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A REPORT OF THE IMPACT STUDY OF
THE ACCELERATED CROP PRODUCTION PROGRAMME



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SEMI-ARID FOOD GRAIN RESEARCH AND DEVELOPMENT
(SAFGRAD)

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P R E F A C E

The SAFGRAD mandated geographic area is estimated to have a total population of 250 million, about 80% of whom are small farmers producing most of the staple food which they consume. Although Africa has experienced rapid population growth, it has not, however, attained commensurate increases in food production. One of the major causes of the decline in per capita food production in the region has been the lack of adaptive technological change in agriculture.

During the last two decades, agricultural research activities have been intensified by the IARCs and the respective SAFGRAD member countries. As some technologies become available, it was assumed that they could be relevant to bring about increases in food production. The Accelerated Crop Production Officers' (ACPO) Programme was SAFGRAD's approach to enhance the testing, verification and adoption of research results by farmers. Concurrently, other functional objectives of the ACPO programme were to provide "feed back" information to the research station and research administrators on the performance of particular technologies, to improve linkages between research and extension as well as to identify researchable themes for further testing.

The ACPO programme through the financial support of USAID was operational in four countries namely, Burkina Faso, Cameroon, Mali and Senegal. The French Technical Cooperation has continued to support similar on-farm testing activities of SAFGRAD in Togo. This report has attempted to document the accomplishments of the ACPO programme in each of the four countries in which ACPO programmes are currently in operation. It does not include Senegal where a similar programme had been discontinued since 1982.

An assessment was made of the impact of the programme in diffusing crop production technologies, in strengthening linkages between national research and extension systems and collaborative SAFGRAD research programmes, and in dynamizing national extension systems as well as its impact on the target farming systems in the countries involved.

Unfortunately, the team detected a certain amount of general donor fatigue and frustration brought about by the lack of revolutionary improvements in the food and agriculture situation in the continent, despite the amount of resources that have been expended searching for them. The fact is that the improved technologies that would revolutionize African agriculture are not yet available. It would, however, be a costly mistake to wait for the miracle variety to arrive before institutionalizing the transfer process that will promptly and effectively get it to the farmers.

The report also contains some recommendations for the future direction of the ACPO programme which could help foster the rapid achievement of the technology transfer process in other SAFGRAD member countries.

The SAFGRAD Coordination Office was fortunate to have Professor George O.I. Abalu, Agricultural Economist from the Institute of Agricultural Research of Ahmadu Bello University, Nigeria and Mr Michel Sedogo, Soil Scientist and former Director the "Institut d'Etudes et Recherches, Agricoles" (INERA) of Burkina Faso to undertake this impact study.

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ACRONYMS AND ABBREVIATIONS

GENERAL.

ACPO	Accelerated Crop Production Officer
CIMMYT	International Maize and Wheat Improvement Centre
CIRAD	Centre International de Recherches Agronomiques pour le Développement
FAC	Fonds d'Aide et de Coopération
IBPGR	International Board for Plant Genetic Resources.
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics.
IARC	International Agricultural Research Centre.
IFDC	International Fertilizer Development Centre.
IITA	International Institute of Tropical Agriculture.
INSAH	Institut du Sahel (CILSS).
IRA	Institut de Recherche Agronomique
OAU	Organization of African Unity.
ORSTOM	Office de Recherche Scientifique d'Outre-Mer (France).
SAFGRAD	Semi-Arid Food Grain Research and Development.
SCO	SAFGRAD Coordination Office
STRC	Scientific, Technical and Research Commission.
USAID	United States Agency for International Development.
WARDA	West African Rice Development Association.

BURKINA FASO

CNRST	Centre National de Recherche Scientifique et Technique.
CRRA	Centres Régionaux de Recherches Agricoles
DA	Direction de l'Agriculture.
FEER	Fonds de l'Eau et de l'Équipement Rural.
IDR	Institut de Développement Rural.

INERA	Institut d'Etudes et Recherches Agricoles Ex Institut Burkinabè (Voltaïque) de Recherches Agronomiques et Zootechniques IBRAZ (IVRAZ)
MESRS	Ministère de l'Enseignement Supérieur et de la Recherche Scientifique
ONG	Organisme Non Gouvernemental
ORD	Organisme Régional de Développement
RSP	Recherche sur les Systèmes de Production
SVAR	Service de Vulgarisation et d'Animation Rurale

CAMEROUN.

CRA	Centre de Recherche Agronomique
DDR	Direction de Développement Rural
DGRST	Délégation Générale à la Recherche Scientifique et Technique
ICP	Institut des Cultures Pérennes
ICVT	Institut des Cultures Vivrières et Textiles
IRA	Institut de Recherche Agronomique
IRAF	Institut de Recherches Agricoles et Forestières
IRFP	Institut des Recherches Forestières et Piscicoles
MESRES	Ministère de l'Enseignement Supérieur et Rech. Scient.
ONAREST	Office National de Recherche Scientifique et Technique
SODECOTON	Société de Développement du Coton
TLU	Testing and Liaison Unit

MALI

AB	Action Blé Diré
ARS	Action Riz - Sorgho de décrue Gao
CMDT	Compagnie Malienne de Développement des Textiles
CNRA	Comité National de la Recherche Agronomique
DAF	Division Administrative et Financière
DDI	Division de la Documentation et de l'Information

DET	Division des Etudes Techniques
DRA	Division Recherche Agronomique
DRSPR	Division de Recherche sur les Systèmes de Production Rurale.
IER	Institut d'Economie Rurale
ODIB	Opération de Développement Intégré de Baguineda
ODIC	Opération de Développement Intégré de Kaarta
ODIPAC	Office de Développement Intégré des Productions Arachidières et Céréalières
ODR	Opération du Développement Rural
OHV	Opération Haute-Vallée
OMM	Opération Mil Mopti
ON	Office du Niger
OPSR	Opération Protection des Semences et Conservation des Récoltes
OPSS	Opération Protection des Semences et Conservation des Récoltes
ORS	Opération Riz Ségou
OTS	Opération Thé Sikasso
OVSTM	Opération des Vallées du Sénégal-Terekolé et Magui
OZL	Opération Zone Lacustre
SRCFJ	Section de Recherche sur le Coton et Fibre Jutières
SRCSS	Section de Règlementation et Contrôle des Semences
SRCVO	Section de Recherche sur les Cultures Vivrières et Oléagineuses
SRFN	Section de Recherche Fruitières et Maraichère
SRTPN	Section de Recherche sur le Tabac et les Nouvelles Plantes
<u>TOGO</u>	
DDR	Direction du Développement Rural
DRA	Direction de la Recherche Agronomique
DR DR	Direction Régionale de Développement Rural
MDR	Ministère du Développement Rural
SOTOCO	Société Togolaise du Coton.

EXECUTIVE SUMMARY

By invitation from the International Coordinator of the Semi-Arid Food Grain Research and Development (SAFGRAD) Project of the Organization of African Unity's Scientific, Technical and Research Commission (OAU/STRC), and in accordance with prescribed terms of reference, an Impact Study was carried out to determine the impact of SAFGRAD's Accelerated Crop Production Officer (ACPO) programme. One of the purposes of the study is to provide the SAFGRAD Coordination Office (SCO) with documentation of the successes and lessons learned in the four countries where ACPO's have worked so far, and to formulate a job description of the ideal ACPO for the future.

After visiting all the ACPO member countries and their programmes and holding discussions with all the relevant individuals as well as administering a detailed set of questionnaires to farmers in villages scattered throughout each of the four countries, i.e. Burkina Faso, Cameroon, Mali and Togo, the team arrived at a number of conclusions and recommendations. These conclusions and recommendations are recorded in the appropriate sections of the report. The major ones are summarized below:-

1. There was unanimous agreement among everybody in all the countries visited that SAFGRAD's ACPO concept of providing a bridge between national research and extension programmes in member states is sound and more relevant today than ever before, in the face of the continued difficulties many African countries are still facing in trying to get the majority of their farmers to move into higher levels of agricultural technology.
2. Although the ACPO projects may not yet have changed the cropping and farming systems of the areas in which they are located, most of the farmers were able to identify increases in the yield of all the SAFGRAD mandated crops, with the exception of cowpeas. The factors contributing to the perceived increases in yield varied from crop to crop and from country to country. In most cases, the use of improved cultural practices and fertilizer were identified as the most important factors.
3. The ACPO programme is only one of several inputs contributing to improvements in the farming systems of the zone in which it operates and is dependent on other components for its success. These other components include the availability of improved technologies that are indeed superior to the technologies the farmers are currently using and appropriate infrastructural and support systems. In most of the ACPO countries these other components do not appear to be functioning effectively.

4. The ACPO programme has succeeded in institutionalizing the technology transmission and diffusion process in all the four countries in which ACPO projects are located. As a result, component research and FSR in these countries are now more likely to be more relevant to the needs of the farmers in these countries. Each of the projects have, however, had strengths and weaknesses.
5. A proposal has been made for the future ACPO programme which attempts to build on the strengths and minimize the weaknesses.
6. Efforts should continue to promote the institutionalization of the ACPO concept in as many SAFGRAD member countries as possible. The focus of the efforts should continue to be on the low resource farmers. SAFGRAD, with its OAU umbrella and its well established credibility and integrity in African countries, has a definite comparative advantage in this area. SAFGRAD should, therefore, continue its leadership role in assisting to build for each member country, a technology transfer process that involves research, based on farmers' needs, an extension system that reaches farmers promptly and effectively and a farmer feedback system that is able to report back to extension and research workers.
7. Low resource agriculture is what most farmers in SAFGRAD member countries do and are likely to continue to do for a while yet. Because of the nature of this agriculture, the level of risk they can take is very low. They are therefore the most vulnerable citizens of their countries. SAFGRAD would be making an invaluable contribution to the development process in Africa by continuing to focus its efforts on these class of farmers.
8. Despite the general awareness in each country of the critical requirement of institutionalizing an effective agricultural technology transfer mechanism, most countries do not have the resources to invest in the process, regardless of the rhetoric to the country. Outside support would therefore be needed for a long time to come.

CHAPTER I. INTRODUCTION

It is now generally accepted that the unprecedented economic crisis currently engulfing the whole of Sub-Saharan Africa is first and foremost a crisis of agricultural production. In the face of rapid increases in the growth of its population, the continent has not been able to produce enough food and agricultural products to keep pace with the population, much less produce a surplus which would be needed to sustain overall economic development.

The very idea of SAFGRAD was prompted by the recognition that the first step towards eliminating the on-going food and agricultural crisis in the Sub-continent in general, and its semi-arid zones in particular, was to ensure that the majority of the ordinary peasant farmers in the sub-region shift to higher levels of agricultural technology. An essential input in this endeavor is, of course, the successful transmission of available new agricultural research results to farmers.

With years of agricultural research activities in both the national and international agricultural research centres in the sub-continent, it was assumed that, while efforts should be intensified in identifying and generating higher levels of agricultural technologies that are suitable and relevant to the agricultural systems in the sub-continent, there already exists, on the shelves of these research centres or elsewhere, improved technologies that can be adopted, perhaps with slight modifications, by the majority of the peasant farmers.

The Accelerated Crop Production programme centred around the Accelerated Crop Production Officer (ACPO) was SAFGRAD's response to a perceived weakness of crop research programmes "in getting research results disseminated, tested, adapted and to the farmer." The project paper, therefore, provided responsibilities in the following three main categories:

1. Conduct field trials and studies under-various conditions to test the adaptability, deficiencies and potential of various recommended crop varieties and practices;

2. Provide a linkage to crop research and development programmes elsewhere in the region to enable the participating country to benefit from and contribute to regional progress;
3. Provide coordination between national research and extension/development agencies in arranging for broader national testing and demonstration of those varieties and cultural practices that appear technologically superior and otherwise suitable.

The Project Paper anticipated that most ACPOs would initially be expatriates provided through bilateral arrangements between individual participating countries and individual donors. African ACPOs were to be trained with "the knowledge and orientation to deal with the broad issues related to translating research into benefits in farmers' fields." They were to be integrated into national research and development programs under the direction of the national research director.

1.1. ORIGIN OF THE STUDY

The ACPO programme currently operates in Burkina Faso, Cameroon, Mali, and Togo. All the country projects with the exception of that of Togo, which is funded by FAC (French Aid), are financed through USAID.

When the ACPO programme as a whole was evaluated during SAFGRAD I it received a positive rating although both successes and failures were identified as well as considerable variation on how the projects were being implemented in the different countries. Furthermore, successful performance of the ACPOs appeared to be associated more with individuals than with the system.

This Impact Study of the ACPO is expected to provide the SAFGRAD Coordination Office (SCO) with documentation of the successes and lessons that can be learned in the four countries where ACPOs have operated so far. The result of the study is also expected to help identify new steps for formulating future ACPO strategies, and permit the SCO to secure additional donor support for the programme.

1.2. WORK SCHEDULE AND COMPOSITION OF THE TEAM

The impact study was carried out by a team comprising Professor G.O.I Abalu of the Institute for Agricultural Research, Ahmadu Bello University, Zaria, Nigeria and Michel Sedogo, former Director of Agricultural Research in Burkina Faso. Details about the members of the Study team are presented in Annex 5. The study was carried out from August 17, 1987 to October 22, 1987. The details of the work schedule of the Team are presented in Annex 3.

1.3. TERMS OF REFERENCE

The study Team operated under the following Terms of Reference:

1. To review on-going on-farm testing activities and determine the effectiveness of the ACPO concept in the diffusion of crop production technologies (by rapid assessment surveys).
2. To assess the impact of the programme with regard to strengthening linkages between national research and extension systems and collaborative SAFGRAD research programmes and also determine any feed back information to research.
3. To determine if the on-farm activities did make impact in dynamizing the national extension systems through translation of research findings into extension recommendations.
4. Based on the performance of the project during the last few years, propose:
 - a) New perspectives on how the ACPO programme should be formulated.
 - b) Criteria for the selection of countries for the ACPO programme.
 - c) Profile and criteria for the ACPO selection.
 - d) Components and approaches for training (long and short-term) of on-farm research officers.

1.4. METHODOLOGY

In the course of the study, the team visited all four countries with an ACPO. In addition to spending time in the capital cities of the countries involved, talking to research and agricultural officers, a considerable amount of the time of the team was spent in remote villages far from the urban and semi-urban areas, visiting trial sites, holding discussions with field research and extension staff, and interviewing farmers right on their fields and in their homes.

In each of the countries visited the following categories of people were visited and interviewed:

1. ACPO Unit
 - a) The ACPO
 - b) Technical Assistants
 - c) Field Staff
2. National Research Administrators
3. National Research Leaders
4. Extension Administrators
5. Extension Agents
6. Cooperating Programmes
 - a) National Programmes
 - b) International Programmes
7. Farmers
 - a) Project Farmers
 - b) Non-Project Farmers.

With the exception of farmers (both participants and non-participants) who were interviewed with the aid of a semi-structured questionnaire (Annex 7) all the other individuals of interest in each country were interviewed informally. These interviews were complemented by field visits and observations. Information was also obtained from relevant documents obtained from both the SA-GRAD Headquarters and from the various institutions in the countries visited (Annexe 1).

In all cases, the data collection exercise centred around the stated objectives of the ACPO programme, the activities instituted in each of the countries to achieve the objectives, and the results so far achieved in the implementation of these activities. In this regard, the various interviews conducted by the team were guided by the following checklist of goals and activities designed to accomplish the goals.

Goal (1) The conduct of field trials and studies on farmers' fields to test the adaptability, deficiencies and potentials of various recommended varieties and practices.

Activities to Accomplish Goal

- a) Regional on-farm trials of materials from international research centres.
- b) Regional on-farm trials of materials from national research centres.
- c) Liaison between and integration with national and regional level research programmes and activities.
- d) Liaison between and integration with international research programmes and activities.
- e) Integration of national and international research activities.

Goal (2) Coordinate with national research and extension/development agencies in arranging for broader national testing and demonstration of those varieties and cultural practices that appear technologically superior and otherwise suitable.

Activities to Accomplish Goal

- a) Strengthening linkages between national research and extension/development organizations.
- b) Encourage broader national testing and demonstration of promising improved technologies.
- c) Respond in a flexible manner to the unique opportunities, priorities and constraints, found in the research and/or extension/development system in the country of ACPO operation.
- d) Provide an effective and lasting bridge between on-farm research and on-station research activities both at International and National levels.
- e) Provide an effective feedback system for farmer reactions to the technologies on offer to researchers on-station, at both the national and international research centres.
- f) Institutionalize an effective decision making structure and an effective planning mechanism for the allocation of resources to the various aspects of the project.
- g) Timely and regular production of useful reports.

