Seminar for Officials of Rural Radios of the countries participating in the Onchocerciasis Control Programme
Ouagadougou. 4–6 May 1977

VOLTA VALLEYS DEVELOPMENT AUTHORITY

The Rationale for the Action of the Volta Valleys Development Authority in the areas defined by the Presidential Decrees Nos. 76/020 and 76/021 of 23 January 1976

Mr S. Sorgho
DEVELOPMENT POLICY FOLLOWED BY THE VOLTA VALLEYS DEVELOPMENT AUTHORITY

The Authority, in accordance with the mission assigned by the Presidential Decree
- drew up principles of development;
- adapted the methods of application to local physical and human conditions.

These principles were developed and the methods refined during the experimental stage; a development policy is now applied.

1. Development of land

The AVV is first of all an operation for the development of natural resources.

It is an integrated operation of which the motor is at present agricultural development through dry farming and, later on, development through irrigated farming which alone enables the fertile soils of these valleys to be fully exploited.

Nevertheless, harmonious development of the different ways of using land is sought through:

- maintenance of the present forestry heritage which is necessary to the Voltaic economy (cheap local source of energy) and to the ecological balance (control of water run-off, soil erosion, dessication through excessive evaporation);
- protection of the fauna (already heavily destroyed in development zones) by the extension of the Po reserves; the touristic potential thus created to be exploited;
- grouping of stock breeders scattered over the whole area in zones specially set aside for ranching, where appropriate development will facilitate the management of the herds;
- the exploitation, at the appropriate time, of the piscicultural potential of the water reservoirs.

Following studies in the fields of pedology, forestry, mixed farming, and on the natural fauna, a master development scheme was prepared which divided the areas into large zones:

- Agricultural zone under rain-fed farming.
- Agricultural zone under irrigated farming around large dams (BAGRE, TAMEN, KARANKASSO, SOUROU) or planned small scale development (Upper Black Volta) forest: the purpose for which classified forest areas were intended will change; new zones will be created in which an attempt will be made to build up large expanses of forest following industrial afforestation operations; inside the agricultural zones forest sectors will be protected and the farmers will be encouraged to undertake village plantation;
ranching: these zones are determined following studies on pastoral farming, even so. They are large grazing areas where extensive animal husbandry will predominate on traditional farms or ranches. They include the existing reserves which are encircled by border areas.

Efforts will be made to create new areas where herds of wild life (elephants, antelopes, buffaloes) can survive without the threat of expansion of existing villages or uncontrolled settlement.

These developments will lead to three large types of operation:

- sectorial projects (afforestation, tourist facilities, ranches, workshops for the manufacture of production implements) which have not yet passed the stage of feasibility studies;

- more advanced agricultural development projects: the White and Red Volta rain-fed agricultural project is going to pass from the experimental to the operational phase; the first phase of the Bougouriba project is ready to be launched;

- hydro-agricultural projects which have yet to be studied.

2. Rural development and agricultural development

The AVV is also an operation for the establishment of individual family farms:

(a) Which yield a regular monetary return distinctly higher than that derived from traditional farming (economic surplus) from:

- a system of intensive farming
  
  . in mixed cropping: 30% cash crop, 70% food crops
  . unsuitable soil (to be protected and put in fallow)
  . labour intensive (1.2 ha/active)
  . rotation with fallow and annual cropping;

- with systematic and generalized use of modern equipment and labour
  
  . selected plant material
  . plant quarantine and fertilization
  . cultivation with ploughing and a programme for the improvement and protection of the health of draught oxen
  . provided with short and medium term agricultural credit facilities;

- land selected for its high yield (particularly, response to fertilizer applications) affected little by variations in rainfall, prepared by mechanical means, then receiving cultivation methods combining an adequate water supply to nourish the plants;

- concentrated technical extension services and an accompanying network of experimental stations to determine the methods of crop rotation, the manure and the varieties best suited to the valley soils.
(b) Which enjoy an adequate level of living.

The following must be brought to regions where they are lacking:
- clean water all the year round, close to dwellings
- road network usable in all seasons
- storage facilities
- community services: schools and dispensaries in so far as teachers and nurses can be found.

