currently covered by the Project. These are: Liberia, Principe and Sao Tome, Uganda, Equatorial Guinea, Gabon, Congo, Angola, Burundi, Rwanda, Djibouti, Malawi, Madagascar, Mozambique, Zaire and Zimbabwe. This determination is in line with the Lagos Plan of Action on ways and means of achieving self-sufficiency in food on continent in the short and medium terms.

The Coordination Office of JP 31 SAFGRAD is of the opinion that it would be premature to envisage this extension before the second phase. This is essentially due to the current lack of logistic and financial means of the Project.

However, FSU activities should be completed by a "Nutrition" component which we consider indispensable to give it wider coherence and efficiency.

5.3. SUPPORT FOR NATIONAL RESEARCHERS

National researchers need to be supported financially to enable them to fully carry out their SAFGRAD regional trials. This means that in the first instance,

I) Research teams will envisage in their budget as of next year some very urgent trial materials.

II) A special fund is later to be set up at the OAU/STRC Coordination Office for this purpose;

III) Agreements will furthermore be signed between member countries and OAU/STRC to partially equip national research laboratories.

COORDINATION BETWEEN RESEARCH INSTITUTES AND JP 31 SAFGRAD

Coordination between the various research institutes participating in JP 31 SAFGRAD, namely, ICRISAT, IITA, PURDUE UNIVERSITY, IRAT, and JP 31 SAFGRAD itself is to be further consolidated for the following reasons:

.../...

- rapid and uncontrolled multiplication of research bodies on the continent;
- generally useless multiplication of field activities;
- waste of funds and energy;
- requests of funding for similar activities from the same donors.

5.4. FUNDING

The bulk of financial support for the Project is provided by USAID under an agreement signed USAID and OAU/STRC on 23 May 1977 and amended successively on 2 September 1977, 29 November 1977, 6 April 1978 and 23 February 1979. This initial agreement for total sum of US\$5,885,00 over three fiscal years (1977, 1978 and 1979) was meant to finance researchers technical material as well as the setting up of scientific installations at the research centres and the training of researchers. American aid to the project is gradually spread out over-time, and to date adds up to \$10,935,000.

The French Aid and Cooperation Fund (FAC) also finances two ACPOs and has awarded three high-level scholarships to three African researchers. At present, the total French Aid is 52,000,500 F CFA.

In May and June 1980, The International Coordinator travelled extensively to seek additional financial support from potential donors who participated in the launching of the project.

The Rockefeller Foundation responded positively and immediately by awarding four post-graduate scholarships in Africa or the US. The following is a list of potential donors and the proposed financial or technical aid to SAFGRAD:

1) German Agency for Technical Cooperation (GTZ)

- Germ plasm collection
- storage and storage protection
- activities of 3 plant pathologists
- training of African researchers in Nigeria.

.../...

2) European Development Fund (EDF).

- 5 ACPOs
- Post-graduate scholarships.

3) Food and Agriculture Organization of the United Nations (FAO)

Further contacts are necessary to draw up a plan of action/support for financial aid.

4) International Development Research Centre (IDRC) and Canadian International Development Agency (CIDA).

- Funding for certain research priorities
- Post-graduate training
- Workshops and ACPO activities

5) United Nations Development Programme (UNDP)

- Specific activities of SAFGRAD.

6) British Ministry of Overseas Development (ODM)

- Request for assistance may be looked into for 1982.

Furthermore, the International Coordinator of JP 31 SAFGRAD wishes to contact the following organizations on possible funding for the project: Arab Banks and financial establishments, German Foundation for International Development (DZE), Swedish International Development Authority (SIDA) and Concerted Action for Development in Africa (CADA).

We are maintaining active contacts with all of these organizations and governments so they can give concrete proof of their goodwill and put SAFGRAD on sound financial and technical footing.

.../....

5.5. SAFGRAD Evaluation

USAID fielded a 5 man evaluation Team to conduct a mid-project evaluation of the AID supported portions of SAFGRAD from 13 May to 26 June 1981. The team was composed of Robert Duell (Leader), Elon Gilbert (Farming Systems Specialist), Herb Hughes (Management Systems Specialist) Leopold Fakambi (Nutritionist) and John Hyslop (Farming Systems Specialist).