Goal (3) Provide a linkage to crop research and development programmes elsewhere in the region to enable the participating country to benefit from and contribute to regional progress.

Activities to Accomplish Goal

- a) Exchange of research materials and results among and between ACPO programmes in the region.
- b) Exchange of ideas and experiences arising from efforts at institutionalizing the ACPO concept in each country.
- c) Holding of regular meetings on problems of common interest to each country.

The team attempted to assess the overall impact of the ACPO programme in each of the countries in which it operates. This was not a very easy exercise as it was immediately apparent that in each country, the ACPO programme represented only one of several factors contributing to any perceived agricultural development and the overall impact of the programme itself depended on the effective functioning of other components of the agricultural development process in motion in the country. This difficulty notwithstanding, an attempt was made in the various interviews with research and extension officers, but most importantly, with the aid of a set of questionnaires administered to farmers in the field, to assess both the tangible and intangible contributions to the development of agriculture in each country that can be attributed to the ACPO programme.

1.5. ACKNOWLEDGEMENTS

The team would like to express much thanks and appreciation to all the agricultural administrators, and research and extension authorities in Burkina Faso, Cameroon, Mali, and Togo who provided so generously of their time to meet and discuss with the members of the team, often at very short notice. Gratitude is also expressed to all the Accelerated Crop Production Officers and their counterparts and assistants in each of the four countries for their high level of cooperation and sense of responsibility in preparing the detailed arrangements for the team's visit in each country. Their cheerful companionships during the long visits to farmers' homes in remote villages sometimes lasting well into the night, is gratefully appreciated.

Our warm gratitude and appreciation also goes to all the farmers of all the villages we visited for their warm reception and cooperation in responding to our various questions. We are sincerely appreciative of their patience and warm reception despite the fact that we were intruding strangers.

We would also like to extend thanks and appreciation to Dr. Kimsey Sawudogo for assistance in administering our questionnaire to farmers in burkina Faso, providing translations to portions of the preliminary draft of this report, and for helping with the processing and analysis of the data from the questionnaire.

We are also grateful to Madame Fanta Nayété for painstakingly typing the draft and final version of this report and to Mrs Mary Ann Briggs for editorial assistance.

Without the assistance of all of these people, this report would not have been possible.

CHAPTER II. THE NATIONAL ACPO PROJECTS

2.1. INTRODUCTION

The advent of the serious food and economic crisis that gripped the African continent from around the early 1970's and the apparent inability of traditional agricultural research methods to bring about an effective solution to the problem, gave birth to what has now come to be known as Farming Systems Research (FSR). Since then, FSR has acquired recognition as possessing considerable potential for bringing about the desired increases in food and agricultural production in the African continent.

The distinguishing feature of the FSR philosophy and methodology is that it places the emphasis in the design and dissemination of improved agricultural technologies on the farmers' reaction to them and on the feedback of this reaction to researchers at the research station. A multi-disciplinary team of researchers work together to identify farmers' constraints so that new technologies and research results from the research stations can be adapted more closely to farmers' conditions and needs. Simultaneously, farmers' reactions to the improved technologies on offer and their priorities are fed back to researchers at the research station. As a result, the research activities of the national programmes become more closely aligned to the needs of the farmers and the conditions under which they operate.

However, the dividing line between where FSR activities end and extension activities begin has often been both thin and grey. To confront the problem, in many African countries the research and extension systems are often under different control and emphasize different goals. Quite often, researchers at the research centre feel that their work ends once an improved technology has been designed and that its adoption is entirely the business of the extension system while the extension people wait for new research results to be delivered at their door steps. The result is that the gap between the creation of new research results and their adoption by farmers continues to widen. The ACPO programme was, therefore, SAFGRAD's contribution towards closing this gap by providing a bridge in the form of Accelerated Crop Production Officers.

In the rest of this chapter, we describe the operation of the ACPO

programme in the four countries, Burkina Faso, Cameroon, Mali and Togo, highlighting their strengths and weaknesses.

2.1. BURKINA FASO

2.2.1. Historical Background

The ACPO project was initiated in Burkina Faso in 1979 following the arrival of an expatriate Accelerated Crop Production Officer. In 1981, a Burkinabè agronomist was assigned to the programme as counterpart. When the expatriate left in 1982, the counterpart took charge of the programme. The objectives of the programme were defined in an agreement signed between the OAU's Scientific, Technical and Research Commission (OAU/STRC) and the government of the then Republic of Upper Volta in 1982. The objectives of the agreement were similar to those of the other SAFGRAD ACPO projects, i.e the development of improved varieties of millet, sorghum, maize, cowpeas and peanuts, and of improved cultural practices adapted to farmers' conditions in order to increase adoption rates.

2.2.2. Organization and Management

Article 2 of the agreement between the government and OAU/STRC stipulates that the ACPO should work under the aegis of the national extension service, which is under the Ministry of Agriculture, and should have regular contact with IVRAZ (now INERA). The ACPO was also expected to have permanent contact with the Coordination Office of OAU/STRC and the USAID Liaison Officer in Ouagadougou. Due to changes in Burkinabè structures, the ACPO is now under the aegis of the Plant Production service of the Directorate of Agriculture for administrative matters. The ACPO has no organic linkages with the extension service of the Ministry of Agriculture nor with INERA which is under a different Ministry, although he is based at the Kamboinse agricultural research station.

The project has presently, five team members:

- an Agronomist (ACPO)
- a Technical Assitant
- a Recorder
- a Driver
- a Clerical Office

It should, however, be noted that until 1984, the team comprised only the Agronomist ACPO and his Driver.

The programme currently operates with one servicable 4-wheeled drive vehicle. All aspects of the project with the exception of the salaries of the ACPO and his Technical Assistant are supported from funds provided to SAFGRAD by USAID for the purpose. The annual operating budget of the programme runs at around 5 million francs CFA per annum. On average, the programme has, however, only utilized about 75% of this amount each year during the last few years.

For transportation and other logistic support, the ACPO depends on the Coordination Office which manages the material and financial resources of the program. The ACPO works closely with the SAFGRAD/ICRISAT and SAFGRAD/TITA teams. However contacts between the ACPO and the FSR program of INERA are mostly on an informal basis.

2.2.3. Method of Work

The activities of the programme are normally formulated following meetings between the ACPO and the different researchers at the research station. In the past these meetings took place under the auspices of the national Research Committee. Ideas about promising research results emerging out of these meetings are then carried on to farmers' fields for testing.

In the field, the ACPO works closely with the erstwhile ORD structures at the sector, sub-sector and village levels. At the start of the agricultural season, the ACPO contacts the Heads of the ORD Research and Development units as well as the extension agents to choose the test sites and participating farmers. The ACPO then supplies the inputs (improved seeds, fertilizers) and the protocol. The extension agent is responsible for supervising the implantation of the tests and for monitoring the field operations being carried out by the farmer. The farmer supplies seeds for the local varieties and retains the harvest from the trial plots.

During the agricultural season, the ACPO visits (sometimes with other scientists) the test sites to find out how farmers react to the themes that are being tested. Generally more than one tests are sited in a given village.

The extension agent thus often has several tests to monitor in one or more villages. Quite often he uses his own means of transportation. All varietal tests have the same layout comparing local and improved varieties with and without fertilizers.

The following activities were carried out in the programme between 1982 and 1986:

- 1) Tests on Tied ridges: These tests were conducted over 3 consecutive years:

1981 : 3 sites - 9 farmers.

1982 : 1 site - 6 farmers, 2 soil types.

1983 : 1 site - 6 farmers, 2 soil types.

In general, tied ridging had a positive effect over simple ploughing or hand-hoeing. The technique increases soil water retention and allows plants to mature properly. The greatest constraint, however, was the labour time required to do the tied ridging.

- 2) Tests on improved sorghum varieties: The tests were conducted over several years: The first compared local varieties with the E35-1 and the SPV35 varieties. Later the Framida variety, ICSV1002 was compared with the local varieties and the E35-1. Under the test conditions the differences between the local and improved varieties were not significant.

- 3) Tests on Millet: The tests were conducted with IRAT-P172 and P173 which are already used in Burkina Faso, and starting in 1986 with ICRISAT's IKMP8201, IKMP2 and IKMP5. A number of problems were apparent in the trials including the fact that the new varieties were less palatable than the local ones while their earliness also posed some problems. The pollen of the IKMP's, for example, were often washed away by rains.

- 4) Tests on Maize: The tests compared local varieties to the Maka, Safita 2, Safita 104 and CSP varieties. No significant differences were observed between the improved and local varieties.

- 5) Tests on Cowpeas: The tests were conducted on the KN-1, Gorom, TVX5236 varieties. The observed yields were very low due to their vulnerability

to parasites. No significant differences were observed between the yields of these varieties and those of the local varieties.

6. Tests on Groundnuts: The tests were conducted on the TS-32-1 and TE3 varieties. While no significant differences were observed between the yields of the local varieties and those of the improved varieties. It is, however, not very clear whether the farmers' check local variety is indeed a local variety or an improved one which he has come to prefer.

2.2.4. Strengths and Weaknesses of the Program

Strengths

- 1) The ACPO has some administrative and financial autonomy which allow him to work effectively.
- 2) There appears to be sufficient material and financial resources to carry out all planned activities.
- 3) The ACPO has easy access to strong agricultural research structures (at both the national and regional levels) which potentially can make available technological packages that may be advantageously applied at the farm level.
- 4) There has been some useful division of labour, in that, other research units are responsible for conducting specific tests, while the ACPO concentrates only on themes that may have a real impact on farm productivity.
- 5) The ACPO has played a useful role as a link between research and extension by using research station results as a basis for his farm trials under farmers conditions.
- 6) The ACPO has been able to acquire the trust and respect of the ORDs as well as the farmers, which in turn has improved his effectiveness at the field level.

The Weaknesses

- 1) The administrative location of the ACPO in the national research and extension systems in the country is very ambiguous. Neither the research nor the extension structures feel directly responsible for his programme. Although the programme was originally under the Directorate of Agriculture, its high dependence on the SAFGRAD Coordination Office makes its management difficult.

- 2) The programme could do with a little more staffing in terms of number and, to a lesser extent, quality of staff.
- 3) On the technical side, the ACPO has no institutional support. This may have resulted because of his rather ambiguous administrative position.
- 4) The rather small operating budget, limited staffing, and restricted transportation means, prevent adequate coverage of the mandated target area of the programme and has worked against the expansion of the programme.
- 5) The limited resources at the disposal of the ORD's does not permit them to take effective advantage of the technology transfer potentials of the ACPO programme.
- 6) Because of the conditions under which they operate, the success of the tests have often depended too heavily on the individual dynamism of the extension agent, the material resources at his disposal, and the distance of his base from the test sites, all of which factors are not under the direct control of the ACPO.
- 7) The ACPO has not succeeded in establishing the confidence and respect of the national and international researchers.

2.3. THE CAMEROON PROGRAMME

2.3.1. Historical Background

The USAID funded SAFGRAD ACPO Programme in Cameroon started in 1979 following the arrival of an expatriate ACPO and the appointment of his Cameroonian counterpart. Both started working at the Maroua Agricultural Research Station at a time when the station lacked trained and experienced staff in the various disciplines. As a result, the ACPO programme was given responsibility for conducting both on-station and on-farm trials.

With the arrival of trained researches to work on cowpeas (entomologist) and sorghum, maize, and groundnuts (breeders and agronomists) the programme was reoriented towards the conduct of pre-extension trials on farmers' fields.

As at the end of 1985, the programme covered five regions within the SODECOTON zone. USAID funding for the project ended in September 1986. The ACPO programme was however, incorporated into the Cameroonian National

Cereal Research and Extension Project (NCRE) and its name changed to Testing and Liaison Unit (TLU).

2.3.2. Organization and Management

The major objective of the TLU in Cameroon is to increase food production in the Northern part of the country through the adoption and utilization of agricultural research results. The unit intends to alleviate the difficulties that are often associated with having research and extension activities under the control of two different ministries. The role of the TLU is therefore to create the necessary liaison between research and extension in Northern Cameroon by:

- 1) Developing , by means of tests on farmers' fields, new extension themes which would increase the yields of the principal crops.
- 2) Providing quantitative feedback to researchers in the research station.
- 3) Developing methodologies for pre-extension tests of agricultural research results.
- 4) Training extension agents.
- 5) Demonstrating new techniques to farmers.

The ACPO team comprises the following:

- One ACPO (Expatriate Agronomist)
- One Cameroonian Counterpart provided and funded by the Institute of Agricultural Research (IRA)
- Three Technicians (2 from IRA and one from SODECOTON)
- Two drivers (1 USAID and one IRA).

The project has three servicable vehicle, a mini computer and adequate supplies of the necessary materials to conduct its field work. The operating annual budget of the project is about 45 million CFA francs out of which USAID contributes 40 million francs CFA while the Cameroon Government contributes five million francs CFA.

There exist a SAFGRAD supported Farming Systems Research project only a short distance away in Garoua but the TLU appears to be working separately from this unit.

The TLU is directly responsible to the Institute of Agricultural Research

(IRA) and is based at the Maroua Station. The expatriate ACPO is fully responsible for the day to day management of the Unit. In this regard, he also manages the funds of the unit in collaboration with the USAID mission in the country. Support funds from the Cameroonian Government are managed within the financial control system of the research centre at Maroua.

The resource level and allocation decisions are made by the ACPO. It was not clear to what extent, the IRA influences these decisions. However, it was obvious that all of the pragmatic decisions about the ACPO programme were made by the ACPO.

For whatever reason, the Cameroonian Counterpart to the ACPO has very little or no involvement, not to talk of influence, in the decision making and planning aspects of the ACPO programme. This has serious implications for the future viability of the project in the country.

2.3.3. The Method of Work

Most of the experiments of the unit are well planned and executed and they normally benefit from careful advance preparation. As a result, the unit has established a good reputation of conducting successful trials. The number of tests carried out during the last four years are as follows:

1987	-	85 Trials
1986	-	180 Trials
1985	-	300 Trials
1984	-	150 Trials

The trials follow a rigid time table each year as follows:

- In January, research results from the previous year's work as well as proposals for the coming season are discussed at a SODECOTON meeting at which both researchers and extension agents participate. The final programme is agreed upon at the end of the discussions and this provides for the number of tests to be conducted, depending on IRA and USAID budget allocations.
- In April-May the test packages are distributed to the SODECOTON officials in the various sectors. Within each sector, the best extension agents are

chosen to be in charge of the trials. During this period the researchers also discuss and explain the protocols of the trials to the extension agents.

- In May-June, the farmers who would participate in the trials are identified and selected by the extension agents. Quite often the extension agents select from among their best and most cooperating farmers. The farmers often start preliminary farming activities on their trial plots around this period as well.
- In June-July, the ACPO team visits each farmer. Observations are made on the activities in test sites, i.e, soil preparation, seeding density, etc. A second visit takes place in July-September, when the rest of the observations are made.

The division of responsibilities between the participating farmers, the extension agents and the researchers are as follows:

- IRA/ACPO are responsible for the administrative and financial aspects of the trials. They supply the scientific staff and the material resources necessary to implement the trials.
- SODECOTON supplies the extension agents who are responsible for implementing and monitoring the trials.
- The farmers supply the relevant local variety seeds and carry out all field work on the plots. The harvested crops are, however, handed over to them at the end of the season.

2.2.4 Strengths and Weaknesses of the Programme

The programme has a number of strengths and weaknesses. These are discussed below.

Strengths

- (1) The Cameroon ACPO System Operates within dynamic and well structured research and extension systems. Not only do the systems operate on clear and mutually reinforcing orientations, they also possess the material and financial resources to successfully pursue these orientations.

- (2) The programme has achieved a certain amount of dynamism which is based on the fact that it operates within a single region in which only one extension system operates, i.e that of SODECOTON, which has a long experience in cotton production, a crop which has traditionally served as an engine of modernization in most French speaking countries of West Africa.
- (3) The Government has accepted the ACPO concept to the extent that it has now been entrenched within the research and extension system not only of the extreme Northern region of the country but of the other regions as well. This has bestowed on the ACPO programme of the country, considerable respect and recognition among researchers, extension people, and agricultural administrators alike.
- (4) The programme holds regular annual meetings between research and extension people and this has permitted it to keep abreast with the real constraints facing farmers in the zone and to take these constraints into account when formulating its annual programme for on-farm trials.
- (5) Because the ACPO programme operates within a larger national programme covering all cereal production in the country, the national programme has provided it with a capacity to respond to the extension needs coming out of the field.
- (6) The existence of a strong and seasoned extension system such as that operated by SODECOTON, guarantees the possibility of diffusing in a widespread manner, any research and/or extension themes which may show promise.
- (7) The ACPO has been able to successfully serve as an effective linkage between research and extension by training extension agents, by successfully testing new technologies on farmers fields, and providing some feedback of farmers reactions to the research centre.
- (8) The ACPO has a strong and dynamic personality and enjoys the confidence of the Cameroonian authorities and donors with regard to the financial management of the project.

