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FARMING SYSTEMS RESEARCH MONITORING TOUR REPORT
IFAD GRANT SUPPORT N° 110

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THE SEMI-ARID FOOD GRAIN RESEARCH AND DEVELOPMENT
(SAFGRAD)

The Coordination Office
BP 1783
OUAGADOUGOU, Burkina Faso

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SAF/5H

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INTRODUCTION

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Farming Systems Research teams comprising of national research scientists and OAU/STRC SAFGRAD Farming Systems Technical experts based in Benin, Burkina Faso and Cameroon, made field tours in the above-mentioned countries. The field tours took place from 20th September to 4th October, 1986, under the supervision of the Director of Research. The purpose of the tour was:

- to follow up the status of the FSR programme implementation at field level, in the three countries;
- to share field experiences from country programmes and make genuine technical recommendations aimed at improving the performance of each programme;
- to discuss with national research directors and scientists, in the three respective countries, both the technical and administrative constraints encountered in the implementation of the FSR programme;
- to appreciate the different approaches of the institutionalization of FSR or its development in the three countries;
- to facilitate interactions between scientists and programmes; and
- to discuss, at field level, with farmers, researchers and extension workers, in order to improve both the contents of programmes and FSR approaches.

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Following the monitoring tour - field visits and discussions, the following general comments were made :

1. In respect to the Cameroon and Benin FSR programmes, it was suggested that the number of field trials and the geographical areas covered by the projects need to be adjusted; it was also suggested that the initial FSR effort should be to develop cotton based farming system in the primary villages of the project activity. As already initiated soil fertility, water and soil conservation elements should be strengthened. The forage and agroforestry components of FSR already initiated should be gradually developed or as soon^{as} experts in this field become available.

2. With regard to the Burkina Faso FSR programme, two levels of FSR integration of various components were suggested. Activities at the primary village sites should be of a long-term nature in order to monitor the recycling of resource and to quantify the resource and economic complementarity of production systems. Concurrently, technological packages would be gradually introduced through farmer-managed trials to integrate production systems (i.e crops, animal production, soil-water management, agroforestry, etc.), both at primary and secondary villages. The problems associated with the identification of new villages and the institutionalization of FSR programme within the respective NARS, were discussed.

With regard to evolving an appropriate FSR theoretical and practical framework, it was recommended that such issues should be further elaborated at the FSR conceptual unity meeting scheduled to take place on 2nd March, 1987.

REPORT ON THE FSR MONITORING TOURS
(20 September - 4 October 1986)

I. FIELD VISIT OF THE SAFGRAD/CAMEROON FSR
(22 - 24 SEPTEMBER, 1986)

First the team was welcomed by chief of IRA Centre, Maroua and then the FSR team visited the experimental site of IRA at Mouda (35 km from Maroua office on Maroua-Garoua road). Chief of IRA, Maroua Centre introduced the Head of Forestry Section who explained the various activities of agro-forestry research. The major focus of the project activity was to establish useful trees and food grains production systems. Another field experiment of particular interest was the soil conservation activities which was going on for the last two seasons on the undisturbed soil. The experimental approach, design and objectives were discussed .

During the field visit discussion also centered on-farm trials conducted by ACPO. Certain sorghum varieties were observed very promising. The multi-locational agronomic evaluation of sorghum, maize etc... carried out by the ACPO/programme is an important source of technology for the newly initiated FSR programme.

After visiting the soil conservation study, the SAFGRAD/ACPO, the entire team was taken to the main IRA research station at Guiring (6 km from Maroua office). Chief of the centre, explained the main activities of research farm and introduced various researchers who were involved in the activities. Though most of the cereal researchers were busy showing around the USAID/IITA team who also started their monitoring tour on 20th September 1986, the FSR team also visited the various activities of research being carried out at the farm.

Among the various varieties of sorghum and millet, the two short cycle varieties (S.35 for relatively low rainfall sahelian area and S.34 for slightly higher rainfall sudan savanna zone) are being extensively evaluated.

Along with Chief of Centre of IRA, Maroua and few researchers from IRA, on-farm trials (researcher and farmer managed) at Pitoa, Bidjouma, Baula Ibib and Ngong were visited. In general, it was commented the on-farm agronomic evaluation was extensive and similarly the socio-economic survey that stretched in the widely spread out geographical zone, should be limited to fewer areas. It was reported that socio-economic survey was not limited only to the SODECOTON farmers but also included non-SODECOTON farmers.