Migrants retain their traditional environment (scattered huts in the case of Mossi, bissa and kassena). Families are grouped in villages each containing about 50 families.

(c) These arrangements are conceived with a regard for economy and simplicity, starting from techniques easy to master (with the exception of bore holes) and lead to structures which cost little to maintain (if possible by the migrants themselves).

(d) Efforts are made to preserve the environment by the arrangement of cultivated strips, the establishment of uncultivated strips as boundaries and for future expansion.

The soils exposed to water run-off, or likely to deteriorate due to intensive exploitation, are set aside. The farmers are asked to plant trees around their plots to produce the firewood they require; in this way it is felt that the surrounding vegetation will be protected; care will be taken through early burning of vegetation, through improvement of the fodder on fallow land, by the use of harvest residues and by the limitation of small ruminants, to avoid over-grazing and the destruction of the herbaceous vegetation.

3. Methods of land management

The application of principles and achievements of the objectives implies the carrying out of a whole series of exhaustive preliminary studies and close coordination of infrastructural work.

The master plan for the development of the areas divided the agricultural zone into sectors (90,000 ha) themselves sub-divided into blocks (12,000 ha). The operations proceed in the following order: basic studies, development studies, execution of the development and settlement of the migrants.

(a) Basic studies:

These begin with aerial photography of the zones on a large scale (in black and white and artificial colours).

A very clear picture of the areas to be developed is obtained rich in information which, when processed, will serve many purposes.

From these photographs a mosaic or photoplan is assembled on a scale of 1/20,000 which serves as the basic cartographic document.
Two basic studies are conducted simultaneously

- **Soil studies:** from land survey and photo-interpretation, using geomorphology, the soils which can be developed and exploited in the AWW perspective are determined, specifying the soil characteristics, acidity, and morphodynamic constraints which have a bearing on their future utilization. Allocation of the soils is done through their classification:
  - agricultural possibilities with light soils
  - agricultural possibilities with heavy soils
  - forest or grazing potential in wet season
  - forests
  - pastures
  - unsuitable (to be protected or put into conservation).

Until now the results are satisfactory since the percentage of land retained for development is greater than 25% sometimes reaching 50%.

It can be stated that, compared with neighbouring regions, i.e. departure areas, the Volta valleys represent a valuable agricultural potential; there are many excellent soils: vertisols, brown soils, etc.

- **Hydrogeological studies:** The Volta valleys (White and Red) unlike the surrounding areas are fairly poor in groundwater. The hardened layers protecting the aquifer have been removed and the sheets of water drained by a dense hydrographical network flowing very often next to the rock and showing little alluvial formation. The search for water cannot, therefore, be improvised.

As a first stage, a geological sketch of the zone is made from a ground survey and aerial photos. The hydrogeologist then locates the spots near the agricultural soils where the transformations, the alluvials or the fractured bed are likely to hold water.

(b) **Primary development studies** (at least one year before the installation of the first migrants on the block):

Once the results of the two previous studies are known, they are put together to make a preliminary layout of the block by sections for cultivation

- respecting the natural frontiers (marshlands or crest line) showing equivalent agricultural surface areas of about 600 ha i.e. the area required for 50 farms;
- including one site for water exploration.

Geophysical measures will show on the selected sites the exact position of the pockets of transformations, alluvials or fractured soils. In these places, sample reconnaissance surveys are carried out by means of the drill best suited to the land being surveyed. Following this campaign, the water resources of the block are located and the quantity assessed.
A master development plan of the block can then be drawn up including:

- the location of the villages, in principle less than 1 km from the water supply points;
- the demarcation of the farming lands of which the farthest parcels should not be more than 4-5 km from the villages;
- the primary, secondary and farm roads which are plotted according to the hydrographical network, and the location of the farm blocks;
- the location of the central store of the block; the schools and the hospital.

(c) Secondary development studies (1 year before the installation of the migrants in the village):

These are intended to establish a master development plan of the village: topographical surveys are carried out on a large scale of the river banks which make up the farming lands and the sites of villages in order to obtain an altitude plan of these areas.

