

UPPER VOLTA
VOLTA VALLEY DEVELOPMENT (686-0222)

TECHNICAL GUIDANCE REPORT

MARCH 1980

Submitted to:

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I. Brief Overview of AVV

The Volta Valley Development Authority (AVV) was created by the Government of Upper Volta in September 1974. It was created as a public establishment having an industrial-commercial character and financial autonomy.

The aim of AVV is to develop the under-populated zones of the Red, White and Black Volta Rivers and tributaries. These zones were defined in January 1976 and are under the sole control of AVV.

AVV is responsible for the studies, coordination and implementation of the operations necessary for economic and social development within these areas. It is through the AVV that all multilateral and bilateral aid is channeled.

The present structure of AVV includes: Director Generals Office; Financial and General Management Office; Planning, Programming and Agricultural Experimentation Section, Works Service, and the Extension Service. A pluri-disciplinary committee comprised of the donor representatives is working with the AVV in order to better deal with the various problematical aspects of development.

II. AVV Farm Model & Technical Package

A. Description

The present AVV Technical Package is based on the premise that all preparations have been made prior to the arrival of the new settlers. This includes roads, a warehouse, a school, a dispensary, 2 wells and houses for the extension agents (male and female), health workers, and veterinary assistant. Within the first year of the settlement a mill and water points for the livestock will be added. A village consists of 25 to 50 families. Each block is to average 7 villages and each sector varies from 2 to 4 blocks. Each sector consists of a minimum of 500 to 700 families. The size of the villages, blocks and sectors is dependent on the amount of arable land available.

The size of the AVV farm is to be dependent on the number of full time farm workers in the family. An adult male worker is the basic unit used in this computation. Extra large families (more than six (6) adult workers) are given two adjoining house plots in the village and two sections to farm (each section being $1\frac{1}{2}$ ha.).

On arrival in the village the farmer is given a one hectare plot to be used as a family garden and housing compound.

He is then given two $1\frac{1}{2}$ ha. areas in two separate fields that have been designated by the AVV.

These fields, which are for the entire village's cotton or sorghum crop, are approximately 75 hectares each. The farmers clear one field by traditional means. The AVV will then come in with the heavy equipment and plow that field and clear and prepare another field of approximately 75 hectares to a depth of 15 to 20 cm for planting. AVV also harrows and lays out the rows. Both fields are then ready for planting. The planting is done in rows by hand. Each field will be mono-cropped. One field will be planted in cotton and the other will be planted in sorghum. Each additional year the farmer is given approximately $1\frac{1}{2}$ hectares of new land to cultivate for four consecutive years, thus completing the AVV farm model. The new land is cleared by the farmers but the AVV plows and prepares it for planting. After the initial plowing done by AVV the farmer is to plow all fields with oxen that he purchases on credit from AVV after his first harvest.

The AVV crop rotation system is:

<u>Field 1</u>	<u>Field 2</u>
1st year Cotton	1st year white sorghum
2nd year $\frac{1}{2}$ corn - $\frac{1}{2}$ cowpeas	2nd year cotton
3rd year $\frac{1}{2}$ cotton - $\frac{1}{2}$ white sorghum	3rd year $\frac{1}{2}$ red sorghum or corn - $\frac{1}{2}$ cow peas or peanuts
4th year fallow fallow	4th year cotton white sorghum
5th year fallow fallow	5th year fallow fallow
6th year white sorghum	6th year fallow fallow

The AVV gives each family on arrival the basic tools that are needed - 1 hatchet, 1 machete, 1 pick-axe, 1 shovel, 1 file, and a seeding rope. After this initial issue the farmer is responsible for the maintenance and replacement of his tools.

AVV recommends one thinning for the crops and at least two weedings and ridgings. The first year this is done by hoe but in subsequent years animal traction is used.

Cotton is to be sprayed at least four times with 10 liters of Endrine, DDT, methyl-malathion per hectare. After manual harvesting, the seeds that the farmer will use the next year are to be treated with THIORAL.

The food crop is protected with Actelic before it is stored in traditional granaries at the farm. If a crop has failed due to no fault of the farmer, insurance is provided to cover the cost of inputs actually used on the crops or portions of the crops that cannot be harvested. Cotton seeds are provided free to the farmers by the C. F. D. T. (Compagnie Francaise pour le Developpement des Fibres Textiles) and are renewed each year.

Seeds for the other crops in the AVV rotation can be purchased at the AVV bloc warehouse. Sorghum and cowpea seeds are renewed every three years. Peanuts are renewed each year.

The AVV recommends fertilizer be applied at the time of planting at the rate of 150 kgs. of N-P-K (14-23-14) and 50 kgs. of urea.

Each farmer is assessed 500 CFA per year for rent of the chemical sprayer. After the first year's harvest the farmer must purchase a pair of draft oxen from the AVV and a yoke, plow, triangle, and ridger, under a seven year credit scheme. This credit loan is serviced after the second harvest and each subsequent harvest for a total of seven years. Installments due are approximately 1/7th of the principal plus interest of 8%. The AVV recommends that the farmer sell his oxen after four working years at a theoretical gross profit of approximately 102%.

The first loan service payment (after second harvest) includes insurance on the oxen for as long as the farmer keeps them as working draft animals. The farmer pays for the needed veterinary care for his oxen at a nominal fee set by the GOUV. All of the farmers' fields except the home garden are plowed for him by AVV the first time they are put into production. Each subsequent year it is to be done by the farmer with animal traction.

The AVV technical package contains the following innovations that the farmer must master as quickly as he can: credit, animal traction; high yield, improved seeds; mono-cropping; row planting; weeding, and ridging practices; fertilizers and insecticides. He is to be assisted in adapting these innovations to local conditions by the extension workers.

B. Evaluation of Technical Package as Performed at Village Level

The technical package does not have an adequate system which is flexible and can accommodate the needs of all the farmers. The great variety of soils present in the different blocks requires accurate testing for fertility.

The present level and "type" of fertilizer is inadequate and seems geared only to the production of cotton without regard to the cereal crops planted in subsequent years. The same can be said of the blanket use of pesticides and insecticides. There is no ongoing field testing at village levels to insure that the applications are timely or actually needed. This is uneconomical and does not bring about the desired effect of maximum yield.

Further, the effects of the use of pesticides and insecticides can be harmful to the health of an unskilled user. The long-term effects on the environment of the chemicals are not well documented in this country.