After orientation sessions, the team drew up an itinerary to visit people and places connected with the programme. John Hyslop, Herb Hughes and Leopold Fakambi flew to Senegal and Mali while Elon Gilbert and Robert Duell went to Nigeria. They had a chance of meeting the Cameroon ACPO in Ouagadougou, and thus eliminated the need to go to Cameroon.

5.6. 2nd TAC and 1st CC meetings, 12-15 OCTOBER 1981

The 1st meeting of the OAU/STRC Consultative Committee (CC) for JP 31 SAFGRAD met in Ouagadougou, Upper Volta, on 14 and 15 October 1981 to look into the project's management, financial and policy problems. This meeting was preceded by the 2nd meeting of the project's Technical Advisory Committee (TAC) in Ouagadougou on 12 and 13 October 1981. TAC drew up a number of recommendations which were later modified, where necessary, and adopted by the Consultative Committee. These recommendations are reproduced in extenso in Annex III of the present report (page 34).

.../...

6. CONCLUSION

In the light of the foregoing, it is evident that obstacles hindering SAFGRAD's development are mainly financial and logistical.

The problem of SAFGRAD's extension implies substantial funding which is yet to be sought. As already mentioned, the entire operating expenses of the project are currently borne by a single donor: the United States Agency for International Development (USAID) to whom we express profound gratitude. We equally appreciate the initial funding efforts of the French Aid and Cooperation Fund (FAC).

What we strongly desire is that OAU should seriously look into our financial problems and ^{make} a contribution to strengthen the administrative structure and protect ^{the} project against a sudden end OAU should also actively and directly seek the assistance of potential donors by sending official missions to accompany the International Coordinator.

Problems relative to contacts and communication with our rural populations in terms of research call for Africanization of personnel in the field taking into account complete field experience and knowledge.

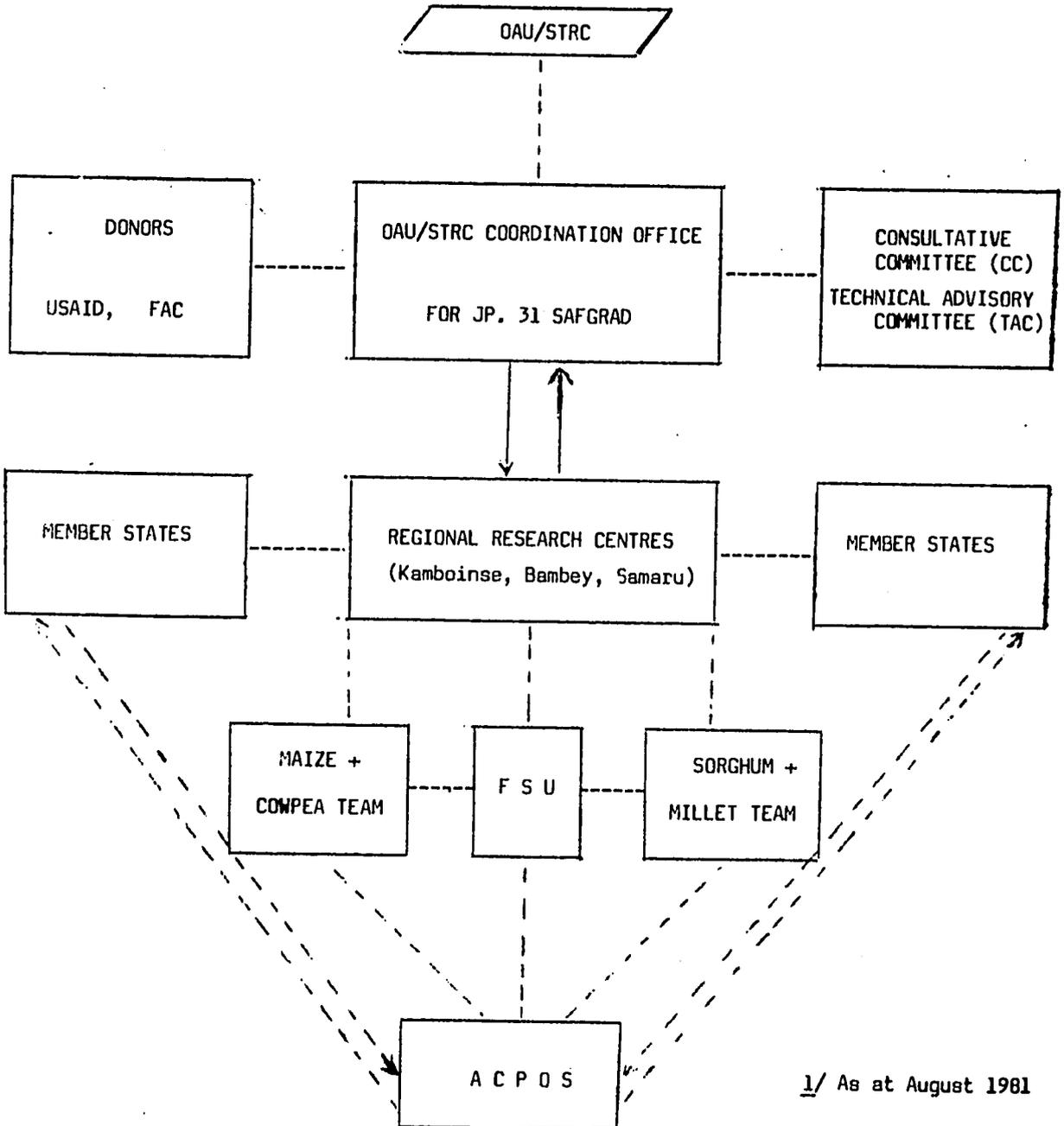
In conclusion, we are of the opinion that the foregoing problems notwithstanding, JP 31 SAFGRAD should move forward on the basis of excellent results obtained since the effective launching of the project. When continental self-sufficiency in food is at stake, time and means are not factors of primary importance.