The team was taken to the SODECOTON office and were introduced to the Deputy Director and the SODECOTON officer in charge of on-farm trials. The Deputy Director of SODECOTON briefed the team about the various activities being carried out by the society in the North of Cameroon. The activities of SODECOTON is not limited only to cotton but also to increase production of food crops.

On the 24th September, 1986 another FSR site which is being carried out in collaboration with SODECOTON at Hamma Kossou was visited. There were two trials (one on maize and another on sorghum) on soil moisture conservation practices in Vertisol. Farmers' fields where sorghum was planted in the end of August and which matures on residual moisture (this is not planted sorghum which is called Muskwari) were visited.

DISCUSSION

After visiting various activities of SAFGRAD/FSR in nearby places to Garoua the team discussed the whole programme at length for about an hour.

The chairman (Director of research) gave brief comments and suggestions on how to improve the FSR activities. His main concern was:

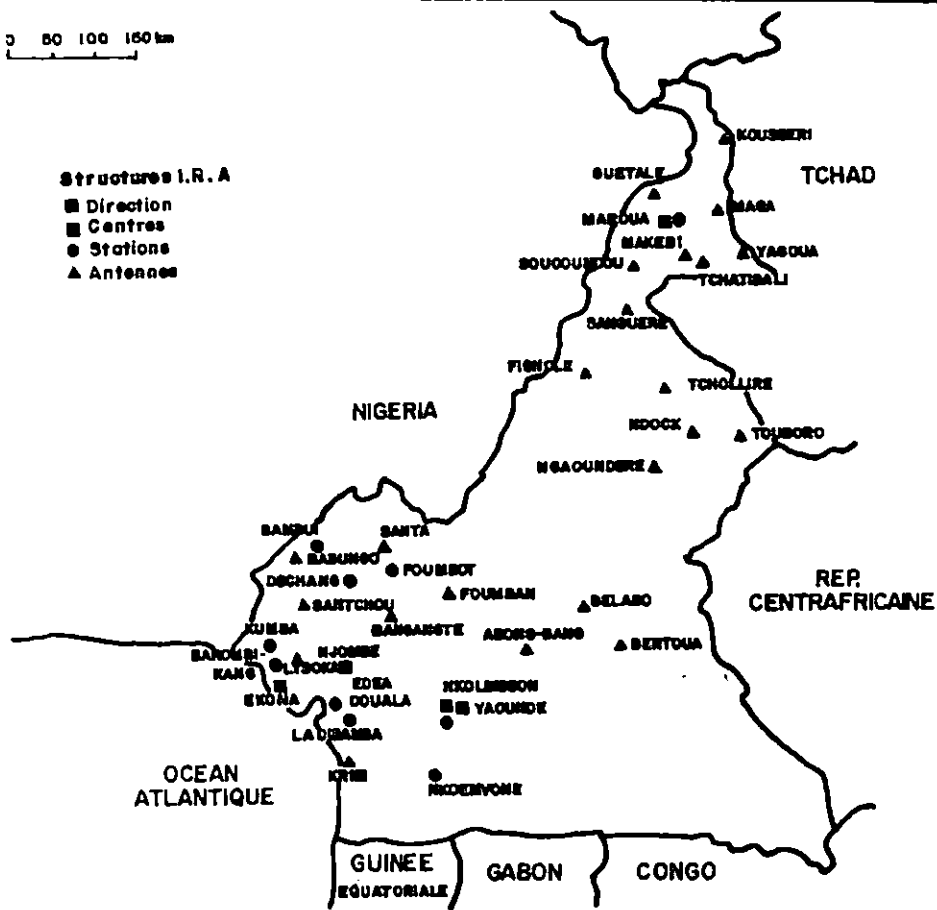
- i) non-SODECOTON farmers should be included in the entire study
- ii) reduction of the number of field trials
- iii) reduction of the areas of activities
- iv) other components of farming system
(i.e animal tractions, forestry, etc. should be gradually included as FSR activities.

CARTE DE SITUATION DES STRUCTURES

0 50 100 150 km

Structures I.R.A

- Direction
- Centres
- Stations
- ▲ Antennes



Some varieties of food crops selected by I.R.A.