The heavy machinery now being used for land clearing, deep plowing and pre-planting operations is too costly and has a negative effect on the soils -- compaction, soil erosion, excessive runoff. Heavy machinery should only be used in extreme cases and highly selectively since they show little regard for the top soil or its depth. This is inappropriate technology and is counterproductive. The agricultural potential in the areas which have shallow soils is being destroyed.

The two-year fallow period is not a good agronomic practice given the environmental and climatic conditions in Upper Volta. It contributed to the loss of top soil and reduces soil fertility. The fields should be sown with a leguminous crop for human or animal consumption. Excessive water runoff and erosion would be checked and the fertility of the soil would be increased.

The practice of row-grown cotton with clear-cut furrows is not recommended due to the increased water runoff and loss of water infiltration which results in excessive loss of topsoil and reduced fertility of the soil. This seems to present a clear case for intercropping or skip row planting of legumes. The plan for the production of cereals seems inappropriate in that no equipment is available to insure proper distribution of seed and proper placement depth in the seed bed. The seeding

rate is too high for dry land farming. Declining yields are to be expected if present tillage practices are not revised - light working of the soil before planting, intercropping, and incorporation of all crop residues into the soil after harvest.

The burning of fields after harvest must be stopped. All crop residues must be returned to the soil or serious depletion of soil fertility and excessive soil erosion will occur.

Not enough attention is being paid to the positive factors in the climate in Upper Volta. There is no encouragement of repeat or relay cropping, and double cropping is not observed. This is neglecting to capitalize on the natural environment which could be done with little or no additional cost to the farmer.

Provision must be made in the technical package for parameter plantings of improved pasture with legumes, perennial grasses and annual shrubs around each field. This would enhance the ability of the farmer to feed his oxen during the dry season, improve water penetration, prevent soil erosion, and increase soil fertility.

The entire technical package of AVV is based upon animal traction after the first year. The animals are not adequately trained and are often too sick at the time they are most needed. Animal traction must be given immediate attention and a better type of oxen should be purchased.

C. Recommendations

AVV should reduce the use of heavy equipment (Caterpillar D6's) to clear land and do initial plowing of the fields. This is too costly and is harmful to the heavy clay soils. These soils have the ability to self-till - this is evidenced by the deep cracks and fissures that appear after the rains have stopped (September-October).

A more specific fertilizer recommendation that is based on soil tests and analysis, balanced for individual fields and crops, would be more cost effective. The present fertilizer recommendation is too general. The practice of broadcasting (applying fertilizer by hand) while walking over the plowed, planted field is virtually useless. Fertilizer should be placed directly in the furrow, about 4" under the seeds or 4 to 5 inches on each side of the rows and buried to a depth of 4 to 5 inches.

AVV should help the farmers extend their growing season and increase their production by using early and late maturing varieties of crops, intercropping, relay cropping, and double cropping in some areas. The low lying areas should be exploited for rice crops, vegetable and fruit production.

The present cultural practices of mono-culture, row crops and clean cut furrows are underutilizing the environmental factors of sunlight and available moisture. The farmers are not realizing their true economic potential. These cultural practices are detrimental to the soils found in the AVV areas as the high winds that precede the torrential rains blow off top soil, then the rain hits the plowed, loose soil - surface between row crops and soil erosion is therefore immediate. These reasons are enough to warrant intercropping. When you add to this the increased yield of the intercrop per ha. and the economic returns of the inter-crop per ha., mono-culture is not economical. In addition, a side affect of intercropping is reduced crop risk to the farmer from insects and disease.

While animal traction is an improved and innovative addition to the overall agriculture sector it is evident that it is not functioning as well as it should. The farmer is faced with the multiple problems of new crops, new land, new technology and techniques and untrained animals after his first year on site. For animal traction to be of maximum benefit it requires healthy, well trained animals and an operator that is fully trained and sufficiently acquainted with the various methods and techniques that are needed for the difficult soils found in this area.

The AVV should utilize the scientific studies generated by its research and experimental section by including the valuable data which they already have on hand in the technical package.

III. Extension Service

A. Description

The extension service is going through a reorganization at present. The following description gives the intended structure.

The extension service will be composed of five sections:

1. Installation of new settlers with sub-sections for installation, transportation and rural radio service.

2. Development of Animal Husbandry with sub-sections for an animal health, animal production and Peulh animal studies.

3. Seed production and distribution.

4. Agricultural development with sub-sections for coordination of rural development, soil conservation, womens activities, agricultural supervision, and animal traction.

5. Areas section with subdivisions for Sector Infirmary & Veterinary Care, Administrative Unit, bloc school and warehouse, village warehouse, male & female extension workers.

Due to the general confusion reorganization has generated, I do not feel that a positive evaluation can be made at this time. I had several interviews with the AVV staff in these sections, expatriate and Voltaic and found that there is no general consensus of opinion in regard to the extension service.

B. Evaluation

An extension service exists and has been functioning in most the areas that have been settled. However, a chronic shortage of qualified experienced staff, funds, equipment for training, office space, transportation and lack of dynamic leadership exists and are recurrent complaints in all of the departments.

It is my opinion that the extension service is suffering from a lack of trained personnel at all levels, and has a real need for the following equipment in the headquarters at Ouagadougou and the following training centers.

C. Recommendations

It is evident that the least efficient section of the AVV is the training section. The reasons given by the section are lack of funds, facilities, training materials and qualified staff. Also, insufficient time is set aside for training and no provision exists for practical field experience.

The present practice of recruiting extension workers largely from urban areas should be discouraged. Recruitment should be from the villages and experience in farming and in living in a rural environment should be the criterion for selection.

There is a great discrepancy between AVV policy and the realities of work actually done on the farm. This shows a breakdown in extension services or deficiency in the caliber of the extension people at the village level.

I would recommend that the training of the male and female extension workers from "Chef du Bloc" down to and including the village level, receive a minimum of one year of training.

This training would be "learn by doing", practically oriented and conducted under field conditions when possible.

The extension workers would be given theoretical training by the various section heads at the centers. During the growing season the female extension workers would live with village families that have been settled 4-5 years and would be rated by the section chief of the area in progress made and competence.

The male extension workers would learn all aspects of agriculture, animal traction plowing, sowing, harvesting techniques and correct storage practices. They would also be instructed in the application of insecticides by the C. F. D. T. agronomist and learn to operate and maintain the chemical sprayer.

I further recommend that the center contact AID/W and request information on the extension service system being used by Malawi. It is considered by FAO and other international organizations to be one of the most efficient and effective in Africa.