ANNEXES

The following series of tables and charts are presented:

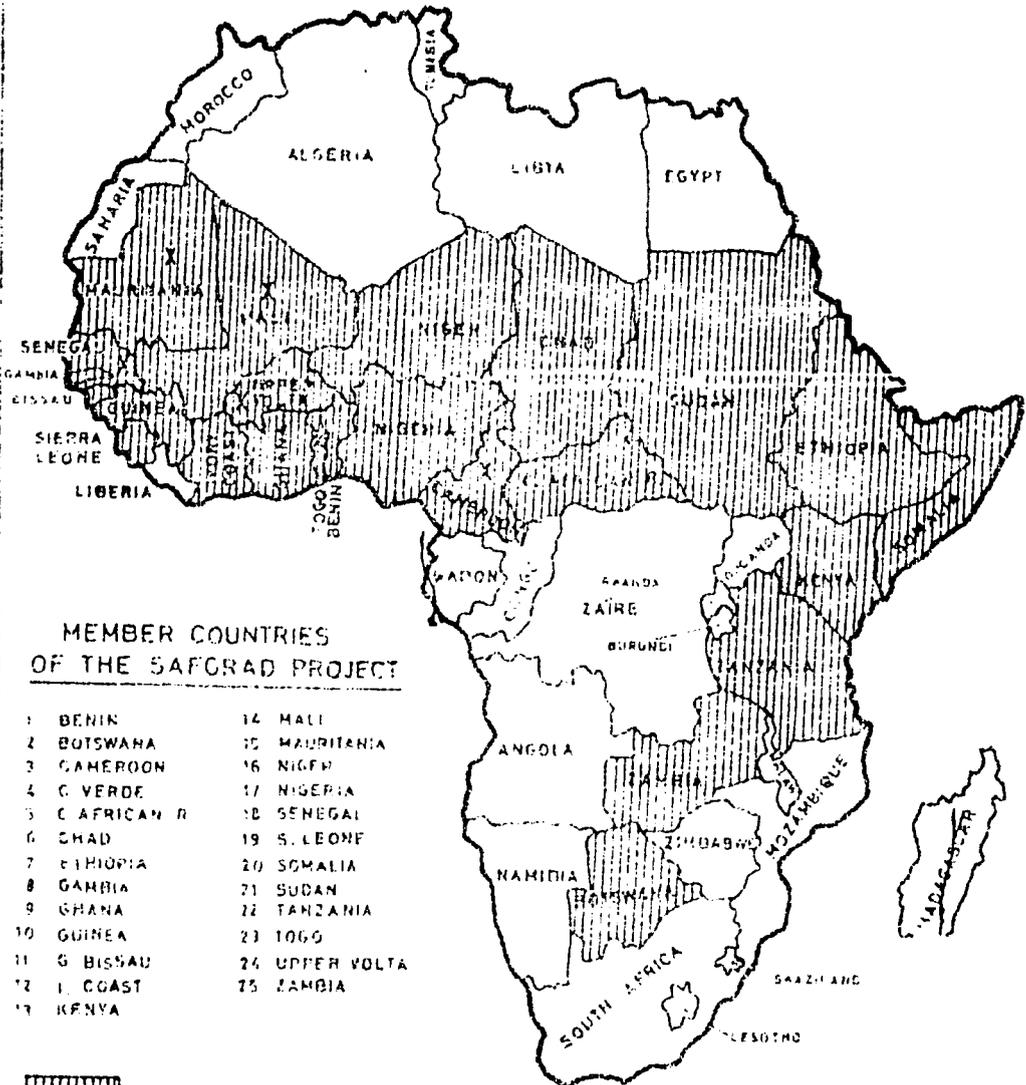
- I SAFGRAD Management Structure
- II Participating Member States (also showing where ACPOs have been posted).
- III Recommendations adopted by the 1st meeting of the OAU/STRC Consultative Committee (CC) for JP 31 SAFGRAD held in Ouagadougou on 14 and 15 October 1981.
- IVa SAFGRAD Scientific Personnel
- IVb SAFGRAD Administrative Personnel (Coordination Office)
- V Training of African Scientific Personnel since beginning of project
- VI Needs of OAU/STRC JP 31 SAFGRAD.