Maize
 High altitude zone : *eeu*
 composite 290
 BACCA

Low altitude zone
 and Forest zone : EKOMA WHITE
 EKOMA YELLOW
 SHAKOKO TZPS 81

Sevensa zone :
 SUBAU TZS 81
 MEXICAN 17 EARLY

RICE

Irrigated rice : MBOS plain : OISADANE
 (700m) CIGA 8
 IYA 232

NDOP PLAIN :
 (1200m) B 2181
 IR 7167
 SEMRY (North) IR 48

Wet season rice : MBOS Plain : IRAT 10
 1045 I

IRAT 112
 IRIM 208

NDOP Plain :
 IRAT 112
 M 55

North East Season : IRAT 110, 112, 113
 IRIM 208

SORGHUM

North and Extreme North Province ; 534-535

MANIOC

High altitude zone : 3 clones: 7619, 7621, 7746
 Forest zone 6 clones: 8064, 8017, 8061, 8006,
 8084, 837

YAM

High altitude zone: *D. cayennensis* ex Batibo, *D. demeterum* ex Jhiri; *D. rotundata* ex Chio

Forest zone : *D. rotundata* ex Bembé and ex
 Mayuka

D. demeterum ex Mayuka (descriit ab
 des)

Adomoses : NGANE and BAKOKAE Varieties.

Varieties of sweet potatoes, Mabe and Plantela
 has also been selected and placed at the disposal
 of Users

I.R.A Publications :

Annual Reports.

"SCIENCE AND TECHNIQUE" Journal Agronomic and Zoo-
 technical Science.

Similarly, it was commented that areas of activities should be limited and work on animal traction, use of crop residues, tied-ridges and animal manure should be encouraged. Research work on animal manures is a long-term activity and need to be monitored on the same site in order to quantify long-term effects. Furthermore, it was pointed out of the need to concentrate research activities by limiting trial sites. It was suggested that FSR activities should lead to recycling resources among FSR components (crops, livestock, forage legumes, etc.)

II. FIELD VISIT OF THE FARMING SYSTEM RESEARCH PROGRAMME IN BENIN (25 September - 1st October, 1986)

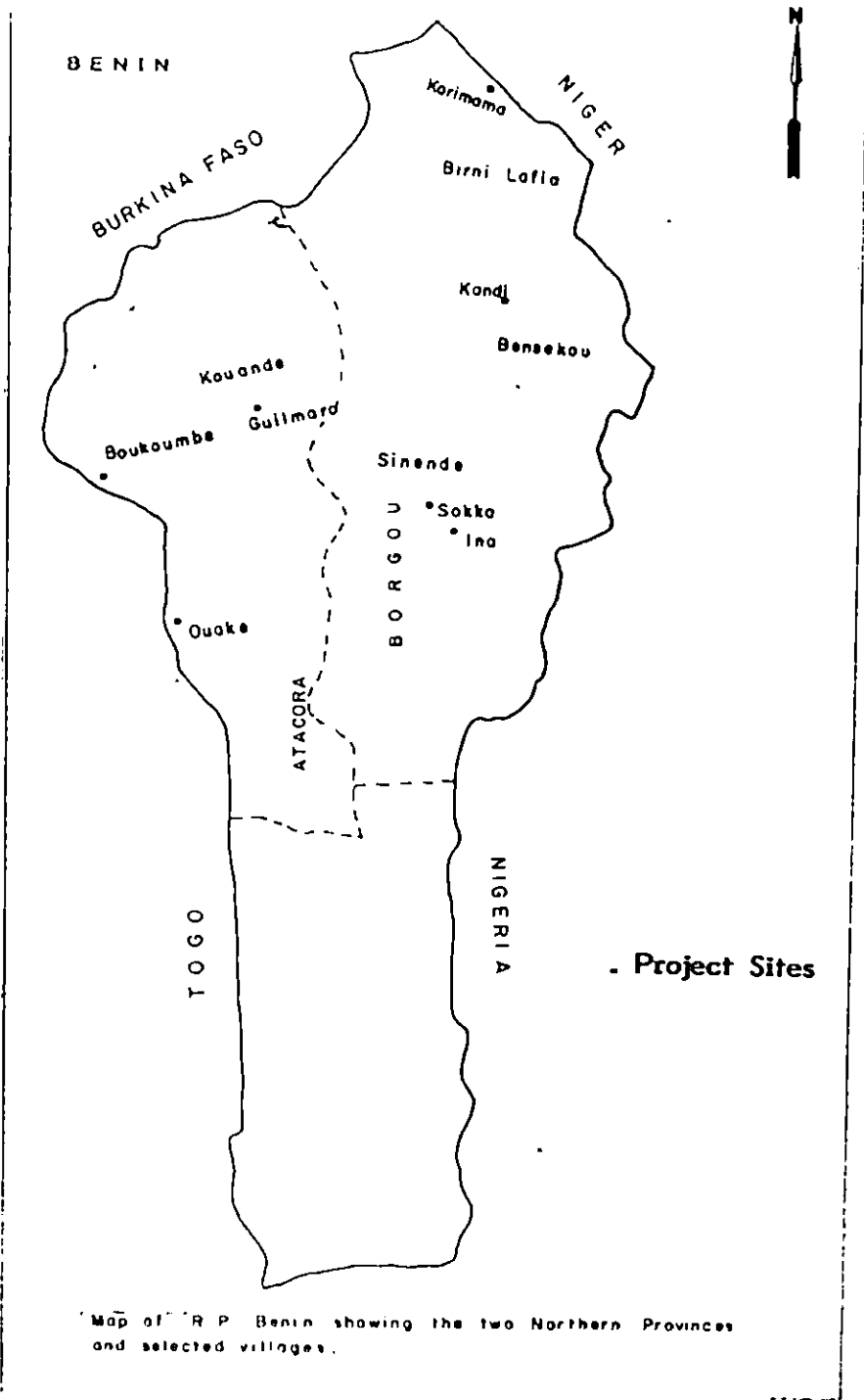
The visit to Benin took place from 26 September to 1st October, 1986 after visiting the Cameroon FSR Programme. (The programme of visit and itinerary is attached). Field visits were made to two SAFGRAD research sites (Bensekou and Sokka, respectively 170 and 35 km from Ina station in two agroecological zones) and one research site (Angaradebou) run by the cotton research programme of Director of Agronomic Research. One morning was devoted to the visit of Ina station-based research activities. Another visit was paid to the Director of CARDER-BORGOU (the extension agency). CARDER organizational chart and extension service were exposed.