D. Needs

1. AVV Headquarters in Ouaga

Conference room; audio visual equipment; film library, test books, technical manuals.

Research branch to study the effectiveness of the training program should be instituted.

2. Personnel

The present training section shows a need for 9 village level extension workers, a section chief, who should be a high level civil servant, two expatriate technical advisors-trainers

with wide experience, a functional literacy program coordinator, three training center supervisors (one each for Mogtedo, Kaibo and Diebougou) and a supervisor of training at Ouagadougou.

3. Equipment

Well-coordinated in-service training material - text books, scientific journals, audio visual aids - technical "How To" manuals.

Back-up organization - for Research in Methods effectiveness and advanced training.

Three mobile training units for field work - self contained with generator, visual aids, illustrated "How To" books.

4. Mogtedo Training Center

Classroom for 50 trainees; technical library; text books; dormitories; mess hall; classroom equipment for practical training in agronomy, horticulture, animal traction; dispensary; field plots for agronomic instruction, and a house for the head of the center.

5. Kaibo Training Center (unobserved but discussed with AVV personnel)

Huts for the trainees; library of technical books and journals, dining facility, out buildings for equipment & storage, equipment for practical training.

6. Diebougou Training Center

Unobserved and not discussed.

IV. Research - Koulipele

A. Description

The AVV has a research center located in the Koulipele Sector (Kaibo North, Kaibo South, and Manga East) that is to provide the development section with agronomic information as regards agricultural production technology in order to determine an effective, viable and profitable agricultural policy in actual farm conditions. This research center has the following means at its disposal for the execution of its tasks:

- contacts with other research organizations and connected projects;
- support agronomic experimentation; and
- a fully qualified and competent staff.

During a brief visit to this station I was able to tour the facilities and see the area used for experimental purposes. The land was not under production as the harvest season had finished in September/October but some cotton was still standing.

The agronomic experiments and research underway and planned is in four main areas:

1. Rain fed crops in general with studies being done under optimal conditions of all soil types and climactic conditions found in AVV areas - and rain fed crops under actual farm conditions by simulation of actual farms, trials of new inputs before introduction to the AVV technical package, and observations on nine farms in order to compare with the simulated farms mentioned above.

2. Water management - this includes surface run off and internal drainage; tillage experiments to determine practices needed for all types of soil found in AVV areas; crop diversification and their application within a new crop rotation system, which includes several new varieties of millet, rice, peanuts, sun flower, sesame, soy bean and mung bean.

3. Soil fertility and response curve on N, P, K. under optimal and actual farm conditions for rice, soy bean and cotton. Incorporation of crop residues on corn and cowpeas - improved fallow using stylo, pidgeon pea, cowpea and mung bean. Crop compatibility for inter-cropping of corn and sorghum with cow peas and mung beans.

4. Agronomic Practices and Cultural Techniques - this includes: seed bed preparation, dates and methods of sowing, thinning practices; weeding by hoe and animal traction; and herbicides. These tests are for economy of time and input using traditional vs. improved methods.

B. Evaluation

This station is well staffed with qualified and competent staff. The experiments are well designed and executed - they meet all scientific criterion.

C. Recommendation

The scientific data generated at this station is of a high quality. It should be acted upon by the AVV directorate immediately. There is no evidence of this important information being instituted at the village level in the other AVV areas as of this date.

V. AVV Research Station - East Sondre Livestock Center

A. Description

This center is charged with the program for the improvement of animal production and grazing land improvement in the AVV areas. A tour of the center and discussions with the staff was informative and enabled me to identify some of the research that is being done.

B. Evaluation

I believe the thrust of the program is the concern for the inter-relationship that exists between the bi-annual migrating Fulani (Peulh) herds and lands that will be under permanent agricultural production, the improvement of cattle used for animal traction on the AVV villages, and the small livestock (sheep, goats, pigs & fowl) that a major portion of the nutrition value and economic importance to the farmer and nomadic people (Peulh) in and adjacent to AVV areas.

The studies as explained to me include: Fulani (Peulh) traditional cattle breeding, breeding and maintenance of bullocks for traction, rural cattle breeding, small livestock studies (sheep, goats, pigs, fowl) specific problems of livestock in the AVV areas, uses of animal traction, supply of animals for the farmers, animal nutrition, health and economics. Agricultural and livestock as related to mixed farming, development and improvement of grazing land, fodder crops production and management.

Some of the studies carried out at this station are outside of my area of expertise. However, I feel they are important to AVV as well as to the national agricultural development scheme of Upper Volta.

C. Recommendations

I am confident that these studies are well designed and should meet scientific criterion.

It is my recommendation that this station be strengthened and the data generated here be incorporated as soon as possible to the AVV Technical Package.

VI. ICRISAT Research Station at Kamboinse

A. Description

In addition to the two AVV experimental stations discussed above the International Crops Institute for the Semi-Arid Tropics (ICRISAT/ UNDP) maintains research staff and facilities at the Kamboinse Agricultural Research Station. At present they are conducting research on agroclimatology, soils, soil moisture, sorghum, millet, cowpea agronomy, intercropping studies, soil management trials and studies on maize, sunflower, grass and legume forages, and wheat.

B. Evaluation

These studies meet all scientific criterion and are conducted by qualified, competent staff.

C. Recommendations

I recommend that AVV formalize relations with this organization and implement their recommendations into its (AVVs) technical package.

VII. Conclusions

AVV says it is currently evaluating the data and experience gained over the past six years and translating this into a more flexible "Integrated Systems" strategy.

The problems that AVV has encountered in its takeoff phase and criticisms of its intervention methodology are being discussed and resolved with the help of the various donors through the Pluri-Disciplinary Committee. However, it is

still the stated policy of AVV that expatriate technical experts can not institute new practices or policy. This can only be done by a Voltaic person. Now this practice is not likely to change but there is a tremendous amount of time spent in getting well trained people in policy making and implementation positions to realize the reasons for some scientific practices.

Decision-making is too concentrated in Ouaga and in the hands of too few people and there are numerous instances of time being wasted due to the inability of field personnel getting a decision from AVV headquarters. Also there is no mechanism which could permit field people to actively participate in the decision-making processes or to respond to emergencies in the field.

The resettlement policy is not flexible or open enough to encourage alternative approaches to settlement with varying degrees of "control".

AVV, in my opinion, does not collaborate enough with other GOUV agencies and is not willing to capitalize on spontaneous migrants at this time. It seems desirable to me that AVV should coordinate its activities closely with those of other GOUV agencies.