According to the gradient and relief of the land, the division of the farm block and of the village shows:

- plots 100-150m wide, in strips, with a longitudinal gradient of 5% and an outlet for the run-off water separated by boundary and expansion strips 5 m wide;
- village plots of 1 hectare for the dwelling and the compound. For the 50-family village, the land is surveyed and registered in 400 plots grouped in 6-7 fields each of 80 hectares, i.e. a total of 500 to 600 hectares.

The topographic teams will then go to set up on the land, the plots intended for the farmers: this is the end of the studies and the start of the development.

4. Implementation of the development

The following operations should be carried out as quickly as possible between the month of October preceding the installation year and the following May. On their arrival the settlers should find all the facilities they require.

The close adherence to a plan of execution, the coordination of the different operations, the distribution of work of little importance, and the search for the least cost investments, led the AVV to undertake the work under Staat's auspices; the full-time use of the site material under correct economic conditions is thus assured. This material is maintained and repaired in a central garage where there is a stock of spare parts, equipment and the necessary tools.

(a) Water Supply points

Two types of equipment are installed according to the type of aquifer: in loose ground - large diameter wells (1.20m) reinforced with cement
- in rock, bore holes with plastic pipes 12 cm in diameter.
The water requirements for 50 families are 10 m$^3$ a day; they are met by
- 2 bore holes each discharging a minimum of 0.8 m$^3$/h, i.e. the usual flow rate of mechanical pumps.

Pumping trials are carried out, and covered borders constructed to provide water which meets the current standards for drinking.

(b) Roads

The blocks are linked to the national road network usable in all seasons by arterial primary roads. The villages are served by branch roads built on to the arterial roads; the roads have the following characteristics:
- type B (classification T.P.)
- carriage-way 7 m wide and 1 m high
- laterite base 5 m wide and 20 cm thick
- side ditches and constructions for water drainage.

Rural roads within the village are given a cost of laterite which is spread over the levelled ground. Agricultural tracks are simply levelled.

These roads are constructed in two stages: temporary opening in the year of settlement and final construction the following year.

(c) Village infrastructure

- **storage**
  - a shed 100 m$^2$ per block, transit warehouse for production material
  - a shed 36 m$^2$, village warehouse for 25 families

- **housing**
  - block personnel (unit chiefs, nurses and teachers)
  - 4 room dwellings

- **social**
  - the Authority constructs one dispensary per block, one school per 250 families.

(d) Farm development

Following the establishment of the plots the farmers clear the roots from their compounds and two plots the first year, then from one plot each of the subsequent years. In return for this human investment the farmer receives supplies from the World Food Programme during the year of settlement.

The cleared lands will be ploughed by heavy mechanical means, in particular by tractors of over 150 cv
- hoeing and heavy spraying of poor soils
- working by Rome plow and light spraying on good soils.
On reading this document it will be noted that all efforts were concentrated on the initial or basic operations in order to create good installation conditions and a satisfactory start to the agricultural operations. This methodology, after many experiments and except for a few details, is now finalized.

At this point everything must be set in motion to ensure that the operation is a complete success in the field. We must already begin to think of the future of the village communities; their own dynamism will soon lead to the completion of our development policy in terms of undertakings leading to the organization of production and improvement of community facilities. The role of the AVV will then be more that of stimulating, modulating and supporting rather than direct or systematic action.
SUMMARY

I. CONDITIONS AND PROCESS OF INSTALLATION OF THE SETTLERS

1.1. Submission of applications and criteria for selection
   1.1.1 Collection of applications
   1.1.2 Investigation of candidates and selection criteria

1.2 Development contract
1.3 Migration
1.4 Installation

II. CHARACTERISTICS OF THE FARMS

2.1 Structure of the farm
2.2 Ox-drawn cultivation - stock breeding
2.3 Land management and soil conservation
2.4 Farming techniques and fertilization
2.5 Loans to the farmers
2.6 Plan of production and income

III. CHARACTERISTICS OF THE VILLAGES

3.1 Description of the infrastructure
3.2 Description of the farm services
1. CONDITIONS AND PROCESS OF INSTALLATION OF THE SETTLERS

The development of the areas of the Volta Valleys freed from onchocerciasis requires the migration and installation of families recruited preferably in over-populated and over-utilized (from the point of view of the land) provinces of Upper Volta (Mossi plateau).