Weaknesses

- (1) The Cameroonian ACPO system depends too heavily on one individual, the ACPO. Even though there exists a Cameroonian counterpart of the ACPO with a reasonably high level of qualification and professional experience, this individual does not appear to be playing an active role in the ACPO activities in the country. On the other hand, the expatriate ACPO, appears to be more loyal and responsible to the donor for the administrative and financial management of the project with very little or no effective delegation of authority. This aspect of the project would certainly pose a very serious problem of continuity following the eventual departure of the expatriate ACPO.
- (2) The physical and conceptual separation of the ACPO programme based in Maroua and the FSR programme based in Garoua has not permitted the exploitation of the complimentary aspects of both programmes which by and large have the same objectives in the region.
- (3) Originally, participating farmers in the ACPO were paid a fee of 3000 francs CFA for participating in the trials. Although this practice has now been stopped, it has however left a psychological legacy with lingering effects, as a number of both current and past participating farmers continue to expect to be paid for participating in the trials. This has tended to negate the catalytic role of the ACPO in creating new and permanent thought patterns among the farmers with regard to the interactive process of agricultural technology transfer.

2.4. MALI

2.1, Historical Background

One of the identified weaknesses of the Agricultural Research System in Mali was the lack of linkages between research and extension. To bridge this gap, the Malian authorities have assigned the principal responsibility over pre-extension trials to the ACPO programme in Mali. The role of the ACPO was defined by Article 2 of the Agreement signed in October 1977 between the Government of Mali and the OAU/STRC.

This article defined the crops to be emphasized in the ACPO programme which included sorghum, millet, maize and leguminous grain crop of cowpeas

and peanuts. Consequently, the project was placed under the Section dealing with Research on foodcrops and oilseeds, with the specific responsibility to pretest the findings of research station results at the farmers' level. This consists of on-farm testing of the most promising results of research stations (both at the national and international levels) before extension by the Rural Development Operation (ORD).

2.4.2. Organization and Management

Administratively, the ACPO programme in Mali is based at the SRCVO Research Station in Sotuba, which itself is under the Division of Agronomic Research (DRA) of the Institute of Rural Economy (IER).

From its inception in 1978 and until September 1982, the ACPO was an expatriate. In September 1982, a U.S. trained national scientist was nominated to serve as the ACPO. The team is currently entirely made up of nationals. Its composition is now as follows:

- 1 ACPO, Agronomist (MSc Degree)
- 3 ACPO Assistants (all Agronomists, one with an MSc degree and the other two with B. Sc degrees)
- 2 Technical Assistants
- 1 Accountant
- 1 Secretary
- 3 Drivers
- 1 Storekeeper
- 1 Cleaner.

The team operates with 3 vehicles although only two of them were serviceable when the team visited Mali. The programme currently operates on an annual budget of about 35 million francs CFA although the ACPO felt that a more reasonable operating annual budget should be around 50 million francs CFA.

The ACPO programme in Mali is completely autonomous with regard to resource management matters. Most of the pragmatic decisions influencing the activities of the programme are made by the ACPO and his team even though the activities of the programme were well integrated into the national research and extension systems.

The management style is quite flexible and capable of responding speedily to programme situations. This style was, however, sharply in contrast to the traditional relatively inflexible one in place in the SRCVO in which the ACPO programme is housed.

The programme depends on the USAID mission for a significant amount of the management and control of its financial resources. Funds for the project are remitted periodically to the ACPO by the mission. The ACPO and his accountant, in turn, submit monthly financial reports to the mission for auditing and control purposes. The accountant of the SCU in Ouagadougou also performs periodic financial auditing of the activities of the programme.

There exists an elaborate and well funded FSR programme in the country. Although members from this programme and the ACPO team cooperate on an informal basis there is no formal collaboration of linkages between the two programmes.

2.4.3. Methodology of Work

Each year, the ACPO team informs the Heads of the Various Extension Operations in the country about the latest research findings that are available and that may be relevant for the zones in which the Operations operate. A schedule based on the needs of each of the Operations is then put together. A work protocol is also prepared and given to the extension officials who would be responsible for initiating and implementing the trials. The actual execution of the trials then begins.

Based on the extension themes to be tested, the Head of the Operations identify the zones in which the trials would be located and appoint the extension agents who would be in charge of them. Each extension agent then chooses the test farmers, and together, they decide on the test sites. In principle, each farmer chosen must have animal traction equipment.

The collaboration between the ACPO researchers, the extension People, and farmers, requires the following division of responsibilities:

- 1) Through the ACPO team, the research side supplies all the necessary inputs (fertilizers, improved seeds, pesticides, etc.). It also organizes monitoring visits, carries out the analysis of the results, and prepares the report which is submitted to the meetings of the Specialized Technical Commission of SRCVO and the National Committee for Agronomic Research.
- 2) The farmer supplies seeds of the local varieties and executes the field work under the guidance of the extension agent. All of the harvested crop are kept by him.
- 3) Through its agents, the extension system ensures that the trials are properly located and monitored and that the protocols are followed. Moreover, it appoints a coordinator at the pre-extension level, who supervises all tests within the mandate of the Rural Development Operation (ORD).

It should however, be emphasized that within each ORD the tests are under the responsibility of one agent. The agents do not receive any remuneration or compensation of any nature for participating in the trials.

Since 1978 the ACPO programme has conducted an average of about 250 trials per year and the range of the number of trials has varied from 100 to 350 trials per year. The trials cover all the ODR's and have involved the following:

- 1) Varietal Tests on Sorghum. These tests were conducted in several series from 1978 to 1986 mainly in the following ODRs: ODIK, OMM, OAW, OHV, and CMDT. The earlier tests compared the performance of improved sorghum varieties and local varieties. From a global point of view, it was observed that the new varieties did not outperform the local ones. In fact, in a large number of cases the improved varieties were inferior to the local varieties. Consequently, the sorghum programme in Mali has now been reoriented towards the development and testing of improvements involving the local sorghum varieties.
- 2) Tests on the National Phosphates of Tilemsi. Starting in 1979 and for 3 consecutive agricultural seasons, a series of tests were carried out on natural phosphates in order to determine their effects on the yields of cereals and legumes, principally in the OMM, OHV and ODIPAC zones.

The results have generally suggested a positive response to the natural phosphates in these three ODRs, both on agronomic and economic grounds.

- 3) Varietal Tests on Maize. The objective of these tests was to compare hybrids or improved maize varieties with improved or local varieties that had already been adopted by farmers. Because of the difficulties in producing the hybrid seeds, however, the tests were discontinued, although the results with IRAT Z81 were quite promising. From 1980 to 1985, many other maize varieties were tested. These included intermediate cycle varieties (100-110 days) such as; Accross 78-44 and Golden Cristal, TZE4Tux peno, SAFITA 2, etc. The test zones were ODIPAC, OHV, CMDT and the DRA.
- 4) Other tests The ACPO programme in Mali has also conducted other tests involving maize/cowpea relay cropping and crop mixtures of maize and millet. The results of these trials showed good potential.

2.4.4. Strengths and Weaknesses of the Programme

Strengths

The strengths of the ACPO programme in Mali include the following:

- 1) The system rests on well organized structures, both at the research and extension levels both of which are under the control of the same Ministry. This has made the establishment of the necessary linkages easier.
- 2) The yearly meetings of the specialized technical commissions and of the National Committee for Agronomic Research provides the ACPO programme with promising results from the research stations, as well as with useful information about the constraints faced by farmers and extension officers in the field. The ACPO is thus often placed in a good position to design a meaningful and relevant work programme.
- 3) The ACPO programme has been able to have access to a large amount of technical themes coming out of many years of research at both the national and international levels. This has permitted it to address, in a meaningful manner, the farming difficulties associated with uncertain rainfall and to experiment with shorter cycle materials as requested by farmers.

- 4) The Malian ACPO system is made up of a team of well trained individuals led by an experienced person who has acquired trust from both his colleagues and superiors at the research centres and the extension officers. The existence of a team with a fairly well defined division of labour has bestowed the system with a certain amount of permanence.
- 5) The Malian ACPO programme has the total support of the extension agents. Most ODRs where test sites are located have appointed adequately educated representatives into a parallel and complementary set up to that of the ACPO system. These representatives supervise the field work of the extension agents and have acquired considerable experience with regard to the design, implementation, and monitoring of trials.
- 6) The system has a certain autonomy which allows it to respond speedily to administrative and technical problems. The programme also has access to means necessary for effective work execution.

Weaknesses

The weaknesses of the system are as follows:

- 1) Except for the salaries of the four agronomists and the two technical assistants in the team, the whole ACPO system depends on external sources for its funds. This raises serious problems with regard to continuation and viability of the project when the support is no longer forthcoming.
- 2) The financial control system of the project is carried out largely out of the USAID mission in Mali, thus preventing the development of a similarly effective management and control apparatus within the national system.
- 3) Concentrating the team at Sotuba while there are vast zones to be covered may have compromised the effectiveness of the programme. This situation is compounded by the limited transportation means available to the team to cover all zones in a country as vast as Mali.
- 4) Separating the ACPO programme from the elaborate and well funded Farming Systems Research Programme in the country has limited the benefits that could have resulted from the complementary nature of the two projects.

- 5) Given the vast nature of the country and the large number of zones to be covered, there would appear to be a shortage of both material and financial resources necessary to meet the demands of the various zones. In this regard, the ACPO may be over stretching its resources, and thus compromising its effectiveness.

2.5. TOGO

2.5.1. Historical Background

The SAFGRAD ACPO Project started in Togo in 1978, following an agreement signed on May 23, 1977 between the Togolese government and USAID. The objective of the project was to conduct regional trials using materials from national, regional or international research centres in order to identify:

- known or adaptable cereal varieties (sorghum - millet - maize);
- legume varieties (groundnuts and cowpeas) ; and
- cultural practices compatible with existing conditions in the farming systems in the areas of interest.

The government of Togo received a grant of US \$70,000.00 to pay for the salaries of the support staff, compensation for the technical staff provided by the government, and for the organization and participation of the project staff in regional conferences. The project was managed by a Togolese counterpart based in IRAT. After two years of operation, and apparently without much success, the USAID stopped funding the project, which was then passed on to the government under the supervision of the Directorate of Agronomic Research (DRA).

In December 1980, a new agreement to restart the programme was signed between the government and OAU/STRC, with FAC funding. The OAU/STRC was to provide Togo with an ACPO who will be based in Lamakara to work on foodcrops. The ACPO was placed under the responsibility of the Director of Agronomic Research, and had contacts with the other regional and International research centers.

The new agreement also provided for the payment of the salaries of the support staff, compensations to the Togolese technical staff and current expenses.

2.5.2. Organization and Management

The Organization and the role of the ACPO in Togo are as complex as those of Togo's agronomic research. The SAFGRAD/ACPO project is under the Directorate of Agronomic Research (DRA) which is based in Lome but works in the Northern part of the country.

The ACPO activities are located in the Kara and Savanna regions of the country. Although the headquarters of the programme is in Kara, ACPO research activities are carried out in 3 different research stations as well as on farmers' fields. The ACPO team includes:

Kara Region

Kara

- 1 Expatriate ACPO (Agronomist)
- 1 Counterpart, ACPO (Agronomist)
- 2 Technical Assistants, (1 paid by SAFGRAD and the other paid by the Togolese Government)
- 2 Drivers
- 1 Cleaner
- 1 Night Guard.

Broukou Station

- 1 Head of Station (agricultural technician)
- 1 Team Leader for maize-cowpeas trials
- 1 Team Leader for sorghum trials
- 1 Team Leader for on-farm trials
- 1 Night Guard.

Abetou Station

- 1 Head of Station (agricultural technician)
- 1 Team Leader for all trials
- Enumerators.

Savanna Region

Tantiegon Station

- 1 Head of Station
- 1 Team Leader for Station trials
- 1 Team Leader for on-farm tests

The ACPO programme : has 2 vehicles and 1 motorcycle in Kara, 1 motorcycle and 1 mobylette at the Broukou station, 1 motorcycle and 3 bicycles at the Abetou station, 1 motorcycle and 1 mobylette at the Tantiegon station.

Ten out of the total staff of 15 are paid by the project, and the remainder by the Togolese government.

Almost all the resource level and allocation decisions are made by the expatriate ACPO although his Togolese counterpart is instrumental in carrying out all planned activities in the field. The ACPO has overall control for the allocation of funds to different aspects of the programme. The financial management and control of project funds appear to be more influenced by the administrative mechanisms of the FAC office in Lome than by the SAFGRAD office in Ouagadougou.

2.5.3. The activities of the programme

The activities of the ACPO programme are carried out in two zones, (Kara and Savanna) and involves two aspects (one regional and one international). The regional aspect concerns varietal tests on maize, millet and cowpeas and is carried out by SAFGRAD as follows:

(1) Maize

Thirty intermediate cycle varieties, and 47 early varieties have been tested since 1980. For the Kara region, two promising varieties were found; an intermediate cycle variety (TZP3) and an early variety (TZESR.W). These varieties have been tested under farmer conditions since 1985.

(2) Cowpeas

From 1980 to 1984, more than 65 intermediate and short cycle varieties were tested. TVX3236 out-performed all others based on yield. Unfortunately the colour of the grains has often been given as a factor preventing wider adoption.

(3) Sorghum

Between 1980 and 1984, 59 SAFGRAD varieties were tested. All varieties had very short cycle. Not much promising results have been obtained so far.

(4) Crop-Mixtures

Work on crop mixtures have not yielded any significant results.

The international aspect of the ACPO programme, on the other hand involves both controlled experiments as well as experiments on farmers' fields. The controlled experiments involve on-station tests of promising varieties of Sorghum and Cowpea from SAFGRAD's collaborative research programmes as well as from other sources. These experiments also have to do with trials involving cultural practices such as the benefits of soil preparation and crop associations.

The on-farm testing of the experiments are concerned with trying out promising materials at the research station level on farmers' fields. In 1984, 60 tests on sorghum, maize and cowpea were carried out. The tests on Framida varieties in Kara region have produced conclusive results confirming earlier finding of resistance against striga. The several tests on maize have also isolated promising stress resistant varieties.

In all, about 36 farmers in the Savanna region and 72 farmers in the Kara region participated in the ACPO trials in 1986.

2.5.4. Strengths and Weaknesses of the ProgrammeStrengths

- 1) The existence of the ACPO programme in Northern Togo has largely contributed in filling the vacuum created by the absence of an operational research set-up in that part of the country. It has consequently filled a wide gap in the technology generation and diffusion of food grains in that part of the country.

- 2) The Programme has contributed towards the establishment of a working relationship between the national agricultural research system and the extension system. In fact, it is the only framework for technical exchange between research and development in that part of the country.
- 3) The Programme has branches in several locations and is serving as liaison between the development and extension structures.
- 4) In comparison with other research activities, the programme is endowed with adequate material and financial resources for conducting on-farm trials.
- 5) The working methodology being used appears to be well integrated within the new rural development strategy currently being implemented in Togo. In this respect, the government has been seeking funds so as to strengthen the ACPO programme in the Kara and Savanna regions.

Weaknesses

- 1) By the force of circumstances the Togo ACPO programme has taken on the semblance of a fully fledged research centre. The willingness to fill the institutional research gap in the Northern Part of the country has led the programme to dissipate its efforts too thinly particularly in carrying out activities in controlled environments, which thus prevents it from concentrating its efforts on pre-extension trials which is its primary function.
- 2) Due to the low capacity of the national agricultural research system, promising agricultural research results which may be proposed and used for extension themes are not readily available to the ACPO programme.
- 3) The financial hardships faced by the extension structures, except SOTOGO, would not enable them to disseminate in a wide spread manner the technical innovations which have been proven to have some potential by the ACPO programme. For instance, trials have shown that the striga resistant variety FRAMIDA has good potential. Yet no seed multiplication policy has been considered in order to release this variety in the heavily striga infested areas.