Informal discussions among team members were conducted all along the visit period and a formal group discussion was held at Ina station in the afternoon of 29 September, 1986.

DISCUSSIONS AND COMMENTS

The Director of Ina station commented that:

Crop improvement still and to priority in research. Some maize material particularly TZB had been identified as promising. Emphasis was to develop short cycle varieties that were also resistant to streak. Sorghum research had not so far produced a suitable high yielding variety. Local variety yields were low (400-600 kg), but yield can be improved by cultural practices to about 1.000 kg/ha.



Map of R.P. Benin showing the two Northern Provinces and selected villages.

- Groundnut varieties 69-101 and RMP.91 had been released and had a high yield potential under normal rainfall condition. These varieties did not however perform well under erratic rainfall which had prevailed since 1981. Cowpea variety TVX 1850-01 was promising with yields as high as 1500 kg/ha provided recommended frequency of insecticide spray was employed.
- Efforts were being pursued to collect many local clones of cassava and yams and current trials compare alternative land preparation practices (mounds vs ridges). Two documents, the 1986 field trials and the socio-economic programme and a map indicating the location of SAFGRAD research site in Northern Benin were distributed. The following comments were made after the field visits.

Dr Taye Bezuneh

The concern of SAFGRAD Coordination Office was to initially develop in Northern Benin an appropriate cotton based farming system. Available funds should be used efficiently including the provision of research support facilities to back up the conduct of thematic research, given the particular situation of research in Northern Benin.

Dr Prudencio

FSR means more than designing improved technologies for the farmers. It has to start with the identification of farmers' constraints and move on to design and implementation of field trials as a response to the identified constraints. A lot of work at the stage of constraints identification, delineation of zones and others studies could be done through collaborative link with the Faculty of Agronomy students (majoring in agricultural economics), in order to save SAFGRAD researchers' time for other field activities. The effect of cotton production on soil fertility in Northern Benin was an interesting research topic for on station work given the importance of cotton.

Dr Kassu Yilala

A number of strong points can be pointed out to the Benin programme:
 (1) commitment of the national research to the objectives of SAFGRAD

FSR programme; (2) no land constraint on farmers' production means possibility to develop a completely integrated FSR programme (crop and livestock production); (3) farmers' own initiative to use animal traction will facilitate the development of that technology in Northern Benin. (4) Farmers' association was in the case of Bensekou, to be explored as a potential mechanism for the transfer of improved technologies.

As to the weakness of the programme, it was pointed out: (1) shortage of personnel (in reference to the agronomist and agroforestry specialist position not yet filled), (2) the programme being stretched on a very wide study area (distances between sites are too large); there is strong emphasis on cropping systems.

Suggestions to improve the programme: (1) attention should be paid to the activities of herders who are settling, in particular, the crops they grow; and research is needed to identify and determine the conditions required for their transition from herding to semi-sedentary life. (2) The experiment at Angaradebou. (Cotton based production system involving rotation sorghum, peanut and maize) needs to be followed up with research aspects integrating forage legumes in the system. (3) The need for adequate laboratory facilities to support some aspects of the agroforestry work.