These families enter into a development contract with the Volta Valley Development Authority.

The organization of the migration and the assignment of families to the different development zones is the responsibility of the AVV.

A reception and work organization service is set up for the period of installation.

1.1 Submission of applications and criteria for selection of volunteer families for the AVV zones

1.1.1 Collection of applications

- collection of applications by the CND agents
- transmission of applications to the Migration Office of the AVV
- preparation of a card with names, addresses and composition of the volunteer family

1.1.2 Review of applications and criteria for selection

Each volunteer is visited during the three months following his application by an investigator from the Migration Office of the AVV.

The investigator studies

- the composition of the family
- the agricultural equipment
- the resources and produce of the family
- the reasons for the migration.

In addition, he must satisfy himself that the volunteer family fulfills two essential conditions:

- at least 3 active persons per family
- the main activity of the candidates should be agriculture; this excludes the installation of persons whose non-agricultural activity is incompatible with their permanent presence at the development zone (trader, civil servant).

Finally, the investigator must inform the family, as fully as possible, of its rights and its duties vis-à-vis the AVV.
The list of migrants by installation zone is drawn up according to the following basic principles:

(1) the migration takes place from the north to the south to ensure that everybody benefits from the rainfall;

(2) the migrants are installed, as far as possible, over 50 km from their former home to avoid their being torn between their former village and their new farm, which would affect their devotion to their farm work.

The list of migrants by zone of settlement having been established, the families concerned are advised a month in advance, by the Investigators of the Migration Office, of the approximate date of their departure and their destination. They are requested to prepare for departure.

Two or three days before departure, they are visited by an investigator to make sure that they are getting ready and to organize their transport by lorry to the settlement zone.

Apart from their personal effects, the family can take a small number of goats and sheep (5 maximum), cutting and at least three weeks food supply. The AVV can lend sacks for the transport of food grains.

The move can be made:
- either in one stage, with the whole family;
- in two stages, the men leaving first and the remainder of the family following one or two weeks later. However, families living far from the zones are required to move all together;
- the large animals, cattle, oxen, donkeys and large herds of sheep and goats must be moved on foot by their owner.

1.4 Installation of the migrants

On their arrival at the development zone, the families take over their property. However, they may shelter in the transit hangar for one or two days.

The first few days are spent by the family in constructing temporary slit shelters on their property.

Next the men are grouped in work teams on various tasks, manufacture of building blocks, clearing of parcels of land, making tracks.

It should be noted that the clearing of the plots and the removal of roots are carried out individually. These fairly trying manual operations evidence the real desire of the farmer to settle.

II. CHARACTERISTICS OF THE FARMS PLANTED WITHIN THE DEVELOPMENT OF THE VALLEYS OF THE WHITE AND RIVER RIVERS

Different models of farms have been devised to provide families of 3 to 4 or 5 active persons (men and women from 15 to 60 years of age) with a greater income than their previous situation on fertile land but without irrigation.
This can be achieved through:

- the size of the area allotted to each family;
- the combination of agriculture and animal breeding on the same farm, and the practice of harnessed cultivation;
- development techniques which lead to conservation of the soil and the maximal use of rain water;
- farming techniques and modern fertilizers;
- a credit system for the farmers;
- production plans which guarantee an important monetary return.

2.1 Structure of farms

Each family is allotted an area of land of about 12 hectares comprising:

(a) 1 plot of 1 hectare devoted to the dwelling and garden

The development of that plot and its cultivation are left to the initiative of each family.