It is apparent to me that the present cost of resettlement of one AVV family (approximately 15,000 \$U. S.) is unacceptable from an economic point of view. AVV should focus more attention on spontaneous or self-selected migrants. It is evident that they are now moving into the AVV lands and adjacent areas at a rate of 3 spontaneous migrant families to 1 AVV family. Including spontaneous migrant families in AVV would represent a considerable savings, and should not be seen as a threat to the authority of AVV as is the case at present.

AVV does not appear to have the capacity to absorb the vast amount of scientific research being done by AVV experimentation department and other research centers. I feel that much available advice is not being acted upon. Also too much time elapses between availability of scientific data generated in-country and utilization of this information.

I feel after talking to various levels of AVV personnel that the AVV must involve itself in instituting new social attitudes toward work and rural life.

The strong points of AVV include six years of valuable resettlement experience, the large amount of scientific data it has acquired, its organization, personnel and a determination to accomplish its objectives.

The weak points are lack of sufficient funds to enable it to plan its strategy over an extended period of time, a continuing need for more and better qualified extension workers, lack of coordination between departments within AVV and the lack of a cooperative, reciprocal working relationship with other GOUV agencies that should provide services such as health, education and veterinarian services to areas under AVV control.

Annex ATime Table of Recommended Changes

As mentioned in the body of this report, these areas of concern are being addressed by AVV. However, USAID should monitor and evaluate the progress made in these potential or presently existing problem areas. This could be done by informal meetings with the pluri-disciplinary committee and interviews with heads of the sections concerns.

Technical Package and Agronomy

1. Too much emphasis on cotton to the detriment of food crops - indeterminate
2. Non-respect for AVV's technical package by farmers with the results that inputs are below recommended levels - indeterminate
3. Rotation improvement - This should be reviewed and some new crops introduced within 2 years
4. Alternative types of insecticides to replace Endrin-D. D. T. , Malathion - indeterminate
5. Application of dry land farming techniques within 3 years
6. New fertilizer recommendation to be made within 2 years
7. Practice of soil sampling to be adopted within 2 years
8. Model farms to be set up at bloc level within 2 years
9. Improved type of implements - animal traction seeder - harrow, plow to be put to use within 2 years
10. Improved type of oxen for animal traction to be made available within 3 years
11. Inter cropping to be introduced within 1 year
12. Improved fallow methods using legumes to be in use within 2 years
13. New tillage system using minimum till, plowing after harvest, and incorporation of crop residues into the soil to be in use within 2 years
14. Annual burning of fields must be stopped as soon as possible - #13 can help prevent this being done
15. Development of low lying areas for rice and fruit trees within 2 years
16. Fruit & Shade Trees to be planted in family compounds within 2 years
17. Improved pasture for cattle, goats & sheep to be developed within 2 years
18. Soil erosion - The above practices should reduce soil erosion by 50% within 2 years
19. Reforestation - This must be monitored on a yearly basis and emphasis placed on planting fruit trees within ? years
20. Deep plowing and ripping of heavy soils, and in removal of large trees should be discontinued within 1 year.

Annex A (continued)**Extension and Training Units**

1. Extension of Training Period from present 2 months to 12 months by 1981
2. Practical Training under actual village conditions - 1981
3. Advanced training for central office personnel - 1982
4. Recruitment practices - to recruit more people with rural background and people willing to do practical village work - 1981
5. Improved relations with other GOUV agencies at bloc level - 1981
6. Increased skills and abilities in all areas - 1982
7. Use of Mobile Training Units - 1981
8. Increased use of visual aids at bloc level - 1981
9. Demonstrations, field days and open house at training center - 1982
10. Fruit & nut orchards at training centers - 1982
11. Small ruminant production units for meat & milk at all training centers - 1982
12. Fowl Production Units with improved breeding units - 1982.

Annex B**Documents Reviewed**

1. Project Review Paper (Dec. 1977)
2. Murphy and Sprey (Feb. 1979)
3. Autorite des Amenagements des Vallees des Volta: Bilan de l'Experimentation d'Accompagnement dans le Secteur de la Koulipele 1976 a 1978: Prospections (Oct. 1979)
4. Annual Report ICRISAT Agronomy Program Upper Volta (1978)
5. Experimentation Agronomique d'Accompagnement - Ministere du Plan et de la Cooperation, AVV Service Experimentation (1978)
6. Courtoy Report (Bruxelles 1978)