- 4) There are often conflicting interests between the ACPO and the agricultural authorities, stemming from lack of consultation and coordination between the ACPO programme and the officials at DRA.
- 5) Administratively and financially, the ACPO programme appears to be too strongly tied to its funding agency, namely FAC, which not only causes resentment among the national researchers and administrators but also, and perhaps more importantly, raises the possibilities of problems of the management and viability of the programme by Togolese nationals in the future.
- 6) The absence of a viable research programme strategy on the Northern areas of the country, that takes both socio-economic and agronomic issues (i.e FSR) into account, hampers the smooth running of the programme.

III. THE IMPACT OF THE ACPO PROGRAMME

3.1. Introduction

Theoretically, the transmission of research results to farmers is a straight forward affair. Collate the most relevant results for a particular area of a country, carry these research results to the farmers who try them out on small portions of their fields, and if they like them, adopt them on ever increasing portions of their fields. It is estimated that a successful technology would take about four to six years for a majority of farmers in an area to adopt it on the majority of their plots.

The practical question, however, is how does one measure the impact of a programme such as ACPO which is only one of several inputs contributing to the widespread adoption of research results, which itself is highly dependent on the effective functioning of other components for its own success. For example, a new variety can be demonstrated to yield 10 times as much as its traditional counterpart. It would, however, be of little usefulness to the resource constrained farmers of most African countries if the fertilizers and pesticides needed to grow it are either not available, or too expensive and if there is no credit to buy these inputs. Even if the recommended inputs were available and the farmers are convinced by the ACPO programme to use them, the farmers may still be unwilling to adopt the new variety if the existing marketing arrangements are counter productive or if adoption does not make economic sense. Furthermore, African farmers have a long history of fierce resistance to non-profitable technologies just as their record of adopting new techniques whose output and profits more than off-set the additional input costs required to produce them, is very good.

It would therefore be inappropriate to attempt to measure the impact of the ACPO programme solely on the basis of whether or not it has resulted in the adoption by farmers of new research results. A more useful way of measuring the impact of the programme would be to identify the major accomplishments of research results in the zones in which the ACPO programmes are operating and determine the extent to which these accomplishments, can be attributed to the programme.

Given the nature of these accomplishments, their impact would need to be determined by ascertaining the views and perceptions of a wide variety of

relevant people including researchers, extension people, government officials, and the intended beneficiaries, i.e the farmers (both those participating and those not participating) in the programme. In the rest of this section we present an assessment of the impact of the ACPO programme in various areas as requested by the Terms of Reference of the Study.

3.2. Methodology

A checklist of questions was drawn up which served as the basis of the several interviews designed to get the perceptions and views of key people in research, extension, and administration. After each interview, which quite often was not limited to the checklist of questions, the team met to identify the emerging key issues, agree on those for further follow-up, and draw conclusions from the interviews. These interviews were complemented by field visits and on the spot observations.

The farmers who are the intended beneficiaries of the programme were given special attention. A set of questionnaires was prepared and, other than in a few cases, administered personally by members of the Team. Soliciting information from farmers on issues dealing with the impact of an agricultural project could be a very sensitive exercise particularly if the information is being obtained in the presence of the extension agent and members of the ACPO team as was the case. It was therefore necessary to ask indirect and seemingly neutral questions which, nonetheless provided some indication of farmers' perception of the technology transfer process in motion in their zones. The opportunity was also used to ask a number of questions which might be useful in shaping the future directions of the technology transfer process in the different countries.

A total of 76 farmers were interviewed in all four countries out of which 28 were interviewed in Togo, 20 in Burkina Faso, 19 in Mali and 9 in Cameroon. Of the total, about half were farmers who were actively involved in the ACPO trials in their country while the other half were farmers chosen randomly from the surrounding villages. The ACPO programme farmers interviewed were, in most cases, chosen by the ACPO Team members. There was however no indication that these farmers were atypical.

3.3. Impact Assessment

3.3.1 The effectiveness of the ACPO concept in the Diffusion of Crop Production Technologies

The most logical way to gauge the effectiveness of the ACPO programme in the diffusion of crop production technologies in the various countries in which the programmes operate would be to determine the extent to which farmers in each country have adopted the improved technologies being transferred to them by the ACPO programme and the impact that this adoption has made, not only on the overall production of the crops involved but also on the incomes and wellbeing of the farmers.

The SAFGRAD mandated crops (Sorghum, Millet, Maize, Cowpeas and Groundnuts) are all of considerable importance in the four countries, both in terms of the quantities of each produced and the amounts of each consumed by the farming family, although the importance of the crops in this regard vary from country to country as can be seen in Table 1.

If one examines the overall trend in the area, yield, and production of these crops in the various countries since the inception of the ACPO programme (Annex 6), the conclusion would be that there has not been any significant increase in the yield and production of the crops over the last decade. However, as indicated in the introduction to this chapter, this impression could be misleading and needs to be interpreted with caution.

However, the fact that there may have been no significant increases in the overall production of the crops does not in itself preclude the possibility of pockets of increased yields and production in areas where the ACPO programmes are located. To ascertain whether or not this is the case would require a detailed comparison between the performance of the crop technologies that have been introduced by the ACPO programme and the traditional technologies which the farmers are accustomed to, and a determination of the extent to which the farmers have adopted the introduced technologies. This type of a study was clearly impossible given the time and resources available to the team. The team therefore had to rely on field observations and on the views of extension agents and the farmers themselves.

All the evidence gathered by the team in the four countries visited would appear to confirm the fear that most of the available improved

Table 1. Farmers' Most Important Production and Consumption Crops.

COUNTRY	PRODUCTION*					CONSUMPTION*				
	Maize	Sorghum	Millet	Cowpeas	Groundnuts	Maize	Sorghum	Millet	Cowpeas	Groundnuts
Burkina Faso	0	29	71	0	0	0	29	71	0	0
Cameroon	0	78	0	0	22	0	89	0	0	11
Mali**	0	58	47	0	16	0	47	53	0	0
Togo***	36	39	21	0	0	36	39	21	0	0
All Countries*	13	46	39	0	6	13	44	40	0	1

S U M M A R Y

Most Important Crop

<u>Country</u>	<u>Production</u>	<u>Consumption</u>
Burkina Faso	Millet	Millet
Cameroon	Sorghum	Sorghum
Mali	Sorghum	Millet
Togo	Sorghum	Sorghum
All Countries	Sorghum	Sorghum

* - Percentage of farmers ranking crop as most important.

** - Total exceeds 100 due to tied rankings.

*** - Total less than 100 due to missing data for 1 farmer.

technologies are not really superior to the traditional technologies that the farmers in the ACPO countries are accustomed to. However, the word superiority as used here needs further elaboration as it involves much more than whether the improved technologies on offer can yield more than their traditional counterparts. For the traditional subsistence farmers who produce the bulk of the agricultural commodities in their countries and are often on the edge of survival, improved technologies on offer must, also of necessity, be less risky.

The only detailed study that has been carried out to compare the performance of the ACPO trials under farmers' conditions with farmers' own traditional practices, was carried out in the OHV zone in Mali. The study concludes that farmers in the OHV zone of Mali have not adopted the varieties that have been introduced by the ACPO programme over the years (Table 2), and that in most cases, the average yields obtained by farmers on their fields for the various crops were inferior to the average yields of farmers in the OHV zone.

However, our own survey results do show that while not being able to quantify the magnitudes of the increases in yields achieved, farmers in the various countries were able to rate the various crops they grow with respect to the relative rate at which their yields have increased during the last 10 years (Table 3). The conclusion is therefore that, while the overall production and yield situation may have remained stagnant during the last 10 years, when measured in aggregate terms, the farmers did nonetheless perceive some differences in the relative performance of the different crops.

We have already alluded to the fact that the ACPO programmes' effectiveness in transferring research results to farmers can only be as good as the specific qualities of the technical knowledge that is available as well as the conduciveness of the socio-economic environment in which the farmers operate. The ACPO programme should not be expected to make any significant impact in the diffusion of improved crop technologies if these technologies are irrelevant to the farmers' constraints and needs. Nor will they be widely adopted if the inputs required for their adoption are either not available or too expensive.

But the farmers' perceptions as revealed in Table 3 show that there have been relative improvements in the yields of all the SAFGRAD crops with the exception of cowpeas. This must mean that at least some of the messages carried by the ACPO trials may have been adopted. If this is so, the question is, to what extent are farmers adopting the various categories of messages contained in the ACPO trials. To answer this question the messages in the trials have been divided into three principal groups, namely, the use of improved varieties, the use of improved cultural practices, and the use of fertilizers.

In Tables 4 to 7, we present farmers' views on the importance of each of these groups of messages and which of them may have contributed most to the yield increases farmers indicated they perceived for the different crops.

It is interesting to note how the importance of the factor that farmers perceive to be responsible for yield increases varies from crop to crop and from country to country. It is also interesting to note that while most trials that have been carried out at the research centres, and by implication, those that are being carried out on farmers' fields by the ACPO programmes, have placed a heavy emphasis on varieties many farmers in the ACPO countries considered the use of improved cultural practices and the use of fertilizer to be of more importance.

What this means is that although the adoption of improved varieties may not be apparent in farmers' fields the farmers may have adopted other aspects of the improved technologies such as planting dates, soil preparation, the use of manure, timely weeding, etc. These are all factors which are often not readily apparent, and hence, easily dismissed as being unimportant.

Several reasons are often given by researchers at the research station to explain why yields on farmers' fields are lower than those obtainable at the research station. The most relevant of these reasons for the ACPO trials which involve a relatively high level of researcher management, is the claim that the farmers often do not clearly understand the objectives of the trials on their fields and so fail to appreciate the fact that their current yields can approach those they obtained in their trial plots if only they adopt the

Table 2: Yields of SAFGRAD on-station and on-farm varietal trials compared to average yield of OHV farmers (Mali).

CROP	Yields (kg/ha)		OHV' FARMERS
	SAFGRAD	TRIALS	
	ON-STATION	ON-FARM	
1984			
Maize	3134	904	1110
Sorghum	1017	649	888*
Millet	831	663	888*
Groundnut	-	555	873
1985			
Maize		836	1225
Sorghum		650	943*
Millet		648	943*
Groundnut		656	924

* Figures represent average yields for both Sorghum and Millet.

Source: Kagbo, R.B., A Field Assessment of SAFGRAD and Seed Multiplication Programmes at OHV, Mali, USAID/OHV.
Bamako, Mali.

Table 3 : Crop with the greatest Increase in yield during the last 10 years

Country	Percentage of Farmers Indicating				
	Maize	Sorghum	Millet	Cowpeas	Groundnut
Burkina Faso	0	19	81	0	0
Cameroon	0	67	0	0	22
Mali	21	32	32	0	10
Togo	43	36	14	0	0
All countries	21	34	35	0	5

S U M M A R Y

Country

Burkina Faso

Cameroon

Mali

Togo

All countries

Crop

Millet

Sorghum

Sorghum/Millet

Maize

Millet

*Adds to less than 100 because of missing data.

Table 4 : Factors Responsible for Increase in Yield of
Maize

Country	Percentage of Farmers Indicating		
	Improved variety % of Farmers Indicating	Fertilizer use	Improved Cultural Practice
Burkina Faso	na*	na	na
Cameroon	na	na	na
Mali	75	25	0
Togo	8	50	50
All Countries	19	44	38

S U M M A R Y

<u>Country</u>	<u>Most Important Factor</u>
Burkina Faso	not applicable
Cameroon	not applicable
Mali	Variety
Togo	Fertilizer/Cultural Practice
All Countries	Fertilizer

*na means not applicable.

**Table 5 : Factors Responsible for Increase in Yield of
Sorghum**

Country	Percentage of Farmers Indicating		
	Improved variety	Fertilizer use	Improved Cultural Practice
Burkina Faso	25	25	50
Cameroon	17	50	17
Mali	67	0	33
Togo	10	80	20
All Countries	23	46	27

S U M M A R Y

Country

Burkina Faso

Cameroon

Mali

Togo

All Countries

Most Important Factor

Improved Cultural Practice

Fertilizer use

Improved Variety

Fertilizer

Fertilizer

**Table 6 : Factors Responsible for Increase in Yield of
Millet**

Country	Percentage of Farmers Indicating		
	Improved variety	Fertilizer use	Improved Cultural Practice
Burkina Faso	24	24	47
Cameroon	na *	na	na
Mali	33	33	33
Togo	0	100	0
All Countries	22	37	37

S U M M A R Y

Country

Burkina Faso

Cameroon

Mali

Togo

All Countries

Most Important Factor

Improved cultural Practice

not applicable

all three tied

Fertilizer use

Fertilizer/Cultural Practice

*na means not applicable

Table 7 : Factors Responsible for Increase in Yield of

Groundnut

Country	Percentage of Farmers Indicating		
	Improved variety	Fertilizer use	Improved Cultural Practice
Burkina Faso	na*	na*	na
Cameroon	50	0	50
Mali	0	50	50
Togo	0	0	0
All Countries	25	25	50

S U M M A R Y

Country

Burkina Faso

Cameroon

Mali

Togo

All Countries

Most Important Factor

not applicable

Variety/Cultural Practice

Fertilizer/Cultural Practice

Not applicable

Cultural Practice

*na means not applicable.

Table 8: Summary of Responses to the question :

"What are your expectation of the ACPO trials"

Type of answer	Frequency	Percent
1. To increase productivity	20	35.09
2. To acquire new varieties	11	19.30
3. To fertilize, improve degraded soils	4	7.02
4. To produce enough and use surplus for market	2	3.51
5. To solve the prob.of water	1	1.75
6. To learn new methods, practices	13	22.81
7. Nothing to lose (keep the crop)	2	3.51
8. Gifts	2	3.51
9. Satisfaction of participating	1	1.75
10. Quality of grain	1	1.75
TOTAL	57	100.00

Table 9 : Farmers Knowledge of the objectives of the ACPO Trials and their perceptions about the adaptation of the trials to their expectations:

Country	Knowledge of objectives of Trials		Adaptation to Expectations		
	Known (% of Farmers)	not Known	Well Adapted	Partially Adapted (% of Farmers)	Not Adapted
Burkina Faso	67	33	50	30	20
Cameroon	80	20	50	50	0
Mali	100	0	72	14	14
Togo	75	25	58	33	9
All countries	77	23	58	30	12

requirements of the trials.

Table 8 provides an indication of the expectations of the farmers who carried out the ACPO trials while Table 9 gives an indication of their knowledge of the objectives of the trials and the extent to which they feel the trials are adapted to their expectations. It is apparent from both tables, that the majority of the farmers were looking forward to increased productivity from the trials. Furthermore, seventy-seven percent of them said that they knew and could reasonably well explain the objectives of the trials sited on their farms. Out of this number of farmers, 58 percent said the trials were well adapted to their expectations, 30 percent said they were only partially adapted, while 12 percent said the trials were not adapted at all to their expectations.

It should be pointed out that the successful transmission and diffusion of crop technologies is a difficult and complex process. It requires not only technologies that are superior to what the farmers are currently using but also a combination of suitable conditions with regard to seeds, fertilizers, pest control, water management, credit, land tenure etc. The ACPO programme was intended to improve upon this transmission and diffusion process. It is, however, very unlikely that by itself, the ACPO programme can make any dramatic impact in transforming agricultural production in the participating country, much less on the welfare of the farmers.

This is, however, not to conclude that the ACPO programmes have not made an impact in the areas in which they are located. On the contrary, the perceptions of all the relevant people, and most importantly of the farmers for whom the programmes were intended, suggest that the ACPO programme has indeed influenced the diffusion of crop technologies in the various areas in which they are located, although this influence may have been in an indirect way. There is evidence to suggest that the farmers who were involved in the trials have indeed acquired and are using new basic cultural practices as well as fertilizers and manure. In a number of cases, it is clear that the crop varieties that are now referred to as local varieties were only a few years ago being referred to as improved varieties.

There have also been some adoption by farmers of improved maize varieties in Burkina Faso, Mali and Togo, while the Framida sorghum variety appears to be gaining popularity in Northern Togo.

The acquisition of basic knowledge about the use of improved cultural practices, fertilizer use, and new varieties would certainly have made more impact if the appropriate infrastructural support was also available. Support is lent to this assumption by the fact that in the same countries and in the same areas where the ACPO programmes are located, cotton yield and production have increased substantially over the years and these increases are due to the fact that in each of the countries cotton production has traditionally been supported by a relatively efficient institutional system.