SAFGRAD MANAGEMENT STRUCTURE 1/



1/ As at August 1981

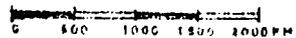
MAP OF AFRICA



MEMBER COUNTRIES OF THE SAFGRAD PROJECT

- | | |
|-----------------|----------------|
| 1 BENIN | 14 MALI |
| 2 BOTSWANA | 15 MAURITANIA |
| 3 CAMEROON | 16 NIGER |
| 4 C. VERDE | 17 NIGERIA |
| 5 C. AFRICAN R. | 18 SENEGAL |
| 6 CHAD | 19 S. LEONE |
| 7 ETHIOPIA | 20 SOMALIA |
| 8 GAMBIA | 21 SUDAN |
| 9 GHANA | 22 TANZANIA |
| 10 GUINEA | 23 TOGO |
| 11 G. BISSAU | 24 UPPER VOLTA |
| 12 I. COAST | 25 ZAMBIA |
| 13 KENYA | |

 SAFGRAD COUNTRIES
 X ACPO's



RECOMMENDATIONS ADOPTED BY THE FIRST MEETING OF THE OAU/STRC
CONSULTATIVE COMMITTEE (CC) FOR JP 31 SAFGRAD HELD IN
OUAGADOUGOU, UPPER VOLTA, ON 14 AND 15 OCTOBER 1981

General

1. To improve its impact, SAFGRAD, as far as possible, should concentrate on problems of a regional/sub regional character common to its member states, thus complementing national programmes for the solution of country-specific problems. In this regard, national institutions require strengthening in order to integrate their activities with those of SAFGRAD.
2. Among the crops of interest to SAFGRAD, research on maize is the most advanced. Consequently, in addition to ongoing maize research the project should now allocate more resources to sorghum, cowpea and millet in view of the relatively greater importance of these crops in semi-arid areas.
3. The current SAFGRAD activities should be expanded to become fully operational programmes in Central, Eastern and Southern Africa.
4. To increase its effectiveness as an advisory body, TAC should have during its future annual meetings, detailed information on on-going programmes and results obtained from them as well as details of concrete projects planned for the following year. This information could come from the suggested new annual programme review meetings involving national and SAFGRAD research workers.
5. Soil analyses and rainfall data of trials sites, together with relevant agronomic details, should be given, wherever possible to help interpret the results obtained.

.../...

CROP IMPROVEMENT

The Committee recommends that:

6. Crop improvement programmes should fully exploit the adaptability and other potentially valuable characteristics of traditional or local varieties especially cowpea, millet and sorghum which exhibit high specific adaptation. The project should promote the collection, conservation, evaluation and utilization of local crop germplas in collaboration with IBPGR, International Research Centres, IRAT, ORSTOM and similar research organizations.