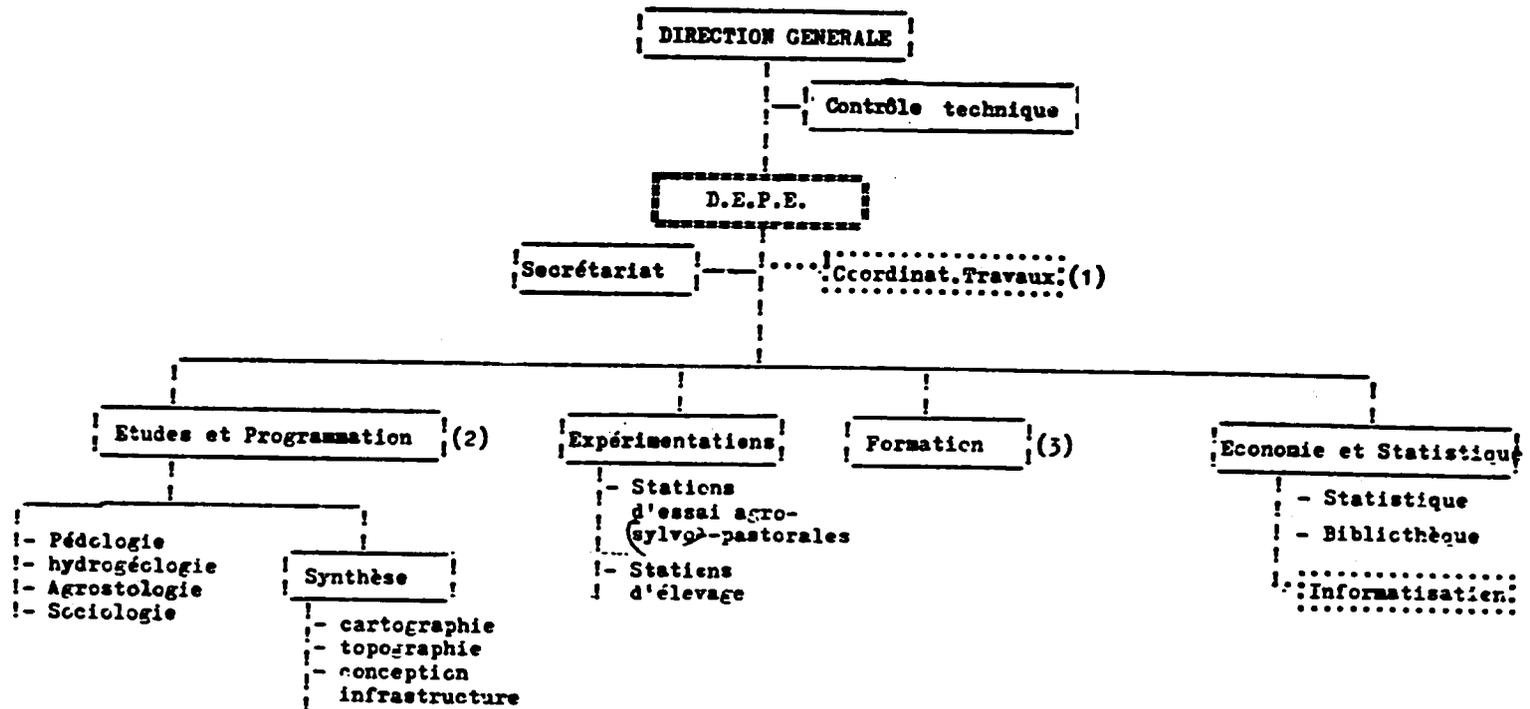
Annex CPeople Contacted

This is a partial list of people contacted.

Mr. Sorgho, Director - AVV
Mr. L. Fimste - AVV
Mr. Renoult - AVV
Mr. Felix - AVV
Mr. Von Steveren - ICRISAT
Mr. Hayboer - AVV
Mr. Peltzer - AVV
Mr. McSwain - OAU-Safgrad
Mr. Slenders - AVV
Mr. Tessier - AVV
Mr. Bitibally - AVV
Mr. Molenaar - AVV
Mr. Van Bitsberg - AVV
Mr. Vayssie - AVV
Mr. Ouedraogo - AVV
Mr. Ver Meer - AVV
Mr. Chauveau - AVV
Mr. Pompen - AVV
Mr. Sanon - AVV
Mr. Nikiema - AVV
Mr. Antoine - AVV
Miss Borst - AVV
Mr. Giroud - World Bank
Fr. Conelli S. J. - Catholic Relief Services
Mr. Issa - University of Ouagadougou
Mr. Lilla - University of Ouagadougou
Mr. Sondarigo - West African Development Bank
10 farmers in villages that have been settled for 5-6 years
10 farmers in villages settled for 1 month
12 students - Mogtedo Training Center
15 male village extension workers with 3-5 years experience
10 female village extension workers with 3-5 years experience

Annex D

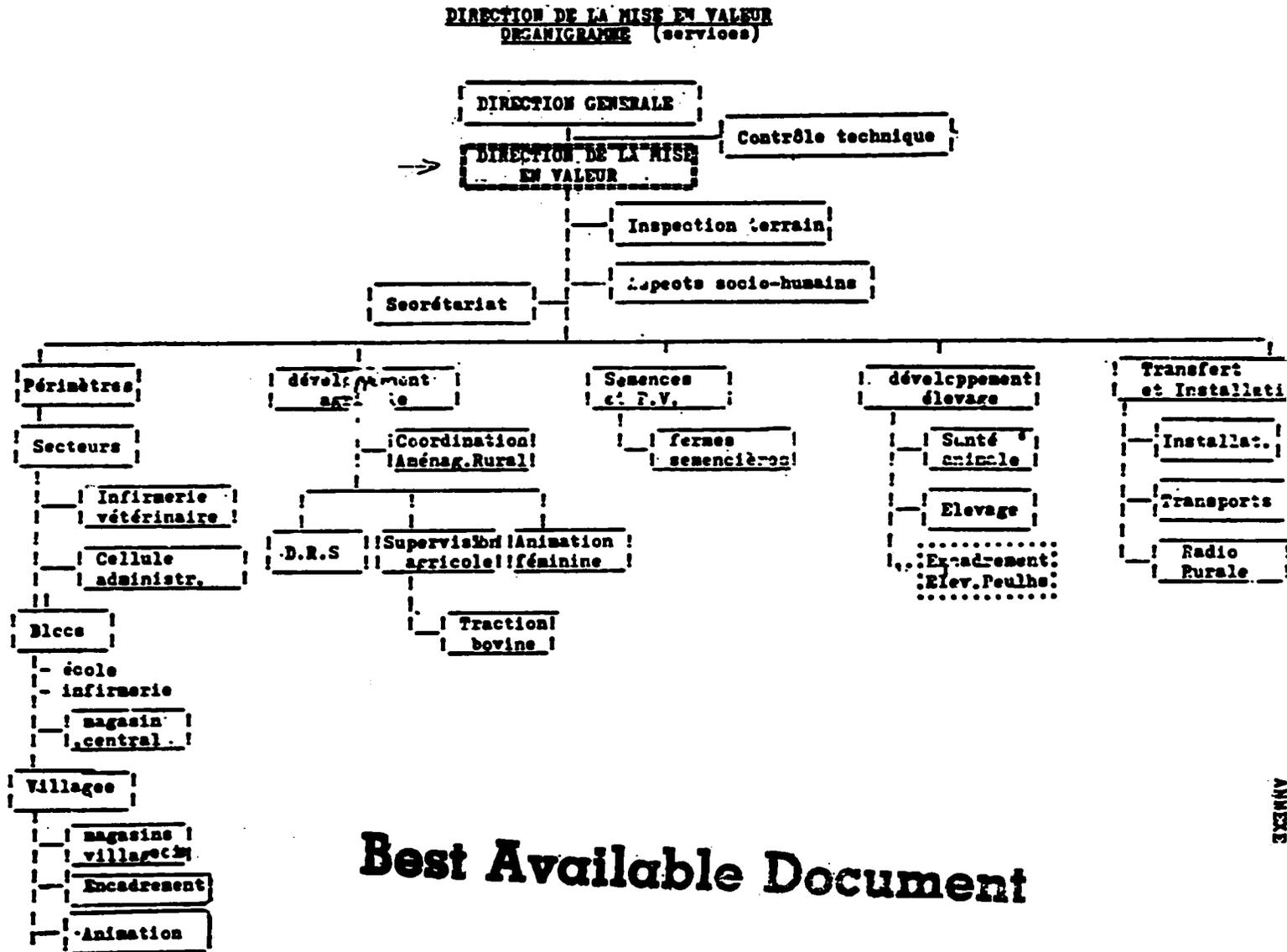
Organigram



Best Available Document

19

Annex D (continued)



Best Available Document

ANNEXE

20

Annex ESite Visit Report

This visit was made March 1, 1980. The inspection was to be on Blocs "Dakongo and Oyayalgui" in the Dougoula Sector.