3.3.2 The Impact of the ACPO Programme in Strengthening Linkages between National Research and Extension Systems, and collaborative SAFGRAD Research Programmes

(a) National Research and National Extension

There is no doubt that in those countries where formal and practical linkages between research and extension did not already exist, the introduction of the ACPO programmes contributed in establishing one. In those countries where such a linkage already existed, the ACPO programme contributed positively in strengthening it.

The unique characteristic of the ACPO programme which has contributed most to the success recorded in this area is the availability of a guaranteed and reasonable amount of operating funds which, in the case of on-farm trials can be quite high. In most cases, the management of the programme has also been quite flexible. This fact combined with the uniquely informal financial and administrative ACPO system has permitted the programme to respond speedily to the requirements of field operations.

However, the impact of the ACPO programme in establishing and or strengthening the linkages between research and extension in each of the countries under consideration is varied. In each country the effectiveness of the linkage depended on:

- (i) The extent to which the ACPO programme was actually entrenched within the existing research and extension system in the country.

- (ii) The adequacy of the research capacity in the country to respond to and tackle technical problems identified by the extension people and of relevance to the farmers.
- (iii) The extent to which the extension people in the field have acquired the basic training and knowledge required to carry out the ACPO tests successfully and to contribute in fostering the technology transfer process which has been put in motion.

Table 10 gives an indication of the themes in the ACPO trials which the majority of the farmers considered to be the most important. It is interesting to note how the themes vary from crop to crop and from country to country.

(b) Linkages between National Research and Collaborative SAFGRAD Programmes

The impact of the ACPO programme in strengthening the linkages between the various national research programmes and the collaborative SAFGRAD programmes varies in each country. In Togo and Burkina Faso the ACPO programmes have been strongly affiliated with the SAFGRAD collaborative programmes although it is not very clear to what extent the work of the ACPO programmes in these countries have influenced the direction of the research thrust of the collaborative programmes.

In Mali and Cameroon where the national research systems are quite strong, these systems appear to have established direct contacts and relationships with the international centres thus minimizing the impact of the ACPO programme on the SAFGRAD collaborative research programmes. The SAFGRAD collaborative programmes, have however, had easy access to ACPO reports in the two countries and the researchers in the collaborative programmes were constantly aware of the nature of ACPO activities in the countries in which they carry out their research activities.

It would therefore appear that the extent of the impact of the ACPO programmes on SAFGRAD's collaborative programmes has varied depending on the strength of the national research system in such a way that the weaker the national research system the stronger the impact. In this regard, the re-orientation of the SAFGRAD collaborative Programmes towards more emphasis on networking would appear to be a right move in the right direction.

Table 10: Farmers perceptions about the most important Extensions themes of in the ACPO trials.

COUNTRY	<u>MAIZE</u>		<u>SORGHUM</u>		<u>MILLET</u>		<u>COWPEA</u>		<u>GROUNDNUT</u>	
	Theme	% of Farmers	Theme	% of Farmers	Theme	% of Farmers	Theme	% of Farmers	Theme	% of Farmers
BURKINA FASO	1/3	17	2	25	2	50	2/3	17	2	8
CAMEROON	2	40	2/3	40	3	20	2	20	3	40
MALI	1/3	25	1	25	1/2	25	1	25	1	25
TOGO	2/3	23	2	46	2	15	3	15	1/2/3	8
ALL COUNTRIES	3	21	2	29	2	26	2/3	10	1/2/3	8

Codes for themes.

- 1: Variety
- 2: Fertilizer recommendation
- 3: Improved cultural practices
- 1/3: Means Code 1 and Code 3 received the same rankings.

(c) Feedback of Information to Research

Of all the potential contributions of the ACPO programme towards the solution of the food and agricultural problems of the countries in which they operate, the most important although most intangible is the generation of feedback information on farmers' production conditions, problems, and constraints and their effective communication and utilization.

Although not readily apparent a number of the ACPO programmes scored some success in this area. In Mali for example, as a result of the activities of the ACPO programme which had tested improved varieties from external sources for a number of years on farmers' fields and found them to be "inferior" to local varieties, the whole national research system is now reorienting itself towards the search of improved local varieties and the best cultural practices to complement them. The Mali ACPO programme was also able to successfully convey the message to researchers that although the phosphate fertilizers being recommended for use by farmers showed potential, because of its rather porous nature, farmers were experiencing considerable difficulties in applying it. The researchers in turn responded by making the fertilizer available in granular form. These represent excellent examples of the potential usefulness of the ACPO programmes in generating and utilizing feedback information for the benefit of farmers.

Another important feedback story of a different sort comes from the Cameroon ACPO programme, following tests by the programme, an improved early maturing sorghum variety (S-35) with acceptable consumption characteristics was adopted by several farmers in 1985, which was a relatively lower rainfall year and ideal for that variety. However, 1986, was a much better year as regards rainfall, and the local variety out-performed the S-35. As a result, in 1987 most farmers reverted to their local variety. The lesson and feedback information? For the improved S-35 variety to be widely accepted it must, among other things, out-perform the local variety in a bad year and perform, at least, no worse than the local variety in a normal year.

The generation of this type of feedback information is one thing. Its effective utilization is another thing as revealed in the case of Burkina Faso.

In this case the ACPO programme provided feedback indicating poor performance of the improved variety being introduced but the agricultural research system was unwilling to utilize the information, citing reasons why the feedback information cannot be valid. While some of these reasons may indeed be valid, it would appear that the Burkina Faso researchers felt that the ACPO programme can only be considered successful if the ACPO trials confirm on-station performances as a result, in the adoption of the improved technologies on offer even if the farmers do not like them and their use is unprofitable.

The contribution of the generation of feedback information from farmers by the ACPO programme cannot and should not be measured by how well it popularizes the research results from the research centre but rather by how well it institutionalizes the technology transfer process by effectively providing a two-way linkage between research, extension and farmers.

Because ACPO programmes are designed to serve the needs of the peasant farmers, there is need to engage them in a dialogue concerning their reactions to the research results being offered to them. Unfortunately, none of the ACPO programmes was able to establish an effective way of carrying out this dialogue and reporting its outcome to both the researchers and the extension agents. This is a major weakness of the feedback mechanism in place in all the ACPO programmes.

A fundamental requirement for an effective feedback system for the transmission of research results to farmers is that the farmers should be made aware of the importance of their knowledge in the feedback process and should be made confident in expressing their opinions in front of researchers and extension people.

It has been difficult to institutionalize this consciousness in the various ACPO programmes. There appears to be a certain intellectual reluctance on the part of the technical researchers as well as a bureaucratic reluctance on the part of field staff to vigorously seek farmers' opinion, scientifically document and utilize the information so obtained.

For example, a farmer in Cameroon who was asked why he did not inform the extension agent about his negative reaction to certain aspects of the trials on his field replied, "because he did not ask me".

A formal opinion survey should be a standard data collection requirement for all future ACPO trials. Farmers are usually able to assess what types of extension messages would be most useful in alleviating their farming constraints as can be seen in Table 11 for farmers in the ACPO countries. This is why there is need to have a socio-economist as a standard member of future ACPO teams.

3.3.3. Impact of the ACPO Programme in Dynamizing the National Extension Systems

Did the on-farm activities of the ACPO programme contribute in dynamizing the extension systems in the countries in which they operate by effectively translating research findings into extension recommendations ? This is a difficult question as it touches on the fundamental objective of the ACPO programme. We have already alluded to the fact that in the final analysis, the extent to which the ACPO programme in any country can dynamize that country's extension system is critically related to the ability of the technical knowledge that is on offer to address the perceived constraints of the farmers.

The best ACPO programme, meticulously designed and implemented, would be incapable of dynamizing any extension system to any reasonable extent if it is centred around the transfer of technologies that are no better than the traditional ones. What's worse, if the ACPO programme insists on pushing an irrelevant or inappropriate variety or technique, the exercise is likely to turn farmers' minds against future efforts at generating and promoting the use of new technologies.

Dynamizing the extension system requires a complex combination of suitable conditions with respect to easy access to improved seeds, fertilizers, and protection chemicals, adequate institutional support in the form of credit, roads and markets, as well appropriate policies with regards price incentives, consumer goods, land tenure, just to mention a few.

Table 11: Farmers' perception of the Extension themes they would like to see emphasized in the future.

COUNTRY	<u>MAIZE</u>		<u>SORGHUM</u>		<u>MILLET</u>		<u>COWPEA</u>		<u>GROUNDNUT</u>	
	Theme	% of Farmers	Theme	% of Farmers	Theme	% of Farmers	Theme	% of Farmers	Theme	% of Farmers
BURKINA FASO	3	43	3	48	3	52	3	52	3	48
CAMEROON	2/3	33	3	56	3	11	3	44	3	56
MALI	1	68	1	53	1	58	1	63	1	68
TOGO	3	36	2/3	36	2	21	1	39	3	32
ALL COUNTRIES	1	34	3	36	3	26	1	35	3	44

Code for themes.

- 1: Variety
- 2: Fertilizer
- 3: Improved cultural practices
- 2/3: Codes 2 and 3 are considered of equal importance.

Table 12 provides an indication of farmers' perception of their most binding constraint in agriculture as well as their views on the most important factor that currently prevents them from adopting new technologies on offer. It is interesting to note that for all countries the most limiting constraint is uncertain rainfall while the most important factor preventing farmers from adopting new technologies is low expected prices or thin markets for the products.

The ACPO programme concentrates its efforts in improving the technical flow of new knowledge from the research centres to the farmers. It is therefore unlikely that the technology transfer process being created or being strengthened can, on its own, dynamize the extension system even if the technical knowledge on offer was superior much less when there are important reasons why the farmers are either unwilling or unable to adopt the new technical knowledge.

The general conclusion is that the on-farm activities of the ACPO programme do not appear to have made any significant impact in dynamizing the national extension systems through the translation of research findings into extension recommendations.

It is, however, important to emphasize that although the more direct impact of the ACPO programme on the national extension system may be minimal, the programme has, nonetheless made indirect impact on the national extension systems. For example, the programmes have made tangible psychological impact on the extension system in each country in the sense that consciously or unconsciously, a number of cultural practices, such as planting in straight lines, timely weeding, and the importance of animal traction have actually caught on and are being routinely used by many farmers. Furthermore the programmes, through the training of team members at the higher degree level, have provided them with valuable on-the-job experience. The programmes have also contributed significantly in providing valuable hands-on training for extension and field staff with regards the design, implementation, monitoring, and evaluation of trials at the farmers' level. These are impacts which, though intangible, have gone a long way in institutionalizing the ACPO concept in all the countries in which the programmes currently operate.

Table 12.

Farmers' perception of their most important constraints and the most important factor that prevents them from adopting new technologies on offer.

COUNTRY	<u>Most Important Constraints in Agriculture</u>					<u>Most Important Factor Preventing Adoption of New Technology</u>				
	% of Farmers Indicating					1	2	3	4	5
Burkina Faso	76	5	5	0	5	0	0	81	0	14
Cameroon	89	0	11	0	0	0	22	22	0	22
Mali	90	0	0	0	0	16	0	37	0	10
Togo	57	11	4	0	14	0	18	43	7	11
All Countries	74	5	4	12	6	4	9	49	3	13

Code: ConstraintsFactors

1 = Uncertain Rainfall.

1 = Recommendations are too complex.

2 = Poor soils.

2 = Recommended Inputs are not available.

3 = Insufficient Land.

3 = Recommended Inputs are too expensive.

4 = Insufficient Labour.

4 = Low prices or lack of markets for the expected increase in production.

5 = Lack of Farming knowledge.

5 = Lack of knowledge to correctly apply the recommended practice.

NOTES: Percentages do not necessarily add up to 100 due to the following:-

- (a) There are a number of non-responses.
- (b) An "Others" category has been left out.
- (c) There are a number of ties in rankings.

In conclusion, it should be said that the ACPO programme was not the only source of new knowledge for farmers in the countries participating in the programmes, Table 13 gives an indication of the importance farmers in each country attach to different sources of new information.

The ACPO programmes so far, have placed most of the emphasis in demonstrating the potential of new technologies by carrying out field trials on their farms. While not minimizing the importance of field trials, it is important to note that field trials alone may not always be sufficient to reduce the fear by farmers of implementing new technologies thus ensuring widespread adoption. There is therefore need for future versions of the ACPO programme to reinforce their trials on farmers' fields with other methods of communicating with farmers, by trying to identify and sensitize the information network to which the farmers in an area belong.

Table 13: The most important source of New Agricultural Information.

COUNTRY	Other Farmers	Extension Agent	ACPO Trials	Radio
	(% of Farmers)			
BURKINA FASO	19	71	10	0
CAMEROON	33	56	11	0
MALI	10	90	5	0
TOGO	4	79	4	4
ALL COUNTRIES	13	77	6	1

Figures do not add necessarily to 100 due to missing data and/or tied rankings.

IV.

NEW PERSPECTIVES OF THE ACPO PROGRAMME

The advent of the Farming Systems Research (FSR) reorientation of traditional agricultural research in Africa in the early 1970's brought along with it a profound awareness of the need to adapt agricultural research activities in African countries to the African environment. SAFGRAD's ACPO concept represented one of the boldest and more imaginative response to this reorientation.

FSR, with its characteristic holistic approach and emphasis on conducting part of agricultural research on farmers' fields, has laid the foundation for the crucial link between research extension and development. It is for this reason that the future ACPO design must seek to more fully exploit the mutually beneficial complementarities that come from integrating it into the global FSR strategy of the National Agricultural Research System (NARS) whenever such a strategy exists.

From the experiences of the four countries in which ACPO's are being implemented it is quite apparent that the ACPO programme cannot function effectively, independently of component and Farming Systems Research. In the same token, the functions and activities of the NARS and the FSR programme (whenever such a programme exists) cannot be divorced from those of the ACPO programme in matters that have to do with the transfer of improved technologies from the research station to the farmer's level. Consequently, future ACPO programmes would be better served if their activities were integrated and coordinated with on-going FSR activities in a country.

However, the ACPO objective of creating appropriate bridges between research and extension are so important that they can only be effectively handled by a separate and autonomous unit set up solely for the purpose of providing the necessary link between research and extension. This is particularly necessary because the research and extension systems in most African countries are often located in different ministries which often have conflicting goals. As a result the scientists and extension officials in both ministries often consider the activities leading to the adoption of research results by farmers as not wholly within each ministry's domain.

There is therefore need for a separate, but flexible, and relatively autonomous ACPO Unit which is unambiguously responsible for all activities leading to the widespread adoption of available research results. Otherwise, researchers at the research centres will continue to be frustrated by the notion that their research results are not being adopted by farmers while the extension people continue to get upset at the feeling that they are not getting useful results from research.

Specific recommendations concerning the various aspects of the future ACPO programme are discussed in the rest of this section.

4.1. The Name

The current name, Accelerated Crop Production Officer (ACPO) personalizes the programme too strongly and does not do justice to its intent and objectives. The name would need to be changed to reflect the fact that the programme is centred around the development of a concept and not an individual, i.e the development of a strong linkage between research and extension and the testing of research results on farmers' fields. This requires a team effort and the new name should reflect that fact. We therefore propose the name:

TESTING AND LIAISON TEAM (TLT)

4.2. The Testing and Liaison Team

The Testing and Liaison Team (TLT) should comprise the following core membership:

- One Team Leader (preferably an agronomist)
- Two Team Members (1 agronomist - 1 Socio-Economist)
- One Technical Assistant
- One Accountant
- One Secretary
- Two Drivers
- One Storekeeper

In addition to the members of the core team of the TLT described above, the programme in each country should be complemented by a field team of two people located in each of the zones (extension or otherwise) into which the country is divided. This field teams should, at the minimum, comprise the following:

- One Technical Assistant
- One Enumerator

Both of these individuals should be provided with adequate means of transportation.

4.2.1 Qualifications of Team Members

(a) Team Leader

The Team Leader should possess at least a good first degree in agronomy. Preference should be given to candidates who also possess a general knowledge of agriculture as well, commensurate professional field experience in research, or extension activities or both.

The Team Leader must have a dynamic personality and be able to motivate his subordinates as well as operate at ease, with his superiors in both the research and extension services.

Although a higher degree of education would also be an advantage for the Team Leader, this factor becomes less important when the individual is dynamic, sincere and sensitive to the problems of resource poor farmers. The success story of Mr Jerry Johnson, the former ACPO of Mali and presently of the TLU of Cameroon provides convincing evidence of this point.

(b) Other Team Members

The other technical team members should have similar qualifications and characteristics as those of the Team Leader described above as each of them should be capable of standing in for the Team Leader in his absence. However, their initial level of practical field experience does not have to be as high as that of the Team Leader.