7. Plant breeding objectives, apart from high yield potential, resistance/tolerance to pests and diseases, and adverse soil and weather conditions, should include:

- a) - nutritional quality
- b) - consumer acceptance
- c) - advantageous post-harvest characters to reduce post-production food losses.

SOIL MANAGEMENT

The committee recommends that:

8. The present limited research on soil and water management should be expanded with the aim of achieving long term maintenance and improvement of soil fertility. Investigations under the programme should include organic fertilizers, rational use of inorganic fertilizers, biological nitrogen fixation, erosion control, micronutrient requirements, the long term effects of mechanical land clearing and tillage etc...

.../...

FARMING SYSTEMS

9. The committee highly commends the Farming Systems component of the SAFGRAD programme which identifies constraints (socio-economic, technical, the human factor) at the farm level and studies on existing traditional farming systems as a basis for developing improved agricultural systems to be tested, modified and adapted at the farmer level. The committee stresses that apart from the collection of agricultural statistics and the desirable economic evaluation of innovations, Farming Systems Research should be characterised by interdisciplinary or multidisciplinary work to improve agricultural productivity and farm incomes.

10. Considering the importance of maize, sorghum, millet and cowpea to SAFGRAD, research on mixed cropping involving sorghum and millet with cowpea should be intensified in addition to the ongoing research on maize/cowpea intercropping.

11. Packages of crop management practices should be developed for improved cultivars before they are released for commercial production, supported by seed multiplication programmes.

12. Production technologies should be developed to suit the realistic levels of input availability, environmental conditions and management capacity of the farmer.

13. The farming systems approach is recommended to Member States of SAFGRAD and collaboration between the project's FSU on the one hand and ACPOs and National extension services on the other should be developed. This implies the extension of technical assistance by SAFGRAD's FSU to countries besides Upper Volta.

.../...

POST-HARVEST CROP LOSSES

14. The committee, taking note of the report of the first TAC meeting recommends continued research, training and development activities aimed at reducing post-harvest crop losses so as to stabilize food crop reserves.

ACTIVITIES OF ACCELERATED CROP PRODUCTION OFFICERS (ACPOs).

15. The committee:

Conscious of the importance of the role of workshops organised by the Coordination Office of JP 31 SAFGRAD as a forum for the exchange of experiences and viewpoints among researchers,

Considering that these workshops cannot in a concrete manner change the operations of ACPOs in the field;

recommends:

i) that urgent steps be taken to assign ACPO's to those SAFGRAD countries which require them.

ii) that ACPO's should participate in the meetings of the National Programme Committee of Member States.

TRAINING OF AFRICAN SCIENTIFIC PERSONNEL

16. The committee,

- considering that training is an imperative priority for Africa in terms of the exploitation of national resources in general and that of agriculture in particular,

- considering the need to progressively Africanize the projects scientific personnel,

.../...

- conscious of the existence in Africa of training structure at the university level as well as at the level of appropriate research institutes, launches a pressing appeal that donor funds allocated for training be increased to make it possible for the specialization of a greater number of African researchers and technicians,

- that member states take steps as soon as possible to present candidates for long or short term training at African University Institutions as well as at regional or national agricultural research establishments.

- that SAFGRAD employ personnel trained under this project for at least 5 years.

WORKSHOPS AND SYMPOSIUM

17. The committee,

- considering the need to reduce the frequency and number of SAFGRAD workshops in view of the inadequacy of financial means allocated to the convening of these workshops:

- considering the importance of the annual evaluation of the research activities carried out in member countries,

- considering that participation of member States in SAFGRAD meetings implies that designated representatives have a good knowledge of the SAFGRAD programme,

recommends:

- that a global SAFGRAD symposium be held every two years on the entire millet, sorghum, maize, cowpea and farming systems programme.

.../...

- that TAC composed of highly qualified scientific personalities make an exhaustive annual evaluation of the SAFGRAD programme elaborated by national and project researchers for the attention of CC.

- that the SAFGRAD project nominates the researchers to be invited for participation in SAFGRAD meetings.