Due to the unavailability of a four-wheel-drive vehicle, and the unfamiliarity of USAID/Ouaga staff of this area, it was necessary for me to pay a surveying team from the FED (Fond Europeen de Developpement), fifty U. S. dollars to find the blocs and transport me to them and back to Ouagadougou.

Providing it was the correct area, the soils were similar in appearance and topography to Rapadama bloc. A predominance of black, heavy cracked and fissured soils were located in the N. E., N. W., and S. W. quadrants. The S. E. quadrant was predominantly shallow, sandy, with intersperced patches of reg/type irregular sandy loam.

Greenery was still evident in some of the perennial shrubs. The annual grasses were dry with 5-10 cm of new growth evident in the burned areas which were of considerable size. There is evidence of crops being grown in the area harvested at this time but some stubble still in the fields. The fields were heavily grazed with attendant loosening of the top soil. These areas were extensively cultivated in millet (cat tail) sorghum and probably cowpeas.

Three villages were sighted 10-20 families and seasonal paths were evidenced.

The site visit reconfirmed the overflight arranged by USAID/Ouaga for myself and Vernita Fort, Environmentalist from REDSO/WA.

Annex FCurrent Training Program

AUTORITE DES AMENAGEMENTS
DES VALLEES DES VOLTA

SERVICE FORMATION

PROGRAMME DE FORMATION INITIALE DES
ENCADREURS ET ANIMATEURS

PROMOTION 1979/80

du 16 Décembre 1979 au 6 Février 1980

Dates	Horaires	Programme	Enc.	Ani.	Responsable
Dimanche 16/12	Après midi	- <u>Arrivée des stagiaires et installation matérielle</u>	x	x	Chef de Centre
Lundi 17/12	8H	- <u>Ouverture du stage par le Directeur Général</u>	x	x	Directeur Général
	9H30-12H30	- <u>Attribution du matériel pédagogique</u> * présentation du programme * organisation des groupes de travail * règlement intérieur du Centre	x	x	Service Formation
	15H-17H30	- <u>Le recrutement des migrants ; sensibilisation - radio rurale - cahiers d'information - ARM - enquête et transfert installation</u> - <u>Le PAN</u>	x	x	MR. NIKIEMA
Mardi 18/12	7H - 8H	- <u>Construction du Centre de dressage</u> - <u>Jardin - basse cour</u>	x	x	Chef de Centre
	8H30 - 10H30	- <u>Statuts du personnel</u> * droits et devoirs * règlements intérieurs	x	x	MR. NASSOURI
	11H-12H30	- <u>DEPE - les études de base</u> * photographie aérienne * schéma directeur * socio-économie * localisation des exploitations agricoles	x	x	MR. OUEDRAGO Antoine
	15H-17H30	- <u>Direction des Travaux (DT)</u> * aménagement des villages et des blocs * travaux d'infrastructure collective	x	x	MR. TAVEL
Mercredi 19/12	7H - 8H	- <u>Construction du Centre de dressage</u> - <u>Jardin - basse cour</u>	x	x	Chef de Centre
	8H 30-10H30	- <u>DNV - objectifs - attribution - différents services et activités</u>	x	x	MR. SANON
	11H-12H30	- <u>L'exploitation Agricole AVV</u> * objectifs de la colonisation en exploitations familiales * indice d'activité et type d'exploitation * champ de case - construction * équipement * attribution des parcelles	x	x	MR. SANON

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Mercredi 19/12	15H-17H30	- <u>L'exploitation agricole</u> * mise en culture * assolement - rotation	x	x	MR. SANON
Jeudi 20/12	8H30-10H	- <u>Topographie</u> - distribution des parcelles * jalonnement - mesure des distances * tracé d'angles et de lignes droites au sol et sur papier * calcul de surface	x	x	MR. RIOUX
	10H30-12H30	* levé d'1 champ à la boussole et à la chaîne d'arpenteur. Report des données	x	x	MR. RIOUX
	15-17H30	- <u>Topographie</u> * report des données * dessin à l'échelle * lecture d'un plan parcellaire	x	x	MR. RIOUX
	20H-22H	- Cinema documentaire et distractif	x	x	CCPV
Vendredi 21/12	7H - 8H	- <u>Construction de reserves fourragères</u> - <u>Jardin - basse cour - P.M.I.</u>	x	x	Chef de Centre
	8H30-10H	- <u>Piquetage des parcelles</u> * repérage d'un parcellaire * orientation * piquetage	x		MR. RIOUX
	10H30-12H30	- <u>Le poste d'oncadrleur</u> * rappel de sa situation dans l'organigramme * les différentes fonctions * les connaissances nécessaires	x		MR. YANOGO Arthur
	15H-17H30	- <u>Le poste d'animatrice</u> * situation dans l'organigramme * fonctions et connaissances nécessaires		x	Mlle YANOGO Clarisse
Samedi 22/12	8H - 10H	- <u>La plante</u> * organes - différentes fonctions	x	x	Sec Formation
	10H30-11H30	- <u>Evaluation</u>	x	x	Chef de Centre
Lundi 24/12	7H - 8H	- <u>Constitution de reserves fourragères</u> - <u>Jardin - basse cour - P.M.I.</u>	x	x	Chef de Centre
	8H30-10H	- <u>Le climat</u> * composantes du climat * instruments météorologiques	x	x	MR. NOLBNAAR

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Lundi 24/12	10H30-12H30	- <u>Le sol</u> * généralités * les fonctions du sol (support- réservoir) * l'aptitude des sols aux travaux agricoles	x	x	MR. TEISSIER
du 25/12/ 79 au 5/1/1980		Congés de Noël et du Nouvel an	x	x	
Dimanche 6/1	à partir de 14H	Rassemblement au bureau Formation de l'AVV pour le départ sur Hogtéo	x	x	Chef de Centre
Lundi 7/1	7H - 9H	- <u>Dressage des boeufs</u> * arrivée des boeufs * affectation des boeufs à dresser * contention	x		MR. BALEO
		- <u>Jardin - P.M.I.</u>		x	Chef de Centre
	9H30-12H30	- <u>La plante</u> * phase de développement * possibilités d'action dont dispose le vulgarisateur	x	x	Sec Formation
	15H-17H30	- <u>Visite des sols AVV</u> * reconnaissance et caractéristique des principaux sols	x	x	MR. TEISSIER