(c) The Technical Field Assistants

The Technical Assistants located in the zones should also be quite dynamic and most importantly, should have a farming background and, preferably, be recruited from the zone in which they are going to work. They would be expected to be both literate and numerate and to be able to speak the local languages.

(d) The Enumerators

The field enumerators should possess the same characteristics as those of the Technical Assistants described above. However, they would only need a minimal and operating level of literacy and numeracy.

4.2.2 Job Description of the Team

The team will have a collective set of job responsibilities as follows:

- (a) Establish regular contacts with researchers in the national and international agricultural research programmes in the country and participate actively in the research decision making process in operation in the country.
- (b) Establish and maintain regular contacts with the appropriate personnel in the extension system and put in place a system for systematically and accurately identifying the extension themes of importance to the extension system.
- (c) Establish and maintain regular contacts with all relevant agricultural institutions and agricultural administrators, winning their confidence and keeping them constantly informed of the activities of the TLT programme.
- (d) Put in motion a process for continuously identifying, with the assistance of the extension agents in the field, real farmer constraints and possible extension themes for their solution.
- (e) Identify, in consultation with researchers in both national and international programmes, available technologies that can be put in the form of extension themes to address identified farmer constraints.
- (f) Carry out pre-extension trials of promising extension themes on farmers' fields, and together with the extension agencies:
 - monitor the adoption process and feedback farmers' reactions to the research stations, and either;
 - continue to modify the themes as suggested by researchers at the research stations; or
 - be prepared to try something else, if despite the modifications to the themes on offer, farmers still do not widely adopt them; or

- in consultation with the extension agency, identify and propose solutions for the most important constraints if the themes are being adopted.

(g) In the event that on-farm research results suggest possibilities of widespread adoption by farmers, propose, in consultation with the FSR programme, to agricultural administrators, the necessary institutional, social and policy actions which would be needed to facilitate the more widespread adoption of the themes (seed production, input and output marketing, social organizations, etc.)

The Team Leader would, in addition, have the following specific job responsibilities:

- (a) Prepare and strictly follow annual programmes of consultations, and meetings with research and extension officials.
- (b) Draw up annual pre-extension trial programmes, make adequate and appropriate advance preparation for their implementation, have them implemented and appropriately monitored, and ensure that all relevant data on the trials are collected including reliable and properly collected data concerning farmers' views on various aspects of the extension themes on trial in the fields.
- (c) Ensure that all data collected are analyzed promptly and ensure that appropriate reports are written in a timely manner and distributed to the following:
 - The SAFGRAD Office
 - Researchers at the NARS, IARCS, and Regional Research Programmes.
 - Extension Services
 - Ministry Officials
 - Field Extension Workers.

It should be emphasized that the different groups identified above have different interests and levels of attention to details. It would therefore be necessary to write different reports pitched at the different interests and levels of each of the groups.

(d) Provide adequate supervision of all staff members of the team and ensure proper management and control of the finances of the programme.

(e) In consultation with the appropriate government officials, draw up a time table for the training of members of the team including, the Team Leader, the technical members of the team, the Technical Assistants, the Extension Agents, and the project enumerators. Ensure that the time table is adhered to as much as possible.

4.2.3 Remuneration

Field work, if properly done is very hard work. It involves total commitment to, as well as sincere identification with the goals and aspirations of resource-poor farmers, often on the edge of survival. Experience has shown that projects such as the proposed TLT which aim to support poor peasant farmers, have in the past, lent themselves easily to bureaucratic and personal interests, which in turn have led to the display of results, which despite the fanfare and rhetoric, have had very little or no impact on the peasant farmers. A conscious effort should, therefore, be made to avoid this situation in the future TLT programmes by attempting to create, for each country, TLT teams with a value and specific incentive system which support and reward team members for orienting themselves towards the solution of farmers' problems.

Spending most of one's time in remote villages conducting extensive on-farm trials, spending much time on the back roads travelling between villages, and keeping in touch with extension agents and farmers, has traditionally not been attractive to agricultural scientists trained to work in air-conditioned offices and laboratories and on experimental fields a few minutes away from large urban centres. This fact may therefore, present a serious role conflict for the scientists engaged as TLT members unless appropriate and adequate provisions are made for specific incentive programmes.

4.2.4 Conditions for the Selection of Countries for a TLT Programme

Following an assessment of the facilitating conditions obtaining in the various ACPO countries and an evaluation of the effectiveness and efficiency

of the ACPO programme in each of these countries, the team considers the following as essential conditions to have in order to benefit maximally from the location of the TLT programme:

- (a) The country must have a well defined set of national policies with regard to agricultural development, research and extension.
- (b) The country must have good plans for the implementation of appropriate policies and support systems that would create the required opportunities conducive to the widespread adoption of proven extension themes.
- (c) The national agricultural research system must be relatively strong, with a reasonable number of qualified staff in key research areas. This capacity is needed to effectively generate new technologies as well as respond to extension needs being feedback from the field.
- (d) The extension system in the country must also be dynamic and must have the means and structures, to quickly and accurately identify the extension needs in its various zones of operation, as well as receive and extend promising extension themes that show good promise. In addition, the extension system must express a desire to be assisted by the research system and demonstrate confidence in the ability of the research system to provide such an assistance.
- (e) The country's research system must also have a well thought out and on-going Farming Systems Research programme manned by an adequate number of qualified people.
- (f) The country must be prepared to provide a minimum amount of financial and material support to the TLT programme in its initial stage to complement whatever support is available externally. The country should also guarantee to provide this support in a timely and regular manner and it should be obvious that the country would abide by this guarantee.

4.2.5 Training

There are several advantages of starting the TLT programme in each of the country in which it is located with an all indigenous team. The most important of these advantages is the fact the TLT would need to spend most of its time in remote villages, scattered throughout the country, constantly talking

to farmers. This is a very sensitive assignment which normally should not be carried out by non-indigenes.

For an effective all indigenous TLT team to materialize in the shortest possible time, there is need for a well programmed training schedule for the team as a whole. In this regard, there should exist a short-term training schedule for the support staff while the other technical staff should be programmed for a longer term training programme.

It should be emphasized that the training programme of the TLT should be seen as an induction exercise involving all members of the team and imbibing them with a clear idea of the goals of the TLT programme and what is expected of each member of the team towards the achievement of these goals.

(a) Short-term Training for Support Staff

Given the experiences from most sub-saharan African countries, the support staff who would normally be assigned to a project such as the TLT would most likely be insufficiently trained to adequately complement and carry out the many essential field extension and research tasks of the programme.

All the support staff of the TLT should therefore be programmed to undergo short-term training in the carrying out of essential analytical and field tasks in research and extension.

(i) Extension Agents

Continuous short-term training should be provided to all team members but particularly to the extension agents in the field, not only on how to carry out trials on farmers' fields, but also on how to learn from farmers and how to effectively convey information from farmers to researchers at the research station. The importance of this type of training cannot be over-emphasized.

(ii) Technical Agents

This level of staff should also be provided with short-term training on how to design and lay out trials on farmers' field. They should also receive training on vigorous record keeping including cost accounting, detailed

accounting, and detailed statistical and socio-economic analysis. There presently exists many training programmes at the national level as well as at the international agricultural research centres which provide excellent opportunities for this type of training.

(b) Long-term training for the Technical Staff of the Team

It is already assumed that each of the senior technical members of the TLT would come in with a minimum of a B.Sc. degree or its equivalent. The long-term expectation, however, would be for each of these senior members of the team to receive an MSc. qualification or its equivalent, although Team Leaders, showing outstanding potentials should be encouraged to eventually obtain training at the Ph. D. level.

However, while training at the M. Sc and Ph. D. levels can continue to be obtained abroad at U.S. and European Universities, there now exists strong postgraduate training opportunities in several African countries which are more relevant to the requirements of the proposed TLT. These opportunities should be explored.

4.2.6. A Regional TLT Coordinator

There is need for a regional TLT Coordinator based at the SAFGRAD Headquarters to coordinate the various national TLT programmes and to manage the flow of information from the national programmes.

The Coordinator should be an experienced international class agronomist or agricultural economist appointed on service conditions similar to those obtaining at the IARC.s. The Coordinator should possess a considerable amount of Farming Systems Research experience and should preferably be a national of one of the member countries of SAFGRAD.

His functions and responsibility would include the following:

- (a) Assist in designing and setting up the TLT programme in member countries.
- (b) Improve the flow of information among and between TLT member countries through:

- (i) The holding of regular meetings among TLT members.
 - (ii) The organization of thematic and other types of workshops to exchange results, experiences, and improve upon methodology.
 - (iii) The regular production of regional TLT publications, summarizing and synthesizing on-farm research results and experiences from member TLT countries.
 - (iv) The regular publication of a TLT Newsletter.
- (c) Coordinate TLT activities within and between all countries having TLT programmes.
- (d) Stimulate collaboration between national research programmes (including FSR programmes) international research programmes, and national TLT programmes in matters that have to do with the generation and transfer of new agricultural technologies.
- (e) Identify sources of financial, logistical and technical support for existing and new TLT programmes.

V. SUMMARY AND CONCLUSIONS.

5.1 The ACPO Concept.

The idea behind the ACPO programme is a sound one. Almost everyone in all the ACPO member countries expressed great desire for the programme to be continued in their countries. An informal survey of participants from SAFGRAD member countries attending SAFGRAD's on-farm research workshop were unanimous in their desire to see the ACPO concept institutionalized in their countries.

Most African countries, with very few exceptions, have at least in principle, a technology transfer process, which is either operating very poorly or not operating at all. This was also the case with regard to the four countries in which the ACPO programme was located.

In all the four countries, the programme was aggressively implemented. Characteristically, the projects were all managed, although to varying degrees, in a uniquely flexible manner which permitted them to respond quickly to emerging research, extension, and administrative needs and contingencies. However, each project in each country had its strengths and weaknesses and these have been highlighted in Chapter II. One strength that was common to all the projects in the four countries was the fact that there was a minimum amount of resources available and identified for use specifically for the transmission of research results to farmers and for the generation of feedback information of farmers to researchers.

It is obvious that the extension needs of the farmers in the various countries vary one from the other and are changing at different rates for different crops. The ACPO projects in each of the countries, at least, attempted to respond to these changes. A common weakness of all the projects was that the necessary dialogue and feedback between farmers and researchers was not sufficiently institutionalized.

In conclusion, it can be said that the programme has been successful in sensitizing agricultural administrators, researchers, extension personnel and farmers alike, to the need for agricultural research results based on farmers' needs and constraints, on extension system that responds quickly and effectively to farmers' needs and reactions, and farmers who can utilize the technology on offer and whose response to extension and research workers are quickly taken into consideration in further research efforts.

5.2 The Impact of the Programme.

Globally, it is difficult to pinpoint technical changes in the farming systems in the locations where the projects are operating that would suggest that farmers have significantly changed their cropping patterns as a result of the ACPO projects and that this has, in turn, led to a transformation of the area. Indeed, available data would suggest that global production and yield levels have not changed much in each of the four countries during the last ten years. It would, however, be hazardous to draw conclusions from this regarding the impact or otherwise of the ACPO programme as a whole.

This is a problematic issue as the ACPO programme is only one of several inputs that can contribute to dramatic increases in the production of the crops under consideration, and the extent of its impact will depend on the effective functioning of these other inputs. In any case, farmers in all countries were able to identify all of the SAFGRAD mandated crops (with the exception of cowpea) as having experienced some increase in yields during the last 10 years, although in most cases it was not the use of improved varieties that was attributed to the observed yields.

There is no doubt that, the farmers who participated in the ACPO trials were, as a result of their participation, able to master some useful techniques with regard to planting dates, soil cultivation techniques, fertilizer application techniques and the use of manure, the importance of timely weeding, etc.

When the appropriate socio-economic conditions are prevailing these farmers would be in a good position to accelerate the technology transmission and diffusion process.

The ACPO programme has accomplished other intangible impacts, including the provision of training, not only to the technical ACPO team members, but also, and perhaps most importantly, to the extension and field staff who have been involved in the design, implementation, monitoring and evaluation of the ACPO trials on farmers' fields. Perhaps the most important impact of the ACPO programme is the fact that it has succeeded in institutionalizing, in all the countries, the transfer linkage for research results between the research station and the farmer. As a result, although dramatic improvements in the cropping systems may still be far from being achieved, it can be said that because of the introduction of the ACPO programmes in the participating countries, their component research and FSR programmes are now more likely to produce useful results, since component and FSR research in these countries are now more likely to become more relevant by focussing their efforts at farmers' reactions to technologies on offer.

5.3 New Perspectives on Future ACPO Programmes.

On the basis of the experiences gained in the operation of the ACPO programme in the four countries under consideration during the last 10 years, a number of recommendations have been made on the future strategy and structure of the ACPO programme. These recommendations are presented in Chapter IV.

ANNEX 1 -

PUBLICATIONS CONTACTED.

- Banque Mondiale - Inventaire de la Recherche Agricole en Afrique de l'Ouest - Février 87 - 420 p.
- INSAH DEVRES - Bilan des ressources de la Recherche Agricole dans les pays du Sahel - 1984 ; Volume II Résumé des rapports nationaux ; 303 p.
- RPAA/SAFGRAD Mali - Rapports annuels 1978 à 1986.
- RPAA/SAFGRAD Burkina - Rapports annuels et de synthèse 1980 à 1986.
- RPAA CAMEROUN - Rapports annuels 1982 - 1986.
- RPAA TOGO - Rapports annuels 1982 - 1986.
- Fily SIDIBE, ; 1986 : Le rôle de la recherche agronomique dans la politique d'autosuffisance alimentaire au Mali. Mémoire de fin d'étude IPR Katibougou. 92 p.
- SAFGRAD : Communications du Togo, Burkina, Mali, Cameroun à la troisième réunion du Comité Consultatif Technique du PC 31 OUA/CSTR SAFGRAD Ouagadougou 9-11 Janvier 1984. Documents de travail.

SAFGRAD : Communications du Cameroun, Togo, Burkina Faso et Mali au deuxième atelier SAFGRAD sur l'expérimentation en milieu paysan, Maroua 21 au 24 Septembre 1987. Documents de travail.
- Jerry JOHNSON, 1985 : On farm test results of sorghum varieties. Comparison of S35 for extension. Document de travail présenté au Symposium International sur la Sécheresse Nairobi 19 - 23 Mai 1986.
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- Ministère du Développement Rural-DRA. Acquis de la Direction de la Recherche Agronomique 1976-1986. Document de travail 12 p.
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- Ministère de l'Agriculture du Mali - OHV : Résultats de l'enquête sur l'impact du programme SAFGRAD en zone OHV. Rapport provisoire - Février 1986, 5 p.
- OUA/CSTR - Convention d'assistance technique et financière avec le Gouvernement de la République du TOGO. 14 Décembre 1980.
- OUA/CSTR - Convention d'assistance technique et financière avec le Gouvernement de la République du Mali. 2 Décembre 1980.
- OUA/CSTR - Convention d'assistance technique avec le Gouvernement de Haute-Volta. 24 Août 1982.
- R.B. Kagbo - A Field Assessment of SAFGRAD and Seed Multiplication Programmes at OHV. A report prepared for the OHV, Bamako, Mali. 18 p.

ANNEX 2.

THE RESEARCH AND EXTENSION SYSTEMS IN
BURKINA FASO, CAMEROON, MALI AND TOGO.

A. BURKINA FASO.1. The Research System.

Several institutions are responsible for research in Burkina Faso.

These include:

(a) The Institute of Agricultural Studies and Research (INERA).

INERA is one of the specialized institutes of the National Centre for Scientific and Technical Research (CNRST) and is under the Ministry of Higher Education and Scientific Research (MESRS). INERA is a product of a reorganization of the former Voltaic Institute for Agricultural and Livestock Research (IVRAZ) created in 1981 to coordinate agricultural research activities in the country. Its present tasks are:

- to define and implement objectives of research studies for development.
- to organize and manage agricultural research and apply results.
- to create and manage the structures of agricultural research.
- to provide technical support to development, including the organization of surveys and the monitoring of project implementation.

Scientific activities are carried out at the research stations or at five Regional Centres for Agricultural Research (CRRA), which cover the entire country. These activities are organized into eight multidisciplinary programmes:

- (a) the Farming Systems Research Programme (FSR).
- (b) the Water, Soil Fertilization, Irrigation and Agricultural Machinery Research Programme.
- (c) the Livestock Productions Research Programme.
- (d) the Cereals Research Programme (Sorghum, Millet, Maize).
- (e) the annual Oil Crops and Grain Legumes Research Programme.
- (f) the Fruits and Vegetables Research Programme.
- (g) The Rice Research Programme.
- (h) the Cotton Research Programme.