Dr Tadesse Kibreab

As land constraint was not a problem at the moment, it was better to develop research programme with assumption of increasing population pressure in mind for Northern Benin. Soil conservation problems for Northern Benin should be looked of more carefully: the problem was not the initial level of fertility but rather how fast fertility depletion occurs, and some emphasis should be given to legume crops which are a link between cropping and soil fertility restoration. Our research effort should aim at stabilizing crop yields and a satisfactory use of resources.

Dr Ngambeki

Issues of methodologies could be dealt at length. The failure of the on-farm sorghum variety test should serve as a lesson and help the scientists to review methodology. There was no need to rush with on farm variety adoption tests if multi-location trials have not been conducted for two/three years.

Dr Kamuanga

In agreement with the comments by Dr Prudencio on the proper role of on-farm trials, the issue of FSR methodology needs to be addressed by SAFGRAD. A conceptual frame work had to be discussed among all and some basics agreed upon. For instance (1) the importance of exploratory survey, its duration and the tools to do it; (2) the identification of farmers constraints and the design and implementation of trials perceived as opportunities to address these constraints (3) the role of collaborative institutions etc...

Dr Taye Bezuneh

Commented on the future activities and mechanism for examining the methodology and approach of each FSR programme. The In-House FSR-Review and Project Management meetings are scheduled to take place sometime in March 1987. A workshop in Parakou, Benin was considered.

In summary the following suggestions and observations were made with regard to the Benin FSR programme:

1. The lack of land constraint in Northern Benin works in favor of a fully integrated FSR programme. (Cropping and livestock systems). The potential for widespread use of animal traction also exists.
2. Soil conservation and maintenance of soil fertility should receive particular attention.

3. There is an urgent need however to review many FSR concepts and their applicability to the particulars of each country.
4. The Benin programme was still heavily oriented towards the cropping systems due to lack of expertise in other areas.
5. It was also proposed that research support for Ina should include some modest improvement of the station, in terms of basic facilities, which are absolutely necessary for effective FSR work.
6. The cooperation with the nationals and the integration of the SAFGRAD FSR programme to the Ina research curriculum were highly commendable.

III. VISIT ^{to} (OF) THE SAFGRAD BURKINA FASO FSR

The SAFGRAD/FSR monitoring tour team arrived in Ouagadougou on October 1st, 1986 at 9.00 p.m. First the team was welcomed by Director of INERA at 9.00 a.m on October 2, at head office in Ouagadougou and he thanked SAFGRAD for making such tour possible. He indicated that substantial research results had yet to be adopted under farmers' environment and socio-economic conditions. The role of FSR could be, therefore, to narrow the yield gap. Under INERA two FSR teams have been launched:

One is based in Kamboinse covering the Central Region
The second is based in Farakoba covering the Western region.

The Director outlined the organisational structure of INERA and mentioned that the institute was charged with the full mandate to carry out agricultural research in Burkina Faso, under the Ministry of Higher Education and Scientific Research. The National Council of Scientific Research and Technology, with members from several ministries, outlined the orientation of agricultural research.

INERA had recently been restructured. It has eight research programmes and FSR is one of them. Regional research centres, to emphasize research work on priority areas, reflecting the major

agricultural practice, and staple food crops have been initiated.

The Kamboinsé research station is planned to be a coordination station where training and laboratory facilities would be improved. The NFSR and soil fertility programmes would be based at the station.

The team also briefly visited the head of NFSR programme in Kamboinsé. The role of the NFSR programme was further elaborated with major focus on linkages with research and development partners. The structure of the Rural Development Organisations was also elucidated.

The team after making courtesy call to office of the station at Kamboinsé, proceeded to visit the FSR field trials.

The trials visited composed of

- . cereal/legume intercropping
- . grain legume mono-cropping
- . forage legumes
- . multipurpose shrub and tree establishment.

The objectives of the trials, with emphasis on multipurpose legume associations gain legumes and forages as a link to crop and animal production systems. Due to lack of time, only one primary village site was visited by the FSR team. Kamsi, 100 km West of Koudougou was visited. The rationale and the criteria used to select representative was pointed out. One of the major determinant factor was the rate of out migration from the region. Four centres of high migration rate were identified in the Mossi Plateau. Another important consideration in selecting sites, was the animal population density. A survey of several villages in each area was conducted by the NFSR team and the staff of O.R.D in each region. As a result three primary village sites were selected.