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Mardi 8/1	7H - 9H	- <u>Dressage des boeufs</u> * l'apprivoisement * l'alimentation - le nettoyage	x		M. BALEO
		- <u>Jardin - P.N.I.</u>		x	Chef de Ce
	9H30-12H30	- <u>les animaux</u> * principaux animaux au service de l'homme * anatomie et conformation du boeuf	x	x	Mr SIMPSON
	15H-17H30	- <u>Les animaux. Le boeuf</u> * choix des animaux * principes d'alimentation	x	x	Mr SIMPSON
Mercredi 9/1	7H - 9H	- <u>Dressage des boeufs</u> * contention et jouage * contention	x		M. BALEO
		- <u>Couture et tricot</u>		x	Mme CUEDRAO Ame
	9H30-12H30	- <u>L'utilisation et l'entretien des boeufs</u> * protection sanitaire * divers (constructions-vaccinations)	x	x	MR SIMPSON
	15H - 17H30	- <u>Sol - eau - plants</u> * relation entre les 3 éléments * les éléments fertilisants * les engrais	x	x	Sce Format
Jeudi 10/1	7H - 9H	- <u>Dressage des boeufs</u> * contention - jouage - alimenta- tion - nettoyage	x		M. BALEO
		- <u>Couture et tricot</u>		x	Mme CUEDRAO Ame
	9H30-12H30	- <u>Les travaux de première installation</u> * défrichement et dessouchage * sous-solage - labour * préparation des sols	x	x	MR CHAUVEAU
	15H - 17H30	- Révision des données sur l'exploita- tion AVV	x	x	MR SANON
	20H-22H	Cinéma documentaire distractif	x	x	CCFV

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Jeudi 11/1	7H - 9H	- <u>Dressage des boeufs</u> • jouage - la sortie	x		MR. BALCO
	9H30-12H30	- <u>Jardin - couture, tricot</u> - <u>Culture attelée à l'AVV</u> • organisation du service • culture attelée (rôle ATB-CDB GNB-F cadres et Animatrices • avantages liés à la Culture Attelée. Attribution aux paysans AVV en 2ème et 3ème année	x	x	MR. BITIBALY
	15H-17H30	- <u>Les travaux du sol</u> • le labour • le scarifiage • les travaux d'entretien	x	x	MR. BITIBALY
Samedi 12/1	8H - 10H	- <u>Le calendrier agricole</u> • les travaux des paysans • les tâches de l'encadrement	x	x	MR. YAMOGO Arthur
	10H30-11H30	<u>Evaluation</u>	x	x	Chef de Centre
Lundi 14/1	7H - 9H	- <u>Dressage des boeufs</u> • conduite des boeufs - alimentation entretien	x		MR. BALCO
	9H30-12H30	- <u>Tricot - couture</u> - <u>Matériel de culture attelée</u> • charrue et équipements annexes • triangle et pièces • charrette • fourniture et entretien • réparation des équipements les forgerons de village	x	x	Mme OUEDRAOGO MR. BITIBALY
	15H-17H30	- <u>Matériel de culture attelée (suite)</u> • semoir	x	x	MR. BITIBALY
Mardi 15/1	7H - 9H	- <u>Dressage des boeufs</u> • conduite des boeufs - alimenta- tion - entretien	x		MR. BALCO
	9H30-12H30	- <u>Tricot - couture - jardin</u> - <u>La fertilisation</u> • organique et minéral	x	x	Mme OUEDRAOGO Sce Formation

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Mardi 15/1	15H - 17H30	- <u>Semis - Travaux d'entretien</u>	x	x	Mr BITIBALY
		* importance des façons culturales			
		* calendrier et techniques			
Mercredi 16/1	7H - 9H	- <u>Dressage des boeufs</u>	x		Mr BITIBALY
		1 ^è évaluation dressage des boeufs			
		2 ^è évaluation tricots - couture		x	Mlle YAMEOGO
	9H30-12H30	- <u>Sorghos et mils</u>	x	x	Mr RENEAUD
		* plante			
	* culture				
	* vulgarisation de technique culturale				
	15H-17H30	- <u>L'Expérimentation agricole</u>	x	x	Mr RENEAUD
		* définition			
		* programme AVV			
		* les points d'expérimentation			
Jeudi 17/1	7H - 9H	- <u>Dressage des boeufs</u>	x		MR. BALEO
		* conduite des boeufs			
		- <u>Cuisine bouillie</u>		x	Mme OUEDRAOGO
	9H30-12H30	- <u>Le cotonnier</u>	x	x	MR. CHAUVÉAU
		* plante			
		* techniques culturales			
	15H-17H30	- <u>Le cotonnier</u>	x	x	MR. CHAUVÉAU
		* parasites - maladies			
		* traitements			
	20H - 22H	Cinema documentaire et distractif	x	x	CCFV
Vendredi 18/1	7H - 9H	- <u>Dressage des boeufs</u>	x		Mr BALEO
		* conduite et entretien			
		- <u>PMI - cuisine - bouillie - jardin</u>		x	Mme OUEDRAOGO
	9H30-12H30	- <u>Crédit Agricole</u>	x	x	Mr SAWADOGO
		* principes généraux d'attribution			
	* court terme et moyen terme				
	15H-17H30	- <u>Crédit Agricole</u>	x	x	Mr SAWADOGO
		* provision - octroi - attribution			
		* remboursements			
		* différents fonds de garantie			