(b) Six fields of 1.50 hectares of good agricultural land which are cultivated according to a rotation plan comprising 4 obligatory crops, two fields being left fallow in the southern zone and 3 in the northern zone. The crops rotate on each plot according to a 4-yearly rotation plan:

- 1st year - cotton
- 2nd year - sorghum
- 3rd year - various (groundnuts, peas, maize or rice)
- 4th year - millet

After these four years of cultivation, the plot is left to lie fallow for use as pasture for 2 or 3 years.

The area of these plots cultivated depends on the number of active persons in the family:

- 1 hectare for families comprising 3 active persons;
- 1.25 hectares for families of 4 active persons;
- 1.50 hectares for families of 5 active persons.

Families of 3 active persons will therefore have a total of 4 hectares of agricultural land to cultivate over 3 years; 4 persons, 5 hectares; 5 persons, 6 hectares. The unworked portion of the plots provides a reserve of farm land.

(a) A parcel for reafforestation of 25 ares\(^1\) installed over 5 years (5 ares a year).

\(^1\)(an are = 10sq. metres)
In short, for an average farm of 5 active persons (type III) the 12 hectares are divided as follows in the northern zone:

- 4 fields of 1.50 hectares under cultivation = 6.00 ha
- 3 fields of 1.50 hectares fallow = 4.50 ha
- 1 hectare - dwelling = 1.00 ha
- 0.50 hectare reafforestation = 0.50 ha

**TOTAL** 12.00 ha

2.2 Ox-drawn cultivation - animal breeding

To develop the land under good conditions the farms are equipped for cultivation by teams of oxen. The soil worked in depth holds the water better and run-off is avoided, increasing the soil’s capacity to retain water. This makes up for a small rainfall. However, the initial work of ploughing the soil, after clearance, is done by tractor.

From the second year, each family will have to maintain a pair of plough oxen. These will be kept in byres and the manure will be used to improve the soil composition.

Moreover, each farm can rear a small number of oxen, sheep or goats to graze the pasture or fallow areas.

The Development Authority provides veterinary assistants to look after the health of the stock.

Rearing methods will be transformed, thanks to fodder reserves and rational use of grazing areas. The stock should be under organised supervision so that the grazing area is utilized in the best manner and animals are prevented from wandering into the crops.

2.3 Development of the land and protection of the soil

The territory of each village is planned in such a way as to facilitate agricultural work and above all protect the soil against erosion.

The plots are arranged in blocks of cultivation according to the contour lines, separated by anti-erosion belts which must be reafforested not only to achieve greater effectiveness, but also to serve as a wind-break. These developments will be collectively maintained by the settled families.

The arguments in favour of grouping plots in blocks on the village level are:

- the need to undertake the work of ploughing the ground mechanically (Bull + Ripper and or Rome Flow);
- the need to set up a crop rotation system and rotation easy to handle on the village level for the greatest protection of the soil;
- greater efficiency of the phytosanitary treatment through mass application.

Where possible rice cultivation will be undertaken in the lowlands.

It is estimated that about 10% of the farms should each exploit 25 ares of developed low-lying ground.
2.4 Farming techniques and fertilizers

- Importance of extension services

The farmers are initiated in modern farming techniques by a number of extension workers (1 for each 25 families the first years): line sowing, spreading of fertilizer, chemical spraying of crops, field work and weeding with bullock ploughing.

Use of production aids:

Systematic use of mineral fertilizers as well as farm manure will lead to an improvement and maintenance of soil fertility guaranteeing high yields.

For each crop, the best doses of fertilizer are studied in three agronomical experimentation centres located in the development area of the Volta valleys, which correspond to three different climatic zones. This experimentation will enable farmers to be provided with the best advice on the varieties and the manures most suited to each zone.

A continuous inspection of the crops will prevent the destruction of crops by diseases or parasites thanks to appropriate treatment.

2.5 Loans to farmers

Supplies, equipment, storage

In addition to technical assistance by extension workers, the AVV guarantees to farmers the loans necessary for implementation of the farming practices imposed.

On their arrival, each family receives, free of charge, a set of tools comprising: an axe, a spade, a pick, a scythe and a rope.

Before the first harvest each family receives, during the first 10 months, a supply of food. This allocation is provided as payment for the various tasks carried out by the active members of the family.