EXTENSION OF THE PROJECT

18. Considering the resolution of the Council of Ministers on JP 31 Number 839 (XXXVI) which calls for extension,

- considering that the principal criteria of the choice of states that should be covered by the project are:

- the existence in these states of a considerable semi-arid zone,

- the importance of basic crops such as millet, sorghum, maize, cowpea or groundnut in these countries,

- the existence of background information and studies on the important crop made by ICRISAT in response to a request to the Heads of States of the South Africa Development Coordinating Committee (SADCC) Countries listed as likely to join SAFGRAD,

The committee recommends:

- that the extension of the project to the remaining states be considered in the next meeting of TAC.

SUPPORT FOR NATIONAL PROGRAMMES

19. The committee

- considering that the Accelerated Crop Production Officers (ACPOs) are working in close collaboration with national researchers under the SAFGRAD programme,

.../...

- considering the existence of material and financial means for national researchers working within the framework of the SAFGRAD project;

recommends:

- that substantial support be given by the project to the national programmes associated with regional trials both materially and financially (manpower, secretariat, scientific equipment etc...) in addition to the budget of the ACPO.

COORDINATION BETWEEN RESEARCH INSTITUTES AND JP 31 SAFGRAD

20. The committee,

- considering the multiplicity of research organizations on the continent,

- considering the risks of duplication of research programmes carried out in the field, and the soliciting of funds from the same donors for similar operations as well as the resultant waste of funds and energy,

- draws the attention of OAU/STRC and that of Member States of the project to such inconveniences,

- recommends that annual consultative meetings between the research institutes participating in JP 31 SAFGRAD, the organizations concerned and the project be held.

INFORMATION

21. The committee,

- considering that information is unfortunately often lacking between researchers and officials of JP 31 SAFGRAD on the one hand and those of regional and national organizations on the other,

.../...

- conscious of the existence since 1979 of the JP 31 SAFGRAD Newsletter,
recommends:

- that the current general information type of Newsletter published
be strengthened by scientific articles from the following regional representatives.

- West Africa Dr. Thiongane of Senegal
 Prof. Agboola of Nigeria
- Central Africa: Dr. N'Gatchou of Cameroon
- East Africa: Dr. Gebrekiden of Ethiopia.

FINANCING

22. The committee,

- considering that the main constraints of SAFGRAD are financial and
personnel,

- considering the increasing role that the project is expected to
play within the framework of the OAU Plan of Action to achieve self-sufficiency
in food by the 2000,

- considering the necessity to evaluate and elaborate as soon as
possible a technical and financial short medium and long term programme for the
project,

recommends:

- that an ad hoc committee of eight high-level experts be set up
including especially:

- Professor ADJANOHOON
- Mr. DJIGMA Albert of Upper Volta
- Professor AGBOOLA of Nigeria
- Dr. Grhane CEBREKIDAN of Ethiopia and four others from IRAT, ICRISAT,
USAID and IITA.

.../...

- proposes the following time table for the preparation and presentation of the document on project evaluation and programming:

1st half of January 1982: meeting of the ad hoc committee

1st half of March 1982: submission of document to TAC subject to the Consultative Committee (CC)'s approval. CC has given its approval in principle.

1st half of April 1982: document is presented to the STRC for onward transmission to the OAU Council of Ministers.

It was also decided that the Coordination Office should make available to the ad hoc committee members all relevant documents pertaining to JP 31 SAFGRAD prior to their departure so as to ensure that the proposed time table is adhered to.

EVALUATION REPORT ON SAFGRAD

23. TAC was informed that the evaluation report is in draft form to be finalized after the comments/reactions being sought from various quarters including SAFGRAD have been received by USAID.

Some TAC members drew attention to incorrect factual statements contained in the recommendations. The committee recommends that the AID representative attending the TAC meeting and SAFGRAD Secretariat should make known to USAID these comments and any other subsequent criticisms before the report is finalized and distributed.

STRENGTHENING OF SAFGRAD HEADQUARTERS

24. In view of the understaffing at the professional level and increasing workload at the Coordination Office, the committee recommends the filling of the posts of Accountant and Director of Research as soon as possible.

.../...

The committee further recommends flexibility in the allocation of funds and the modalities relating to the disbursement of such funds by the Coordination Office of JP 31 SAFGRAD.

VOTE OF THANKS TO HOST GOVERNMENT

The participants in the first OAU/STRC Consultative Committee meeting held in Ouagadougou, Upper Volta, from 14-15 October 1981 wish to express their gratitude to His Excellency Col. Saye ZERBO Chairman of the Military Relief Committee for National Progress and Head of State, to the Government and the entire voltaic people for their hospitality and the excellent facilities put at their disposal for the success of the meeting.