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Samedi 19/1	Journée	Visite du Centre Expérimental de Kamboinsé	x	x	Mr OUEDRAGO Ernest
Dimanche 20/1	14H	Départ pour Noptédo	x	x	Chief de Centre
Lundi 21/1 au Vendredi 25/1	7H - 9H Journées	- <u>Dressage des boeufs</u> Intervention CESAO communication et animation	x	x	MR. BALEO CESAO et Mr. NIKIEMA M. NANA JB
Samedi 26/1	8H - 12H	Visite du Centre d'élevage de Noptédo	x	x	Chief de Centre
du Lundi 28/1 au Vendredi 1/2	7H - 9H Journées	- <u>Dressage des boeufs</u> Intervention CESAO Communication et animation	x	x	Mr. BALEO CESAO et Mr. NIKIEMA M. NANA JB.
Samedi 2/2	8H - 12H	Visite barrage et plaine irriguée coopérative de pêche	x	x	Chief de Centre
Lundi 4/2	7H - 9H Journée	- <u>Dressage des boeufs</u> - <u>Statistique</u> * enquête en milieu traditionnel * mise en commun des enquêtes	x	x	Mr. BALEO Mr OUEDRAGO François
Hardi 5/2	7H - 9H	- <u>Dressage des boeufs</u> * conduite et entretien	x		Mr. BALEO
		- <u>PHI - cuisine - bouillie - jardin</u>		x	Mr OUEDRAGO
	9H30	- <u>Alphabétisation fonctionnelle</u> * historique * principes * sensibilisation	x	x	Mr OUEDRAGO Ernest
	15H-17H30	- <u>Alphabétisation fonctionnelle</u> * avantages liés à l'alphabétisés	x	x	MR OUEDRAGO Ernest
	20H-22H	Cinema documentaire et districtif	x	x	CCPV
Mercredi 6/2	9H	Clôture du stage	x	x	Directeur Gér. & DNV Formation
	14H	Départ des stagiaires	x	x	Chief de Centre

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RESEARCH CARRIED OUT BY ICRISAT
AT KAMBOINSE AGRICULTURAL RESEARCH STATION 1978

1. Introduction
 - 1.1. Agroclimatology and weather of 1978
 - 1.2. Soils and soil moisture studies
2. Sorghum agronomy
 - 2.1. Preliminary variety trials at two planting densities and on different soil types.
 - 2.2. Management of advanced varieties on a toposequence
 - 2.3. Summary / Conclusions
3. Millet agronomy
 - 3.1. Planting date trial
 - 3.2. Preliminary variety trials at two planting densities and on different soil types.
 - 3.3. Toposequence studies
 - 3.4. Summary / Conclusions
4. Cowpea agronomy
 - 4.1. I.I.T.A. cowpea management trial
 - 4.2. Adaptation of cowpea varieties to different planting dates and soil types in a toposequence
 - 4.2.1. Comparisons between varieties
 - 4.2.2. Comparisons between planting dates
 - 4.3. Summary / Conclusions
5. Intercropping studies
 - 5.1. Sorghum with early maturing intercrops
 - 5.2. Millet with groundnuts
 - 5.3. Cereal/cowpea intercropping
 - 5.4. Summary / Conclusions
6. Management trials
 - 6.1. Trials on shallow gravelly soils
 - 6.2. Land management systems/Seedbed preparation
 - 6.3. Effect of intercrop legumes on a successive cereal crop
7. Miscellaneous studies
 - 7.1. Maize
 - 7.2. Sunflower
 - 7.3. Grass and legume forages
 - 7.4. Wheat
8. Summary

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Annex G

Recommended Studies to be Carried Out Prior to Settlers' Arrival

1. Pedological - to be on a scale of 1/20,000 in order to compile a map of possible utilization of various environmental zones and a map for land apportionment.
2. Hydrogeological - relevant to the Pedological study, in order to obtain geophysical prospection data and do exploratory probe test results.
3. Photogrametric - this will include aerial photography and ground surveys.
4. Topographic - mapping the features of the land by Ground Survey Areas.
5. Summary - to establish a plan for the integrated development of blocs and village, fields, etc.

Agrostological and grazing land studies

: to establish the size of herds in the sector, the nutritive value of grasses and shrubs available, make an accurate estimate of development potential, and to determine levels of production.

Wildlife

: to identify the variety and quantity of wildlife in the sector and to plan reserves.

Socio-economic and statistical studies

: to evaluate the viability of the AVV resettlement methodology on a sociological, economic and statistical basis.

Soil Tests

: should be done on each field prior to clearing with a follow up soil test after each cropping season on each field. An initial soil test and a follow up every 2 years should be done on the family garden plot.

Soil Tests can now be done by "Service de Sols", Ouagadougou.

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Annex HLinks with Other Organizations

The following organizations have some working relationship with AVV in varying degrees of expertise available under formal and informal arrangements :

- FRANCE :

- GERDAT (Groupement d'Etudes et de Recherches pour le Développement de l'Agriculture Tropicale).
- CEEMAT (Centre d'Etudes et d'Expérimentation du Machinisme Agricole Tropical).
- CTFT (Centre Technique Forestier Tropical)
- IEMVT (Institut d'Élevage et de Médecine Vétérinaire des Pays Tropicaux)
- IFRA (Institut de Recherches des Fruits et Agrumes)
- IFCC (Institut Français du Café, du Cacao et autres plantes stimulantes)
- IRAT (Institut de Recherches Agronomiques Tropicales et des Cultures vivrières)
- IRCA (Institut de Recherches sur le Caoutchouc en Afrique)
- IRCT (Institut de Recherches du Coton et des Textiles Exotiques)
- IRHO (Institut de Recherches pour les Huiles et Oléagineux)
- INRA (Institut National de la Recherche Agronomique)
- ORSTOM (Office de la Recherche Scientifique et Technique d'Outre-Mer)
- AFVP (Association Française des Volontaires du Progrès)
- ASEOMA (Association pour la Sécurité de la Navigation Aérienne)
- BCDOM (Bureau Central d'Etudes pour les Equipements d'Outre-Mer)
- BDPA (Bureau pour le Développement de la Production Agricole)
- BRGM (Bureau de Recherches Géologiques et Minières)
- CFTD (Compagnie Française pour le Développement des Fibres Textiles)
- CIDR (Compagnie Internationale de Développement Rural)
- IGN (Institut Géographique National)
- SATEC (Société d'Assistance Technique et de Conseil)
- SCEI (SCEI International - Société Centrale pour l'Équipement du Territoire International)
- SEDES (Société d'Etudes pour le Développement Économique et Social)
- SOGREAH (Société Grenobloise d'Etudes et d'Applications Hydrauliques)

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- PNUD (Programme des Nations-Unis pour le Développement)
- NETHERLANDS :
 - ITC
 - IWACO. B.V.
- ICRISAT (International Crop Research Institute for the Semi-Arid Tropics)
- SAFGRAD (Semi-Arid Food Grain Research and Develop.Project)
- ADRAO (WARDA)
- U.S.A.
 - Purdue University
- CILSS (Comité Permanent Inter-Etats de Lutte Contre la Sécheresse dans le Sahel)