The activities of CIRAD, the French Conglomerate of agricultural research Institutes, are integrated within INERA. INERA also cooperates with other regional or international research centres such as WARDA, IITA, ICRISAT, CIMMYT, IBPGR, INSAH, IFDC, SAFGRAD, etc.

The Farming Systems Research Programme attempts to forge linkages between research and extension through activities aimed at:

- understanding how farming systems function
- identifying the constraints to agricultural development
- developing and proposing new technologies.

The activities of the programme are geared towards providing educational support for the continuous training of the extension staff and farmers.

A number of bodies allow INERA to have continuous linkages with development and/or extension structures in the country. These include:

- the Management Advisory Board of INERA which brings together the highest authorities of research and development and which defines INERA's programmes.
- the various commissions which gather researchers, developers and farmers within each programme with a view to reconciling research proposals and development needs.
- the Technical Committees within the regional research centres which take into account regional objectives of development.

(b) The Regional and International Research Programmes.

The regional and international programmes operating in the country are all based at the Kamboinsé Station. Administratively, they are under the authority of CNRST, thus under the Ministry of Higher Education and Scientific Research. They include:

(i) ICRISAT.

ICRISAT was introduced in Burkina Faso in 1975 as part of a UNDP funded regional programme. Its major objective is the development of new and improved varieties of sorghum and millet. ICRISAT is also responsible for the sorghum programme within SAFGRAD.

(ii) SAFGRAD/IITA.

IITA has carried out activities in Burkina Faso since 1977, within the SAFGRAD project. The objective is to develop improved maize and cowpeas varieties for the 26 member countries of SAFGRAD.

Activities include maize and cowpea breeding, the improvement of cropping systems of the two crops and, the protection and conservation of cowpeas against various parasites.

(c) Other Research Structures.

There are other research structures in Burkina Faso which include the following:

(i) The Institute of Rural Development.

This institute is located within the University and carries out some research activities on sorghum, millet, peanuts and tubers, mostly by faculty members.

(ii) The Directorate of Agriculture.

This directorate carries out research on plant protection and integrated pest management. The Directorate works through separate projects funded by the different partners in the country.

(iii) ORSTOM.

This is a French Institute under CNRST. Its activities include agricultural and livestock systems studies in the northern part of Burkina Faso.

In conclusion, one may say, from a general point of view, that Burkina Faso has considerable research potential. Many scientific results have been generated and would appear to be on the shelves of these research structures.

2. The Extension System.

Until recently (May 1987), extension work in Burkina Faso was under the Regional Organizations for Development (ORD). The ORD's were created in 1966 under the authority of the Ministry of Agriculture and Livestock. The ORDs are presently responsible for the training of farmers while new institutions are being created for this purpose. Their activities in this regard involve the diffusion of technological packages, supplying of inputs, pre-extension

trials, and the promotion of village associations (groupements) and co-operatives. The country is divided into 21 ORDs for this purpose.

To carry out their extension work, the ORDs are subdivided into sectors, sub-sectors and cells. The Heads of sectors as well as some sub-sectors are civil servants who have had specialized training. The field extension staff (known as encadreurs) are contractual labour without any special training. There are about 1200 encadreurs working under the 11 ORDs (63 sectors and 167 sub-sectors). The number of farmers per encadreur varies greatly by ORD, from a low of 315 to a high of 1330, with a global mean of 650.

The ORDs are expected to supply all support services required for field work.

Extension policies are formulated by a central service, the Service of Extension and Rural Community Organization (SVAR), itself under the Directorate of Agriculture. SVAR's objectives are as follows:

- to coordinate ORD level extension programmes nationwide,
- to communicate the most promising research results to extensionists,
- to organize and manage the national extension programme.

Several structures are involved in on-farm tests and pre-extension activities in the country.

These include:

- a) Each ORD has a research and development unit which is responsible for the supervision of all research activities. The head of this unit is the contact person of the research services. He identifies the most important technical themes for the ORD and organizes meetings with the researchers to define the plan of activities.
- b) Within INERA, the FSR programme provides the linkage between research and development. Besides the tests and surveys that it conducts, this programme also identifies the constraints of each ORD and communicates them to the thematic research teams.

- c) A Fertilizer Programme, initially funded by FAO, conducts a large number of tests in the entire country. It is under the Ministry of Agriculture.
- d) The Water and Rural Equipment Fund (FEER) within the Ministry of Water Resources is responsible for building and monitoring anti-erosion structures nationwide. The FEER concentrates its activities in the former ORDs of Yatenga, Centre-Ouest (Koudougou), Centre Nord (Kaya), Centre Est (Koupèla), Centre (Ouaga) and Est (Fada). Some NGOs (Non Governmental Organizations) also work with FEER in the same regions.
- e) The SAFGRAD/ACPO Programme which is the subject of this impact study.

B. CAMEROON.

1. The Research System.

Research on food crops in Cameroon is carried out under the aegis of the Institute of Agricultural Research (IRA), one of five specialized institutes under the Ministry of Higher Education and Scientific Research (MESRES).

(a) Historical background.

Until 1974, agricultural research in Cameroon was conducted by the institutes within the French Cooperation Group, in particular, IRAT, IRCT, and IRHO. In 1974, the government centralized all research activities formerly carried out on contract basis by foreign organizations, under the newly created National Office of Scientific and Technical Research (ONAREST). Three agricultural research institutes were created within ONAREST: the Institute of Food Crops and Textiles (ICVT), the Institute of Perennial Crops (IPC), and the Institute for Research in Forestry and Agriculture (IRAF). In 1976, the activities of the 3 institutes were merged into one structure, the Institute of Agricultural and Forestry Research (IRAF).

In 1979, ONAREST was replaced by a General Directorate of Scientific and Technical Research (DGRST), within which IRAF was replaced by the Institute of Agricultural Research (IRA) with headquarters in Yaounde. In 1984, DGRST was replaced by the Ministry of Higher Education and Scientific Research (MESRES) with 5 research institutes including IRA.

(b) Organization of IRA Activities.

IRA is responsible for the development and implementation of research programmes in all areas of agriculture and forestry. It is also responsible for the diffusion of research results intended to improve agricultural and forestry production.

To achieve these objectives, IRA is divided administratively into centres and stations, and technically into programmes.

Administratively, IRA includes six agricultural Research Centres (ARC), out of which four deal with agricultural research and two with research in specialized fields (soil and forestry). The institute operates 15 research stations and 29 sub-stations.

The station is the basic unit where programming and budgeting are done.

Scientific activities are conducted in 22 research programmes as follows:

- Food crops.
 - . Cereals
 - . Tubers
 - . Legumes
 - . Garden crops
 - . Plantain
 - . Fruits
- Cash crops.
 - . Cocoa
 - . Coffee
 - . Oilseeds
 - . Textile plants
 - . Rubber trees
 - . Bananas
 - . Pineapples.
- Food technologies.
- Soil fertility.

- Forestry.
 - . Dense forest
 - . Savanna forest
 - . Research on wood
- Botany.
- Medicinal plants.
- Farming systems.
- Genetic resources.

(c) The Maroua Agricultural Research Centre

This centre covers the entire northern part of Cameroon and includes 3 provinces (up from Ngaoundéré). It operates one station and several sub-stations.

The centre operates 6 programmes as follows:

- . Cereals (sorghum, millet, maize and rice).
- . Tubers in the southern part (cassava, yam and sweet potato).
- . Legumes (peanuts, cowpeas, bambara nuts).
- . Textiles (cotton).
- . Citrus fruits and other fruit trees.
- . Farming systems.

Except for cotton, the implementation of these programmes has not been continuous due to internal and external administrative changes. Some programmes such as those dealing with farming systems, cowpeas and rice have only recently been initiated.

2. The Extension System in Northern Cameroon.

Extension in northern Cameroon is under the authority of SODECOTON, a cotton company created in 1940, and responsible for promoting the development of cotton. SODECOTON intervenes in the production, harvesting, processing and marketing of the by-products of fibers, cotton oil, and cottonseed cakes.

Since 1974, SODECOTON has also had the additional responsibility for food crops in rotation with cotton (sorghum, maize, peanut and cowpea).

A Directorate of Rural Development is responsible for extension issues. The part of the country where SODECOTON operates is divided into 8 regions, which are further subdivided into 35 sectors, 300 zones, with a head for each structure. The village is the basic structure of extension operation with an agent responsible for extension activities. Each agent is also responsible for monitoring 100 ha of intensive cropping plots involving cotton, sorghum, maize, rainfed rice, peanut and cowpeas.

At the zonal level, a regional instructor, assisted by community organizers is responsible for general education, retraining and community organization, in addition to providing technical training.

An agricultural experiment station in cooperation with IRA is responsible for carrying out experiments on cotton and other crops. The field staff of these stations or, in cases where they do not exist, the Head of the zone is responsible for conducting the trials.

C. MALI.

1. The Research System.

Malian agricultural research on crop production is carried out under the aegis of the Institute of Rural Economy (IER) created in 1960, the year the country became independent. Since its creation it has assumed the role of coordinating and providing linkages between the various organizations and authorities responsible for research and agricultural development.

The activities of the Institute are conducted in six divisions under the authority of a Director-General assisted by a Deputy Director.

The divisions include:

- . The Administrative and Financial Division (DAF)
- . The Division of Documentation and Information (DDI)
- . The Division of Planning and Evaluation (DPE)
- . The Division of Technical Studies (DET)
- . The Division of Research on Rural production Systems (DRSPR)
- . The Division of Agricultural Research (D.R.A.)

Each division is divided into sections and the sections subdivided into cells.

The general trend of agricultural research in Mali is determined at the meetings of the National Committee on Agricultural Research which are held once every two years. This committee comprises individuals involved in agricultural research, the authorities of the Operations of Rural Development (ODR), as well as the representatives of neighboring countries and invited regional and international institutions. During the meetings of the National Committee research results and programmes proposed by the specialized technical commissions, which meet every year between March and April, are discussed.

The following tasks are assigned to the National Committee for agricultural Research:

- . To define the orientation of research and isolate results that are amenable for pre-extension or extension.
- . To define priority areas where research should be continued or initiated.
- . To determine funding plans and prepare annual budget estimates.
- . To coordinate and harmonize the relationships between research and extension units.

The development plan of the country defines the objectives of rural development which, in turn, provides guidelines for the research structures, the specialized technical commissions, and the Technical and Scientific Committee.

Agricultural research is carried out by two divisions of IER, namely, DRA and DRSPR.

(a) The Division of Agricultural Research (DRA) implemented the agricultural research programmes as defined by the National Committee for agricultural research in the major scientific branches of crop production. As such its responsibilities include:

- implementing and monitoring agricultural research and experiments on all crops grown in Mali.
- coordinating and monitoring the activities of the specialized regional or international agricultural research organizations.

In this regard, research and experiments are carried out by five specialized sections dealing with:

- Research on Food Crops and Oilseeds (SRCVO)
- Research on Cotton and Jute Fibers (SRCFJ)
- Research on Fruit and Garden-Cropping (SRFM)
- Research on Tobacco and New Plants (SRTPN)
- Regulations and Monitoring of Selected Seeds (SRCSS).

SRCVO is responsible for implementing all programmes related to crops and oilseeds, particularly sorghum, millet, maize, cowpeas and peanuts. It is composed of research units and associated projects (ICRISAT and ACPO/SAFGRAD). Although SRCVO has its headquarters at the Sotuba Station, its activities are carried out in several research support bases (PAR) and permanent experiment bases.

(b) The Division of Research on Rural Production Systems (DRSPR).

DRSPR was created in 1979 with the objective to carry out the interdisciplinary research needed to develop farming systems which fit into each of the ecological zones of Mali. It includes three sections:

- The agricultural section with responsibility to study the technical constraints of cropping systems and, carry out research and experiments both on-farm and at the station.
- the livestock section which carries out studies aimed at improving farmers' livestock management practices as well as the management of pastures and livestock routes. The goal is to create a better integration of agriculture and livestock.
- The socio-economic section which carries out studies of farm units and their environments stratified by types. This section also evaluates the social and economic implications of the technologies that are proposed for farmers' adoption, including their impact at the local and regional levels.

2. The Extension System.

The extension system in Mali is carried out through a total of 14 operations which work in specific geographic areas. These operations are:

- . the Malian Company for Textile Development (CMDT)
- . the Office of the Niger (ON)
- . the Segou Rice Operation (ORS)
- . the Mopti Rice Operation (ORM)
- . the Mopti Millet Operation (OMM)
- . the Kaarta Integrated Development Operation (ODIK)
- . the Banguinedo Integrated Development Operation (ODIB)
- . the Upper Valley Operation (OHV)
- . the Office for Integrated Development of Peanut and Cereal Production (ODIPAC)
- . the Action on Rice and Sorghum on Receding River Banks (ARS)
- . the Lake Zone Operation (OSL)
- . the Operation of the Senegal - Tarakole - Magui Valleys (OVSTM)
- . the Wheat Action, Diré (AB)
- . the Segou Tea Operation (OTS)
- . the Selected Seeds Production Operation (OPSS)
- . the Seed Protection and Crop Conservation Operation (OPSR).

All operations are under the Ministry of Agriculture. They all have management autonomy, to some extent. Their mission is to promote economic and social development in the respective zones. As such, they are involved in production related activities as well as in agricultural credit, produce marketing, and education.

These operations all have the same structure: subdivision into sectors, sub-sectors and villages with extension agents at the base. These agents are responsible for farmer training and for the diffusion of new technologies.

D. TOGO

1. The Research System

Part of agricultural research in Togo is under the responsibility of the Directorate of Agricultural Research (DRA) which is under the General Directorate of Rural Development within the Ministry of Rural Development (MDR). Decree 18/MDR defines the tasks of DRA, and was revised by decree 80-78 of 4/11/80 which created the General Directorate of Rural Development. Its responsibilities include:

- the definition of government research policy in the area of rural development
- the setting up and execution of research programmes
- the management of research centres
- the training of scientists
- the gathering, analysis and publishing of agricultural research data
- the strengthening of cooperation with out-stations
- the supervision of research programmes of foreign research institutions in Togo.

Besides these tasks, a new decree 18/MDR of 12/16/83 created the Committee of Coordination of Agricultural Research and placed its permanent secretariat under DRA, with the following functions:

- Dealing with administrative matters
- Taking care of technical and material aspects of meetings
- Writing-up and diffusing proceedings.

There are several agricultural research centres in Togo whose principal research programmes include the following:

- a) The Phytogenetic Resource Programme, which protects, evaluates, and multiplies certain phytogenetic resources in Togo.
- b) The Maize Improvement Programme (the oldest programme of the DRA whose objective is to develop hybrid varieties for maize.
- c) the Rice Programme.
- d) the Sorghum-Millet Programme, being implemented by SAFGRAD.

- e) The Grain Legume Programme.
- f) The Seed Production Programme.
- g) The Programme on Crop Protection, related to the maize and sorghum-millet improvement programmes.
- h) The Fertilizer Programme whose objective is to increase the profitability of rock phosphate and to restore degraded soils.
- i) The Rural Socio-Economic Programme.
- j) The Farming Systems Programmes based in the coastal areas and working mostly on crop mixtures.
- k) The Livestock Production Programme with a veterinary component on piggery and ruminants and a zootechnical component on feed for local poultry breeds.

In addition to these research programmes, the different agricultural development projects in the country also conduct research relevant to their needs.

The SAFGRAD research programme based in Kara carries out research activities in the savanna and Kara regions.

2. The Extension System

Agricultural extension in Togo is under the supervision of the General Directorate of Rural Development within the Ministry of Rural Development. Extension work is carried out by the Regional Directorates of Rural Development (DRDR). For this purpose, the country is divided into 5 agricultural zones: Maritime, Plateaux, Centre, Kara and Savannes. Each agricultural zone is managed by a Regional Director of Rural Development, assisted by agricultural advisers: extension, livestock, forestry production, agricultural credit.

Each agricultural zone is subdivided into sectors and sub-sectors. Administratively, the sectors coincide with the prefectures. Each head of sector is assisted by agricultural advisers (extension, production, etc.).

The heads of sub-sectors work with the extension agents, who, in turn, are in contact with the farmers. Large sectors are however subdivided into autonomous units with sub-sectors.