For production requirements (seeds, fertilizer, chemicals) the farmers benefit from a country loan (C.T.) reimbursable after the harvest.

For the equipment utilized in harnessed farming (M.T.) the provision of stock and tools is subject to credit facilities over 7 years. The same applies to the purchase of a cart.

Each village has a warehouse for storing supplies available to the farmers as and when required.

2.6 Production plan - revenue

In drawing up the plan of production for each type of farm a certain number of constraints were taken into account:

- working the land by harnessed farming from the second year;
- work time available taking into account the composition of families and periods of work;
- supplies of cereals grown on the farm;
- fodder available for draught animals and animals raised for meat production.
Taking these constraints into consideration, the production plans allow for a balance between food and cash crops.

The development is progressive (installation of farm over 3 years).

At least half of the farm is cleared the first year, the remainder over the following two years.

The farms reach their optimum economic potential from the 3rd year. At that time the net monetary returns through farming will be about 20,000 - 50,000 F for vegetable production after reimbursement of credit and assuming the consumption of cereals produced on the farm (against 3,000 to 6,000 F in traditional farming).

From the first year it is 10,000 to 30,000 F according to the number of active persons. To these figures must be added the returns from animal breeding.

III. CHARACTERISTICS OF THE VILLAGES

Description of the infrastructure

The settled farms are grouped in villages of 25 - 75 families each.

Each village has or should have:

2 or 3 shafted wells (or bore-holes) fitted with a manual pump (one well is allowed for each 20-25 families)

- a school for the education of all the children of the migrants;
- medical and veterinary services with, in particular, distribution of drugs necessary for the prevention of onchocerciasis;
- accommodation for extension workers and a store for supplies;
- access roads and tracks to villages.

Some of these structures (school, hospital) serve a block grouping several villages. Others (market, places of worship) in view of their specificity, are only projected.

For the development of the infrastructure (building sites) migrants will sometimes be called upon and paid as labourers.

3.2 Description of services on the land

Villages are grouped in blocks of about 400 families, e.g. 8 villages of 50 or 16 villages of 25 families. Four to five blocks make up a sector.

The basic personnel services are made up of the following:

Sector Chief
Unit Chief
Manager - Unit storekeeper
Extension worker (extension work, functional literacy)
Animatrice (female) (motivation and functional literacy).
Other field personnel in view of the social infrastructure outlined above, are, or will be:

- 1 nurse
- 1 veterinary assistant
- 1 teacher

The AVV settler benefits from the best technical, economical and social conditions suitable for his development and thereby that of the Voltaic rural world.
EXPERIMENTAL PHASE OF THE DEVELOPMENT PROJECT
OF THE VOLTA VALLEYS

Introduction

The experimental phase of the project is ending: three agricultural campaigns have taken place and the penultimate campaign in this trial phase is well underway.

Looking back over the activities carried out by the Authority during the first 3 years of the launching of the project it is possible:

- first of all to compare the forecasts and initial ideas with the achievements and investments;
- to see whether the results obtained justify the investments granted so far;
- to calculate the financial outlay borne by each source of financing when it contributes to the installation of a migrant on the AVV areas;
- finally, drawing on the experience gained, to perfect the procedures and, in the light of the realities, to consider with optimism or pessimism the annual settlement goals.

Achievements

It was planned to install 1000 families during the first 3 years of the experimental phase.

At the end of these 3 years, 450 families had been installed, which represents 45% of the initial goal.

This result is, of course, modest compared with the estimate.

However, it should be noted that the estimate, based mostly on technical data, did not take sufficient account of:

- on the one hand the complexity of the non-technical factors: natural, psychological and social factors which affect the start of an operation and influence the rather serious decision of a family to volunteer for migration;
- on the other hand, the many activities to be undertaken simultaneously to enable the settlement of the first migrants.

Taking into account the difficulties which can arise from such a conjuncture, the estimates seem to have been rather optimistic for an experimental phase.