Yalka in Ouahigouya area,
Kamsi in Koudougou area,
and Kamsaoghin in Koupela region,

The NFSR team concentrated its activities on the three primary village sites. The team further collaborated in investigations on secondary village sites where the O.R.D took primary responsibility.

The team also visited the fallow field experiments and researcher-managed trials on farmers' fields. The research activities included :

- . alley cropping of *Cajanus cajan* on broader strips;
- . forage legume oversowing on natural pasture;
- . perennial legume shrub planting: *leucaena leucocephala* and *Cajanus cajan*;
- . tree planting along borders;
- . grass forage trials;
- . intercropping of *Dolichos lablab* with sorghum;
- . silage and compost making.

The potential of integrating forage legumes, cereals and multipurpose shrubs on a given site for food production, animal feed and soil restoration was discussed.

The agronomic technology evaluation work consisted researcher managed trials on several farmers' fields. Treatments composed of tied-ridging with and without fertilizer application. The crops considered were: maize, millet, white sorghum, red sorghum, cowpeas, peanuts and bambara nuts. For each intervention recommended varieties of crops were planted along with local varieties grown by farmers. Maize was already harvested. Sample locations of each crop were visited.

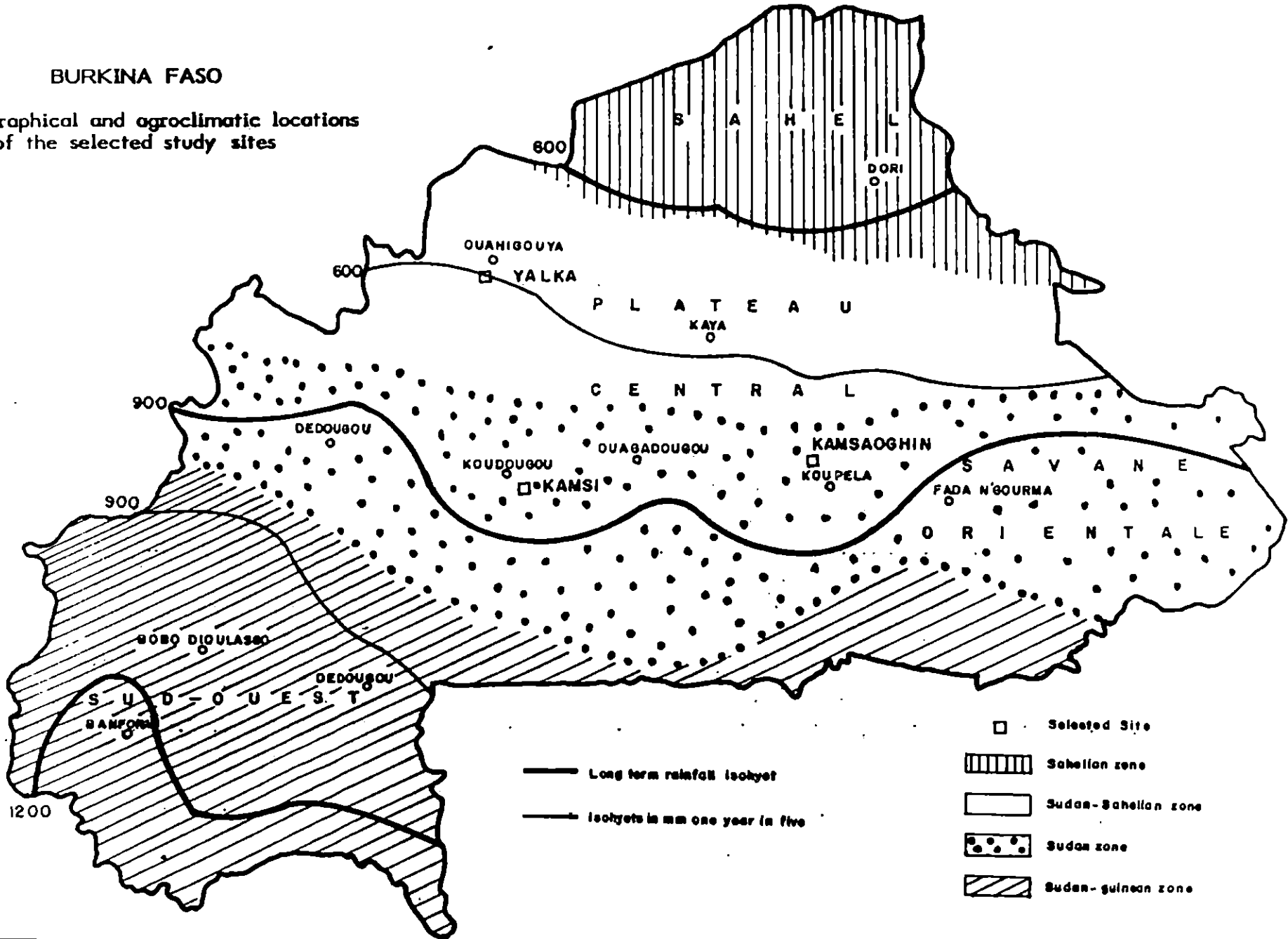
SOCIO-ECONOMIC SURVEY

On-going activities on socio-economic survey of sample farmers were presented and discussed.

After field tour, the team met at the Coordination Office on 4 October 1986. The objectives of the meeting were:

BURKINA FASO

Geographical and agroclimatic locations of the selected study sites



- . to further exchange views in improving the on-going FSR country programmes;
- . to enhance the integration of the technical and administrative aspects of the programme into the national framework.

It was pointed out by chairman that previous experience of FSR in Burkina Faso by FSU, ICRISAT and IRAT was relevant and the NFSR programme should draw experience from these. The IFAD-FSR support started at a crucial phase at the time INERA created the NFSR to serve as pivotal link among the other research programmes.

Regardless of various constraints encountered, the 1986 FSR activities was successfully launched in the three primary villages.

COMMENTS ON BURKINA FASO NFSR PROGRAMME

1. The experimental site of the FSR at Kamboinse research station is on a degraded soil and the attempt of the team to regenerate its fertility and arrest the rate of erosion by building dykes is positive. The site needs to be retained for long term research study.

- . The on-station research work apparently did not introduce soil conservation techniques in order to minimize soil erosion. FSR needed to interact with other research programmes in order to reduce the rate of soil degradation.

- . The type of fertilizer applied on the sandy soils (low buffering capacity) need to be carefully chosen to avoid long-term acidity.

2. On fallow land and on-farm trials

- . The overall activities of the programme indicate each component was well conceived and has clear objectives;