VOTE OF THANKS TO DONOR AGENCIES

The committee also wishes to express its gratitude to all the donor agencies who have been supporting SAFGRAD especially the United States Agency for International Development (USAID) the French Aid and Cooperation Fund (FAC) and the Rockefeller Foundation.

It requests the Secretary General of OAU to solicit other donors to join the present ones in giving support to the current and subsequent phases on the project.

VOTE OF THANKS TO COLLABORATORS

The committee wishes to congratulate and thank most sincerely the collaborating organizations namely IITA, ICRISAT, Purdue University, and IRAT as well as the various National Institutions and Universities for the impressive results so far achieved through their cooperation in achieving the major objectives of JP 31 SAFGRAD.

.../...

VOTE OF THANKS TO THE INTERNATIONAL COORDINATOR AND HIS ADMINISTRATIVE
AND RESEARCH STAFF.

The committee commends the excellent performance of the International Coordinator and his staff for the very effective management of the project and calls on the General Secretariat of the OAU to give all possible assistance for the strengthening of the Coordination Office.

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SAFGRAD SCIENTIFIC PERSONNEL

POSITION	NAME	FINANCING	DONOR	LOCATION	DATE ARRIVED ON DUTY
Maize Breeder	V. ASNANI	IITA	USAID	Kamboinse Research Stat. Upper Volta	May, 1979
Maize Agronomist	M. RODRIGUEZ	IITA	USAID	" "	April, 1979
Soil Fertility Agronomist	F. BROCKMAN	IITA	USAID	" "	April, 1979
Entomologist	Y RATHORE	IITA	USAID	" "	April, 1979
Production Agronomist	P. CHRISTENSEN	Purdue University FSU	USAID	" "	Jun., 1979
Rural Sociologist Anthropologist	R. SWANSON	"	USAID	" "	Nov, 1979
Agricultural Economist	R. SINGH	"	USAID	" "	Oct., 1979 departed March, 11, 81
Soil Management Agronomist	E. PERRIER	ICRISAT	USAID	IRA Samaru Nigeria	
Sorghum Breeder	N. RAO	ICRISAT	USAID	" "	
Production Agronomist	H. BOLING	"	USAID	" "	
Entomologist	J. McFARLANE	"	USAID	" "	

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Annex IVa (continued)

POSITION	NAME	FINANCING	LOCATION	DATE ARRIVED	COMMENT
ACPO-Mali	J. JOHNSON	USAID	Bamako/Mali	Sept., 1977	
ACPO-Upper Volta	C. KORTMEG	USAID	Kamboise	Apr., 1978	
ACPL-Cameroon	D. GMATHMEY	USAID	Maroua Research Station Cameroon	May, 1979	
ACPO-TOGO	R. MARTIN	FRANCE	Lamakara Togo	June, 1980	
ACPO-Guinea		FRANCE	Kankan		
ACPO-Benin		FRANCE	INA Research Station Benin		
ACPO-Mauritania	B. ESQUIVIE	FRANCE	Kaedi Research Station Mauritania		
National ACPO Senegal	FALL	USAID	North of Senegal	Feb., 1980	
National ACPO Ivory Coast					
Guinea Bissau					
National ACPO Rep. of Centre Afr.	ANDJIBIA				
National ACPO Somalia	ALIO				

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SAFGRAD Administrative Personnel (Coordination Office)

<u>NAME</u>	<u>POST</u>	<u>NATIONALITY</u>
1. Mr. K.O. Akadiri-Soumaïla	International Coordinator	Beninese
2. Mr. Herbert Hughes	USAID Liaison Officer	American
3. Mr. Kodjo M. Doamekpor	Personnel Officer	Togolèse
4. Mr. Denis Ouedraogo	Press Officer	Voltaic
5. Mr. Maxwell Adjei-fah	Translator (English)	Ghanaian
6. Mr. Boniface Sanou	Translator (French)	Voltaic
7. Mrs Alizeta Ouedraogo	Accountant	Voltaic
8. Miss Victoria Tobossi	Secretary	Beninese
9. Mrs Fatou Gueye	Secretary	Senegalese
10. Miss Yvonne Toc	Secretary	Voltaic
11. Miss Celestine Some	Secretary	Voltaic
12. Mrs Aïssata Kabore	Receptionist	Voltaic
13. Mr. Amadou Doumbia	Driver	Voltaic
14. Mr. Boureïma Kouda	Driver	Voltaic
15. Mr. Boukary Dramane Tadia Malam	Telex Operator	Voltaic
16. Mr. Saïdou Kabore	Messenger	Voltaic
17. Mr. Soumaïla Pitroipa	Cleaner	Voltaic
18. Mr. Sibiri Bagagnan	Watchman	Voltaic
19. Mr. Francis Ouedraogo	Watchman	Voltaic