To achieve the settlement of these 450 migrants, the Authority carried out a number of projects divided between the 4 main categories of activity which form the basis of its settlement policy: studies, production, infrastructure and equipment.
1. Studies

The following studies have been carried out over the last 5 years:

(a) Basic Document: Preparation of a basic document covering 22,000 km² using aerial photography on a scale of 1/20,000.

(b) Development Studies

Pedology: 960,000 ha of land was covered by soil surveys at 1/100,000
257,000 ha in detailed study (1/20,000) of which:
244,000 ha in mixed farming
13,000 in industrial afforestation

Hydrogeology: 250,000 ha covered in general and detailed survey
2,140 metres in depth studies

Topography: 11,140 ha surveyed

Agronomical experiments: establishment of 4 support stations of a 30 ha seed farm and a market gardening experimental station

(c) Sectorial Studies

Tourism: A nearly completed study on the development of tourism over 300,000 ha

Dams: Two dam sites were determined - one on the White Volta - at Bogré - and the other on the Black Volta at Karankasso. According to the progress of the studies at Bogré, it is estimated that construction of the dam will start in 1979.

Afforestation: Study of 13,000 ha completed
The operational phase of this project will commence in 1977

Mixed farming studies: Over 250,000 ha of which 150,000 were mapped.

2. Infrastructure

Construction of:
- 125 km of roads
- 41 km of primary roads
- 38,000 m² surface covered by different constructions: accommodation for extension services, stores, schools, dispensaries, etc.
- 53 farm wells totalling 1500 m.l bored.
3. **Equipment**

One of the conditions for the success of the project is the availability of adequate working material for all sectors.

The Authority therefore purchased large agricultural, public works, transport and office equipment.

4. **Production**

As a result of the opening-up of 6 blocks including the creation of 13 villages:

- 2,300 ha were put under cultivation of which 1,400 ha of cereals
  700 ha of cotton
  200 ha of various crops
- yields exceeded t/ha
- 241 pairs of draught stock were mobilized

**Cost of Projects undertaken**

The overall cost (investments + running costs) of all these undertakings is CFA 1,300 million over the last four years.

The end product of the AVV activities being the settled, independent farmer, one is naturally tempted to relate the investments to the number of migrants actually settled. This cost/benefit relationship which determines the cost of settling a migrant can be determined using two different approaches:

- the first, a very simple approach, consists of dividing all the costs by the number of families settled;
- the second more complex approach, consists of identifying and evaluating all the physical needs required for the settlement of 50 families, which remains a durable social and economic unit.

These physical needs include studies, infrastructure, farm development, and establishment costs to which must be added the annual running costs of the extension services and the general costs of the Headquarters.

According to the first approach the cost of a migrant is $1300\text{ million} - $450 = 2.8$ million CFA and the second approach gives a figure of 700,000 CFA in the running phase of the project.

The use of these two different methods to evaluate the cost of a migrant shows a difference of over 2 million CFA.

The justification is very easy. In fact, the first method, which is global, integrates the costs related to:

- 1. Activities of which the results were not used in the installation of the settled families. This is the case of numerous sectorial studies already carried out:
- industrial afforestation studies
- tourism development studies
- mixed farming studies
- dan studies (Bagré).

2° Activities of which only a part of the results relate to the settlement of the 450 families: pedological and hydrogeological studies and preparation of basic documents through aerial photography - the majority of the results of which will be used for future settlements.

3° Heavy investments granted in the domain of basic equipment which will continue to serve for future settlements: garage equipment, public works material (construction material, road units), heavy agricultural equipment, (bulldozers, tractors, etc.), boring equipment, transport material and office equipment.

A rough evaluation of the cost of these studies and of the residual value of the real estate fixes the investments not related to the settlement of these families at 750 million. This amounts to $1,300 - 0.750 = 550$ million.

The cost of a migrant can thus be calculated at $550 \div 450 = 1.2$ million.

This figure still appears high, but it is perfectly justified for an experimental phase which is concerned less with achieving minimal costs than with refining the settlement procedures and acquiring different information which will enable costs to be reduced at a later stage during the operational phase of the project.