Overall agricultural policy in Togo is based on a system of organization defined in what is known as the "new strategy for rural development". This strategy is the consequence of a recent reorganization exercise involving all agricultural services in the country.

ANNEX 3.

ITINERARY OF THE STUDY TEAM.

- AUGUST 17, 1987 - Sedogo commences work in Ouagadougou (Briefing and background documentation).
- AUGUST 18-21 - Sedogo visits research stations and villages in Burkina Faso.
- AUGUST 24-25 - Sedogo departs by road to Bamako, Mali.
- AUGUST 26-29 - Sedogo visits research centres, ministries and villages in Mali.
- AUGUST 30 - Sedogo departs for Ouagadougou by road.
- AUGUST 31 - Abalu arrives Ouagadougou.
- SEPTEMBER 1-4 - Team continues visits to ministries, research centres, and villages in Burkina Faso.
- SEPTEMBER 5 - Discussion and preparation of questionnaires.
- SEPTEMBER 7 - Team departs to Togo by road.
- SEPTEMBER 8-10 - Team holds discussions with Togo ACPO Team, Visits extension zones and villages and administer questionnaires to farmers in the Kara and Savannes regions.
- SEPTEMBER 10 - Team departs to Lome by road.
- SEPTEMBER 11-13 - Team holds discussions with ministry officials in Lome.
- SEPTEMBER 13 - Depart to Douala by air.
- SEPTEMBER 14 - Depart to Maroua by air. Discussions with officials of Maroua research centre.
- SEPTEMBER 15-19 - Visit to ministries, SODECOTON, the Experimental Stations in Maroua. Visit to villages in the Extreme North zone and administration of questionnaires to farmers.
- SEPTEMBER 21-24 - Participation in the SAFGRAD workshop on on-farm research. Discussions with Director of IRA, Cameroon, Programme Leader for cereals research, and participants at the workshop.

- SEPTEMBER 24-26 - Sedogo departs to Ouagadougou, Abalu departs to Nigeria.
- SEPTEMBER 28 - Sedogo continues with contacts in Burkina Faso.
- SEPTEMBER 29 - Abalu arrives Ouagadougou.
- SEPTEMBER 30-OCT 3. - Discussions and preliminary report writing.
- OCTOBER 3-4 - Abalu departs for Bamako by road.
- OCTOBER 5-9 - Administration of questionnaires to farmers in Burkina Faso.
- Abalu holds discussions with research and extension officials, USAID, and ministry officials. Visits villages in zones and administer questionnaires to farmers.
- OCTOBER 9-10 - Abalu departs for Ouagadougou by road.
- OCTOBER 12-23 - Data processing and analysis, writing and submission of final report.

ANNEX 4 -

LIST OF PERSONS CONTACTED.

CAMEROUN.

Dr. Jacques ECKEBIL

Mr. BEKELO

Mr. Zachée BOLY

Mr. Jerry JOHNSON

Mr. Martin FOBASSO

Mr. Joseph SAMAKI

Dr. O.P. DANGI

Mr. André DJONNEMIA

Dr. M.R. RAO

Dr. Ayuk-TAKEM

Mr. Thomas MEKONTCHOU

Mr. Georges NTOUKAM

Directeur IRA - Cameroun

D.G. Adjoint SODECOTON Maroua

Chef du Centre de Maroua - IRA -

RPAA-Agronome TLU - Maroua

Homologue RPAA. TLU - Maroua

Technicien TLU - Maroua

Sélectionneur Sorgho-Mil-NCRE-Maroua

Homologue Sélectionneur Sorgho

Agronome Projet NCRE - Maroua

Chef du Programme Céréale - Centre
de NKOLBISSON (Yaoundé)

Sélectionneur arachide IRA - Maroua

Entomologiste niébé - IRA - Maroua.

TOGO.

Mr. M.T. AITHNARD

Mr. Syb DOGBE

Melle O. ATCHIKI

Mme AYELE Mawuto GNINOUFU

Directeur DRA - Lomé

Chef du Programme Riz-Directeur
DRA p.i.

Chercheur IRAT - Lomé

Chargée de la coordination de
la Recherche Agronomique.
MDR - Lomé

Mr. Payaro TOKY

Mr. Apedo KOFFI

Mr. Cani ASSIOU

Mr BINIZI

Mr. Kambara SARAMAYANGA

Mr. Baba-Cika AMOUSHI

Mr. Potopose AHOUMOTOME

Mr N'Saliba OUADIA

Homologue RPAA Togo

Chef d'Agence FED

Encadreur, Sous-Secteur Sarakawa

Chef de Sous-Secteur Sara-Kawa

Chef de Sous-Secteur Atchan G'ode

Chef de Sous-Secteur Sirka

Encadreur Zone Atchan Gbade

Chef de Secteur SOTOCO Kanté

Mr. Didiogou LARE
 Mr. DONI
 Mr. GBADORE

Chef de Secteur Assoli - Badilo
 Chef de Secteur DRDR Doudelgou
 Responsable vulgarisation-Doufelgou

MALI

Mr. Mamadou Fatogoma TRAORE	D.G. IER Bamako
Mr. Dotianga DIAMANTENE	D.G. Adjoint IER Bamako
Mr. KANTE	D.G. A joint OHV Bamako
Mr. Mamadou YEROBAR	D.G. O IPAC
Mr. Mamadou TOURE	Chef de service vulgarisation CMDT
Mr. Noumoutié DIAKITE	Chef de section Formation OHV
Mr. Karim TANGARA	Adjoint section Formation OHV
Mr. Adama DIARRA	Coordonnateur recherche OHV Bamako
Mr. Lassana KONATE	Chef de Sone Kolokani ODIPAC
Mr. Koida KONE	Chef de ZER OHV
Mr. Mahamadu DIALLO	Chef de sous-secteur Didieni
Mr. N. BAGOURI	Directeur Adjoint de l'Agriculture
Dr. Samth K. READY	Agronome USAID Bamako
Mr. Tracy ATWOOD	Agricultural Development Office USAID Bamako
Mr. Oumar DIA	Specialiste des programmes USAID Bamako
Mr. Elzadier WASHINGTON	Economiste-Projet USAID Nianougou
Mr. Panganignou DOLO	Chef de SRCVO IER - Sotuba
Mr. Mamadou GOITA	Chef de Division Système IER
Mr. Moussa SANOGO	Responsable des essais multilocaux Bamako
Mr. Zana SANOGO	Chef de la Division Recherche - IER
Mr. Lamine TRAORE	Chef d'équipe RPAA IER Bamako
Mr. Hassane DAO	Adjoint RPAA
Mr. Amidou SANGARE	Agronome équipe RPAA
Mr. Dji COULIBALY	Agronome équipe RPAA

BURKINA FASO.

Mr. P. Célestin BELEM

Mr. Issa DRABO

Dr. D.S. MURTY

Mr. G. HOFFMAN

Dr. C.M. PATTANAYAK

Dr. S.N. LOHANI

Dr. K.V. RAMAIAH

Mr. Michel KABORE

Mr. Alassane OUATTARA

Mr. Alphonse VENEGDA

Mr. Ousmane BELVIRE

Mr. Moussa Omer KABORE

Chef de Division Programme INERA

Sélectionneur Niébé-Chef de station
KamboinséSélectionneur Sorgho ICRISAT
Kamboinsé

Agronome Striga ICRISAT

Sélectionneur-Responsable Réseau
Sorgho Afrique de l'Ouest.

Sélectionneur Mil

Sélectionneur Sorgho (Striga)

Chef de Bureau Formation Vulgarisation
ORD KoupèlaResponsable section Recherche-Développement
ORD Koupèla

Encadreur village de Birghin

Chef de sous-secteur Kombissiri
(ORD Centre Ouaga)

RPAA Kamboinsé.

ANNEX 5 -

BRIEF RESUME OF THE STUDY TEAM MEMBERS.

George O.I. ABALU is a Nigerian Agricultural Economist with a Ph.D. from the IOWA State University (ISU) in Ames, IOWA USA. Since graduating from ISU in 1973, he has devoted most of his career carrying out research into the agricultural problems of small scale resource-constrained farmers of Northern Nigeria. He served as the Head of the Department of Agricultural Economics and Rural Sociology of the Faculty of Agriculture of Ahmadu Bello University for several years. He has been the Leader of the Farming Systems Research Programme of Ahmadu Bello University's Institute for Agricultural Research for several years. He also served as the International Coordinator of the West African Farming Systems Research Network during its formative years from 1983 to 1986. He has at various times served as consultant to the Nigerian government, the World Bank, the FAO, the UN and the OAU. He is currently the National Coordinator of the Nigerian National Farming Systems Research Network.

Michel SEDOGO a Burkinabè Soil-Scientist attended the Agronomy College of Nancy (France) where he obtained his "Docteur Ingénieur" in 1981. He started working at the Saria Agricultural Research Station Burkina Faso in 1978, on manure and soil fertility maintenance under various crops. His responsibilities have included serving as the Head of the Food Crops Department at the Voltaïc Institute for Agricultural and Zootechnical Research Institute (IVRAZ) from 1981 to 1983 and then Director of the same Institute which has now become the Institute for Agricultural Studies and Research (INERA), from 1983 to June 1987. Since then he has resumed his research activities and has been conducting research at both the farmers' level and on station.

Annex 6. Area, Yield and Production of Principal Crops
in ACPO Programme Countries

A - Total Cereal Production

Country	Area (1000 ha)					Yield (Kg/Ha)					Production (1000 Tonnes)				
	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985
Burkina Faso	2017	2146	2172	2181	2072	578	561	509	501	763	1166	1205	1106	1093	1580
Cameroon	1021	999	980	976	1028	848	947	978	1005	1032	866	946	959	981	1061
Mali	1387	1624	1544	1502	1702	783	828	740	674	803	1086	1344	1142	1013	1366
Togo	398	308	335	373	356	768	995	868	1178	1152	305	306	290	440	410

B - MAIZE

Country	Area (1000 Ha)					Yield (Kg/Ha)					Production (1000 Tonnes)				
	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985
Burkina Faso	123	135	135	140	140	876	823	520	500	929	108	111	70	70	130
Cameroon	495	450	475	475	500	844	1000	1053	1053	1060	418	450	500	500	530
Mali	90	90	80	70	90	676	992	875	714	1000	61	89	70	50	90
Togo	125	136	167	216	200	1225	1112	868	1025	1040	154	151	145	222	208

Source: FAO Production Yearbook.

C - SORGHUM

Country	Area (1000 ha)					Yield (Kg/Ha)					Production (1000 Tonnes)				
	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985
Burkina Faso	1049	-	1075	1080	1000	591	-	568	556	900	620	-	611	600	900
Cameroon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mali	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Togo	122	-	89	83	80	714	-	892	1430	1379	87	-	80	119	110

- Means: Data not available.

D - MILLET

Country	Area (1000 Ha)					Yield (Kg/Ha)					Production (1000 Tonnes)				
	1979- 1981	1982*	1983	1984	1985	1979- 1981	1982*	1983	1984	1985	1979- 1981	1982*	1983	1984	1985
Burkina Faso	796	909	924	930	900	490	485	424	403	556	390	441	392	375	500
Cameroon	503	525	475	475	500	799	805	761	842	880	402	423	361	400	440
Mali	1077	1362	1300	1250	1400	744	776	692	640	786	801	1057	900	800	1100
Togo	121	144	55	52	50	364	943	926	1464	1415	44	136	51	76	71

* Figures are for both millet and sorghum.

Source: FAO Production Yearbook.

E - GRAIN LEGUMES

Country	Area (1000 ha)					Yield (Kg/Ha)					Production (1000 Tonnes)				
	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985
Burkina Faso	473	475	475	460	475	372	375	371	337	373	176	178	176	155	177
Cameroon	193	200	210	210	214	542	549	548	543	561	105	110	115	114	120
Mali	41	48	53	54	55	1048	1063	1038	926	1036	43	51	55	50	57
Togo	72	76	91	76	78	328	373	385	546	521	24	28	35	41	41

F - GROUNDNUTS (In Shell)

Country	Area (1000 Ha)					Yield (Kg/Ha)					Production (1000 Tonnes)				
	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985
Burkina Faso	129	155	137	143	200	540	473	599	580	385	70	73	82	83	77
Cameroon	337	315	300	300	320	405	286	400	367	438	137	90	120	110	140
Mali	200	200	200	200	200	680	471	350	500	600	136	94	70	100	120
Togo	23	18	19	25	22	1094	968	860	934	1023	25	18	16	23	22

Source: FAO Production Yearbook

G - COTTON

Country	Area (1000 ha)					Yield (Kg/Ha)					Production (1000 Tonnes)				
	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985	1979- 1981	1982	1983	1984	1985
Burkina Faso	76	65	72	77	78	875	882	1050	1039	1026	67	58	76	80	80
Cameroon	62	55	71	75	77	1320	1325	1330	1333	1364	81	72	95	100	105
Mali	100	86	101	101	110	1321	1137	1275	1505	1591	132	98	129	152	175
Togo	27	23	26	30	30	700	900	1039	815	1794	19	21	27	24	54

Source: FAO Production Yearbook.

ANNEX 7.

FARMER QUESTIONNAIRE FOR ACPO IMPACT STUDY.

(1) Country (2) Region.....

(3) Village..... (4) Name of Farmer.....

- (5) Of the following five crops (Sorghum, Millet, Cowpea, Groundnuts, Maize), please order them in terms of importance to you as follows:
(1 = most important. 5 = Least important)

I. Your Total Crop ProductionYour Total Consumption of foodSorghum Sorghum Millet Millet Cowpea Cowpea Groundnut Groundnut Maize Maize

- (6) Which of the five crops has received the greatest improvement in yield during the last 10 years? (list in order of improvement: 1 = most improved, 5 = least improved)

Sorghum Millet Cowpea Groundnut Maize

- (11) For the crops involved in your ACPO trials, please indicate below the aspects which are most important to you (for each crops list in order of importance from 1 to 4).

	<u>Maize</u>	<u>Sorghum</u>	<u>Millet</u>	<u>Cowpea</u>	<u>Groundnut</u>
Variety	_____	_____	_____	_____	_____
Fertilizer Recommendations	_____	_____	_____	_____	_____
Improved Cultural Practices	_____	_____	_____	_____	_____
Other (Specify)	_____	_____	_____	_____	_____

- (12) Are you involved or have you ever been involved in similar trials as the ACPO trials?

YES ☐

NO ☐

- (13) If the answer to question 12 is YES, how do you rate the ACPO trials compared to others? (Tick as appropriate)

More Realistic

☐

The Same

☐

Less Realistic

☐

- (14) How do you rate the ACPO trials in meeting your expectations from the trials? (Tick as appropriate)

The trials are meeting
my expectations

☐

The trials are meeting
only part of my
expectations

☐

The trials are not meeting
my expectations

☐

- (15) Which technical themes would you like future ACPO trials to emphasize? (List in order of importance from 1 to 4).

	<u>Maize</u>	<u>Sorghum</u>	<u>Millet</u>	<u>Cowpea</u>	<u>Groundnut</u>
Variety	_____	_____	_____	_____	_____
Fertilizer Recommendations	_____	_____	_____	_____	_____
Improved Cultural Practices	_____	_____	_____	_____	_____
Other (Specify.....)	_____	_____	_____	_____	_____

- (16) What are your most limiting farming constraints?
(List in order of importance from 1 to 6)

Uncertainty of Rainfall	<input type="checkbox"/>
Poor Soils	<input type="checkbox"/>
Shortage of Land	<input type="checkbox"/>
Shortage of Labour	<input type="checkbox"/>
Lack of knowledge of improved farming activities	<input type="checkbox"/>
Others (Specify.....)	<input type="checkbox"/>

- (17) What are your important sources of new information for your farming activities? (List in order of importance from 1 to 5).

From other farmers	<input type="checkbox"/>
From the Extension Officer	<input type="checkbox"/>
From Trials such as those conducted by ACPO	<input type="checkbox"/>
From the Radio	<input type="checkbox"/>
Other source (Specify.....)	<input type="checkbox"/>

- (18) What factors prevent you from fully adopting recommended practices that are available to you?

(List in order of importance from 1 to 6)

The recommendations are too complex

☐

Non availability of Recommended Inputs

☐

High prices of Recommended Inputs

☐

Lack of markets for the crops

☐

Lack of knowledge to successfully apply
the recommended practices

☐

Others (Specify.....)

☐

1990

A REPORT OF THE IMPACT STUDY OF THE ACCELERATED CROP PRODUCTION PROGRAMME

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