- . the activities on the fallow field showed the anticipated integration of crops and animal production systems and was commendable. At the moment, however, the agronomic activities on the fallow field were lacking. A design in

which each component is incorporated on the same unit taking into consideration the requirements of the farmers was of paramount importance to achieve the goal of the NFSR programme.

- . The output of one component is expected to serve as an input to another. This hypothesis needs to be tested to formulate a clear conceptual framework. In order to carry out such work the sites need to be retained for several seasons so that the long term effects could be quantified.
- . As regards integrating all the components on the same unit, the concept was accepted, but due to the delay in acquiring the fallow land, some of the agronomic and water management could not be conducted this year. These will be included during the following season.
- . The team hoped to retain the sites for the intended long term activities.

GENERAL

An important issue that surfaced during discussing on the FSR programmes of the three countries, was to elaborate in greater depth what is understood by integration of farming system both at conceptual level and practice. The major approaches are being pursued to test this hypothesis. At field level this includes:

1. Researcher managed trials on primary village sites where multidisciplinary research comprising of different production systems (i.e crops and animal production, soil-water management, soil fertility, forage legumes, and agroforestry practices) are evaluated on fixed primary village site. This approach enables one to monitor input and output flows and interactions of systems of production with regard to recycling of resources for improving the resource base for productive agriculture. Economic complementarity among systems of production could also be investigated. Since various promising research results are being verified on-farmers field, this can be considered as "packaging phase".

2. Farmer managed trials - Concurrently, promising technologies not necessarily "in package" could be evaluated by the farmers extensively at primary and secondary village sites.
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SAFGRAD FARMING SYSTEMS RESEARCH PROJECT

FSR TOUR IN CAMEROON SEPTEMBER 22-24, 1986

PROGRAMME OF VISITS

-
- 22 /9/1986
- Arrival of visitors at Maroua airport
 - Lunch at Maroua airport (by courtesy of Mr. Boli.Z. (Chef de centre)
 - Visit trials at Mokolo Road (by courtesy of Mr. Jerry Johnson)
 - Visit Mouda water shed and Gazal trials (by courtesy of Messrs Seiny and Eyog)
 - Visit Guiring research farm, Maroua
 - Accomodation Novotel Garoua.
- 23/9/1986
- 7.00 am - Visit Pitoa field trials
 - 9.00 am - Visit Badjouma field trials
 - 10.00 am - Visit Boula Ibib
 - 11.00 am - Visit Ngong field trials
 - 13.00-15.00 pm - Break
 - 15.00 pm courtesy call at SODECOTON
 - 16.00 - 18.00 pm discussion: Venue IRA office - GAROUA
- 24/9/1986
- 8.00 am - Visit Gachiga and Hamakoussou field trials.
 - 12.30 am - Break
 - 14.00 pm - Depart
-

AFGRAD FARMING SYSTEMS RESEARCH PROJECT

FSR TOUR IN BENIN SEPTEMBRE 25-30, 1986

PROGRAM OF VISITS

THURSDAY 25 SEPT.