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Training since beginning of Project

Long-term

14 Africans from 4 OAU Member States have benefited from SAFGRAD training in the U.S.

7 others from 7 OAU Member States are being considered for long-term training.

<u>NAME</u>	<u>NATIONALITY</u>	<u>TRAINING INSTITUTION</u>	<u>SPECIALIZATION</u>	<u>DURATION</u>
1. Lamina Traore	Mali	Texas A&M Univ.	MSc Agronomy	10/79-10/81
2. Lassana Tigana	Mali	" " "	MSc Sorghum Breeding	1/79- 1/81*
3. Adama Coulibaly	Mali	Calif.Poly.State U.	BSc Agronomy	10/79- 3/81
4. Moriba Konate	Mali	Texas	MSc Maize Breeding	6/80- 6/82
5. Koasi Sevonou	Togo		MSc Plant Breeding	6/80- 6/82
6. Issa Kargougou	Upper Volta	Oklahoma State U.	MSc PhD Agronomy	1/79- 1/82
7. Sanson Da	Upper Volta	Texas A&M Univ.	PhD Plant Breeding	1/79- 1/82
8. Saïdou Koala	Upper Volta	Montana State Univ.	Ms Agronomy	6/80- 6/82
9. Mory Draby	Guinea	Texas	MS Plant Breeding	6/80-12/83
10. Souleymane Condé	Guinea	Texas	MS Soil Sciences	6/80- 6/83
11. Mody Sory Barry	Guinea	New Mexico	MS Ag. Hydraulics	6/80-12/83
12. Gilbert Sakou	Guinea	California	MS Plant Breeding	6/80-12/83
13. Bangaly Bernard Lenaud	Guinea	California	MS Plant Pathology	6/80- 6/82
14. Louis Mazhani	Botswana	Univ. of Nebraska		

* Returned due to illness June 1980.

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NEEDS OF OAU/STRC JP 31 SAFGRAD

I COORDINATION OFFICE

- Financing for additional staff (Research Supervisor, Accountant, Conference Officer etc...)
- Financing for travel in Africa
- Financing for annual travel of at least 15 African Researchers to SAFGRAD Member countries.
- Financing for Office Equipment
- Vehicles.

II TAINING

- Post-graduate fellowships in Africa, Europe, Canada, USA, etc...

III RESEARCH

- a) - Setting up 3 regional research centers in Eastern and Southern Africa.
- b) - FSU extension in East Africa.
- c) Personnel
 - 6 plant pathologists (millet and sorghum)
 - 4 plant breeders (maize, cowpeas, sorghum and millet)
 - 3 plant breeders (millet and sorghum)
 - 3 Entomologists
 - 5 Agronomists soil scientists
 - 2 Striga specialists
 - 2 Agricultural mechanization specialists
 - 2 Anthropologists
 - 2 Agro-economists

d) Financing for both national and expatriate ACPOs

Benin, Botswana, Cepe Verde, Ethiopia, Gambia, Ghana, Guinea Bissau, Ivory Coast, Guinea, Kenya, Niger, Nigeria, Central African Republic, Sierra Leone, Somalia, Sudan, Tanzania, Chad, Zambia.

e) Infrastructure

Reinforcement of research stations of needy member states

Cape Verde, Gambia, Guinea Bissau, Togo, Chad, Benin, Niger Somalia, Upper Volta (Kamboinse): Laboratories for: Agronomy, seed multiplication, plant pathology.

f) Studies requiring financing

- Ecological and plant (environment interaction studies for better utilization of national resources).
- Research on small farm equipment
- Collection of plant material (germplasm)
- Storage and stock protection
- Use of animal traction.

IV

Symposium, Conferences and Workshops.