4 pm : SAFGRAD FSR teams from Cameroon and Burkina Faso arrive in Cotonou
Accommodation at Hotel Croix du Sud.

FRIDAY 26 SEPT.

8 :30 am : Courtesy visit to the DRA
Meeting with Professor ADJAHOSSOU

1:00 pm : Administrative arrangements and free time

5:00pm : Departure to Parakou (Air Benin)

6:30pm : Accommodation at Hotel "LES ROUTIERS"

7:30 pm - 8pm : Presentation of the Benin SAFGRAD Program by the Director of Ina research station and Dr. KAMUANGA.

SATURDAY 27 SEPT.

8:30 am : Teams leave Parakou for Bensekou (SAFGRAD research site) and Angaradebou (research site for cotton based production systems).

8:00 pm : Return at Parakou.

SUNDAY 28 SEPT :

8:30 am - 12am : Visit to sokka (2nd SAFGRAD research site)

AFTERNOON : Informal discussion and free time

MONDAY 29 SEPT.

9:00 am : Teams arrive INA research Station
Morning : Visit the research station
Lunch (Courtesy of Director Ina) and video projection of Ina station and SAFGRAD research activities.

3:00 pm : Group discussions, review, comments and synthesis at Ina Station.

.../...

TUESDAY 30 SEPT.

8 - 8:30 am : Courtesy visit to CARDER
 11:00 am : Leave for COTONOU (by road)
 5:00 am : Teams arrive in COTONOU, accomodation at
 Hotel "Crois du Sud"
 8:00 pm ; Diner at Croix du Sud
 Courtesy of the Director of Agricultural
 Research.

WEDNESDAY 1 OCTOBER

Morning : Informal discussions and other visits
 7:00 pm : FSR teams depart for Ouagadougou./-

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SAFGRAD FARMING SYSTEMS RESEARCH PROJECT

FSR TOUR IN BURKINA FASO OCTOBER 1-4, 1986

PROGRAMME OF VISITS

-
- October 1st, 1986 : Arrive in Ouagadougou
- October 2, 1986 :
- 8.30 am-10.00 am Meeting of scientists with Director
of Research INERA - Ouagadougou
- 10.15 am-12.00 Visit Kamboinsé research station
Briefing on Institutional linkages of NFSR
programme by the national coordinator
- 14.30-17.00 pm Discussion of Benin, Cameroon FSR programme
Scientists with SAFGRAD Coordination Office
- October 3, 1986
- 8.00-10.30 Visit of FSR trials at Kamboinsé research station
- 11.00-14.00 Trip to one primary village site Kamsi,
Koudougou
- 14.00-17.00 Visit FSR research activities in Kamsi
- 17.00-19.00 Return to Ouagadougou
- October 4, 1986
- 8.00-12.00 Discussion on FSR programmes based on the
monitoring tour observation
- 15.00-17.00 Follow up discussion
-

PARTICIPANTS

Dr Teye Bezuneh	Director of Research, SAFGRAD
Dr Tadesse Kibreab	Soil scientist and team Leader FSR/Burkina
Dr Kassu Yilala	Animal Scientist FSR/Burkina Faso
Dr Y.C, Prudencio	Agricultural Economist/FSR Burkina Faso
Dr Adama Sohero	Eng. Agronome FSR/Burkina Faso (National Representative)
Dr Mulumba Kamuanga	Agricultural Economist FSR/Benin
Dr Adamou Moustapha	Director INA/Benin
Mr Boli Zachee *	Chief of IRA Centre/maroua
Mr Seiny Boukar *	Soil Scientist IRA/Maroua
Mr Eyog*	Forester IRA/Maroua
Mr Paul Asfom*	SODECOTON Representative
Mr Ngono*	Antenna Coordinator IRA/Maroua
Dr D.S Ngambeki	Agricultural Economist FSR/Cameroon
Dr L. Singh	Soil Scientist FSR/Cameroon

* Participated in the monitoring tour of Cameroon FSR only.

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